

**8th Sepex conference  
1st Joint conference of the EPS and SEPEX**

# **Book of Abstracts**

**Eds.**

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© **8th Sepex Conference**  
Ediciones Sider S.C. Granada  
1st edition: April 2010  
ISBN: 978-84-96876-81-1

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## Welcome

We warmly welcome you to the 1<sup>st</sup> Joint EPS/SEPEX Conference in Granada! We are delighted to have the opportunity to host such a historically relevant event, bringing together researchers from United Kingdom, Spain and other European countries.

It was 12 years ago that the first “real” SEPEX conference was held in Granada. At that time experimental psychology in Spain was represented by a small number of researchers and Spanish experimental psychology was not yet internationally known. Since then Spanish experimental psychology has grown enormously and our members now publish in prestigious international Journals and collaborate with our European partners on many research projects. The Spanish Society for Experimental Psychology was created in 1997 in an attempt to bring our efforts together and create a framework in which the Spanish scientific psychology could grow. We took other European Societies such as the Experimental Psychology Society as our models. For this reason it is a special joy for all Spanish experimental psychologists to host this Joint EPS/SEPEX meeting. We hope this is an opportunity to create stronger links and research collaborations between our two societies.

The organizing committee is proud to say that the meeting has attracted around 550 visitors with 466 contributions on a wide variety of current issues that share an experimental methodology.

As is traditional in SEPEX meetings, the Committee has invited leading international figures to give keynote lectures. Professor Susan Gathercole will be opening the conference with a talk on *Working memory deficits in slow learners: Risk factor or cognitive phenotype?* On Friday, Professor Nuria Sebastián-Gallés will give the SEPEX lecture *Sibboleth*. Professor Mark Johnson will close the meeting with the 7th EPS Mid Career Award lecture: *Understanding the “social brain”: A developmental cognitive neuroscience approach*, and Dr Michelle de Haan has been invited by the EPS to arrange a symposium to accompany this award lecture on *Developmental cognitive neuroscience*.

The present book contains a detailed programme of the Conference. Symposia, and thematic presentations have been distributed in five parallel sessions. Oral presentations (both in symposia and thematic sessions) are meant to last 20 minutes (15 minutes for the talks and 5 minutes for questions). Speakers are requested to adjust their talk to this limit out of courtesy to speakers in parallel sessions. Poster sessions are organized through the three conference days and will be held in a large hall close to the conference rooms. Participants are requested to put up their poster as early as possible on the day of their poster presentation (from 8 am onwards), so as to increase the opportunity for other participants to read it. Posters should be removed by the end of the day, but can stay on the panels until then. This way, conference participants can have a look at your poster before and after the poster session.

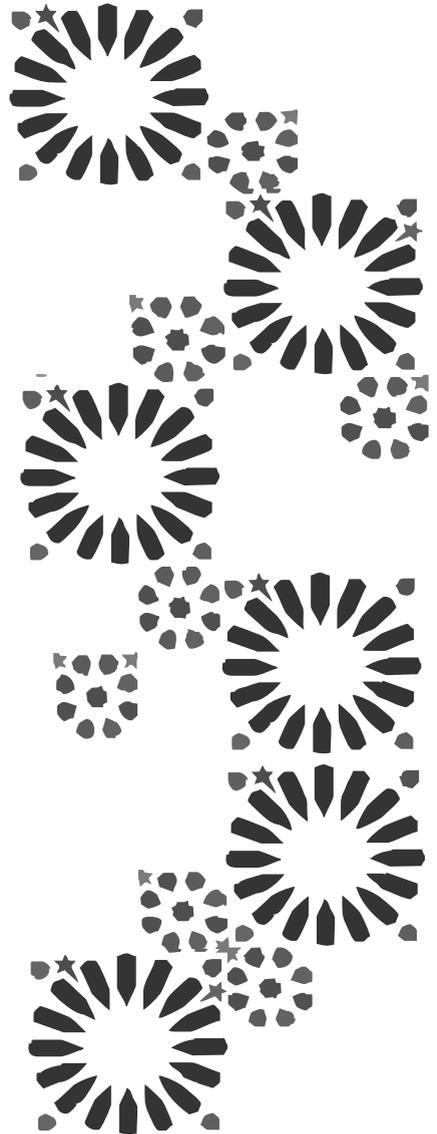
The book of abstracts is organised in three main sections: First, an overview of the program is provided. Then the full program is detailed, including the three poster sessions. Each contribution to a symposium, thematic session or poster is accompanied by a code

(For example ([3D5]). The first number corresponds to the session. The letter corresponds to the room in which the presentation will be delivered (A = Room Andalucía I & II; B = Room Andalucía III; C = Room Machuca; D = Room Manuel de Falla; E = Room Picasso) and the second number to the number of the paper in the session. Posters are coded according to session and number within the session, for example ([P3-85]). Following the program, the complete set of conference abstracts is provided. This is organised in four subsections: Keynote talks, Symposia, Thematic Sections, and Posters. The abstracts within each subsection are organised alphabetically. Finally, we have included a complete Author Index.

On behalf of SEPEX and the EPS we wish you an enjoyable conference and a wonderful stay in Granada.

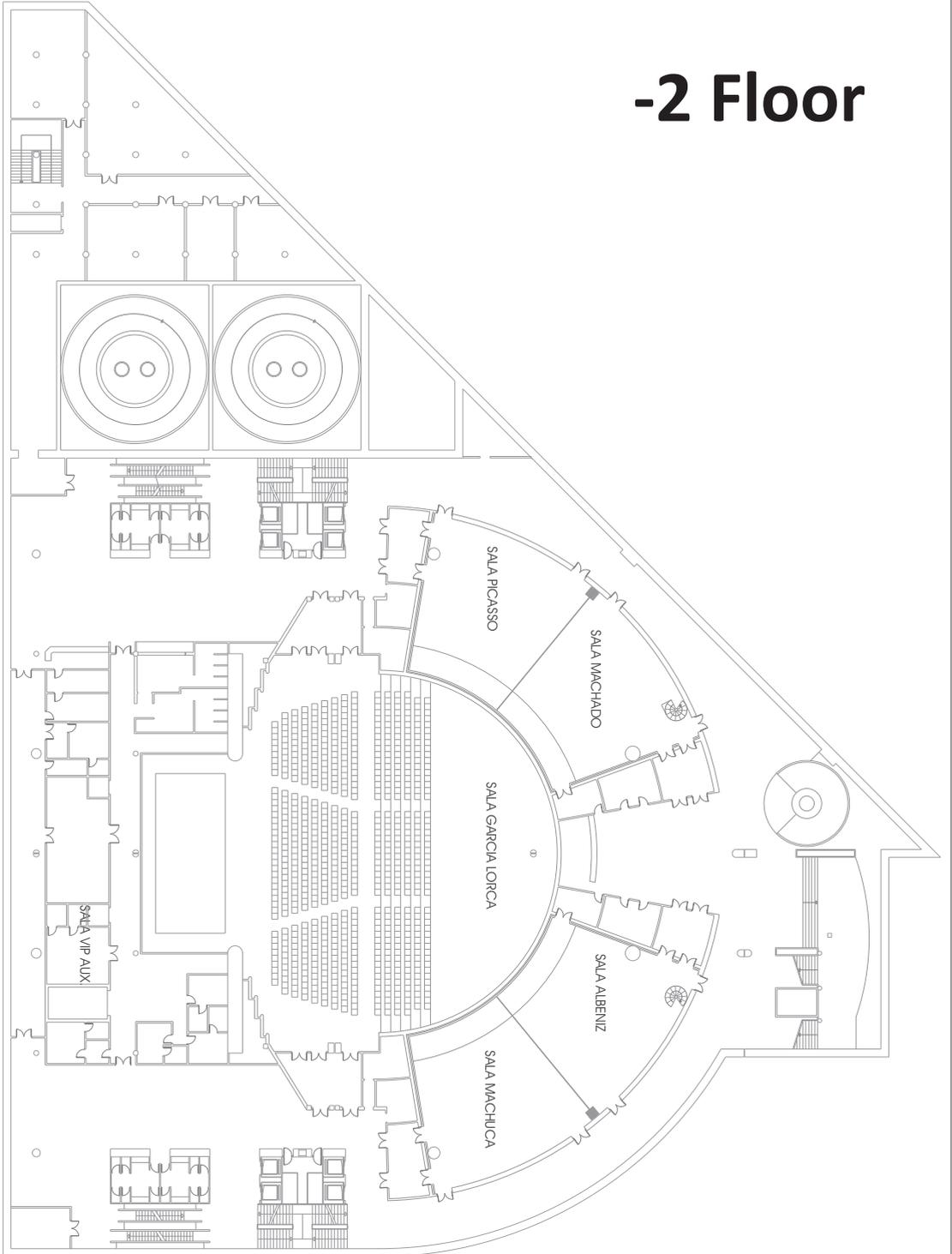
The organizing committee.

# MAPS





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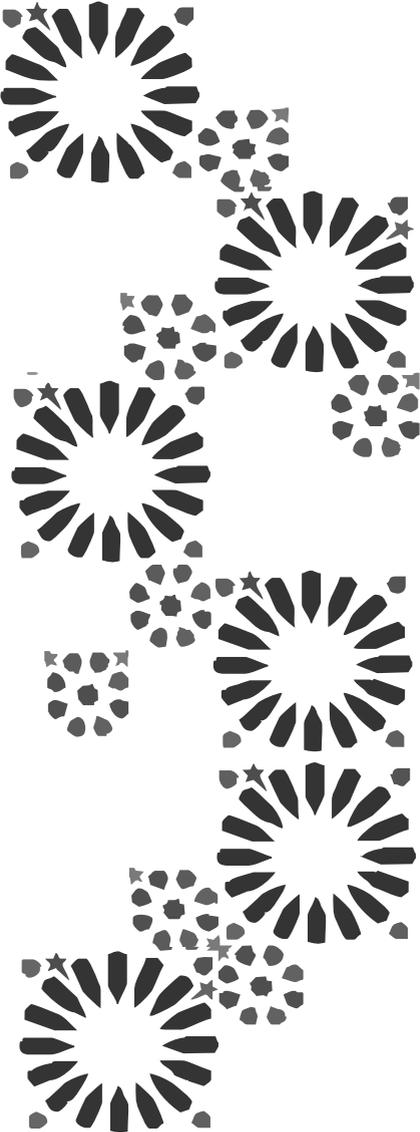
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# PROGRAMME OVERVIEW





## Thursday, 15 April

08:00 - 09:30

Registration

09:30-11:00

Opening and Key Note: Susan Gathercole

11:00-11:20

Coffee Break

	Room Andalucía I & II	Room Andalucía III	Room Machuca	Room Manuel de Falla	Room Picasso
	<p><b>Thematic Session 1A:</b> Bilingualism</p> <p><b>Chair:</b> Costa, A.</p> <p><b>[1A1]</b> Examining linguistic and contextual factors on the processing of two-digit number words <i>Macizo, P.; Herrera, A.; Martín, M.C.; Román, P.; Ramos, O.</i></p>	<p><b>Thematic Session 1B:</b> Face Processing</p> <p><b>Chair:</b> Caldara, R.</p> <p><b>[1B1]</b> Categorical perception for unfamiliar faces: effect of covert and overt face learning <i>Kikutani, M.; Roberson, D.; Hanley, J.R.</i></p>	<p><b>Thematic Session 1C:</b> Memory Disorders</p> <p><b>Chair:</b> Fernández, A.</p> <p><b>[1C1]</b> Attention effects on long-term memories during retrieval: A study with young and older adults <i>Mayas Arellano, J.; Fuentes, L.; Ballesteros, S.</i></p>	<p><b>Thematic Session 1D:</b> Language 1</p> <p><b>Chair:</b> Perea, M.</p> <p><b>[1D1]</b> Letter or graphemes? An examination of basic coding units in visual word recognition <i>Acha, J.; Perea, M.</i></p>	<p><b>Thematic Session 1E:</b> Attention 1</p> <p><b>Chair:</b> Lupiáñez, J.</p> <p><b>[1E1]</b> The role of cue-to-target translation in attention switching <i>Houghton, G.; Grange, J.G.</i></p>
11:20 – 11:40	<p><b>[1A2]</b> Bilingual advantage on executive control in absence of conflicting information <i>Hernández, M.; Costa, A.; Humphreys, G.W.</i></p>	<p><b>[1B2]</b> Specificity of face processing impairments in children with autism spectrum disorders <i>Ewing, L.; Pellicano, E.; Rhodes, G.</i></p>	<p><b>[1C2]</b> Recognition by familiarity in Parkinson's and Lewy-Body disease patients <i>Algarabel, S.; Rodriguez, L.; Escudero, J.; Fuentes, M.; Peset, V.; Pitarque, A.; Combita, L.M.; Mazón J.</i></p>	<p><b>[1D2]</b> Force dynamics and causal and adversative sentences comprehension <i>Morera, Y.; De Vega, M.</i></p>	<p><b>[1E2]</b> Attention enhances spatial and temporal resolution <i>Skarrat, P.A.; Cole, G.G.</i></p>
11:40 – 12:00					

	Room Andalucía I & II	Room Andalucía III	Room Machuca	Room Manuel de Falla	Room Picasso
12:00 – 12:20	[1A3] Highly-proficient bilinguals reconfigure semantic expectations faster than monolinguals during sentence reading <i>Martin, C.; Thierry, G.; Kuipers, J-R.; Costa, A.</i>	[1B3] Critical roles for right OFA and right pSTS in distinct face-processing tasks: An rTMS double dissociation <i>Atkinson, A.P.; Dzhelyova, M.P.; Ellison, A.</i>	[1C3] A comparison of memory and executive functions in Alzheimer disease and frontal variant of frontotemporal dementia <i>Sebastian, M.V. Hernández-Gil, L.</i>	[1D3] Subliminal semantic priming from novel prime words <i>Ortells, J.J.; Mari-Beffa, P.; Plaza-Ayllón, V.</i>	[1E3] What's in a name? Observers' name grab attention even subliminally <i>Vuong, Q.C.; Stranney, M.A.</i>
12:20 - 12:40	[1A4] Deterioration of the lexical representation in bilingual patients with dementia <i>Calabria, M.; Hernández, M.; Marne, P.; Juncadella, M.; Reñé, R.; Ugas, L.; Betran, S.; Costa, A.</i>	[1B4] Neural repetition suppression is abolished by other-race faces <i>Caldara, R.; Viziali, L.; Rousselet, G.</i>	[1C4] Long - term accelerated forgetting of verbal and non-verbal information in Temporal Lobe Epilepsy <i>Wilkinson, H.L.; Holdstock, J.S.; Baker, G., Herbert, A.; Clague, F., Downes, J.</i>	[1D4] Relative clause attachment to emotion nouns: an ERP study <i>Piñeiro, A.; Galdo, S.; Fraga, I.; Acuña, C.; Comesaña, M.</i>	[1E4] Links between working memory capacity and gesture rates <i>Melinger, A.; Keehner, M.</i>
12:40- 13:00	[1A5] Immersion in L2 and expertise in professional translation determine language activation and language selection <i>Martín, M.C., Macizo, P.; Bajo, M.T.</i>	[1B5] Culture impacts on extrafoveal information use for faces but not for visual scenes <i>Miellat, S.; Caldara, R.</i>	[1C5] A heritable verbal memory impairment in four living generations of the same family: Evidence from cognitive and neuroimaging analyses <i>Briscoe, J., Chilvers, R., Baldeweg, T., Skuse, D.</i>	[1D5] What information about pages of text is made explicit in the first steps of human vision? <i>Roger Watt</i>	[1E5] The distribution of exogenous and endogenous attention in visuo-spatial working memory <i>Botta, F.; Lupiáñez, J.</i>
13:00 – 14:40	<b>Lunch &amp; Break</b>				

	Room Andalucía I & II	Room Andalucía III	Room Machuca	Room Manuel de Falla	Room Picasso
	<p><b>Thematic Session 2A:</b> Memory 1 <b>Chair:</b> Jarrold, C.</p>	<p><b>Symposium:</b> Embodied robotics: From affordances to action <b>Chair:</b> Borghi, A.M.</p>	<p><b>Symposium:</b> The functioning of the Attentional Networks on different populations <b>Chair:</b> Lupiáñez, J. &amp; Fuentes, L.</p>	<p><b>Thematic Session 2D:</b> Language 2 <b>Chair:</b> Ruz, M.</p>	<p><b>Symposium:</b> Basic processes in learning <b>Chair:</b> Hall, G.</p>
14:40 - 15:00	<p><b>[2A1]</b> The Edinburgh Virtual Errands Task (EVET): An experimental study of the complexities of everyday cognition <i>Trawley, S.; Law, A.; Logie, R.</i></p>	<p><b>[2B1]</b> Overview of cognitive robotics networks in Europe <i>Borghi, A. M.</i></p>	<p><b>[2C1]</b> Anxiety, attention and processing styles <i>Pacheco, A.; Acosta, A.; Lupiáñez, J.</i></p>	<p><b>[2D1]</b> Specific Language Impairment as a phonological processing deficit: Evidence from data and computational modelling <i>Jones, G.</i></p>	<p><b>[2E1]</b> Encoding specificity in associative learning <i>Honey, R.C.; Lin, T.-C. E.</i></p>
15:00 – 15:20	<p><b>[2A2]</b> Specificity in autobiographical recall: Associations with episodic and short-term memory and with problem solving <i>Aizpurua, A.; Koutstaal, W.</i></p>	<p><b>[2B2]</b> The integration of action and language in cognitive robots <i>Morse, A.; Cangelosi, A.</i></p>	<p><b>[2C2]</b> Development of attention networks and their interactions during childhood <i>Pozuelos, J. P.; Paz-Alonso, P. M.; Combita, L. M.; Fuentes, L. J.; Rueda, M. R.</i></p>	<p><b>[2D2]</b> Implications of theory of mind and general intelligence on language comprehension in schizophrenia <i>Gavilán Ibañez, J.M.; García-Albea Ristol, J.E.</i></p>	<p><b>[2E2]</b> 6-hydroxydopamine lesions to the nucleus accumbens shell and core, comparison with the effects of amphetamine on latent inhibition and overshadowing <i>Nelson, A. J. D.; Thur, K. E.; Spicer, C.; Marsden, C. A.; Cassaday, H. J.</i></p>

	Room Andalucía I & II	Room Andalucía III	Room Machuca	Room Manuel de Falla	Room Picasso
15:20 – 15:40	<p><b>[2A3]</b> Do I have your memory? Joint memory effects on visual attention <i>Xun He; Sebanz, N.; Humphreys, G.W.</i></p>	<p><b>[2B3]</b> Neural structures for language-mediated perception and action <i>Buccino, G.</i></p>	<p><b>[2C3]</b> Detecting infrequent targets while measuring the three attentional networks <i>Roca, J.; Castro, C.; López-Ramón, M. F.; Lupiáñez, J.</i></p>	<p><b>[2D3]</b> Reading and comprehension monitoring in autism spectrum disorders <i>Saldaña, D.; Rodríguez, I.R.; Moreno, F.J.; Luque, A.; Aguilera, A.; González, I.</i></p>	<p><b>[2E3]</b> The role of GluA1 in recognition memory <i>Sanderson, D. J.</i></p>
15:40 – 16:00	<p><b>[2A4]</b> Memory and suggestion: influences of theory of mind and individual suggestibility <i>Pérez-Mata, N.; Moreno, A.; Diges, M.</i></p>	<p><b>[2B4]</b> The deeply immersed brain conjecture: embodiment in the visual system <i>Ellis, R.</i></p>	<p><b>[2C4]</b> Do the interactive effects between attentional networks vary as a function of WMC? An investigation utilising two versions of the ANT task <i>Ahmed, L.; de Fockert, J.</i></p>	<p><b>[2D4]</b> Inferences in language comprehension: Speed-accuracy-tradeoff experiments on Gricean implicatures <i>Bott, L.; Bailey, T.; Grodner, D.</i></p>	<p><b>[2E4]</b> Habituation to shock: roles of direct and associative activation <i>Hall, G.; Symonds, M.</i></p>
16:00 – 16:20	<p><b>[2A5]</b> Face naming and retrieval inhibition <i>Marful, A.; Paolieri, D.; Sanches Ferreira, C.; Bajo, M. T.</i></p>	<p><b>[2B5]</b> Studying the interplay of overt, covert and linguistic attention for action <i>Fischer, M.</i></p>	<p><b>[2C5]</b> The functioning of the attentional networks and the interaction between them, in patients diagnosed with Parkinson's Disease. <i>Rodríguez, L. A.; Funes, M. J.; Escudero, J.; Lupiáñez, J. (presenting author: Lupiáñez, J.)</i></p>	<p><b>[2D5]</b> More than the sum of the parts: the combined effect of connectives and word frequency on poor readers' text comprehension <i>Fajardo, I.; Ávila, V.; Tavares, G.; Ferrer, A.</i></p>	<p><b>[2E5]</b> Extinction does not generally change context processing. <i>Nelson, B.</i></p>

	Room Andalucía I & II	Room Andalucía III	Room Machuca	Room Manuel de Falla	Room Picasso
16:20 – 16:40			<p><b>[2C6]</b> Attention deficits in Alzheimer' disease and dementia with Lewy Bodies</p> <p><i>Fernández, P.J.; Campoy, G; Antequera, M, García-Sevilla, J; Antúnez, C.; Fuentes, L. J. (presenting author: Fuentes, L.J.)</i></p>		
16:20 - 17:40	<b>Poster I &amp; Coffee Break</b>				
	<p><b>Thematic Session 3A:</b> Learning 1 <b>Chair:</b> Pellón, R.</p>	<p><b>Thematic Session 3B:</b> Social 1 <b>Chair:</b> Samson, D.</p>	<p><b>Symposium:</b> Development of control and memory processes: A Cognitive Neuroscience approach <b>Chair:</b> Rueda, R. &amp; Gómez-Ariza; C.</p>	<p><b>Thematic Session 3D:</b> Language 3 <b>Chair:</b> Vega, M.</p>	<p><b>Thematic Session 3E:</b> Attention 2 <b>Chair:</b> Botella, J.</p>
17:40 – 18:00	<p><b>[3A1]</b> What is contingency information used for? A study on preparation behavior <i>Blanco, F.; Matute, H.; Vadillo, M.A.</i></p>	<p><b>[3B1]</b> A causal network model of alibi evidence <i>Lagnado, D.</i></p>	<p><b>[3C1]</b> incidental recognition memory in developmental amnesia <i>Munoz, M.; Chadwick, M.; Perez-Hernandez, E.; Mishkin, M.; Vargha-Khadem, F.</i></p>	<p><b>[3D1]</b> Pictures speak louder than numbers: on communicating medical risks to immigrants with limited non-native language proficiency <i>García-Retamero, R.; Dharmi, M.K.; Galesic, M.</i></p>	<p><b>[3E1]</b> The attentional blink as reflected by illusory conjunctions <i>Botella, J.; Privado, J.; Gil-Gómez de Liaño, B.</i></p>

	Room Andalucía I & II	Room Andalucía III	Room Machuca	Room Manuel de Falla	Room Picasso
18:00 – 18:20	<p><b>[3A2]</b> Gender differences in a virtual Morris water task <i>Chamizo, V.D.; Artigas, A.A.; Sansa, J.; Banterla, F.</i></p>	<p><b>[3B2]</b> The dice are cast: The effects of intended versus actual contribution on responsibility attributions <i>Gerstenberg, T.; Lagnado, D. A.; Kareev, Y.</i></p>	<p><b>[3C2]</b> Error-detection and self-regulation throughout development <i>Rueda, M. R.; Checa, P.</i></p>	<p><b>[3D2]</b> The asymmetric nature of agreement computation: Evidence from Spanish <i>Molinero, N.; Barber, H.A.; Mancini, S.; Carreiras, M.</i></p>	<p><b>[3E2]</b> Does attention move or spread when tracing lines? <i>Crundall, D.</i></p>
18:20 - 18:40	<p><b>[3A3]</b> Blocking of conditioned inhibition in human causal learning: Effects of different outcome continua <i>Lotz, A.; Vervliet, B.; Lachnit, H.</i></p>	<p><b>[3B3]</b> Desire for revenge against another person modulates the ability to take the other person's perspective in a simple visual perspective taking task <i>Samson, D.; Chipchase, S.</i></p>	<p><b>[3C3]</b> Are children able to reject false memories? <i>Carneiro, P.; Fernandez, A.</i></p>	<p><b>[3D3]</b> Hands on the future: selective increase of cortico-spinal facilitation when reading the future tense of hand-related action verbs <i>Leone, B.; Carreiras, M.; Candidi, M.; Aglioti, S.M.; Barber, H.</i></p>	<p><b>[3E3]</b> The role of individual differences in distractibility upon visual selection attention under high and low perceptual load <i>Judge, J.; Harris, R.; Taylor, P.J.</i></p>
18:40 - 19:00	<p><b>[3A4]</b> Perception of contingency in classical conditioning: From associative learning to psychophysics <i>Carnero, S.; Acebes, F.; Moris, J.; Solar, P.; Loy, I.</i></p>	<p><b>[3B4]</b> Socially modulated inhibition of return <i>Cole, G. G.; Skarratt, P. A.; Kingstone, A.</i></p>	<p><b>[3C4]</b> Developmental changes in overcoming proactive interference: Behavioral and neural correlates <i>Paz-Alonso, P. M.</i></p>	<p><b>[3D4]</b> Attentional effects in conceptual metaphor congruency tasks: A test of the Coherent Working Models theory <i>Santiago, J.; Ouellet, M.; Román, A.; Valenzuela, J.</i></p>	<p><b>[3E4]</b> Stimulus competition for attentional capacity: perceptual load vs. dilution <i>Lavie, N.; Torralbo, A.</i></p>

	Room Andalucía I & II	Room Andalucía III	Room Machuca	Room Manuel de Falla	Room Picasso
19:00 – 19:20	<p><b>[3A5]</b> Interferences between predictors and causes in cue competition</p> <p><i>Thorwart, A.; Lotz, A.; Lachnit, H.</i></p>	<p><b>[3B5]</b> Social cues modulate attentional control</p> <p><i>Rodríguez-Bailón, R.; Jiménez, G.; Cañadas, E.; Lupiáñez, J.</i></p>	<p><b>[3C5]</b> The development of inhibitory control of memory: Evidence from retrieval-induced forgetting</p> <p><i>Ortega, A.; Luque, C.; Román, P. E.; Gómez-Ariza, C.,J.; Bajo, M. T.</i></p>	<p><b>[3D5]</b> Speaker's alignment in spatial communication by pointing and direction words</p> <p><i>Rodrigo, M.J.; De Vega, M.; Padrón, I.</i></p>	<p><b>[3E5]</b> Consolidation of implicit sequence knowledge</p> <p><i>Coomans, D.; Deroost, N.; Vandenbossche, J.; Zeischka, P.; Soetens, E.</i></p>
19:20 – 19:40		<p><b>[3B6]</b> Eye movements in Aspergers Syndrome for complex scene inspection</p> <p><i>Benson, V., Castlehano, M., Yeung, S.A; Rayner, K.</i></p>			



## Friday, 16 April

	Room Andalucía I & II	Room Andalucía III	Room Machuca	Room Manuel de Falla	Room Picasso
	<p><b>Thematic Session 4A:</b> Memory 2 <b>Chair:</b> Logie, B.</p>	<p><b>Symposium:</b> Human causal learning: Going beyond the contingency-based framework <b>Chair:</b> Greville, W.J. &amp; Buehner, M.J.</p>	<p><b>Symposium:</b> The hypnotizable brain <b>Chair:</b> Naish, P.</p>	<p><b>Symposium:</b> Orthographic processing in visual word recognition <b>Chair:</b> Carreiras, M.</p>	<p><b>Thematic Session 4E:</b> Emotion <b>Chair:</b> Chapman, P.</p>
8:20 - 8:40	<p><b>[4A1]</b> How does processing affect storage in working memory tasks? Evidence for both domain-general and domain-specific effects <i>Jarrod, C.; Tam, H.; Baddeley, A.; Harvey, E.</i></p>	<p><b>[4B1]</b> Temporal predictability facilitates human causal learning <i>Greville, W. J.; Buehner, M. J.</i></p>	<p><b>[4C1]</b> Hypnosis, hallucinations and hemispheric differences <i>Naish, P.</i></p>	<p><b>[4D1]</b> A dual-route theory of orthographic processing <i>Grainger, J.</i></p>	<p><b>[4E1]</b> Perception of the duration of emotionally- evocative stimuli <i>Wearden, J.</i></p>
8:40 - 9:00	<p><b>[4A2]</b> Mental rotation in a dynamic spatial test: SDT 2.0 <i>Martinez-Molina, A.; Contreras, M. J.; Shih, P. C.; Colom, R.; Santacreu, J.</i></p>	<p><b>[4B2]</b> Real-time causal inference <i>Speekenbrink, M.; Lagnado, D.</i></p>	<p><b>[4C2]</b> Fixational eye- movements during hypnotic induction <i>Lamas, J. R.; Blanco, M. J.</i></p>	<p><b>[4D2]</b> The search of an input coding scheme: Transposed-letter priming in Arabic <i>Perea, M.; Abu Mallouh, R.; Carreiras, M.</i></p>	<p><b>[4E2]</b> Memory for emotional pictures depends on the distribution of central information in the scene <i>Chapman, P.</i></p>
9:00 - 9:20	<p><b>[4A3]</b> Representational pseudoneglect in an auditory-driven spatial working memory task <i>Brooks, J.; Logie, R.; McIntosh, R.; Della Sala, S.</i></p>	<p><b>[4B3]</b> Children's use of temporal information in making causal structure judgments <i>McCormack, T.; Frosh, C.; Lagnado, D.; Burns, P.</i></p>	<p><b>[4C3]</b> The valencia model of waking hypnosis: Theory and experimental basis <i>Mendoza, M. E.; Capafons, A.</i></p>	<p><b>[4D3]</b> What do nonword rejection times tell us about the orthographic code? <i>Brybaert, M.; Keuleers, E.</i></p>	<p><b>[4E3]</b> Individual differences in early imitation are associated with temperament <i>Hilbrink, E.; Gattis, M.; Ellis, K.; Fowler, N.; Sakkalou, E.</i></p>

	Room Andalucía I & II	Room Andalucía III	Room Machuca	Room Manuel de Falla	Room Picasso
9:20 - 9:40	<b>[4A4]</b> Autobiographical memory for trauma. <i>Manzanero, A. L., Aróztegui, J., El-Astal, S.</i>	<b>[4B4]</b> Models of elemental diagnostic reasoning <i>Waldmann, M. R., Meder, B.; Mayrhofer, R.</i>	<b>[4C4]</b> Does the addition of hypnosis to pain-modifying suggestions create an altered state of consciousness? <i>Derbyshire, S.</i>	<b>[4D4]</b> The recognition of mirror-letters and mirror-words: Insights from the masked priming paradigm. <i>Duñabeitia, J. A., Molinaro, N.; Carreiras, M.</i>	<b>[4E4]</b> Emotional Intelligence and attentional control processes: Temporal preparation in a go-nogo task <i>Pérez-Dueñas, C.; Acosta, A.; Correa, A.; Lupiáñez, J.</i>
9:40 – 10:00	<b>[4A5]</b> Greater distractor processing under high cognitive load can lead to better task performance <i>Fockert, J. W.; Bremner, A.</i>	<b>[4B5]</b> Detrimental impact of delay is mediated through trial structure information in human causal learning <i>Buehner, M.; Greville, W. J.; Hohansen, M.; Cassar, A.</i>	<b>[4C5]</b> The 'cold control' theory of hypnosis <i>Dienes, Z.</i>	<b>[4D5]</b> Modeling priming effects in visual-word recognition with the diffusion model <i>Gomez, P.; Perea, M.</i>	<b>[4E5]</b> Emotional conflict in economic games: An fMRI and HD-ERP investigation <i>Ruz, M.; Madrid, E.; Tudela, P.</i>
10:00 – 11:00	<b>Poster II &amp; Coffee Break</b>				
	<b>Thematic Session 5A:</b> Memory & Decision <b>Chair:</b> Higham, P. A.	<b>Symposium:</b> Recent advances in the relation between perception and action <b>Chair:</b> López-Moliner, J.	<b>Symposium:</b> Neural oscillatory activity underlying human memory <b>Chair:</b> Fuentemilla, L.	<b>Symposium:</b> Orthographic processing: From letters to lexical activation <b>Chair:</b> Pitchford, N.J.	<b>Thematic Session 5E:</b> Learning 2 <b>Chair:</b> Chamizo, V.

	Room Andalucía I & II	Room Andalucía III	Room Machuca	Room Manuel de Falla	Room Picasso
11:00 - 11:20	<p>[5A1] Dissociating sequential effects from explicit expectancies: towards a model of sequential decision making</p> <p><i>Tubau, E.; López-Moliner, J.; Supér, H.</i></p>	<p>[5B1] Sub-cortical processing of imminent collision in humans</p> <p><i>Billington, J.; Field, D. T.; Wilkie, R. M.; Wann, J. P.</i></p>	<p>[5C1] Distraction improves memory</p> <p><i>Cashdollar, N.; Lavie, N.; Duzel, E.</i></p>	<p>[5D1] Using rotation to determine the reading grain size for regular and irregular English words</p> <p><i>Riddell, P.; Pye, R.; Gibbons, W.</i></p>	<p>[5E1] Internet-based experimenting: Methods and experiences</p> <p><i>Reips, U.</i></p>
11:20 - 11:40	<p>[5A2] Can 'Pure' Implicit Memory Be Isolated? A Test of a Single-System Model of Recognition and Repetition Priming</p> <p><i>Berry, Ch. J.; Shanks, D.R.; Li, S.; Rains, L. S.; Henson, R.N.A.</i></p>	<p>[5B2] An ecological/dynamical analysis of perception-action couplings and changes therein</p> <p><i>Jacobs, D. M.</i></p>	<p>[5C2] Age-related benefits of semantic encoding of associative memories is manifested in power modulations of alpha oscillations</p> <p><i>Crespo-García, M.; Cantero, J. L.; Atienza, M.</i></p>	<p>[5D2] Inhibitory effects of exterior letter frequency on visual word recognition: differential patterns across English and Greek</p> <p><i>Pitchford, N. J.; Ktori, M.; van Heuven, W.</i></p>	<p>[5E2] Cue-density effects on outcome prediction and causal judgment</p> <p><i>Vadillo, M.A.; Musca, S. C.; Blanco, F.; Matute, H.</i></p>
11:40 - 12:00	<p>[5A3] Deciding how to use memory: The distinctiveness heuristic</p> <p><i>Verde, M.F.</i></p>	<p>[5B3] A Bayesian approach of interceptive timing</p> <p><i>López-Moliner, J.</i></p>	<p>[5C3] Neural reactivation of context-specific information in associative recognition memory</p> <p><i>Fuentemilla, L.; Penny, W. D.; Jafarpour, A.; Bunzeck, N.; Düzel, E.</i></p>	<p>[5D3] Orthographic priming effects in eye movements while reading</p> <p><i>Paterson, K.</i></p>	<p>[5E3] Investigating stimulus novelty and familiarity using a three-stage procedure: Tests of lesions of the perirhinal cortex, and systemic scopolamine administration.</p> <p><i>Whitt, E.J.; Robinson, J.; Jones, P. M.</i></p>

	Room Andalucía I & II	Room Andalucía III	Room Machuca	Room Manuel de Falla	Room Picasso
12:00 - 12:20	<p><b>[5A4]</b> Memory for radio advertisements: effect of program congruence, typicality and divided attention</p> <p><i>Martin Luengo, B.; Migueles Seco, M.</i></p>	<p><b>[5B4]</b> Dynamical factors in action selection: The selection of head and eye movements when controlling reaching movements.</p> <p><i>Mon-Williams, M.; Wilkie, W.</i></p>	<p><b>[5C4]</b> Oscillatory activity during the maintenance of verbal-spatial bound representations</p> <p><i>Poch, C.; Campo, P.; Parmentier, F. B. R.; Ruiz-Vargas, J. M.; Eilsley, J. V.; del Pozo, F.; Maestú, F.</i></p>	<p><b>[5D4]</b> Eye movements of second language learners when reading spaced and unspaced Chinese text</p> <p><i>Liversedge, S. P.; Shen, D.; Tian, J.; Zang, C.; Cui, L.; Bai, X.; Yan, G.; Rayner, K.</i></p>	<p><b>[5E4]</b> Training and instructions modulate context processing in human predictive learning</p> <p><i>Rosas, J.M.; León, S.P.; Callejas Aguilera, J.E.</i></p>
12:20 - 12:40	<p><b>[5A5]</b> Applying Type-2 Signal Detection Theory to Investigate Differences Between Regular Gamblers and Non-Gamblers</p> <p><i>Lueddeke, S.E.; Higham, P.A.</i></p>	<p><b>[5B5]</b> Dynamic gaze patterns for dynamic actions: The role of head and eye movements in controlling locomotor steering.</p> <p><i>Wilkie, R.M.; Kountouriotis; G.K.; Woodgate, P.; Hostler, T.</i></p>		<p><b>[5D5]</b> Backpropagation and holographic coding: an empirical correspondence</p> <p><i>Hannagan, T.; Dandurand, F.; Grainger, J.</i></p>	<p><b>[5E5]</b> Adjunctive behaviour is reinforced behaviour</p> <p><i>Pellón, R.</i></p>
12:40 – 13:40	<b>Núria Sebastián (SEPEX Conference)</b>				
13:40 – 15:20	<b>Lunch &amp; Break</b>				

	Room Andalucía I & II	Room Andalucía III	Room Machuca	Room Manuel de Falla	Room Picasso
	<p><b>Symposium:</b> Perceiving and representing faces <b>Chair:</b> Calder, A &amp; Pellicano, L.</p>	<p><b>Thematic Session 6B:</b> Perception 1 <b>Chair:</b> Ballesteros, S.</p>	<p><b>Symposium:</b> The processing and representation of numerals <b>Chair:</b> Herrera, A.</p>	<p><b>Symposium:</b> The impact of vocabulary growth on lexical processing and memory <b>Chair:</b> Raman, I. &amp; Ellis, A.</p>	<p><b>Symposium:</b> The use of social cues for the perception of others' actions and perspectives <b>Chair:</b> Wang, J &amp; Samson, D.</p>
15:20 - 15:40	<p><b>[6A1]</b> Human faces are represented holistically: Evidence from gaze-contingency <i>Rossion, B.; Van Belle, G.; Busigny, T.; Lefèvre, P., de Graef, P.; Verfaillie, K.</i></p>	<p><b>[6B1]</b> The Horizontal-Vertical Illusion in the haptic modality across lifespan <i>Ballesteros, S.; Mayas, J.; Reales, J. M.; Heller, M. A.</i></p>	<p><b>[6C1]</b> A spatial orientation of the number magnitude in preschoolers <i>Noël, M. P.</i></p>	<p><b>[6D1]</b> Spanish oral reading is flexible and influenced by lexical factors like age of acquisition <i>Davies, R.; Barbon, A.; Cuetos, F.</i></p>	<p><b>[6E1]</b> Automatic level-1 visual perspective taking in adults- do the effects go beyond subitizing and information selection? <i>Wang, J. J.; Apperly, I. A.</i></p>
15:40 - 16:00	<p><b>[6A2]</b> Adaptive norm-based coding of faces, or why faces don't all look the same <i>Rhodes, G.; Jaquet, E.; Jeffery, L.; Evangelista, E.</i></p>	<p><b>[6B2]</b> Developmental of visual and proprioceptive contributions to perceived hand position in early childhood <i>Bremner, A. J.; Hill, E. L.; Pratt, M.; Spence, C.</i></p>	<p><b>[6C2]</b> Understanding the real value of fractions <i>Butterworth, B; Iuculano, T.</i></p>	<p><b>[6D2]</b> Strategic control and age of acquisition effects in visual word recognition <i>Raman, I.</i></p>	<p><b>[6E2]</b> Perspective taking in children and adults- the Level-1/ Level-2 distinction provides a limit on efficient perspective taking <i>Surtees, A. D. R.; Apperly, I. A.</i></p>

	Room Andalucía I & II	Room Andalucía III	Room Machuca	Room Manuel de Falla	Room Picasso
16:00 - 16:20	<p><b>[6A3]</b> Capturing within-person variability in face representations <i>Burton, M.; Jenkins, R.</i></p>	<p><b>[6B3]</b> Tracking down the time course of spatial remapping of touch: Evidence from saccadic latencies and evoked potentials <i>Soto-Faraco, S.; Overvliet, K. E.; Azañón, E.; Calabresi, M.</i></p>	<p><b>[6C3]</b> Processing fractions and negative numbers <i>Ganor-Stern, D.</i></p>	<p><b>[6D3]</b> Can childhood frequencies replace age-of-acquisition ratings? <i>Brybaert, M.; Keuleers, E.</i></p>	<p><b>[6E3]</b> The influence of observing others on visuo-spatial perspective taking and gaze following <i>Zwikel, J.; Müller, H. J.</i></p>
16:20 - 16:40	<p><b>[6A4]</b> Mechanisms underlying the perception of gaze direction <i>Calder, A. J.; Keane, J.</i></p>	<p><b>[6B4]</b> Virtual lesions of right parietal cortex disrupt spatial compatibility effects <i>Valle-Inclán, F.; Fernández del Olmo, M.; Blanco, M.</i></p>	<p><b>[6C4]</b> Position coding in two-digit Arabic numbers <i>García-Orza, J; Valle, L.; Perea, M.</i></p>	<p><b>[6D4]</b> Simulating age/order of acquisition effects in word production and comprehension through cumulative learning of foreign words in the lab <i>Izura, C.; Perez, M. A.; Agallou, E.; Wright, V.; Marin, J.; Ellis, A.</i></p>	<p><b>[6E4]</b> The role of low- and high-level social cues in anticipating other's actions <i>Jellema, T.; Palumbo, L.</i></p>
16:40 - 17:00	<p><b>[6A5]</b> Eye-gaze aftereffects in autism: Further evidence of weakened adaptive mechanisms <i>Pellicano, E.; Rhodes, G.</i></p>	<p><b>[6B5]</b> The role of the posterior parietal cortex in the remapping of touch <i>Azañón, E.; Longo, M. R.; Haggard, P.; Soto-Faraco, S.</i></p>	<p><b>[6C5]</b> Semantic processing in the production of numerals across notations <i>Herrera, A.; Macizo, P.</i></p>	<p><b>[6D5]</b> Cue utilisation and judgments of learning: What can we learn from an integrative approach? <i>Illman, I.; Morrison, C. M.</i></p>	<p><b>[6E5]</b> The neural correlates of Fitts's law in an action observation task: an fMRI study <i>Eskenazi, T.; Rotshtein, P.; Grosjean, M.; Knoblich, G.</i></p>
17:00 – 17:20	<b>Coffee Break</b>				

Room Andalucía I & II	Room Andalucía III	Room Machuca	Room Manuel de Falla	Room Picasso
<p><b>Symposium:</b> Experimental and clinical psychology: Building bridges for knowledge <b>Chair:</b> Vázquez, C.</p>	<p><b>Symposium:</b> Exploring the self through ownership: Cognitive, neural and developmental perspectives <b>Chair:</b> Cunningham, S.</p>	<p><b>Symposium:</b> The development of counterfactual emotions into adulthood <b>Chair:</b> Weisberg, D.P. &amp; Burns, P.</p>	<p><b>Thematic Session 7D:</b> Language Comprehension <b>Organizer:</b> Cuetos, F.</p>	<p><b>Thematic Session 7E:</b> Visual perception <b>Organizer:</b> Gellatly, A.</p>
<p><b>[7A1]</b> Inhibitory control in memory in mental disorders <i>Soriano, M. F.; Ros, M. J.; Bajo, M. T</i> <i>.(Presenting author: Bajo, M.T.)</i></p>	<p><b>[7B1]</b> Minimal ownership: cognitive effects and underlying mechanisms <i>Van den Bos, M.</i></p>	<p><b>[7C1]</b> Executive control and complex emotions in children: switching predicts the experience of regret <i>Burns, P.; Beck, S. R.; Riggs, K. J.</i></p>	<p><b>[7D1]</b> The role of question format and text availability on Reading Comprehension Assessment <i>Ferrer, A.; Vidal-Abarca, E.; Mañá, A.; Llorens, A.C.</i></p>	<p><b>[7E1]</b> The Venus effect in paintings, photographs, and real rooms <i>Bertamini, M.; Lawson, R.</i></p>
<p><b>[7A2]</b> Is there a mood congruent effect in cognitive processing beyond awareness? Empirical evidence for implicit memory biases in depression using a lexical decision task <i>Romero, N.; Vázquez, C.; Sánchez, A. (Presenting author: Vazquez,C.)</i></p>	<p><b>[7B2]</b> Exploring the neural substrates of self-ownership and memory <i>Turk, D. J.</i></p>	<p><b>[7C2]</b> Choosing to Regret: The effect of choice on children's early experience of regret and relief <i>Weisberg, D. P.; Beck, S. R.</i></p>	<p><b>[7D2]</b> Predictive inferences activation during reading: Analysis of the causal powers components in global coherence <i>Escudero, I.; León, J.A.</i></p>	<p><b>[7E2]</b> Mechanisms underlying the development of probabilistic cuing in large-scale environmental search <i>Smith, A. D.; Pellicano, L.; Briscoe, J.; Cristino, F.; Gilchrist, I. D.; Hood B. M.</i></p>
<p>17:20 - 17:40</p>				
<p>17:40 - 18:00</p>				

	Room Andalucía I & II	Room Andalucía III	Room Machuca	Room Manuel de Falla	Room Picasso
18:00 - 18:20	<p><b>[7A3]</b> Do we pay attention to the positive because we are happy, or is it the other way around? Attentional biases and mood regulation: an eye-tracking study <i>Sánchez, A.; Vázquez, C.; Romero, N.; Hervás, G.</i></p>	<p><b>[7B3]</b> The object of my attention: An ERP study of self-relevant information processing <i>Handy, T. C.</i></p>	<p><b>[7C3]</b> The role of understanding of expectations and counterfactual thoughts in children's understanding of emotions <i>Ferrell, J. M.; Guttentag, R.</i></p>	<p><b>[7D3]</b> The comprehension of deictic sentences is modulated by the reader's location <i>De Vega, M.; Castillo, D., Junco, J.</i></p>	<p><b>[7E3]</b> Searching scenes for targets: The effect of scene priming on eye movements. <i>Hillstrom, A. P.; Scholey, H.; Liversedge, S.</i></p>
18:20 - 18:40	<p><b>[7A4]</b> Anxiety-related interpretative biases in older adults <i>Cabrera, I.; Montorio, I.; Herrera, S.</i></p>	<p><b>[7B4]</b> A world of my own: The emergence of ownership effects in childhood <i>Cunningham, S. J.</i></p>	<p><b>[7C4]</b> When the alternative had been better - counterfactual reasoning and the emergence of regret <i>Rafetseder, E.; Perner, J.</i></p>	<p><b>[7D4]</b> Monitoring the penalization of ambiguity in vector model representations <i>Jorge-Botana, G.; Olmos, R.; León, J.A.</i></p>	<p><b>[7E4]</b> Visual awareness of objects and object features as revealed by an abrupt cueing task. <i>Pilling, M.; Gellatly, A.</i></p>
18:40 - 19:00	<p><b>[7A5]</b> Influence of positive and negative emotions over the eating behaviour in "emotional eaters" <i>Baños, R.; Cebolla, A.; Etchemendy, E.; Felipe, S.; Pérez, I.; Botella, C.</i></p>	<p><b>[7B5]</b> Blowing up Teddy: Implications of unique identity and ownership on cognitive biases <i>Gjerroe, N. L.; Hood, B. M.</i></p>	<p><b>[7C5]</b> Counterfactual thinking and the amplification of regret <i>Zeelenberg, M.</i></p>	<p><b>[7D5]</b> Looking what we are not told: Eye movements and the topic of negative sentences <i>Orenes, I.; Duñabeitia, J.A.; Beltrán, D.; Santamaría, C.</i></p>	<p><b>[7E5]</b> Interaction between intrinsic and extrinsic principles of perceptual grouping in vision <i>Montoro, P.R.; Luna, D.</i></p>
19:00 – 20:00	<b>Business Meeting: SEPEX (Picasso); EPS (Machuca)</b>				

## Saturday, 17 April

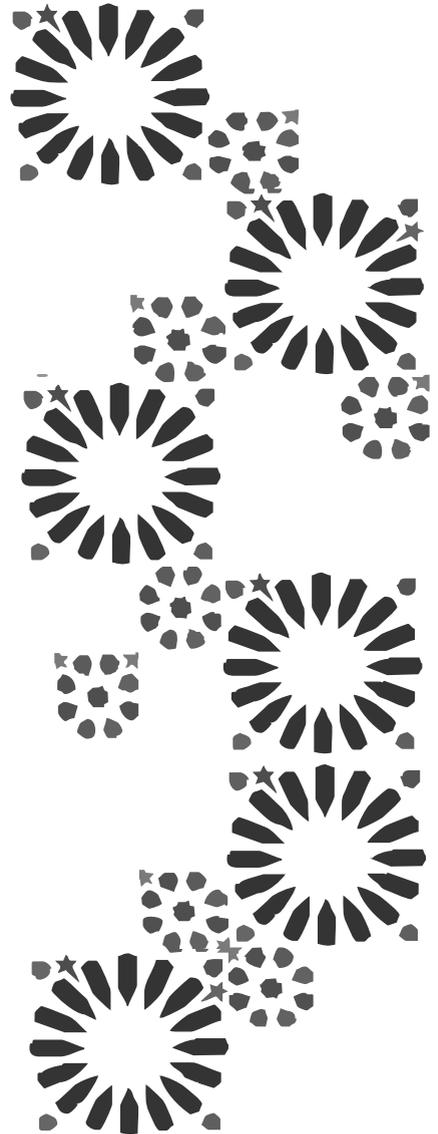
	Room Andalucía I & II	Room Andalucía III	Room Machuca	Room Manuel de Falla	Room Picasso
	<p><b>Thematic Session 8A:</b> Cognitive Disorders <b>Chair:</b> Correa, A</p> <p><b>[8A1]</b> Visuomotor feedback training results in long term improvements in activities of daily living in patients with hemispatial neglect <i>Harvey, M.; Muir, K.; Reeves, I.; Duncan, G.; Birschel, P.; Roberts, M.; Livingstone, K.; Jackson, H.; Hogg, C.; Castle, P.; Learmonth G.; Rossit, S.</i></p>	<p><b>Thematic Session 8B:</b> Thinking <b>Organizer:</b> McCloy, R.</p> <p><b>[8B1]</b> Children's understanding of counterfactual alternatives <i>McCloy, R.; Strange, P.; Mason-Apps, E.</i></p>	<p><b>Thematic Session 8C:</b> Social 2 <b>Chair:</b> Rodríguez, R.</p> <p><b>[8C1]</b> How to distinguish between knowledge-based and recognition-based decisions: Discrimination Index <i>Bearman, C. P.; Smith, P. T.</i></p>	<p><b>Thematic Session 8D:</b> Language 4 <b>Chair:</b> Izura, C.</p> <p><b>[8D1]</b> Phonological priming in Tip-Of-the-Tongue states resolution: The role of syllabic position and word length in a European Portuguese study <i>Pureza, R.; Carvalho Soares, A.P.; Comesaña Vila, M.</i></p>	<p><b>Thematic Session 8E:</b> Perception 2 <b>Chair:</b> Roberson, D.</p> <p><b>[8E1]</b> Is that blue or green? Categorical perception and discrimination thresholds for color <i>Roberson, D.; Hanley, R.; Pak, H.</i></p>
9:00 - 9:20					
	<p><b>[8A2]</b> ERP evidence of differences in visual verification for high schizotypal people <i>Santamaría, C.; Orenes, I.; Navarrete, G.; Beltrán, D.</i></p>	<p><b>[8B2]</b> Situational self-awareness influences 3- and 4-year-olds' prosocial self-regulation <i>Ross, J.; Anderson, J. R.; Campbell R. N.</i></p>	<p><b>[8C2]</b> Predicting group processes from personality dissimilarity <i>Solanas, A.; Manolov, R.; Leiva, D.; Andrés, A.</i></p>	<p><b>[8D2]</b> Polysemy advantage: automatic process or sensitive to grammatical context? <i>Jager, B.; Cleland, S.</i></p>	<p><b>[8E2]</b> The psychometrics of photographic cropping <i>McManus, C.</i></p>
9:20 - 9:40					

	Room Andalucía I & II	Room Andalucía III	Room Machuca	Room Manuel de Falla	Room Picasso
9:40 - 10:00	<p><b>[8A3]</b> Interference control in Parkinson's disease and freezing of gait</p> <p><i>Vandenbosch, J.; Zeischka, P.; Coomans, D.; Vercruyse, S.; Spildooren, J.; Deroost, N.; Soetens, E.; Kerckhofs, E.</i></p>	<p><b>[8B3]</b> Task switching, inhibition, and executive control in children with autism.</p> <p><i>Stoet, G.; López, B.</i></p>	<p><b>[8C3]</b> Goal-directed behaviour in human drug users</p> <p><i>Blundell, P.</i></p>	<p><b>[8D3]</b> Early word learning in nine-month-olds: Dynamics of picture-word priming</p> <p><i>Junge, C.; Hagoort, P.; Cutler, A.</i></p>	<p><b>[8E3]</b> How far we can see? The apparent horizon and the inherent geometry of the Visual Space</p> <p><i>Aznar-Casanova, J. A.</i></p>
10:00 - 10:20	<p><b>[8A4]</b> What paranoia has to do with depression? Avoidance of threatening faces is increased by depression-related primes</p> <p><i>Provencio, M.; Vázquez, C.; Valiente, C.; Hervás, G.</i></p>	<p><b>[8B4]</b> Executive functioning in children with specific language impairment</p> <p><i>Henry, L.; Messer, D.; Nash, G.</i></p>	<p><b>[8C4]</b> Perception of battered women with priming experimentation</p> <p><i>Montilla, G.; Aranda, M.; Montes-Berges, B.</i></p>	<p><b>[8D4]</b> Semantic information influences the recognition of newly learned words overtime</p> <p><i>Ferreira, R.; Ellis, A.</i></p>	<p><b>[8E4]</b> Saccade processing in hemispatial neglect</p> <p><i>Szymanek, L.; Butler, S. H.; Rossit, S.; Harvey, M.</i></p>
10:20 - 10:40	<p><b>[8A5]</b> Neuropsychology of temporal preparation: frontal lesions, fibromyalgia and aging</p> <p><i>Correa, A.; Miró, E.; Triviño, M.; Capizzi, M.; Valles, A.; Lupiáñez, J..</i></p>	<p><b>[8B5]</b> Basic inference processes in premature children</p> <p><i>Moreno-Ríos, S.; Roldán, M.D.</i></p>	<p><b>[8C5]</b> Simpson's paradox in a web experiment: The impact of cognitive focus, sample size, and trend information on social inference</p> <p><i>Fraundorfer, D.; Reips, U.D.</i></p>	<p><b>[8D5]</b> ERP evidence for differential effects of word length in the left and right cerebral hemispheres</p> <p><i>Wright, V.; Fouquet, N.; Mills, D.; Izura, C.</i></p>	<p><b>[8E5]</b> Is substitution masking reduced for long duration items because identity information is available in VSTM or because target and mask objects are better individuated?</p> <p><i>Gellatly, A.; Guest, D.; Pilling, M.</i></p>

	Room Andalucía I & II	Room Andalucía III	Room Machuca	Room Manuel de Falla	Room Picasso
10:40 – 11:00					<b>[8E6]</b> Dichromats basic colour categories use depends on red-green mechanism residual activity utilisation <i>Moreira, H.; Lillo, J.; Alvaro, L.; Durán, M. C.</i>
10:40 - 11:40	<b>Poster III &amp; Coffee Break</b>				
	<b>Thematic Session 9A:</b> Language production <b>Chair:</b> Perea, M.	<b>Thematic Session 9B:</b> Perception & action <b>Chair:</b> Soto-Faraco, S.	<b>Symposium:</b> Mathematical cognition <b>Chair:</b> Colomé, A.	<b>Symposium:</b> Neural bases of memory development <b>Chair:</b> de Haan, M.	<b>Symposium:</b> Competitive learning: Inferential reasoning or automatic process? <b>Chair:</b> Matute, H & Shanks, D.R.
11:40 - 12:00	<b>[9A1]</b> Segmentation of spontaneous speech <i>White, L.; Wiget, L.; Rauch, O.; Sven L.; Mattys White, L.</i>	<b>[9B1]</b> Audio-visual sensory interaction dissociates magnoc- and parvocellular processing <i>Jaekl, P.; Soto, S.</i>	<b>[9C1]</b> Dissociation between arithmetic operations <i>Salguero-Alcañiz, M. P.; Alameda-Bailén, J. R.</i>	<b>[9D1]</b> The social brain in adolescence <i>Blakemore, S.</i>	<b>[9E1]</b> Direct measures of associative cue competition as evidenced from priming studies <i>Moris, J.; Cobos, P. L.; Luque, D.; López, F. J.</i>
12:00 - 12:20	<b>[9A2]</b> Audiovisual speech integration: Visual attention to articulation affects brain responses in 6-9 month old infants. <i>Kushnerenko, E.; Tomalski, P.; Ribeiro, H.; Patton, A.; Axelsson, E.; Moore, D.G.</i>	<b>[9B2]</b> Walking low level perception through the embodiment continuum <i>Rodríguez, S.; Costa, A.; Vigliocco, G.</i>	<b>[9C2]</b> Effects of TMS induced disruption to right and left parietal cortex on addition and Multiplication <i>Semenza, C.; Salillas, E.; Basso, D.; Vecchi, T.; Siegal, M.</i>	<b>[9D2]</b> Genotype/phenotype relations <i>Karmiloff-Smith, A.</i>	<b>[9E2]</b> Cue-competition in contextual cue learning <i>Beesley, T.; Shanks, D. R.</i>

	Room Andalucía I & II	Room Andalucía III	Room Machuca	Room Manuel de Falla	Room Picasso
12:20 - 12:40	<p><b>[9A3]</b> Differences in the production and comprehension of compound words <i>Janssen, N.; Pajtas, P.E.; Caramazza, A.</i></p>	<p><b>[9B3]</b> Body parts are unlike faces: Behavioral evidence from the singleton paradigm <i>Mohamed. T. N., Neumann, M. F.; Schweinberger, S. R.</i></p>	<p><b>[9C3]</b> Cultural differences in calculation and estimation strategies <i>Imbo<sup>1</sup>, LeFevre, J-A.</i></p>	<p><b>[9D3]</b> Early word learning and the developing brain. <i>Mills, D. L.</i></p>	<p><b>[9E3]</b> When there is no time to think cues augment each other rather than compete <i>Matute, H.; Vadillo, M. A.</i></p>
12:40 - 13:00	<p><b>[9A4]</b> Further evidence for automatic activation of inner speech in silent reading <i>Humphreys, J.</i></p>	<p><b>[9B4]</b> The Effect of Context in Multisensory Events <i>Sarmiento, B.; Shore, D. I.; Milliken, B.; Sanabria, D.</i></p>	<p><b>[9C4]</b> Effects of format, operation and size in calculation strategies <i>Colomé, A.; Bafalluy, M. G.; Lorite, R.</i></p>	<p><b>[9D4]</b> Changes in face processing during the first year of life <i>Pascalis, O.</i></p>	<p><b>[9E4]</b> Attentional biases in human learning: Controlled or automatic? <i>Le Pelley, M. E.</i></p>
13:00 - 13:20	<p><b>[9A5]</b> Stress awareness and the acquisition of the orthographic stress in Spanish <i>Gutiérrez Palma, N.; Deflor, S.; Serrano, F.; Jiménez Fernández, G.; González Trujillo, M. C.</i></p>		<p><b>[9C5]</b> The origin of the distance effect in numerical updating tasks <i>Pelegrina, S.; Lendínez, C.; Lechuga, T.</i></p>	<p><b>[9D5]</b> Neurocognitive development of attention <i>Rueda, M. R.</i></p>	<p><b>[9E5]</b> Against better judgment: Looking for non-propositional learning <i>De Houwer, J.</i></p>
13:30 – 14:30	<b>Mark Johnson, EPS conference</b>				

# FULL PROGRAMME





## Thursday, 15 April

<b>08:00 – 09:30</b>	<b>Registration</b>
<b>09:30 – 11:00</b>	<b>Opening conference: Susan E. Gathercole</b>
<b>11:00 – 11:20</b>	<b>Coffee Break</b>
<b>11:20 – 13:00</b>	<b>Thematic Session 1A: Bilingualism</b>
	<b>Room Andalucía I &amp; II    Chair: Costa, A</b>

**11:20 [1A1]** Examining linguistic and contextual factors on the processing of two-digit number words

<sup>1</sup>Macizo, P.; <sup>2</sup>Herrera, A.; <sup>1</sup>Martín, M.C.; <sup>3</sup>Román, P. ; <sup>1</sup>Ramos, O.

<sup>1</sup>University of Granada; <sup>2</sup>University of Murcia; <sup>3</sup>University Jaume I

**11:40 [1A2]** Bilingual advantage on executive control in absence of conflicting information

<sup>1</sup>Hernández, M.; <sup>2</sup>Costa, A.; <sup>3</sup>Humphreys, G. W.

<sup>1</sup>University of Barcelona; <sup>2</sup>Pompeu Fabra University; <sup>3</sup>University of Birmingham

**12:00 [1A3]** Highly-proficient bilinguals reconfigure semantic expectations faster than monolinguals during sentence reading

<sup>1</sup>Martin, C.; <sup>2</sup>Thierry, G.; <sup>2</sup>Kuipers, J-R.; <sup>1</sup>Costa, A.

<sup>1</sup>Pompeu Fabra University; <sup>2</sup>University of Bangor

**12:20 [1A4]** Deterioration of the lexical representation in bilingual patients with dementia

<sup>1</sup>Calabria, M.; <sup>2</sup>Hernández, M.; <sup>1</sup>Marne, P.; <sup>3</sup>Juncadella, M.; <sup>3</sup>Reñé, R.; <sup>4</sup>Ugas, L.; <sup>4</sup>Betran, S.; <sup>15</sup>Costa, A.

<sup>1</sup>Pompeu Fabra University; <sup>2</sup>University of Barcelona; <sup>3</sup>Bellvitge University Hosta; <sup>4</sup>General Hospital of Granollers; <sup>5</sup>Institució Catalana de Recerca i Estudis Avançats

**12:40 [1A5]** Immersion in L2 and expertise in professional translation determine language activation and language selection

Martín, M.C.; Macizo, P.; Bajo, M. T.

University of Granada

### **11:20 – 13:00    Thematic Session 1B: Face Processing**

**Room Andalucía III    Chair: Caldara, R**

**11:20 [1B1]** Categorical perception for unfamiliar faces: effect of covert and overt face learning

Kikutani, M.; Roberson, D.; Hanley, J. R.

University of Essex

**11:40 [1B2]** Specificity of face processing impairments in children with autism spectrum disorders

<sup>1</sup>Ewing, L.; <sup>2</sup>Pellicano, E.; <sup>1</sup>Rhodes, G.

<sup>1</sup>University of Western Australia; <sup>2</sup>Institute of Education, London

**12:00 [1B3]** Critical roles for right OFA and right pSTS in distinct face-processing tasks: An rTMS double dissociation

<sup>1</sup>Atkinson, A. P.; <sup>2</sup>Dzhelyova, M. P.; <sup>1</sup>Ellison, A.

<sup>1</sup>University of Durham; <sup>2</sup>University of St. Andrews

**12:20 [1B4]** Neural repetition suppression is abolished by other-race faces

Caldara, R.; Vizioli, L.; Rousselet, G.

University of Glasgow

**12:40 [1B5]** Culture impacts on extrafoveal information use for faces but not for visual scenes  
*Miellet, S.; Caldara, R.*  
University of Glasgow

**11:20 – 13:00 Thematic Session 1C: Memory Disorders**

**Room Machuca Chair: Fernández, A.**

**11:20 [1C1]** Attention effects on long-term memories during retrieval: A study with young and older adults

<sup>1</sup>*Mayas Arellano, J.*; <sup>2</sup>*Fuentes, L.J.*; <sup>1</sup>*Ballesteros, S.*

<sup>1</sup>Universidad Nacional de Educación a Distancia (UNED); <sup>2</sup>University of Murcia

**11:40 [1C2]** Recognition by familiarity in Parkinson's and Lewy-Body disease patients

<sup>1</sup>*Algarabel, S.*; <sup>2</sup>*Rodríguez, L. A.*; <sup>3</sup>*Escudero, J.*; <sup>1</sup>*Fuentes, M.*; <sup>3</sup>*Peset, V.*; <sup>1</sup>*Pitarque, A.*; <sup>2</sup>*Cómbita, L. M.*; <sup>3</sup>*Mazón, J. F.*

<sup>1</sup>University of Valencia; <sup>2</sup>University of Granada; <sup>3</sup>General Hospital of Valencia

**12:00 [1C3]** A comparison of memory and executive functions in Alzheimer disease and frontal variant of frontotemporal dementia

*Sebastian, M. V.; Hernandez-Gil, L.*

Complutense University of Madrid

**12:20 [1C4]** Long - term accelerated forgetting of verbal and non-verbal information in Temporal Lobe Epilepsy

<sup>1</sup>*Wilkinson, H.*; <sup>2</sup>*Holdstock, J. H.*; <sup>3</sup>*Baker, G.*; <sup>4</sup>*Herbert, A.*; <sup>5,6</sup>*Clague, F.*; <sup>2</sup>*Downes, J. J.*

<sup>1</sup>University of Chester; <sup>2</sup>University of Liverpool; <sup>3</sup>University Department of Neurosciences, Walton Centre for Neurology and Neurosurgery; <sup>4</sup>Devon Partnership NHS Trust; <sup>5</sup>Astley Ainslie Hospital of Edinburg; <sup>6</sup>University of Edinburg

**12:40 [1C5]** A heritable verbal memory impairment in four living generations of the same family: Evidence from cognitive and neuroimaging analyses

<sup>1</sup>*Briscoe, J.*; <sup>2</sup>*Chilvers, R.*; <sup>2</sup>*Baldeweg, T.*; <sup>2</sup>*Skuse, D.*

<sup>1</sup>University of Bristol; <sup>2</sup>University College London

**11:20 – 13:00 Thematic Session 1D: Language 1**

**Room Manuel de Falla Chair: Perea, M**

**11:20 [1D1]** Letter or graphemes? An examination of basic coding units in visual word recognition

*Acha, J.; Perea, M.*

<sup>1</sup>Basque Center on cognition, brain and language; <sup>2</sup>University of Valencia

**11:40 [1D2]** Force dynamics and causal and adversative sentences comprehension

*Morera, Y.; de Vega, M.*

University of La Laguna

**12:00 [1D3]** Subliminal semantic priming from novel prime words

<sup>1</sup>*Ortells, J. J.*; <sup>2</sup>*Mari-Beffa, P.*; <sup>1</sup>*Plaza-Ayllón, V.*

<sup>1</sup>University of Almeria; <sup>2</sup>University of Wales

**12:20 [1D4]** Relative clause attachment to emotion nouns: an ERP study

<sup>1</sup>*Piñeiro, A.*; <sup>1</sup>*Galdo, S.*; <sup>1</sup>*Fraga, I.*; <sup>1</sup>*Acuña, C.*; <sup>2</sup>*Comesaña, M.*

<sup>1</sup>University of Santiago de Compostela; <sup>2</sup>University of Minho

**12:40 [1D5]** What information about pages of text is made explicit in the first steps of human vision?

*Watt, R.*

University of Stirling

**11:20 – 13:00 Thematic Session 1E: Attention 1**

**Room Picasso Chair: Lupiáñez, J.**

**11:20 [1E1]** The role of cue-to-target translation in attention switching

*Houghton, G.; Grange, J. G.*

University of Wales Bangor

**11:40 [1E2]** Attention enhances spatial and temporal resolution

<sup>1</sup>*Skarrat, P. A.*; <sup>2</sup>*Cole, G. G.*

<sup>1</sup>University of Hull <sup>2</sup>University of Essex

**12:00 [1E3]** What's in a name? Observers' name grab attention even subliminally

*Vuong, Q. C.; Stranney, M. A.*

University of Newcastle

**12:20 [1E4]** Links between working memory capacity and gesture rates

*Melinger, A.; Keehner, M.*

University of Dundee

**12:40 [1E5]** The distribution of exogenous and endogenous attention in visuo-spatial working memory

<sup>12</sup>*Botta, F.*; <sup>2</sup>*Lupiáñez, J.*

<sup>1</sup>University "Sapienza" of Rome; <sup>2</sup>University of Granada

**13:00 – 14:40 Lunch**

**14:40 – 16:20 Thematic Session 2A: Memory 1**

**Room Andalucía I & II Chair: Jarrold, C.**

**14:40 [2A1]** The Edinburgh Virtual Errands Task (EVET): An experimental study of the complexities of everyday cognition

<sup>1</sup>*Trawley, S.*; <sup>2</sup>*Law, A.*; <sup>1</sup>*Logie, R.*

<sup>1</sup>University of Edinburgh; <sup>2</sup>Liverpool John Moores University

**15:00 [2A2]** Specificity in autobiographical recall: Associations with episodic and short-term memory and with problem solving

<sup>1</sup>*Aizpurua, A.*; <sup>2</sup>*Koutstaal, W.*

<sup>1</sup>University of the Basque Country; <sup>2</sup>University of Minnesota

**15:20 [2A3]** Do I have your memory? Joint memory effects on visual attention

<sup>1</sup>*Xun He*; <sup>2</sup>*Sebanz, N.*; <sup>1</sup>*Humphreys, G. W.*

<sup>1</sup>University of Birmingham; <sup>2</sup>Radboud University Nijmegen

**15:40 [2A4]** Memory and suggestion: influences of theory of mind and individual suggestibility

*Pérez-Mata, N.; Moreno, A.; Diges, M.*

Autónoma University of Madrid

**16:00 [2A5]** Face naming and retrieval inhibition

*Marful, A.; Paolieri, D.; Sanches, C.; Bajo, M. T.*

University of Granada

**14:40 – 16:20 Symposium: Embodied robotics: From affordances to action**

**Room Andalucía III Chair: Borghi, A.M.**

**14:40 [2B1]** Overview of cognitive robotics networks in Europe

*Borghi, A. M.*

University of Bologna

**15:00 [2B2]** The integration of action and language in cognitive robots

*Morse, A.; Cangelosi, A.*

University of Plymouth

**15:20 [2B3]** Neural structures for language-mediated perception and action

*Buccino, G.*

University of Parma

**15:40 [2B4]** The deeply immersed brain conjecture: embodiment in the visual system

*Ellis, R.*

University of Plymouth

**16:00 [2B5]** Studying the interplay of overt, covert and linguistic attention for action

*Fischer, M. H.*

University of Dundee

**14:40 – 16:20 Symposium: The functioning of the Attentional Networks on different populations**

**Room Machuca Chairs: Lupiáñez, J. & Fuentes, L.**

**14:40 [2C1]** Anxiety, attention and processing styles

*Pacheco, A.; Acosta, A.; Lupiáñez, J.*

University of Granada.

**15:00 [2C2]** Development of attention networks and their interactions during childhood

<sup>1</sup>*Pozuelos, J. P.;* <sup>1</sup>*Paz-Alonso, P. M.;* <sup>1</sup>*Combata, L. M.;* <sup>2</sup>*Fuentes, L. J.;* <sup>1</sup>*Rueda, M. R.*

<sup>1</sup>University of Granada; <sup>2</sup>University of Murcia

**15:20 [2C3]** Detecting infrequent targets while measuring the three attentional networks

<sup>1</sup>*Roca, J.;* <sup>1</sup>*Castro, C.;* <sup>2</sup>*López-Ramón, M. F.;* <sup>1</sup>*Lupiáñez, J.*

<sup>1</sup>University of Granada; <sup>2</sup>National University of Mar del Plata

**15:40 [2C4]** Do the interactive effects between attentional networks vary as a function of WMC? An investigation utilising two versions of the ANT task

*Ahmed, L.; de Fockert, J.*

Goldsmiths College

**16:00 [2C5]** The functioning of the attentional networks and the interaction between them, in patients diagnosed with Parkinson's Disease.

<sup>1</sup>*Rodríguez, L. A.;* <sup>1</sup>*Funes, M. J.;* <sup>2</sup>*Escudero, J.;* <sup>1</sup>*Lupiáñez, J.*

<sup>1</sup>University of Granada; <sup>2</sup>Hospital General de Valencia.

**16:20 [2C6]** Attention deficits in Alzheimer's disease and dementia with Lewy Bodies

<sup>1</sup>*Fernández, P. J.;* <sup>1</sup>*Campoy, G.;* <sup>2</sup>*Antequera, M. ,* <sup>1</sup>*García-Sevilla, J.;* <sup>1</sup>*Antúnez, C.;* <sup>2</sup>*Fuentes, L. J.*

<sup>1</sup>University of Murcia; <sup>2</sup>Hospital Virgen de la Arrixaca Murcia

**14:40 – 16:20 Thematic Session 2D: Language 2****Room Manuel de Falla Chair: Ruz, M. .**

**14:40 [2D1]** Specific Language Impairment as a phonological processing deficit: Evidence from data and computational modelling

*Jones, G.*

University of Nottingham Trent

**15:00 [2D2]** Implications of theory of mind and general intelligence on language comprehension in schizophrenia

*Gavilán Ibáñez, J. M.; García-Albea Ristol, J. E.*

Universitat Rovira i Virgili Universit

**15:20 [2D3]** Reading and comprehension monitoring in autism spectrum disorders

*Saldaña, D.; Rodríguez, I. R.; Moreno, F. J.; Luque, A.; Aguilera, A.; González, I.*

University of Sevilla

**15:40 [2D4]** Inferences in language comprehension: Speed-accuracy-tradeoff experiments on Gricean implicatures

<sup>1</sup>*Bott, L.;* <sup>1</sup>*Bailey, T.;* <sup>2</sup>*Grodner, D.*

<sup>1</sup>University of Cardiff; <sup>2</sup>Swarthmore College

**16:00 [2D5]** More than the sum of the parts: the combined effect of connectives and word frequency on poor readers' text comprehension

*Fajardo, I.; Ávila, V.; Tavares, G.; Ferrer, A.*

University of Valencia

**14:40 – 16:20 Symposium: Basic processes in learning****Room Picasso Chair: Hall, G.**

**14:40 [2E1]** Encoding specificity in associative learning

*Honey, R. C. ; Lin, T-C. E.*

Cardiff University

**15:00 [2E2]** 6-hydroxydopamine lesions to the nucleus accumbens shell and core, comparison with the effects of amphetamine on latent inhibition and overshadowing

*Nelson, A. J. D.; Thur, K. E.; Spicer, C.; Marsden, C. A.; Cassaday, H. J.*

University of Nottingham

**15:20 [2E3]** The role of GluA1 in recognition memory

*Sanderson, D. J.*

University of Oxford

**15:40 [2E4]** Habituation to shock: roles of direct and associative activation

*Hall, G.; Symonds, M.*

University of York

**16:00 [2E5]** Extinction does not generally change context processing

*Nelson, B.*

University of the Basque Country

**16:20 – 17:40 Poster I & Coffee Break**

**17:40 – 19:20 Thematic Session 3A: Learning 1**

**Room Andalucía I & II Chair: Pellón, R.**

**17:40 [3A1]** What is contingency information used for? A study on preparation behavior  
*Blanco, F.; Matute, H.; Vadillo, M. A.*  
University of Deusto

**18:00 [3A2]** Gender differences in a virtual Morris water task  
<sup>1</sup>*Chamizo, V. D.;* <sup>1</sup>*Artigas, A. A.;* <sup>1</sup>*Sansa, J.;* <sup>2</sup>*Bantera, F.*  
<sup>1</sup>University of Barcelona; <sup>2</sup>University of the Basque Country

**18:20 [3A3]** Blocking of conditioned inhibition in human causal learning: Effects of different outcome continua  
<sup>1</sup>*Lotz, A.;* <sup>2,3</sup>*Vervliet, B.;* <sup>1</sup>*Lachnit, H.*  
<sup>1</sup>Philipps-Universität Marburg; <sup>2</sup>University of Amsterdam; <sup>3</sup>University of Leuven

**18:40 [3A4]** Perception of contingency in classical conditioning: From associative learning to psychophysics  
<sup>1</sup>*Carnero, S.;* <sup>1</sup>*Acebes, F.;* <sup>2</sup>*Moris, J.;* <sup>1</sup>*Solar, P.;* <sup>1</sup>*Loy, I.*  
<sup>1</sup>University of Oviedo; <sup>2</sup>University of Málaga

**19:00 [3A5]** Interferences between predictors and causes in cue competition  
*Thorwart, A.; Lotz, A.; Lachnit, H.*  
Philipps University of Marburg

**17:40 – 19:20 Thematic Session 3B: Social 1**

**Room Andalucía III Chair: Samson, D.**

**17:40 [3B1]** A causal network model of alibi evidence  
*Lagnado, D.*  
University College London

**18:00 [3B2]** The dice are cast: The effects of intended versus actual contribution on responsibility attributions  
<sup>1</sup>*Gerstenberg, T.;* <sup>1</sup>*Lagnado, D.A.;* <sup>2</sup>*Kareev, Y.*  
<sup>1</sup>University College London; <sup>2</sup>The Hebrew University of Jerusalem

**18:20 [3B3]** Desire for revenge against another person modulates the ability to take the other person's perspective in a simple visual perspective taking task  
*Samson, D.; Chipchase, S.*  
University of Nottingham

**18:40 [3B4]** Socially modulated inhibition of return  
<sup>1</sup>*Cole, G. G.;* <sup>2</sup>*Skarratt, P. A.;* <sup>3</sup>*Kingstone, A.*  
<sup>1</sup>University of Essex; <sup>2</sup>University of Hull; <sup>3</sup>University of British Columbia

**19:00 [3B5]** Social cues modulate attentional control  
*Rodríguez-Bailón, R.;* *Jiménez-Moya, G.;* *Cañadas, E.;* *Lupiañez, J.*  
University of Granada

**19:20 [3B6]** Eye movements in Aspergers Syndrome for complex scene inspection  
<sup>1</sup>*Benson, V.;* <sup>2</sup>*Castlehano, M.;* <sup>1</sup>*Au Yeung, S.;* <sup>3</sup>*Rayner, K.*  
<sup>1</sup>University of Southampton; <sup>2</sup>Queens University; <sup>3</sup>University of California

**17:40 – 19:20 Symposium: Development of control and memory processes: A Cognitive Neuroscience approach**
**Room Machuca Chair: Rueda, R. & Gómez-Ariza; C.**
**17:40 [3C1]** Incidental recognition memory in developmental amnesia

<sup>1</sup>Munoz, M.; <sup>2</sup>Chadwick, M.; <sup>3</sup>Perez-Hernandez, E.; <sup>4</sup>Mishkin, M.; <sup>5</sup>Vargha-Khadem, F.

<sup>1</sup>UCL Institute of Child Health; <sup>2</sup>Wellcome Trust Centre for Neuroimaging; <sup>3</sup>Developmental and Educational Psychology; <sup>4</sup>Complutense School of Education; <sup>5</sup>The National Institute of Mental Health

**18:00 [3C2]** Error-detection and self-regulation throughout development

*Rueda, M. R.; Checa, P.*

University of Granada

**18:20 [3C3]** Are children able to reject false memories?

<sup>1</sup>Carneiro, P.; <sup>2</sup>Fernández, A.

<sup>1</sup>University of Lisboa; <sup>2</sup>University of Salamanca

**18:40 [3C4]** Developmental changes in overcoming proactive interference: Behavioral and neural correlates

<sup>1,2</sup>Paz-Alonso, P. M.

<sup>1</sup>University of Granada; <sup>2</sup>University of California

**19:00 [3C5]** The development of inhibitory control of memory: Evidence from retrieval-induced forgetting

<sup>1</sup>Ortega, A.; <sup>2</sup>Luque, C.; <sup>3</sup>Román, P. E.; <sup>3</sup>Gómez-Ariza, C. J.; <sup>1</sup>Bajo, M. T.

<sup>1</sup>University of Granada; <sup>2</sup>Jaume I University; <sup>3</sup>University of Jaén

**17:40 – 19:20 Thematic Session 3D: Language 3**
**Room Manuel de Falla Chair: Vega, M**
**17:40 [3D1]** Pictures speak louder than numbers: on communicating medical risks to immigrants with limited non-native language proficiency

<sup>1,2</sup>García-Retamero, R. ; <sup>3</sup>Dharmi, M. K.; <sup>2</sup>Galesic, M.

<sup>1</sup>University of Granada; <sup>2</sup>Max Planck Institute for Human Development;

<sup>3</sup>University of Cambridge

**18:00 [3D2]** The asymmetric nature of agreement computation: Evidence from Spanish

<sup>1</sup>Molinero, N.; <sup>2</sup>Barber, H. A.; <sup>1</sup>Mancini, S.; <sup>1,2</sup>Carreiras, M. .

<sup>1</sup>Basque center on cognition, Brain and Language; <sup>2</sup>University of La Laguna

**18:20 [3D3]** Hands on the future: selective increase of cortico-spinal facilitation when reading the future tense of hand-related action verbs

*Leone, B.; Carreiras, M.; Candidi, M.; Aglioti, S. M. ; Barber, H. A.*

University of La Laguna

**18:40 [3D4]** Attentional effects in conceptual metaphor congruency tasks: A test of the Coherent Working Models theory

<sup>1</sup>Santiago, J.; <sup>1</sup>Ouellet, M.; <sup>1</sup>Román, A.; <sup>2</sup>Valenzuela, J.

<sup>1</sup>University of Granada; <sup>2</sup>University of Murcia

**19:00 [3D5]** Speaker's alignment in spatial communication by pointing and **direction** words

*Rodrigo, M. J.; de Vega, M.; Padrón, I.*

University of La Laguna

**17:40 – 19:20      Thematic Session 3E: Attention 2**

**Room Picasso      Chair: Botella, J.**

**17:40    [3E1]**    The attentional blink as reflected by illusory conjunctions  
*Botella, J.; Privado, J.; Gil-Gómez de Liaño, B.*  
University of Madrid

**18:00    [3E2]**    Does attention move or spread when tracing lines?  
*Crundall, D.*  
University of Nottingham

**18:20    [3E3]**    The role of individual differences in distractibility upon visual selection attention under high and low perceptual load  
*Judge, J.; Harris, R.; Taylor, P. J.*  
University of Central Lancashire

**18:40    [3E4]**    Stimulus competition for attentional capacity: perceptual load vs. dilution  
*Lavie, N.; Torralbo, A.*  
University College London

**19:00    [3E5]**    Consolidation of implicit sequence knowledge  
*Coomans, D.; Deroost, N.; Vandenbosch, J.; Zeischka, P.; Soetens, E.*  
Vrije University of Brussels

## Friday, 16 April

### 08:20 – 10:00 Thematic Session 4A: Memory 2

**Room Andalucía I & II    Chair: Logie, B.**

**8:20    [4A1]**    How does processing affect storage in working memory tasks? Evidence for both domain-general and domain-specific effects

<sup>1</sup>Jarrold, C.; <sup>2</sup>Tam, H.; <sup>2</sup>Baddeley, A.; <sup>2</sup>Harvey, E.

<sup>1</sup>University of Bristol; <sup>2</sup>University of York

**8:40    [4A2]**    Mental rotation in a dynamic spatial test: SDT 2.0

<sup>1</sup>Martínez-Molina, A.; <sup>2</sup>Contreras, M. J.; <sup>1</sup>Shih, P. C.; <sup>1</sup>Colom, R.; <sup>1</sup>Santacreu, J.

<sup>1</sup>Autonoma University of Madrid; <sup>2</sup>UNED

**9:00    [4A3]**    Representational pseudoneglect in an auditory-driven spatial working memory task

<sup>1,2</sup>Brooks, J.; <sup>1</sup>Logie, R.; <sup>1</sup>McIntosh, R.; <sup>1</sup>Della Sala, S.

<sup>1</sup>University of Edinburgh; <sup>2</sup>Suor Orsola Benincasa University

**9:20    [4A4]**    Autobiographical memory for trauma.

<sup>1</sup>Manzanero, A. L.; <sup>1</sup>Aróztegui, J.; <sup>2</sup>El-Astal, S.;

<sup>1</sup>Complutense University of Madrid ; <sup>2</sup>University of Al-Azhar

**9:40    [4A5]**    Greater distractor processing under high cognitive load can lead to better task performance

Fockert, J. W.; Bremner, A. J.

University of London

### 08:20 – 10:00 Symposium: Human causal learning: Going beyond the contingency-based framework

**Room Andalucía III    Chair: Greville, W.J & Buehner, M.J.**

**8:20    [4B1]**    Temporal predictability facilitates human causal learning

Greville, W. J.; Buehner, M. J.

Cardiff University

**8:40    [4B2]**    Real-time causal inference

Speekenbrink, M.; Lagnado, D.

University College London

**9:00    [4B3]**    Children's use of temporal information in making causal structure judgments

McCormack, T.; Frosh, C.; Lagnado, D.; Burns, P.

Queen's University Belfast

**9:20    [4B4]**    Models of elemental diagnostic reasoning

Waldmann, M. R.; Meder, B.; Mayrhofer, R.

University of Göttingen

**9:40    [4B5]**    Detrimental impact of delay is mediated through trial structure information in human causal learning

Buehner, M. J.; Greville, W. J.; Hohansen, M.; Cassar, A.

Cardiff University

**08:20 – 10:00      Symposium: The hypnotizable brain**

**Room Machuca      Chair: Naish, P.**

**8:20      [4C1]**      Hypnosis, hallucinations and hemispheric differences

*Naish, P.*

The Open University

**8:40      [4C2]**      Fixational eye-movements during hypnotic induction

<sup>1</sup>*Lamas, J. R.*; <sup>2</sup>*Blanco, M. J.*

<sup>1</sup>University of La Coruña; <sup>2</sup>University of Santiago de Compostela

**9:00      [4C3]**      The valencia model of waking hypnosis: Theory and experimental basis

*Mendoza, M. E.*; *Capafons, A.*

University of Valencia

**9:20      [4C4]**      Does the addition of hypnosis to pain-modifying suggestions create an altered state of consciousness?

*Derbyshire, S.*

University of Birmingham

**9:40      [4C5]**      The 'cold control' theory of hypnosis

*Dienes, Z.*

University of Sussex

**08:20 – 10:00      Symposium: Orthographic processing in visual word recognition**

**Room Manuel de Falla      Chair: Carreiras, M.**

**8:20      [4D1]**      A dual-route theory of orthographic processing

*Grainger, J.*

CNRS & Aix-Marseille University

**8:40      [4D2]**      The search of an input coding scheme: Transposed-letter priming in Arabic

<sup>1</sup>*Perea, M.*; <sup>2</sup>*abu Mallouh, R.*; <sup>2,3</sup>*Carreiras, M.*

<sup>1</sup>University of Valencia; <sup>2</sup>Basque Center on Cognition, Brain and Language; <sup>3</sup>IKERBASQUE. Basque Foundation for Science

**9:00      [4D3]**      What do nonword rejection times tell us about the orthographic code?

*Brysbaert, M.*; *Keuleers, E.*

Ghent University

**9:20      [4D4]**      The recognition of mirror-letters and mirror-words: Insights from the masked priming paradigm.

<sup>1</sup>*Duñabeitia, J. A.*, <sup>1</sup>*Molinero, N.*; <sup>1,2</sup>*Carreiras, M.*

<sup>1</sup>Basque Center on Cognition, Brain and Language; <sup>2</sup>IKERBASQUE. Basque Foundation for Science

**9:40      [4D5]**      Modeling priming effects in visual-word recognition with the diffusion model

<sup>1</sup>*Gomez, P.*; <sup>2</sup>*Perea, M.*

<sup>1</sup>DePaul University; <sup>2</sup>University of Valencia

**08:20 – 10:00      Thematic Session 4E: Emotion**

**Room Picasso      Chair: Chapman, P.**

**8:20      [4E1]**      Perception of the duration of emotionally-evocative stimuli

*Wearden, J.*

University of Keele

**8:40 [4E2]** Memory for emotional pictures depends on the distribution of central information in the scene  
*Chapman, P.*  
 University of Nottingham

**9:00 [4E3]** Individual differences in early imitation are associated with temperament  
*Hilbrink, E.; Gattis, M.; Ellis, K.; Fowler, N.; Sakkalou, E.*  
 Cardiff University of Cardiff

**9:20 [4E4]** Emotional Intelligence and attentional control processes: Temporal preparation in a go-nogo task  
*Pérez-Dueñas, C.; Acosta, A.; Correa, A.; Lupiáñez, J.*  
 University of Granada

**9:40 [4E5]** Emotional conflict in economic games: An fMRI and HD-ERP investigation  
*Ruz, M.; Madrid, E.; Tudela, P.*  
 University of Granada

**10:00 – 11:00** **Poster II & Coffee Break**

**11:00 – 12:40** **Thematic Session 5A: Memory & Decision**

**Room Andalucía I & II** **Chair: Higham, P. A.**

**11:00 [5A1]** Dissociating sequential effects from explicit expectancies: towards a model of sequential decision making  
*Tubau, E.; López-Moliner, J.; Supér, H.*  
 University of Barcelona

**11:20 [5A2]** Can 'Pure' Implicit Memory Be Isolated? A Test of a Single-System Model of Recognition and Repetition Priming  
<sup>1</sup>*Berry, Ch. J.*; <sup>1</sup>*Shanks, D. R.*; <sup>1</sup>*Li, S.*; <sup>1</sup>*Rains, L. S.*; <sup>2</sup>*Henson, R. N. A.*  
<sup>1</sup>University College London; <sup>2</sup>MRC Cognition and Brain Sciences Unit, Cambridge

**11:40 [5A3]** Deciding how to use memory: The distinctiveness heuristic  
*Verde, M. F.*  
 University of Plymouth

**12:00 [5A4]** Memory for radio advertisements: effect of program congruence, typicality and divided attention  
*Martín Luengo, B.; Migueles, M.*  
 University of Basque Country

**12:20 [5A5]** Applying Type-2 Signal Detection Theory to Investigate Differences Between Regular Gamblers and Non-Gamblers  
*Lueddeke, S. E.; Higham, P. A.*  
 University of Southampton

**11:00 – 12:40** **Symposium: Recent advances in the relation between perception and action**

**Room Andalucía III** **Chair: López-Moliner, J.**

**11:00 [5B1]** Sub-cortical processing of imminent collision in humans  
<sup>1</sup>*Billington, J.*; <sup>2</sup>*Field, D. T.*; <sup>3</sup>*Wilkie, R. M.*; <sup>1</sup>*Wann, J. P.*  
<sup>1</sup>University of London; <sup>2</sup>University of Reading; <sup>3</sup>Leeds University

**11:20 [5B2]** An ecological/dynamical analysis of perception-action couplings and changes therein

*Jacobs, D. M.*

Autonomous University of Madrid

**11:40 [5B3]** A Bayesian approach of interceptive timing

*López-Moliner, J.*

University of Barcelona

**12:00 [5B4]** Dynamical factors in action selection: The selection of head and eye movements when controlling reaching movements

*Mon-Williams, M.; Wilkie, W.*

Leeds University

**12:20 [5B5]** Dynamic gaze patterns for dynamic actions: The role of head and eye movements in controlling locomotor steering

*Wilkie, R. M.; Kountouriotis, G. K. ; Woodgate, P.; Hostler, T.*

Leeds University

**11:00 – 12:40 Symposium: Neural oscillatory activity underlying human memory**

**Room Machuca Chair: Fuentemilla, L.**

**11:00 [5C1]** Distraction improves memory

<sup>123</sup>*Cashdollar, N.; <sup>1</sup>Lavie, N.; <sup>13</sup>Düzel, E.*

<sup>1</sup>University College London; <sup>2</sup>National Hospital for Neurology & Neurosurgery of London; <sup>3</sup>Otto-von-Guericke University

**11:20 [5C2]** Age-related benefits of semantic encoding of associative memories is manifested in power modulations of alpha oscillations

*Crespo-García, M.; Cantero, J. L.; Atienza, M.*

University Pablo de Olavide

**11:40 [5C3]** Neural reactivation of context-specific information in associative recognition memory

<sup>12</sup>*Fuentemilla, L.; <sup>3</sup>Penny, W. D.; <sup>1</sup>Jafarpour, A.; <sup>1</sup>Bunzeck, N.; <sup>13</sup>Düzel, E.*

<sup>1</sup>University College London; <sup>2</sup>University of Barcelona and Institute of Advanced Studies in Biomedicine of Llobregat; <sup>3</sup>Otto von Guericke University

**12:00 [5C4]** Oscillatory activity during the maintenance of verbal-spatial bound representations

<sup>1</sup>*Poch, C.; <sup>2</sup>Campo, P.; <sup>34</sup>Parmentier, F.B. R.; <sup>5</sup>Ruiz-Vargas, J. M.; <sup>3</sup>Elsley, J. V.; <sup>2</sup>del Pozo, F.; <sup>1</sup>Maestú, F.*

<sup>1</sup>Complutense University of Madrid; <sup>2</sup>Polytechnic University of Madrid; <sup>3</sup>University of the Balearic Islands; <sup>4</sup>University of Plymouth; <sup>5</sup>University Autonoma of Madrid, Madrid

**11:00 – 12:40 Symposium: Orthographic processing: From letters to lexical activation**

**Room Manuel de Falla Chair: Pitchford, N.J.**

**11:00 [5D1]** Using rotation to determine the reading grain size for regular and irregular English words

*Riddell, P.; Pye, R.; Gibbons, W.*

University of Reading

**11:20 [5D2]** Inhibitory effects of exterior letter frequency on visual word recognition: differential patterns across English and Greek

*Pitchford, N. J.; Ktori, M.; van Heuven, W.*

University of Nottingham

**11:40 [5D3]** Orthographic priming effects in eye movements while reading

<sup>1</sup>*Paterson, K.*

University of Leicester

**12:00 [5D4]** Eye movements of second language learners when reading spaced and unspaced Chinese text

<sup>1</sup>*Liversedge, S. P.;* <sup>2</sup>*Shen, D.;* <sup>2</sup>*Tian, J.;* <sup>2</sup>*Zang, C.;* <sup>2</sup>*Cui, L.;* <sup>2</sup>*Bai, X.;* <sup>2</sup>*Yan, G.;* <sup>3</sup>*Rayner, K.*

<sup>1</sup>University of Southampton; <sup>2</sup>Tianjin Normal University; <sup>3</sup>University of California

**12:20 [5D5]** Backpropagation and holographic coding: an empirical correspondence

*Hannagan, T.; Dandurand, F.; Grainger, J.*

University of Provence

**11:00 – 12:40 Thematic Session 5E: Learning 2**

**Room Picasso Chair: Chamizo, V.**

**11:00 [5E1]** Internet-based experimenting: Methods and experiences

*Reips, U. D.*

University of Deusto

**11:20 [5E2]** Cue-density effects on outcome prediction and causal judgment

<sup>1</sup>*Vadillo, M. A.;* <sup>2</sup>*Musca, S. C.;* <sup>3</sup>*Blanco, F.;* <sup>1</sup>*Matute, H.*

<sup>1</sup>University of Deusto; <sup>2</sup>Blaise Pascal University; <sup>3</sup>Catholic University of Leuven

**11:40 [5E3]** Investigating stimulus novelty and familiarity using a three-stage procedure: Tests of lesions of the perirhinal cortex, and systemic scopolamine administration

*Whitt, E. J.; Robinson, J.; Jones, P. M.*

University of Nottingham

**12:00 [5E4]** Training and instructions modulate context processing in human predictive learning

*Rosas, J. M.; León, S. P.; Callejas Aguilera, J. E.*

University of Jaén

**12:20 [5E5]** Adjunctive behaviour is reinforced behaviour

*Pellón, R.*

UNED

**12:40 – 13:40 Núria Sebastián-Gallés . (SEPEX Conference)**

**13:40 – 15:20 Lunch & Break**

**15:20 – 17:00 Symposium: Perceiving and representing faces**

**Room Andalucía I & II Chair: Calder, A & Pellicano, L.**

**15:20 [6A1]** Human faces are represented holistically: Evidence from gaze-contingency

<sup>1</sup>*Rossion, B.;* <sup>12</sup>*Van Belle, G.;* <sup>1</sup>*Busigny, T.;* <sup>1</sup>*Lefèvre, P.;* <sup>2</sup>*de Graef, P.;* <sup>2</sup>*Verfaillie, K.*

<sup>1</sup>Université Catholique de Louvain, Louvain-la-Neuve; <sup>2</sup>Katholieke Universiteit Leuven

**15:40 [6A2]** Adaptive norm-based coding of faces, or why faces don't all look the same  
*Rhodes, G.; Jaquet, E.; Jeffery, L.; Evangelista, E.*  
University of Western Australia

**16:00 [6A3]** Capturing within-person variability in face representations  
*Burton, M.; Jenkins, R.*  
University of Glasgow

**16:20 [6A4]** Mechanisms underlying the perception of gaze direction  
*Calder, A. J.; Keane, J.*  
University of Cambridge

**16:40 [6A5]** Eye-gaze aftereffects in autism: Further evidence of weakened adaptive mechanisms  
<sup>1,2</sup>*Pellicano, E.; Rhodes, G.*  
<sup>1</sup>University of London, <sup>2</sup>University of Western Australia

**15:20 – 17:00 Thematic Session 6B: Perception 1**

**Room Andalucía III Chair: Ballesteros, S.**

**15:20 [6B1]** The Horizontal-Vertical Illusion in the haptic modality across lifespan  
<sup>1</sup>*Ballesteros, S.; Mayas, J.; Reales, J. M.; Heller, M. A.*  
<sup>1</sup>Universidad Nacional de Educación a Distancia (UNED); <sup>2</sup>Eastern Illinois University

**15:40 [6B2]** Developmental of visual and proprioceptive contributions to perceived hand position in early childhood  
<sup>1</sup>*Bremner, A. J.; Hill, E. L.; Pratt, M.; Spence, C.*  
<sup>1</sup>University of London; <sup>2</sup>University of Oxford

**16:00 [6B3]** Tracking down the time course of spatial remapping of touch: Evidence from saccadic latencies and evoked potentials  
<sup>1,4</sup>*Soto-Faraco, S.; Overvliet, K. E.; Azañón, E.; Calabresi, M.*  
<sup>1</sup>Institució Catalana de Recerca i Estudis Avançats (ICREA); <sup>2</sup>University of Leuven; <sup>3</sup>University of Barcelona; <sup>4</sup>Pompeu Fabra University

**16:20 [6B4]** Virtual lesions of right parietal cortex disrupt spatial compatibility effects  
<sup>1</sup>*Valle-Inclán, F.; Fernández del Olmo, M.; Blanco, M. J.*  
<sup>1</sup>University of La Coruña; <sup>2</sup>University of Santiago de Compostela

**16:40 [6B5]** The role of the posterior parietal cortex in the remapping of touch  
<sup>1</sup>*Azañón, E.; Longo, M. R.; Haggard, P.; Soto-Faraco, S.*  
<sup>1</sup>University of Barcelona; <sup>2</sup>Pompeu Fabra University; <sup>3</sup>University College London; <sup>4</sup>Institució Catalana de Recerca i Estudis Avançats (ICREA)

**15:20 – 17:00 Symposium: The processing and representation of numerals**

**Room Machuca Chair: Herrera, A.**

**15:20 [6C1]** A spatial orientation of the number magnitude in preschoolers  
*Noël, M. P.*  
University of Louvain

**15:40 [6C2]** Understanding the real value of fractions  
*Butterworth, B.; Luculano, T.*  
University College of London

**16:00 [6C3]** Processing fractions and negative numbers  
*Ganor-Stern, D.*  
 Achva Academic College and Ben-Gurion University of the Negev

**16:20 [6C4]** Position coding in two-digit Arabic numbers  
<sup>1</sup>*García-Orza, J.*; <sup>1</sup>*Valle, L.*; <sup>2</sup>*Perea, M.*  
<sup>1</sup>University of Malaga; <sup>2</sup>University of Valencia

**16:40 [6C5]** Semantic processing in the production of numerals across notations  
<sup>1</sup>*Herrera, A.*; <sup>2</sup>*Macizo, P.*  
<sup>1</sup>University of Murcia; <sup>2</sup>University of Granada

**15:20 – 17:00 Symposium: The impact of vocabulary growth on lexical processing and memory**

**Room Manuel de Falla Chair: Raman, I. & Ellis, A.**

**15:20 [6D1]** Spanish oral reading is flexible and influenced by lexical factors like age of acquisition  
<sup>1</sup>*Davies, R.*; <sup>2</sup>*Barbón, A.*; <sup>2</sup>*Cuetos, F.*  
<sup>1</sup>University of Oxford Brookes; <sup>2</sup>University of Oviedo

**15:40 [6D2]** Strategic control and age of acquisition effects in visual word recognition  
*Raman, I.*  
 Middlesex University

**16:00 [6D3]** Can childhood frequencies replace age-of-acquisition ratings?  
*Brybaert, M.*; *Keuleers, E.*  
 Ghent University

**16:20 [6D4]** Simulating age/ order of acquisition effects in word production and comprehension through cumulative learning of foreign words in the lab  
<sup>1</sup>*Izura, C.*; <sup>2</sup>*Pérez, M. A.*; <sup>1</sup>*Agallou, E.*; <sup>1</sup>*Wright, V.*; <sup>2</sup>*Marín, J.*; <sup>3</sup>*Ellis, A. W.*  
<sup>1</sup>Swansea University; <sup>2</sup>University of Murcia; <sup>3</sup>University of York

**16:40 [6D5]** Cue utilisation and judgments of learning: What can we learn from an integrative approach?  
*Illman, I.*; *Morrison, C. M.*  
 University of Leeds, UK

**15:20 – 17:00 Symposium: The use of social cues for the perception of others' actions and perspectives**

**Room Picasso Chair: Wang, J & Samson, D.**

**15:20 [6E1]** Automatic level-1 visual perspective taking in adults- do the effects go beyond subitizing and information selection?  
*Wang, J. J.*; *Apperly, I. A.*  
 University of Birmingham

**15:40 [6E2]** Perspective taking in children and adults- the Level-1/ Level-2 distinction provides a limit on efficient perspective taking  
*Surtees, A. D. R.*; *Apperly, I. A.*  
 University of Birmingham

**16:00 [6E3]** The influence of observing others on visuo-spatial perspective taking and gaze following

*Zwikel, J.; Müller, H.J.*

Ludwig-Maximilians University

**16:20 [6E4]** The role of low- and high-level social cues in anticipating other's actions

*Jellema, T.; Palumbo, L.*

University of Hull

**16:40 [6E5]** The neural correlates of Fitts's law in an action observation task: an fMRI study

<sup>1</sup>*Eskenazi, T.*; <sup>2</sup>*Rotshtein, P.*; <sup>3</sup>*Grosjean, M.*; <sup>1</sup>*Knoblich, G.*

<sup>1</sup>Radboud University; <sup>2</sup>University of Birmingham; <sup>3</sup>Leibniz Research Centre for Working Environment and Human Factors

**17:00 – 17:20** Coffee Break

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**17:20 – 19:00** Symposium: Experimental and clinical psychology: Building bridges for knowledge

**Room Andalucía I & II** Chair: Vázquez, C.

**17:20 [7A1]** Inhibitory control in memory in mental disorders

*Soriano, M. F.; Ros, M. J.; Bajo, M. T. (Presenting author: Bajo, M. T.)*

University of Granada

**17:40 [7A2]** Is there a mood congruent effect in cognitive processing beyond awareness?

Empirical evidence for implicit memory biases in depression using a lexical decision task

*Romero, N.; Vázquez, C.; Sánchez, A. (Presenting author: Vazquez, C.)*

Complutense University of Madrid

**18:00 [7A3]** Do we pay attention to the positive because we are happy, or is it the other way around? Attentional biases and mood regulation: an eye-tracking study

*Sánchez, A.; Vázquez, C.; Romero, N.; Hervás, G.*

Complutense University of Madrid

**18:20 [7A4]** Anxiety-related interpretative biases in older adults

*Cabrera, I.; Montorio, I.; Herrera, S.*

Autonoma University

**18:40 [7A5]** Influence of positive and negative emotions over the eating behaviour in "emotional eaters"

<sup>13</sup>*Baños, R.*; <sup>23</sup>*Cebolla, A.*; <sup>3</sup>*Etchemendy, E.*; <sup>1</sup>*Felipe, S.*; <sup>1</sup>*Pérez, I.*; <sup>23</sup>*Botella, C.*

<sup>1</sup>University of Valencia; <sup>2</sup>Jaume I University; <sup>3</sup>CIBER

**17:20 – 19:00** Symposium: Exploring the self through ownership: Cognitive, neural and developmental perspectives

**Room Andalucía III** Chair: Cunningham, S.

**17:20 [7B1]** Minimal ownership: cognitive effects and underlying mechanisms

*Van den Bos, M.*

University of Aberdeen

**17:40 [7B2]** Exploring the neural substrates of self-ownership and memory

*Turk, D. J.*

University of Aberdeen

**18:00 [7B3]** The object of my attention: An ERP study of self-relevant information processing  
*Handy, T. C.*  
 University of British Columbia

**18:20 [7B4]** A world of my own: The emergence of ownership effects in childhood  
*Cunningham, S. J.;*  
 University of Aberdeen

**18:40 [7B5]** Blowing up Teddy: Implications of unique identity and ownership on cognitive biases  
*Gjersoe, N. L.; Hood, B. M.*  
 Bristol University

**17:20 – 19:00 Symposium: The development of counterfactual emotions into adulthood**

**Room Machuca Chair: Weisberg, D.P. & Burns, P.**

**17:20 [7C1]** Executive control and complex emotions in children: switching predicts the experience of regret  
<sup>1</sup>*Burns, P.;* <sup>1</sup>*Beck, S. R.;* <sup>2</sup>*Riggs, K. J.*  
<sup>1</sup>University of Birmingham; <sup>2</sup>London Metropolitan University

**17:40 [7C2]** Choosing to Regret: The effect of choice on children's early experience of regret and relief  
*Weisberg, D. P.;* *Beck, S. R.*  
 University of Birmingham

**18:00 [7C3]** The role of understanding of expectations and counterfactual thoughts in children's understanding of emotions  
<sup>1</sup>*Ferrell, J. M.;* <sup>2</sup>*Guttentag, R.*  
<sup>1</sup>London Metropolitan University; <sup>2</sup>University of North Carolina at Greensboro

**18:20 [7C4]** When the alternative had been better - counterfactual reasoning and the emergence of regret  
*Rafetseder, E.;* *Perner, J.*  
 University of Salzburg

**18:40 [7C5]** Counterfactual thinking and the amplification of regret  
*Zeelenberg, M.*  
 Tilburg University

**17:20 – 19:00 Thematic Session 7D: Language Comprehension**

**Room Manuel de Falla Chair: Cuetos, F.**

**17:20 [7D1]** The role of question format and text availability on Reading Comprehension Assessment  
*Ferrer, A.;* *Vidal-Abarca, E.;* *Mañá, A.;* *Llorens, A. C.*  
 University of Valencia

**17:40 [7D2]** Predictive inferences activation during reading: Analysis of the causal powers components in global coherence  
*Escudero, I.;* *León, J. A.*  
<sup>1</sup>Nebrija University; <sup>1</sup>Autonoma University of Madrid

**18:00 [7D3]** The comprehension of deictic sentences is modulated by the reader's location  
*de Vega, M.; Castillo, M. D. , Junco, J.*  
University of La Laguna

**18:20 [7D4]** Monitoring the penalization of ambiguity in vector model representations  
*de Jorge-Botana, G.; Olmos, R.; León, J. A.*  
Autonoma University of Madrid

**18:40 [7D5]** Looking what we are not told: Eye movements and the topic of negative sentences  
*<sup>1</sup>Orenes, I.; <sup>12</sup>Duñabeitia, J. A.; <sup>1</sup>Beltrán, D.; <sup>1</sup>Santamaría, C.*  
<sup>1</sup>University of La Laguna; <sup>2</sup>Basque Center on Cognition, brain and language

**17:20 – 19:00 Thematic Session 7E: Visual perception**

**Room Picasso Chair: Gellatly, A.**

**17:20 [7E1]** The Venus effect in paintings, photographs, and real rooms  
*Bertamini, M.; Lawson, R.*  
University of Liverpool

**17:40 [7E2]** Mechanisms underlying the development of probabilistic cuing in large-scale environmental search  
*<sup>1</sup>Smith, A. D.; <sup>2</sup>Pellicano, L.; <sup>3</sup>Briscoe, J.; <sup>3</sup>Cristino, F.; <sup>3</sup>Gilchrist, I. D.; <sup>3</sup>Hood, B. M.*  
<sup>1</sup>University of Nottingham; <sup>2</sup>University of London; <sup>3</sup>University of Bristol

**18:00 [7E3]** Searching scenes for targets: The effect of scene priming on eye movements  
*<sup>1</sup>Hillstrom, A. P.; <sup>1</sup>Scholey, H.; <sup>2</sup>Liversedge, S. P.*  
<sup>1</sup>University of Portsmouth; <sup>2</sup>University of Southampton

**18:20 [7E4]** Visual awareness of objects and object features as revealed by an abrupt cueing task  
*Pilling, M.; Gellatly, A.*  
Oxford Brookes University

**18:40 [7E5]** Interaction between intrinsic and extrinsic principles of perceptual grouping in vision  
*Montoro, P. R.; Luna, D.*  
UNED

**19:00 – 20:00 Business Meeting: SEPEX (Picasso); EPS (Machuca)**

## Saturday, 17 April

### 09:00 – 10:40 Thematic Session 8A: Cognitive Disorders

**Room Andalucía I & II    Chair: Correa, A**

**9:00 [8A1]** Visuomotor feedback training results in long term improvements in activities of daily living in patients with hemispatial neglect

<sup>1</sup>Harvey, M.; <sup>2</sup>Muir, K.; <sup>2</sup>Reeves, I.; <sup>2</sup>Duncan, G.; <sup>2</sup>Birschel, P.; <sup>2</sup>Roberts, M.; <sup>2</sup>Livingstone, K.; <sup>2</sup>Jackson, H.; <sup>3</sup>Hogg, C.; <sup>3</sup>Castle, P.; <sup>4</sup>Learmonth G.; <sup>5</sup>Rossit, S.

<sup>1</sup>University of Glasgow; <sup>2</sup>Southern General Hospital; <sup>3</sup>Mansion House Unit, Glasgow; <sup>4</sup>Victoria Infirmary; <sup>5</sup>University of Western Ontario

**9:20 [8A2]** ERP evidence of differences in visual verification for high schizotypal people  
*Santamaría, C.; Orenes, I.; Naverrete, G.; Beltrán, D.*

University of La Laguna

**9:40 [8A3]** Interference control in Parkinson's disease and freezing of gait

<sup>1</sup>Vandenbosch, J.; <sup>1</sup>Zeischka, P.; <sup>1</sup>Coomans, D.; <sup>2</sup>Vercruyse, S.; <sup>2</sup>Spildooren, J.; <sup>1</sup>Deroost, N.; <sup>1</sup>Soetens, E.; <sup>2</sup>Kerckhofs, E.

<sup>1</sup>Vrije Universiteit Brussel; <sup>2</sup>Catholic University of Leuven

**10:00 [8A4]** What paranoia has to do with depression? Avoidance of threatening faces is increased by depression-related primes

*Provencio, M.; Vázquez, C.; Valiente, C.; Hervás, G.*

Complutense University of Madrid

**10:20 [8A5]** Neuropsychology of temporal preparation: frontal lesions, fibromyalgia and aging

<sup>1</sup>Correa, A.; <sup>1</sup>Miró, E.; <sup>2</sup>Triviño, M.; <sup>1</sup>Capizzi, M.; <sup>3</sup>Vallesi, A.; <sup>1</sup>Lupiáñez, J.

<sup>1</sup>University of Granada; <sup>2</sup>San Rafael University Hospital, Granada; <sup>3</sup>International School for Advanced Studies, Trieste

### 09:00 – 10:40 Thematic Session 8B: Thinking

**Room Andalucía III    Chair: McCloy, R.**

**9:00 [8B1]** Children's understanding of counterfactual alternatives

*McCloy, R.; Strange, P.; Mason-Apps, E.*

University of Reading

**9:20 [8B2]** Situational self-awareness influences 3- and 4-year-olds' prosocial self-regulation

<sup>1</sup>Ross, J.; <sup>2</sup>Anderson, J. R.; <sup>2</sup>Campbell, R. N.

<sup>1</sup>University of Dundee; <sup>2</sup>University of Stirling

**9:40 [8B3]** Task switching, Inhibition, and executive control in children with autism

<sup>1</sup>Stoet, G.; <sup>2</sup>López, B.

<sup>1</sup>University of Leeds; <sup>2</sup>University of Portsmouth

**10:00 [8B4]** Executive functioning in children with specific language impairment

<sup>1</sup>Henry, L.; <sup>2</sup>Messer, D.; <sup>1</sup>Nash, G.

<sup>1</sup>London South Bank University, <sup>2</sup>Open University

**10:20 [8B5]** Basic inference processes in premature children

<sup>1</sup>Moreno-Ríos, S.; <sup>2</sup>Roldán, M. D.

<sup>1</sup>University of Granada; <sup>2</sup>University of Almería

**09:00 – 10:40 Thematic Session 8C: Social 2**

**Room Machuca Chair: Rodriguez, R. .**

**9:00 [8C1]** How to distinguish between knowledge-based and recognition-based decisions: Discrimination Index

*Beaman, C. P.; Smith, P. T.*

University of Reading

**9:20 [8C2]** Predicting group processes from personality dissimilarity

*Solanas, A.; Manolov, R.; Leiva, D.; Andrés, A.*

University of Barcelona

**9:40 [8C3]** Goal-directed behaviour in human drug users

*Blundell, P.*

University of Leeds

**10:00 [8C4]** Perception of battered women with priming experimentation

*Montilla, G.; Aranda, M.; Montes-Berges, B.*

University of Jaén

**10:20 [8C5]** Simpson's paradox in a web experiment: The impact of cognitive focus, sample size, and trend information on social inference

<sup>1</sup>*Fraendorfer, D.*; <sup>2,3</sup>*Reips, U. D.*

<sup>1</sup>University of Zurich; <sup>2</sup>University of Deusto; <sup>3</sup>Basque Foundation of Science

**09:00 – 10:40 Thematic Session 8D: Language 4**

**Room Manuel de Falla Chair: Izura, C.**

**9:00 [8D1]** Phonological priming in Tip-Of-the-Tongue states resolution: The role of syllabic position and word length in a European Portuguese study

*Pureza, R.; Carvalho Soares, A. P.; Comesaña, M.*

University of Minho

**9:20 [8D2]** Polysemy advantage: automatic process or sensitive to grammatical context?

*Jager, B.; Cleland, S.*

University of Aberdeen

**9:40 [8D3]** Early word learning in nine-month-olds: Dynamics of picture-word priming

<sup>1,2</sup>*Junge, C.*; <sup>1,2</sup>*Hagoort, P.*; <sup>1,2,3</sup>*Cutler, A.*

<sup>1</sup>Max Planck Institute for Psycholinguistics; <sup>2</sup>Radboud University; <sup>3</sup>University of Western Sydney

**10:00 [8D4]** Semantic information influences the recognition of newly learned words overtime

*Ferreira, R.; Ellis, A. W.*

University of York

**10:20 [8D5]** ERP evidence for differential effects of word length in the left and right cerebral hemispheres

<sup>1</sup>*Wright, V.*; <sup>1</sup>*Fouquet, N.*; <sup>2</sup>*Mills, D. L.*; <sup>1</sup>*Izura, C.*

<sup>1</sup>University of Swansea; <sup>2</sup>University of Bangor

**09:00 – 10:40 Thematic Session 8E: Perception 2****Room Picasso Chair: Roberson, D.**

**9:00 [8E1]** Is that blue or green? Categorical perception and discrimination thresholds for color

<sup>1</sup>Roberson, D.; <sup>1</sup>Hanley, J. R.; <sup>2</sup>Pak, H.

<sup>1</sup>University of Essex; <sup>2</sup>Yeungnam University

**9:20 [8E2]** The psychometrics of photographic cropping

McManus, C.

University College London

**9:40 [8E3]** How far we can see? The apparent horizon and the inherent geometry of the Visual Space

Aznar-Casanova, J. A.

University of Barcelona

**10:00 [8E4]** Saccade processing in hemispatial neglect

<sup>1</sup>Szymanek, L.; <sup>2</sup>Butler, S. H.; <sup>3</sup>Rossit, S.; <sup>1</sup>Harvey, M.

<sup>1</sup>University of Glasgow; <sup>2</sup>University of Strathclyde; <sup>3</sup>University of Western Ontario

**10:20 [8E5]** Is substitution masking reduced for long duration items because identity information is available in VSTM or because target and mask objects are better individuated?

Gellatly, A.; Guest, D.; Pilling, M.

Oxford Brookes University

**10:40 [8E6]** Dichromats basic colour categories use depends on red-green mechanism residual activity utilisation

<sup>1</sup>Moreira, H.; <sup>2</sup>Lillo, J.; <sup>2</sup>Alvaro, L.; <sup>2</sup>Durán, M. C.

<sup>1</sup>Cardenal Cisneros University College; <sup>2</sup>Complutense University of Madrid

**10:40 – 11:40 Poster III & Coffee Break****11:40 – 13:20 Thematic Session 9A: Language production****Room Andalucía I & II Chair: Perea, M**

**11:40 [9A1]** Segmentation of spontaneous speech

White, L.; Wiget, L.; Rauch, O.; Sven L.; Mattys White, L.

University of Bristol

**12:00 [9A2]** Audiovisual speech integration: Visual attention to articulation affects brain responses in 6-9 month old infants.

<sup>1</sup>Kushnerenko, E.; <sup>1,2</sup>Tomalski, P.; <sup>2</sup>Ribeiro, H.; <sup>1</sup>Potton, A.; <sup>1</sup>Axelsson, E.; <sup>1</sup>Moore, D. G.

<sup>1</sup>University of East London; <sup>2</sup>University of London

**12:20 [9A3]** Differences in the production and comprehension of compound words

<sup>1</sup>Janssen, N.; <sup>2</sup>Pajtas, P. E.; <sup>2</sup>Caramazza, A.

<sup>1</sup>University of La Laguna; <sup>2</sup>Harvard University

**12:40 [9A4]** Further evidence for automatic activation of inner speech in silent reading

Humphreys, J.

University of the West of England

**13:00 [9A5]** Stress awareness and the acquisition of the orthographic stress in Spanish  
*<sup>1</sup>Gutiérrez Palma, N.; <sup>2</sup>Defior, S.; <sup>2</sup>Serrano, F.; <sup>2</sup>Jiménez Fernández, G.; <sup>2</sup>González Trujillo, M. C.*  
<sup>1</sup>University of Jaén; <sup>2</sup>University of Granada

**11:40 – 13:20 Thematic Session 9B: Perception & Action**

**Room Andalucía III Chair: Soto-Faraco, S.**

**11:40 [9B1]** Audio-visual sensory interaction dissociates magno- and parvocellular processing  
*<sup>1</sup>Jaekl, P.; <sup>1,2</sup>Soto, S.*  
<sup>1</sup>Universitat Pompeu Fabra Center for Brain and Cognition; <sup>2</sup>Institució Catalana de Recerca i Estudis Avançats (ICREA)

**12:00 [9B2]** Walking low level perception through the embodiment continuum  
*<sup>1</sup>Rodríguez, S.; <sup>1</sup>Costa, A.; <sup>2</sup>Vigliocco, G.*  
<sup>1</sup>Pompeu Fabra University; <sup>2</sup>University College of London

**12:20 [9B3]** Body parts are unlike faces: Behavioral evidence from the singleton paradigm  
*<sup>1</sup>Mohamed, T. N.; <sup>2</sup>Neumann, M. F.; <sup>2</sup>Schweinberger, S. R.*  
<sup>1</sup>FSU Jena; <sup>2</sup>Sohag university

**12:40 [9B4]** The Effect of Context in Multisensory Events  
*<sup>1</sup>Sarmiento, B. R.; <sup>2</sup>Shore, D. I.; <sup>2</sup>Milliken, B.; <sup>1</sup>Sanabria, D.*  
<sup>1</sup>University of Granada; <sup>2</sup>Neuroscience and Behaviour McMaster University

**11:40 – 13:20 Symposium: Mathematical cognition**

**Room Machuca Chair: Colomé, A**

**11:40 [9C1]** Dissociation between arithmetic operations  
*Salguero-Alcañiz, M. P.; Alameda-Bailén, J. R.*  
University of Huelva

**12:00 [9C2]** Effects of TMS induced disruption to right and left parietal cortex on addition and Multiplication  
*<sup>1</sup>Semenza, C.; <sup>2</sup>Salillas, E.; <sup>1</sup>Basso, D.; <sup>3</sup>Vecchi, T.; <sup>4</sup>Siegel, M.*  
<sup>1</sup>University of Padova; <sup>2</sup>University of Texas; <sup>3</sup>University of Pavia; <sup>4</sup>University of Sheffield

**12:20 [9C3]** Cultural differences in calculation and estimation strategies  
*<sup>1</sup>Imbo, I.; <sup>2</sup>LeFevre, J-A.*  
<sup>1</sup>University of Huelva; <sup>2</sup>Carleton University

**12:40 [9C4]** Effects of format, operation and size in calculation strategies  
*Colomé, A.; Bafalluy, M. G.; Lorite, R.*  
University of Barcelona

**13:00 [9C5]** The origin of the distance effect in numerical updating tasks  
*Pelegriña, S.; Lendínez, C.; Lechuga, M. T.*  
University of Jaen

**11:40 – 13:20 Symposium: Neural bases of memory development****Room Manuel de Falla Chair: de Haan, M.****11:40 [9D1]** The social brain in adolescence*Blakemore, S.*

University College London

**12:00 [9D2]** Genotype/phenotype relations*Karmiloff-Smith, A.*

Birkbeck Centre for Brain &amp; Cognitive Development

**12:20 [9D3]** Early word learning and the developing brain*Mills, D. L.*

Bangor University

**12:40 [9D4]** Changes in face processing during the first year of life*Pascalis, O.*

Peirre Mendès University

**13:00 [9D5]** Neurocognitive development of attention*Rueda, M. R.*

University of Granada

**11:40 – 13:20 Symposium: Competitive learning: Inferential reasoning or automatic process?****Room Picasso Chair: Matute, H & Shanks, D.R. .****11:40 [9E1]** Direct measures of associative cue competition as evidenced from priming studies*Morís, J.; Cobos, P. L.; Luque, D.; López, F. J.*

University of Málaga

**12:00 [9E2]** Cue-competition in contextual cue learning*Beesley, T.; Shanks, D. R.*

University College London

**12:20 [9E3]** When there is no time to think cues augment each other rather than compete*Matute, H.; Vadillo, M. A.*

University of Deusto

**12:40 [9E4]** Attentional biases in human learning: Controlled or automatic?*Le Pelley, M. E.*

Cardiff University

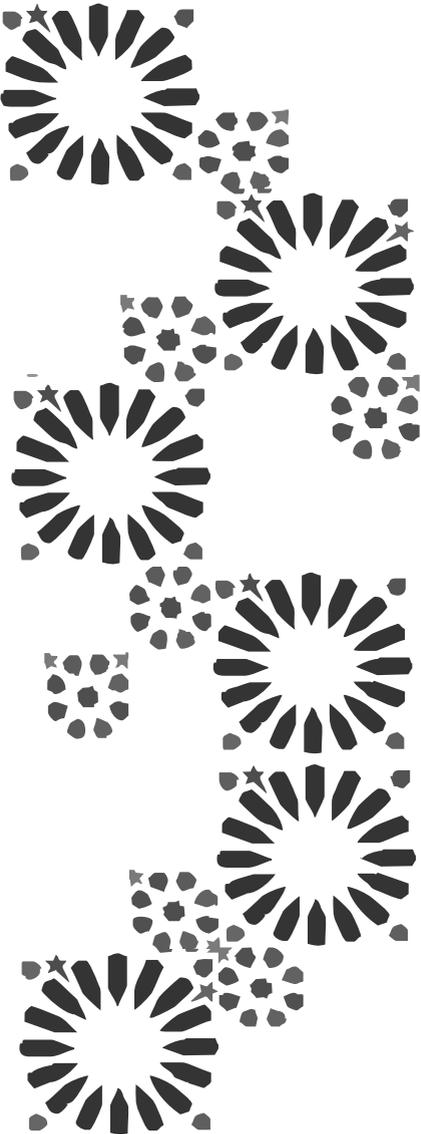
**13:00 [9E5]** Against better judgment: Looking for non-propositional learning*de Houwer, J.*

Ghent University

**13:30 – 14:30 Mark H. Johnson, EPS conference**



# POSTER SESSIONS





## POSTER SESSION I

**[PI-1]** The relationships between age, strength and movement dexterity

<sup>1</sup>Edwards, M. G.; <sup>12</sup>Martin, J. A.; <sup>3</sup>Ramsey, J.; <sup>4</sup>Hughes, C.; <sup>4</sup>, <sup>5</sup>Peters, D.

<sup>1</sup>University of Birmingham; <sup>2</sup>Centre for Neurology; <sup>3</sup>University of Birmingham; <sup>4</sup>University of Worcester; <sup>5</sup>University of Agder

**[PI-2]** The effects of hypnosis on performance of executive control tasks in a patient with frontal lobe damage

Agis, I. F.; Daza, M. T.; del Águila, E. M.; Aguado, R.; Soriano, C.

University of Almería

**[PI-3]** The effect of task-set complexity on task-set reconfiguration

van 't Wout, F.; Lavric, A.; Monsell, S.

University of Exeter

**[PI-4]** Discrimination studies with priming: An up-to-date review

Montes-Berges, B. ; Castillo-Mayén, M. R.

University of Jaén

**[PI-5]** The role of monitoring and control in discrimination of targets from similar non-targets

Miles S. M.; Macken, W. J.

School of Psychology, Cardiff University

**[PI-6]** Better measurement with visual analogue scales: A web experiment

<sup>1</sup>Funke, F.; <sup>23</sup>Reips, U. D.

<sup>1</sup>University of Tübingen; <sup>2</sup>University of Deusto; <sup>3</sup>Basque Foundation of Science

**[PI-7]** Background sound impairs interruption recovery in dynamic task situations

<sup>12</sup>Hodgetts, H. M.; <sup>1</sup>Vachon, F.; <sup>1</sup>Champagne, J.; <sup>2</sup>Jones, D. M.; <sup>1</sup>Tremblay, S. (presenting author)

<sup>1</sup>Laval University; <sup>2</sup>Cardiff University

**[PI-8]** Tms shows different roles for sma and pre-sma regions of medial frontal cortex in preparation for a task-switch

Stevens, T.; Monsell, S.

University of Exeter

**[PI-9]** A brain-potential correlate of task-set conflict

Elchlepp, H.; Lavric, A.; Rumball, F.

University of Exeter

**[PI-10]** Reduced target-distracter interference in congenital prosopagnosia

<sup>1</sup>Zubko, O.; <sup>1</sup>Wilkinson, D.; <sup>2</sup>, <sup>3</sup>DeGutis, J.; <sup>2</sup>, <sup>3</sup>Milberg, W.; <sup>4</sup>Nakayama, K.

<sup>1</sup>University of Kent; <sup>2</sup>New England Geriatric, Research, Education & Clinical Center, Veterans Affairs Boston Healthcare System; <sup>3</sup>Harvard Medical School; <sup>4</sup>Harvard University

**[PI-11]** Electrophysiological correlates of automatic and controlled temporal preparation

Capizzi, M.; Correa, A.; Sanabria, D.

University of Granada

**[PI-12]** Influences of prism adaptation on exogenous orienting of attention and inhibition of return

Asanowicz, D.; Marzecova, A.; Michalczyk, L.; Wolski, P.

Jagiellonian University of Kraków

**[PI-13]** Comparing visual effect size indices for single-case designs

Manolov, R.; Solanas, A.; Leiva, D.

University of Barcelona

**[PI-14]** Inferences with diagrammatic premises to study the differences between children and adults

<sup>1</sup>Moreno-Ríos, S.; <sup>1</sup>Rodríguez-Gualda, I.; <sup>2</sup>Rojas, C.; <sup>3</sup>García-Madruga, J.

<sup>1</sup>University of Granada; <sup>2</sup>Catholic University of Chile; <sup>3</sup>UNED

**[PI-15]** The development of social attention control from 1 to 4 months

<sup>1</sup>Perra, O.; <sup>2</sup>Gattis, M.

<sup>1</sup>Queen's University Belfast; <sup>2</sup>Cardiff University

**[PI-16]** Goal-directed imitation: State or trait?

Sakkalou, E.; Ellis, K.; Fowler, N.; Hilbrink, E.; Gattis, M.

Cardiff University

**[PI-17]** Differential responses of children with down's syndrome to the preschool children scale for skill and learning potential

Robles Bello, M. A.

University of Jaén

**[PI-18]** Telling the brain what to do: Interactions between speech and cognitive control in Parkinson disease patients

Mari-Beffa, P.; Kirkham, A.; Wright, S.; Williams, F.; Houghton, G.

Bangor University

**[PI-19]** Generating phonological structure: Evidence from English phrase production

<sup>1</sup>Malpass, D.; <sup>1</sup>Wheeldon, L.; <sup>2</sup>Lahiri, A.

<sup>1</sup>University of Birmingham; <sup>2</sup>University of Oxford

**[PI-20]** Can domain-general associative mechanisms support language learning? Evidence from statistical learning

<sup>1,2</sup>Pizzioli, F.; <sup>1</sup>Karmiloff-Smith, A.

<sup>1</sup>University of London; <sup>2</sup>Catholic University of Louvain

**[PI-21]** Implicit causality revisited: A cross-linguistic study of different domains of verbs in western and non-western languages

<sup>1</sup>Franco, F.; <sup>1</sup>Baluch, B.; <sup>1</sup>Çatal, T.; <sup>2</sup>Danaye-Tousi, M.; <sup>1</sup>Leivo, K.; <sup>3</sup>Major, A.; <sup>1</sup>Sigger, J.; <sup>1</sup>Skoczen, I.; <sup>3</sup>Zotovic, M.

<sup>1</sup>Middlesex University; <sup>2</sup>Novi Sad University; <sup>3</sup>Guilan University

**[PI-22]** Cued language switching in sentence reading: Control inhibition and the asymmetric switching cost

Ibáñez, A.; Bajo, M. T.

University of Granada

**[PI-23]** Emotion words have a processing advantage over neutral words in both first and second language

<sup>1</sup>Rodríguez, S.; <sup>2</sup>Vinson, D.; <sup>2</sup>Lemmens, E.; <sup>1</sup>Costa, A.; <sup>2</sup>Vigliocco, G.

<sup>1</sup>University Pompeu Fabra; <sup>2</sup>University College of London

**[PI-24]** Switching between languages: Erp study

<sup>1</sup>Van der Meij, M.; <sup>2</sup>Cuetos, F.; <sup>3</sup>Carreiras, M. .; <sup>1</sup>Barber, H. A.

<sup>1</sup>University of La Laguna; <sup>2</sup>University of Oviedo; <sup>3</sup>Basque Center on Cognition Brain and Language;

<sup>4</sup>IKERBASQUE Basque Foundation for Science

**[PI-25]** Cross-linguistic models of reading: Comparisons between normal and impaired reading in English and Spanish

<sup>1</sup>Cuetos, F.; <sup>2</sup>Rodríguez-Ferreiro, J.; <sup>3</sup>Davies, R.; <sup>4</sup>Monaghan, P.

<sup>1</sup>University of Oviedo; <sup>2</sup>University of Barcelona; <sup>3</sup>Oxford Brookes University; <sup>4</sup>Lancaster University

**[PI-26]** The recognition of generated and provided words: An electrophysiological study

González Nosti, M.; Cuetos, F.

University of Oviedo

**[PI-27]** Longitudinal patterns of fluency impairment in dementia: The role of domain and "nuisance variables"

Moreno-Martínez, F. J.; Montoro, P. R.

National University of Distance Education (UNED)

- [PI-28]** Connectives comprehension and individual differences in reading  
*Moreno, I.; Díaz, J.M.; Gámez, E.; León, I.; Morera, Y.; de Vega, M.*  
 University of La Laguna
- [PI-29]** Effect of feedback on different levels of task-oriented reading skills  
*Ávila, V.; Vidal-Abarca, E.; Gil, L.; Llorens, A.C.*  
 University of Valencia
- [PI-30]** Potenciales cerebrales asociados al procesamiento léxico en niños con trastorno por déficit de atención con hiperactividad  
*González-Pérez, P.A.; Domínguez, A.; Beltrán, D.; Hernández, S.*  
 University of La Laguna
- [PI-31]** Knowledge of function and manipulation on everyday tools: An rtms study  
<sup>1</sup>*Ishibashi, R.*; <sup>2</sup>*Pobric, G.*; <sup>2</sup>*Lambon, M. A.*  
<sup>1</sup>Kyoto University; <sup>2</sup>University of Manchester
- [PI-32]** Relationship between order of acquisition and vocabulary size  
<sup>1</sup>*Pérez, M. A.*; <sup>2</sup>*Izura, C.*; <sup>3</sup>*Marín, J.*; <sup>3</sup>*Ellis, A. W.*; <sup>4</sup>*Stadthagen-González, H.*  
<sup>1</sup>University of Murcia; <sup>2</sup>University of Wales; <sup>3</sup>University of York; <sup>4</sup>University of Wales Bangor
- [PI-33]** Interpersonal verbs and body locomotion  
*Gámez, E.; Díaz, J. M.; Marrero, H.; de Vega, M.*  
 University of La Laguna
- [PI-34]** Bilingual advance in cued and uncued task-switching within language  
<sup>1</sup>*Mas, E.*; <sup>1234</sup>*de Diego-Balaguer, R.*; <sup>5</sup>*Ruz, M.*  
<sup>1</sup>University of Barcelona; <sup>2</sup>Catalan Institution of Research and Advanced Studies; <sup>3</sup>IDIBELL; <sup>4</sup>Normal Highschool of Paris; <sup>5</sup>University of Granada
- [PI-35]** Infants learn rules more easily over vowels than over consonants  
*Pons, F.; Toro, J. M.*  
 University of Barcelona
- [PI-36]** Face reality: Eye movements to real and photographic faces  
<sup>1</sup>*Cooper, R.*; <sup>2</sup>*Cristino, F.*  
<sup>1</sup>Edinburgh Napier University; <sup>2</sup>University of Bristol
- [PI-37]** Contextual biconditional discrimination of conditioned flavour preference in rats  
<sup>1</sup>*González, F.*; <sup>2</sup>*Hall, G.*  
<sup>1</sup>University of Granada; <sup>2</sup>Universidad de York
- [PI-38]** Decrease in conditioned flavour preference after post-training cs exposure is due to conditioned inhibition rather than to extinction: Evidence from retardation and summation tests  
*García-Burgos, D.; González, F.*  
 University of Granada
- [PI-39]** The combined effect of interventions designed to improve children's logical reasoning performance  
*McKenzie, R.; Handley, S.*  
 University of Plymouth
- [PI-40]** The effect of stimulus pre-exposure schedule in human perceptual learning  
*Vázquez, G.A.; Arriola, N.; Alonso, G.*  
 University of the Basque Country
- [PI-41]** A study of interference between outcomes based in a cued-response priming task  
*González Martín, E.; Cobos Cano, P.L.*  
 University of Málaga
- [PI-42]** Associative evocation explains a perceptual learning effect after short preexposure  
<sup>1</sup>*Contel, D. M.*; <sup>1</sup>*Artigas, A. A.*; <sup>1</sup>*Sansa, J.*; <sup>2</sup>*Prados, J.*  
<sup>1</sup>University of Barcelona; <sup>2</sup>University of Leicester

**[PI-43]** Human classical conditioning: The role of the valence and arousal of the unconditioned stimulus

*Méndez, A.; Redondo, J.*

University of Santiago de Compostela

**[PI-44]** Semantic distraction in free recall: Modality differences reduce source-monitoring errors

<sup>1</sup>*Marsh, J. E.*; <sup>2</sup>*Hodgetts, H. M.*; <sup>3</sup>*Beaman, C. P.*; <sup>1</sup>*Jones, D. M.*

<sup>1</sup>Cardiff University; <sup>2</sup>University of Laval; <sup>3</sup>Reading University

**[PI-45]** Recalling our past changes thoughts about the future: The effects of retrieving food memories on predicted enjoyment and choice

*Robinson, E.; Blissett, J.; Higgs, S.*

University of Birmingham

**[PI-46]** The effect of relearning on directed forgetting

*Gómez-Ariza, C. J.; Iglesias-Parro, S.*

University of Jaén

**[PI-47]** Inhibition processes in prospective memory

*Meilán, J. J. G.; Arana, J. M.; Pérez Sáez, E.; Gordillo, F.*

University of Salamanca

**[PI-48]** The contribution of the temporal nature and familiarity of imagined scenes to episodic future thinking

<sup>12</sup>*de Vito, S.*; <sup>1</sup>*Gamboz, N.*; <sup>1</sup>*Brandimonte, M. A.*

<sup>1</sup>Suor Orsola Benincasa University; <sup>2</sup>University of Edinburgh

**[PI-49]** Dissociations between retrieval and metacognitive monitoring in recall: The mixed blessing of high inter-target association

*Guzel, M. A.; Higham, P. A.*

University of Southampton

**[PI-50]** Production of false memories in the drm paradigm using lists with two critical items: Position in the list vs. Associative strength

*Oliveira, H.; Albuquerque, P. B.; Machado, A. B.*

University of Minho

**[PI-51]** An investigation of two types of familiarity

*Neil, G.; Higham, P. A.*

University of Southampton

**[PI-52]** Percentage of nonoverlapping corrected data

*Manolov, R.; Solanas, A.*

University of Barcelona

**[PI-53]** An r package for measuring and testing steepness in dominance hierarchies

<sup>1</sup>*Leiva, D.*; <sup>2</sup>*de Vries, H.*

<sup>1</sup>University of Barcelona; <sup>2</sup>Utrecht University

**[PI-54]** On the money – monetary and numerical judgments of currency

*Goldman, R.; Ganor-Stern, D.; Tzelgov, J.*

Ben-Gurion University of the Negev

**[PI-55]** The intention of speech: Temporal erp evidence for an early dissociation between meaning and words

<sup>12</sup>*Strijkers, K.*; <sup>3</sup>*Holcomb, P.*; <sup>2</sup>*Costa, A.*

<sup>1</sup>Pompeu Fabra University; <sup>2</sup>University of Barcelona; <sup>3</sup>Tufts University

**[PI-56]** Automatic processing of magnitude in <sup>1</sup>-digit arabic numbers in third-grade children

*Rodríguez-Santos, J. M.; García-Orza, J.; Iza, M.; Calleja, M.*

University of Málaga

**[PI-57]** Functional independence between written and oral calculation

*Salguero-Alcañiz, M. P.; Alameda-Bailén, J. R.*

University of Huelva

- [PI-58]** Modification of the visual response evoked by geometric images in healthy subjects obtained during two laboratory stressors: The cold pressor test and an arithmetical mental task  
<sup>1</sup>*Pellicer, O.;* <sup>1</sup>*Pérez-Arroyo, M.;* *Salvador, A.*  
<sup>1</sup>Miguel Hernández University; <sup>2</sup>University of Valencia
- [PI-59]** Backward effects from task 2 motor response on task 1 performance: Interference at central level or response coupling at motor level?  
*Ruiz Fernández, S.;* *Ulrich, R.*  
 Eberhard Karls University
- [PI-60]** Stimulus pre-exposure schedule and eye-tracking activity in a visual stimuli identification task  
<sup>1</sup>*Angulo, R.;* <sup>2</sup>*Di Stasi, L. L.;* <sup>2</sup>*Catena, A.;* <sup>1</sup>*Alonso, G.*  
<sup>1</sup>University of the Basque Country; <sup>2</sup>University of Granada
- [PI-61]** Non-conventional TV advertising: Visual impact and viewer's visual behaviour  
*Añaños, E.;* *Mas, M. T.;* *Estaún, S.;* *Valli, A.;* *Padilla, A.;* *Jaén, S.;* *Jiménez, S.;* *Astals, A.;* *Jiménez, S.*  
 Autonomous University of Barcelona
- [PI-62]** Amplitude and speed of wielding modulate length perception through dynamic touch  
*Lobo, L.;* *Travieso, D.*  
 Autonomous University of Madrid
- [PI-63]** Is the difference threshold a function of the physical or of the perceived stimulus?  
<sup>1</sup>*Pedraja, M. J.;* <sup>2</sup>*Montoro, P. R.*  
<sup>1</sup>University of Murcia; <sup>2</sup>National University of Distance Education
- [PI-64]** Automatic tactile remapping without space encoding  
<sup>1</sup>*Camacho, K.;* <sup>12</sup>*Azañón, E.;* <sup>13</sup>*Soto-Faraco, S.*  
<sup>1</sup>Pompeu Fabra University; <sup>2</sup>University of Barcelona; <sup>3</sup>Catalan Institution of Research and Advanced Studies
- [PI-65]** "That's not a real body": Identifying stimulus qualities that modulate synaesthetic experiences of touch  
*Holle, H.;* *Ward, J.*  
 University of Sussex
- [PI-66]** Testing simulations of dichromate vision: A psychophysical method  
<sup>1</sup>*Alvaro, L.;* <sup>1</sup>*Lillo, J.;* <sup>1</sup>*Durán, M. C.;* <sup>2</sup>*Moreira, H.*  
<sup>1</sup>University of Madrid; <sup>2</sup>Universitary School Cardenal Cisneros
- [PI-67]** Interpersonal perception, personality, and academic achievement: An empirical study with undergraduate students  
<sup>1</sup>*Andrés, A.;* <sup>12</sup>*Solanas, A.;* <sup>1</sup>*Salafranca, Ll.*  
<sup>1</sup>University of Barcelona; <sup>2</sup>Institute for Brain, Cognition, and Behavior
- [PI-68]** Auditory self-relevance and the perception of gaze  
*Stoyanova, R.;* *Ewbank, M.;* *Calder, A. J.*  
 MRC Cognition and Brain Sciences Unit
- [PI-69]** Psychology of learning effects and the gain-loss theory in social psychology  
*Cristina Orgaz, C.;* *Matute, H.;* *Vadillo, M. A.*  
 University of Deusto
- [PI-70]** Priming use in studies on staff selection  
*Aranda, M.;* *Pérez-Cordón, L. G.;* *Montes-Berges, B.*  
 University of Jaén
- [PI-71]** Using subliminal priming in the gender discrimination  
*Castillo-Mayén, M. R.;* *Montes-Berges, B.*  
 University of Jaén

**[PI-72]** Psychological analysis of the emotional impact of the European tobacco warning labels campaign

<sup>1</sup>Roselló, F.; <sup>1</sup>Sánchez-Nácher, N.; <sup>1</sup>Muñoz, M. A.; <sup>2</sup>Viedma-del-Jesus, M. I.; <sup>1</sup>SanJuan R.; <sup>2</sup>Vila, J.; <sup>1</sup>Montoya, P.

<sup>1</sup>University of Balearic Islands; <sup>2</sup>University of Granada

**[PI-73]** When language gets emotional: Irony and the embodiment of affect in discourse

<sup>1</sup>Filik, R.; <sup>2</sup>Hunter, CH. M.; <sup>2</sup>Leuthold, H.

<sup>1</sup>University of Nottingham; <sup>2</sup>University of Glasgow

**[PI-74]** Differential brain activity during the negative initial aesthetic impression formation

Munar, E.; Nadal, M.; Roselló, J.; Flexas, A.; Cela, C. J.

Grupo de Evolución y Cognición Humana, asociado al Instituto de Física Interdisciplinar y Sistemas Complejos (UIB-CSIC)

**[PI-75]** Context effects in judgments of happiness produced by reward

De Rivas Hermosilla, S. ; Álvarez-Bejarano, A.; Fernández-Dols, J. M.

Autonomous University of Madrid

**[PI-76]** Antecedents and consequences of the perception of social power (and its legitimacy)

Willis, G. B.; Rodríguez-Bailón, R.

University of Granada

**[PI-77]** Warm women and cold men: Gender accessibility and environmental temperature

Jiménez-Moya, G.; Willis, G.B.; Santiago, J.; Rodríguez-Bailón, R.

University of Granada

**[PI-78]** Measuring causal reasoning in clinicians during reading of clinical reports

Flores, A.; Cobos, P.L. ; López, F.J.

University of Málaga

**[PI-79]** Identifying the same causal mechanism across different contexts

<sup>1</sup>Barbería, I.; <sup>2</sup>Baetu, I.; <sup>1</sup>Sansa, J.; <sup>2</sup>Baker, A.G.

<sup>1</sup>University of Barcelona; <sup>2</sup>McGill University

## POSTER SESSION II

**[PII-1]** No category effect in alzheimers disease

*Laws, K. R.; Moreno-Martínez, F. J.; Adlington, R. A.; Gale, T. M.; Irvine, K.*

University of Hertfordshire

**[PII-2]** Working memory updating in normal ageing

<sup>1</sup>*Rodríguez-Fernández, R.*; <sup>2</sup>*Martín-Aragoneses, M. T.*

<sup>1</sup>National University of Distance Education; <sup>2</sup>University of Madrid

**[PII-3]** Effects of aging and divided attention on intentional forgetting: Behavioural data and erp correlates

*Menor de Gaspar, J.*

University of Oviedo

**[PII-4]** Interference in dual-task performance: Evidence for a response initiation bottleneck

*Leuthold, H.*

University of Glasgow

**[PII-5]** Priming choice behaviour by action observation

<sup>1,2</sup>*Pereda, A.*; <sup>2,3</sup>*Soto-Faraco, S.*

<sup>1</sup>*Parc Científic de Barcelona, Barcelona*; <sup>2</sup>*Dept de Tecnologies de la Informació i les Comunicacions, Universitat Pompeu Fabra, Barcelona*; <sup>3</sup>*Institució Catalana de Recerca i Estudis Avançats (ICREA)*

**[PII-6]** Task switching paradigm: The simplicity of the stimuli does not alter reversal of typical effect

*Plaza-Ayllón, V.; Noguera, C.; Álvarez, D.; Carmona, E.*

University of Almería

**[PII-7]** Can intention override the “automatic pilot”?

<sup>1</sup>*Striemer, C. L.*; <sup>2</sup>*Yukovsky, J.*; <sup>1</sup>*Goodale, M. A.*

<sup>1</sup>University of Western Ontario; <sup>2</sup>University of Birmingham

**[PII-8]** Integration of auditory and visual verbal cues in cognitive control

*Kirkham, A.; Mari-Beffa, P.*

Bangor University

**[PII-9]** Generalisation and training of proportion congruent effect and specificity of conflict adaptation

*Torres Quesada, M. ; Funes, M. J.; Lupiáñez, J.*

University of Granada

**[PII-10]** The effect of the cueback on inhibition of return

*Martín-Arévalo, E.; Lupiáñez, J.*

University of Granada

**[PII-11]** Do circadian rhythms modulate post-error slowing?

*Molina, E.; Amayra, C. ; Araújo, R.; de la Rosa, E.; González, L.; Lara, I.; Moreno T.; Arturo, A.; Sanabria, D.; Correa, A.*

University of Granada

**[PII-12]** Cognitive control in frontal damaged patients

*Rodríguez-Bailón, M.; Lupiáñez, J.; Ruiz, R.; Funes, M. J.*

University of Granada

**[PII-13]** Two coupled dynamic fields can explain how rts in ior depends of stimulation's spatio-temporal structure

*Ibáñez-Gijón, J.; Travieso, D.; Jacobs, D.M.*

Autonomous University of Madrid

**[PII-14]** Measuring exogenous spatial attention during and after an acute bout of aerobic exercise

*Luque, A.; Morales, E.; Gálvez, G.; Sanabria, D.*

University of Granada

**[PII-15]** The neural correlates of counterfactuals: A fmri study with contents of effort

<sup>1</sup>*Urrutia, M.;* <sup>1</sup>*de Vega, M.;* <sup>2</sup>*Gennari, S.*

<sup>1</sup>University of La Laguna; <sup>2</sup>University of York

**[PII-16]** Episodic memory in infants aged 12 months: An eye tracking study

*Ressel, V.;* *Sebastián-Gallés, N.*

Pompeu Fabra University

**[PII-17]** Effects of global structure on verbatim narrative recall in adults and children

*Weaver, A.;* *Briscoe, J.*

University of Bristol

**[PII-18]** Improvement of visuospatial disturbances in children with precedents of great prematurity by differential outcomes

*Martínez, L.;* *Sánchez-Joya, M.;* *Estévez, A. F.;* *Róldan-Tapia, L.*

University of Almería

**[PII-19]** Effects of a training program of sphincter control in children with down's syndrome

*Robles Bello, M. A.*

University of Jaén

**[PII-20]** The relevance of the verb's motor associations in action naming by parkinson's disease patients

<sup>1</sup>*Herrera-Gómez, E.;* <sup>2</sup>*Rodríguez-Ferreiro, J.;* <sup>1</sup>*Cuetos, F.*

<sup>1</sup>University of Oviedo; <sup>2</sup>University of Barcelona

**[PII-21]** Reading acquisition in Albanian

*Avdyli, R.;* *Cuetos-Vega, F.*

University of Oviedo

**[PII-22]** Electrophysiological correlates of complement complexity in abstract verb processing

<sup>1</sup>*Rodríguez-Ferreiro, J.;* <sup>2</sup>*González-Nosti, M.;* <sup>2</sup>*Cuetos, F.*

<sup>1</sup>University of Barcelona; <sup>2</sup>University of Oviedo

**[PII-23]** Sign language effects on memory skills: A study with sign language interpreters and bilinguals

<sup>1</sup>*Muñoz, S.;* <sup>2</sup>*Carratala, P.;* <sup>2</sup>*Prasad, L.;* <sup>2</sup>*Bermudo, E.;* <sup>2</sup>*Casado, N.*

<sup>1</sup>University of La Laguna; <sup>2</sup>University of Málaga

**[PII-24]** "...baby hypothermic following intubation": Communicating temporal information in nursing summaries and its application in natural language generation

<sup>1</sup>*Sambaraju, R.;* <sup>2</sup>*Gatt, A.;* <sup>1</sup>*Logie, R.*

<sup>1</sup>University of Edinburgh; <sup>2</sup>University of Malta

**[PII-25]** The European Portuguese adaptation of the affective norms for English words (anew)

<sup>1</sup>*Soares, A. P.;* <sup>1</sup>*Comesaña, M.;* <sup>2</sup>*Simões, A.;* <sup>1</sup>*Fonte, L.;* <sup>1</sup>*Frade, C. S.*

<sup>1</sup>University of Minho; <sup>2</sup>Porto Polytechnic Institute

**[PII-26]** An investigation of acronym properties: Norms, recognition, naming and association times for <sup>1</sup>75 acronyms

*Playfoot, D.;* *Izura, C.*

Swansea University

**[PII-27]** The role of the experimental list in ambiguous relative clauses attachment: Two completion studies

*Piñeiro, A.;* *Ledo, A.;* *Fraga, I.;* *Acuña, C.*

University of Santiago de Compostela

**[PII-28]** Effects of word length but not frequency in visual word recognition are differentially influenced by visual noise dynamics

<sup>1</sup>*Pitchford, N. .;* <sup>2</sup>*Watt, R.;* <sup>1</sup>*Ledgeway, T.;* <sup>1</sup>*Ktori, M.*

<sup>1</sup>University of Nottingham; <sup>2</sup>University of Stirling

- [PII-29]** The neural correlates of counterfactuals: A fmri study with degrees of effort  
<sup>1</sup>Urrutia, M.; <sup>1</sup>de Vega, M.; <sup>2</sup>Gennari, S.  
<sup>1</sup>University of La Laguna; <sup>2</sup>University of York
- [PII-30]** Semantic vs. Superficial processing of hyperlinks in a wikipedia reading task  
<sup>1</sup>Salmerón, L.; <sup>1</sup>Cerdán, R.; <sup>2</sup>Naumann, J.; <sup>1</sup>García, V.; <sup>1</sup>García-Carrión, P.; <sup>1</sup>Tavares, G.  
<sup>1</sup>University of Valencia; <sup>2</sup>German Institute for International Educational Research
- [PII-31]** Reading salt activates the gustatory cortex  
Barrós-Loscertales, A.; Gonzalez, J.; Ventura-Campos, N.; Bustamante, J. C.; Costumero, V.; Cruz-Gómez, A. J.; Avila, C.  
Jaume I University
- [PII-32]** Verbs and nouns in sli: Evidence from eye movements  
<sup>1</sup>Andreu, L.; <sup>2</sup>Buil, L.; <sup>2</sup>Sanz-Torrent, M.  
<sup>1</sup>Oberta University of Catalunya; <sup>2</sup>University of Barcelona
- [PII-33]** Cognitive factors involved in paper and electronic reading comprehension of sixth graders  
García, V.; Salmerón, L.  
University of Valencia
- [PII-34]** Visualizing polysemy structures using lsa and predication algorithm  
<sup>1</sup>de Jorge Botana, G.; <sup>1</sup>León, J. A.; <sup>1</sup>Olmos-Albacete, R.; <sup>2</sup>Escudero, I.  
<sup>1</sup>Autonomous University of Madrid; <sup>2</sup>Antonio de Nebrija University
- [PII-35]** New algorithms for evaluation summaries comparing lsa and human graders into two different academic levels  
Olmos-Albacete, R.; León, J. A.; de Jorge Botana, G.; Escudero, I.  
<sup>1</sup>Autonomous University of Madrid; <sup>2</sup>Antonio de Nebrija University
- [PII-36]** Bias in perspective taking during reading: Adjusting the knowledge of characters  
Moreno-Ríos, S.; Rodríguez-Gualda, I.; Rodríguez-Mechén, M. A.  
University of Granada
- [PII-37]** Time course of activation for backward and forward inferences during reading: An fmri investigation  
<sup>12</sup>León, J. A.; <sup>12</sup>Escudero, I.; <sup>2</sup>Pratt, C.; <sup>2</sup>Just, M. A.  
<sup>1</sup>Autonomous University of Madrid; <sup>2</sup>Carnegie Mellon University
- [PII-38]** A normative database with rating values of emotional content for 6.000 spanish words  
<sup>1</sup>Conrad, M.; <sup>1</sup>Spiegel, M. A.; <sup>1</sup>Hansen, L.; <sup>3</sup>Bajo, M. T.; Carreiras, M.; <sup>2</sup>Jacobs, A.  
<sup>1</sup>Frei University of Berlin; <sup>2</sup>Basque Center on Cognition, Brain and Language; <sup>3</sup>University of Granada
- [PII-39]** A new measure of reading comprehension for primary school: The darc Its relation with prolec-r, working memory and intelligence  
<sup>1</sup>Gómez-Veiga, I.; <sup>1</sup>Elosúa, M. R.; <sup>2</sup>López Escribano, C.; <sup>1</sup>Orjales, I.; <sup>2</sup>Pérez, E.; <sup>1</sup>Gil, L.; <sup>1</sup>García-Madruga, J. A.  
<sup>1</sup>UNED; <sup>2</sup>Complutense University of Madrid
- [PII-40]** Testing online research methods in associative learning research: A comparison of learning curves in the laboratory and on the internet  
Ortega-Castro, N.; Vadillo, M. A.; Orgaz, C.; Matute, H.  
University of Deusto
- [PII-41]** Training insight problem solving through focus on barriers and assumptions  
Walinga, J.; Cunningham, J. B.; MacGregor, J. N.  
<sup>1</sup>Royal Roads University; <sup>2</sup>University of Victoria
- [PII-42]** Taxonomic categorization effects in insight problem solving  
James N. MacGregor, J. N.; Cunningham, J. B.; Hunter, G.  
<sup>1</sup>University of Victoria; <sup>2</sup>University of Lethbridge
- [PII-43]** Misperception of causality: Implications for quackery and pseudoscience  
<sup>1</sup>Yarritu, I.; <sup>2</sup>Blanco, F.; <sup>1</sup>Matute, H.; <sup>1</sup>Vadillo, M. A.  
<sup>1</sup>University of Deusto; <sup>2</sup>University of Leuven

- [PII-44]** Framing effects in decision making and causal judgments  
*Müller, S. M.; García-Retamero, R.; Okan, Y.; Perales, J. C.; Maldonado, A.*  
University of Granada
- [PII-45]** The salience of repetitive structures tested in rats  
*Martínez, D.; Toro, J. M.*  
Pompeu Fabra University
- [PII-46]** Source monitoring: Characteristics of memories also help to determine the confidence in the source decisions  
*<sup>1</sup>Luna Ortega, K.; <sup>2</sup>Martín Luengo, B.*  
<sup>1</sup>University of Minho; <sup>2</sup>University of the Basque Country
- [PII-47]** Inhibitory deficits in bipolar disorders  
*<sup>1</sup>Bajo, M. T.; <sup>2</sup>Soriano, M. F.; <sup>1</sup>Ros, M. J.*  
<sup>1</sup>University of Granada; <sup>2</sup>Hospital of San Agustín (Linares)
- [PII-48]** Effect of prenatal choline supplementation on object recognition long-term memory in adult wistar rats  
*<sup>1</sup><sup>2</sup> Moreno, H.; <sup>1</sup> Díaz, A.; <sup>2</sup> Carias, D.; <sup>1</sup> Gallo, M.; <sup>1</sup> de Brugada, I.*  
<sup>1</sup>University of Granada; <sup>2</sup>University Simón Bolívar
- [PII-49]** Previous knowledge about chronological organization of everyday activities avoids retrieval-induced forgetting in recall  
*García-Bajos, E.; Migueles, M.*  
University of the Basque Country
- [PII-50]** Intelligence and working memory in different dynamic spatial test conditions  
*<sup>1</sup>Contreras, M. J.; <sup>2</sup>Martínez-Molina, A.; <sup>2</sup>López-Almeida, P. I.; <sup>2</sup>Shih, P. C.; <sup>2</sup>Santacreu, J.*  
<sup>1</sup>National University of Distance Education (UNED); <sup>2</sup>Autonomous University of Madrid
- [PII-51]** Effect of activation and valence of iaps images on incidental recognition using discrimination and bias measures (a' y b''d)  
*<sup>1</sup>Gordillo, F.; <sup>1</sup>Arana, J. M.; <sup>1</sup>Meilán, J. J. G.; <sup>2</sup>Salvador, J.; <sup>2</sup>Mestas, L.; <sup>1</sup>Carro, J.*  
<sup>1</sup>University of Salamanca; <sup>2</sup>National Autonomous University of Mexico
- [PII-52]** Directed forgetting and the selective control of retrieval  
*Cano, E.; García, A. M.; García, Y.; Marín, A. A.; Martos-Luque, R.; Navarro, M. C.; Ortega, M. B.; Ruiz, M.; Iglesias-Parro, S.; Gómez-Ariza, C. J.*  
University of Jaén
- [PII-53]** Retrieval induced forgetting on facial features  
*<sup>1</sup>Sanches, C.; <sup>1</sup>Marful, A.; <sup>2</sup>Albuquerque, P. B.; <sup>1</sup>Bajo, M. T.*  
<sup>1</sup>University of Granada; <sup>2</sup>University of Minho
- [PII-54]** Producing false memories through the drm paradigm: The role of theme identifiability and word strength association  
*Albuquerque, P. B.; Resende, A.; Paulo, R.; Capelo, A.*  
University of Minho
- [PII-55]** Response time variability in choice response time tasks and tapping tasks correlates positively  
*Stoetm, G.; Gray, K.*  
Leeds University
- [PII-56]** Online and offline experiments on priming through a customizable free software application  
*Garaizar, P.; Vadillo, M. A.; Matute, H.*  
University of Deusto
- [PII-57]** The influence of number processing on selective attention: An eye-tracker study  
*<sup>1</sup>Rahona, J. J.; <sup>2</sup>Ruiz Fernández, S.; <sup>1</sup>Hervás, G.; <sup>1</sup>Vázquez, C.*  
<sup>1</sup>Complutense University of Madrid; <sup>2</sup>Eberhard Karls University

**[PII-58]** Is non-symbolic "number sense" related to formal mathematics ability?

<sup>1</sup>Attridge, N.; <sup>1</sup>Gilmore, C.; <sup>2</sup>Inglis, M.

<sup>1</sup>University of Nottingham; <sup>2</sup>Loughborough University

**[PII-59]** Individual differences in numerical skills and probabilistic reasoning

Gracia, M.; Tubau, E.; Colomé, A.; Núñez-Peña, M. I.

University of Barcelona

**[PII-60]** The effect of phonological similarity on updating in working memory

Martín-Puga, M. E.; Pelegrina, S.

University of Jaén

**[PII-61]** Eye movements in autistic and typically developed individuals during a static versus dynamic false belief task

<sup>1</sup>Au Yeung, S. ; <sup>1</sup>Kovshoff, H.; <sup>1</sup>Benson, V.; <sup>2</sup>Smith, T. J.

<sup>1</sup>University of Southampton; <sup>2</sup>University of Edinburgh

**[PII-62]** Predicting what other people will do: Spatial and temporal brain dynamics in response to expected and unexpected gaze shifts

<sup>1</sup>Tipples, J.; <sup>2</sup>Johnston, P.

<sup>1</sup>University of Hull; <sup>2</sup>Swinburne University

**[PII-63]** The effects of priming with positive and negative affect words on ratings of facial attractiveness

Rogers, R.; Johnston, R. A.

University of Kent at Canterbury

**[PII-64]** The effect of auditory warning signals on temporal preparation: A dissociation between sound intensity and eye startle reflex

Cappucci, P.; Correa, A.; Guerra, P. M.; Lupiáñez, J.

University of Granada

**[PII-65]** Visual clarity and standard measurements: Comparing several methods for transforming photometric measurements

<sup>1</sup>Durán, M. C.; <sup>1</sup>Lillo, J.; <sup>2</sup>Moreira, H.; <sup>1</sup>Alvaro, L.

<sup>1</sup>University of Madrid; <sup>2</sup>Universitary School Cardenal Cisneros

**[PII-66]** Differential outcomes: Improving delayed face recognition in adults with mental handicaps

<sup>1</sup>Valdeavero, N.; <sup>1</sup>Estévez, A. F.; <sup>2</sup>Plaza, V.; <sup>3</sup>López-Crespo, G.; <sup>1</sup>Esteban, L.; <sup>2</sup>Fuentes, L. J.

<sup>1</sup>University of Almería; <sup>2</sup>University of Murcia; <sup>3</sup>University of Zaragoza

**[PII-67]** Cross-modal prediction in audiovisual speech perception

<sup>1</sup>Sánchez, C.; <sup>2</sup>Alsius, A.; <sup>3</sup>Enns, J. T.; <sup>14</sup>Soto-Faraco, S.

<sup>1</sup>Pompeu Fabra University; <sup>2</sup>University of Barcelona; <sup>3</sup>University of British Columbia; <sup>4</sup>Catalan Institution of Research and Advanced Studies

**[PII-68]** Cumulative effects of cognitive control in a stroop task: The importance of taking previous trials into account

Méndez, A.; Jiménez, L.

University of Santiago de Compostela

**[PII-69]** Gaze-driven attention dynamics with different facial expressions: An n2pc study

<sup>1</sup>Sassi, F.; <sup>2</sup>Galfano, G.; <sup>2</sup>Sarlo, M.; <sup>2</sup>Munaffò, M.; <sup>2</sup>Umiltà, C. A.; <sup>1</sup>Fuentes, L. J.

<sup>1</sup>University of Murcia; <sup>2</sup>University of Padua

**[PII-70]** Evoked potentials related to emotional consistency associated to discourse

León, I.; Díaz, J. M.; de Vega, M.; Hernández, J. A.

University of La Laguna

**[PII-71]** Top-down modulations of the happiness advantage in emotional visual search

Damjanovic, L.; Wilkinson, H.; Lloyd, J.

University of Chester

**[PII-72]** Social categories and attentional control

<sup>1</sup>Cañadas, E.; <sup>1</sup>Rodríguez-Bailón, R.; <sup>2</sup>Milliken, B.; <sup>1</sup>Lupiáñez, J.

<sup>1</sup>University of Granada; <sup>2</sup>McMaster University

**[PII-73]** Order effects in moral judgment: Implications for psychological theories of moral reasoning

Okan, Y. , Wiegmann, A. , Nagel, J.

University of Göttingen

**[PII-74]** An erp study with affective masked priming using arousing positive and negative words and emoticons: Are they the same?

<sup>1</sup>Comesaña, M.; <sup>1</sup>Soares, A. P.; <sup>2</sup>Perea, M. Piñeiro, A.; <sup>3</sup>Fraga, I.; <sup>3</sup>Galdo, S.; <sup>1</sup>Pinheiro, A.

<sup>1</sup>University of Minho; <sup>2</sup>University of Valencia; <sup>3</sup>University of Santiago de Compostela

**[PII-75]** Control and consciousness: A erps study about the effect of a mask in a cognitive conflict task

Panadero Sanchís, M. A.; Tudela, P.

University of Granada

**[PII-76]** Detecting fakers of the autobiographical iat

Ghirardi, S. A. V.; Sartori, G.

University of Papua

**[PII-77]** Inferred feelings vs. Real feelings of victims of child sexual abuse

Cantón-Cortés, D.; Moreno Ríos, S.

University of Granada

**[PII-78]** Judgments of time to contact are affected by the rate at which fine-grained texture elements become visible

Díaz, A.; Jacobs, D. M.

Autonomous University of Madrid

**[PII-79]** Social perception of traditional sexual roles: The role of rape myth acceptance and perpetrator´ sexist attitudes

Durán, M. M.; Moya, M.; Megías, J. L.

University of Granada

**[PII-80]** The role of sound symbolism in the perception of attractiveness: Crosslinguistics studies

<sup>1</sup>Santiago, L.; <sup>1</sup>Zaefferer, D.; <sup>2</sup>Santiago, J.

<sup>1</sup>Ludwig Maximilians University; <sup>2</sup>University of Granada

**[PII-81]** Costs of thinking about verbal probabilities: Is processing directionality easier than processing probabilistic meaning?

Gourdon, A.; Beck, S. R.

University of Birmingham

**[PII-82]** The influence of domain and category rule on children's induction strategies

Badge, J. R.; Shapiro, L. R.

Aston University

## POSTER SESSION III

**[PIII-1]** Perception of the self and others in healthy adult ageing*Girardi, A.; Della Sala, S.; MacPherson, S. E.*

University of Edinburgh

**[PIII-2]** Semantic and affective priming in healthy seniors and alzheimer's disease*<sup>1</sup>Marín -Gutiérrez, A.; <sup>2</sup>Avilés, A.; <sup>2</sup>Carreiras, M.*<sup>1</sup>University of Salamanca; <sup>2</sup>Basque Center on Cognition, Brain and Language**[PIII-3]** Size matters: A study on naming and size knowledge in dementia of the alzheimer type*Moreno-Martínez, F. J.; Goñi Imízcoz, M.*

National University of Distance Education (UNED)

**[PIII-4]** Proactive and retroactive processing in tentacle lowering conditioning in the common snail (*helix aspersa*): Blocking and sensory preconditioning*Solar, P.; Acebes, F.; Carnero, S.; Loy, I.*

University of Oviedo

**[PIII-5]** Pkm $\zeta$  role in the maintenance of an active avoidance memory in rats*Gamiz, F.; Manrique T.; Gallo, M.*

University of Granada

**[PIII-6]** Learned induced aversions to temporal and spatial context: A comparison*Gómez-Chacón, B.; Gamiz, F.; Martínez-Escudero, L.; Gallo, M.*

University of Granada

**[PIII-7]** Dual-task processing when task-difficulty and task-order varies: Optimized central processing order?*Ruiz Fernández, S.; Leonhard, T.; Rolke, B.; Ulrich, R.*

Eberhard Karls University

**[PIII-8]** Heightened conflict during cue-encoding increases backward inhibition in set-switching*Grange, J. A.; Houghton, G.*

Bangor University

**[PIII-9]** The effect of parietal lesions in response to salient singletons*<sup>1</sup>Hernández, M.; <sup>2</sup>Costa, A.; <sup>3</sup>Humphreys, G. W.*<sup>1</sup>University of Barcelona; <sup>2</sup>University Pompeu Fabra; <sup>3</sup>University of Birmingham**[PIII-10]** Ant, gaze-direction, emotional expression and anxiety: A preliminary analysis*Colmenero, J. M.; Ortega, A. R.; Ramírez, E.; García-Viedma, R.; Montes, R.*

University of Jaén

**[PIII-11]** Attention network functioning in mild cognitive impairment with subcortical vascular features*<sup>1</sup>Fenández, P. J.; <sup>1</sup>Fuentes, L. J.; <sup>1</sup>Campoy, G.; <sup>2</sup>Antequera, M.; <sup>1</sup>García, J.; <sup>2</sup>Marín, J.; <sup>2</sup>Antúnez, C.*<sup>1</sup>University of Murcia; <sup>2</sup>Universitary Hospital Virgen de la Arrixaca (Murcia)**[PIII-12]** Development of attentional networks in prelingually deaf children*García-Giménez, N.; Daza, M. T.*

University of Almería

**[PIII-13]** Attentional and motor features of cueing effects*Gálvez, G.; Lupiáñez, J.*

University of Granada

**[PIII-14]** Phasic and tonic alertness: The effects on the exogenous orienting of attention*<sup>1</sup>Martella, D.; <sup>1</sup>Casagrande, M.; <sup>1</sup>Marotta, A.; <sup>2</sup>Fuentes, L. J.*<sup>1</sup>University of Roma; <sup>2</sup>University of Murcia

- [PIII-15]** Chinquisit: A program to preprocess the inquisit result in priming problems  
*Pérez-Cordón, L. G.; Castillo-Mayén, M. R.; Montes-Berges, B.*  
University of Jaén
- [PIII-16]** The us preexposure effect: Evidence from a conditioned flavour preference procedure  
<sup>1</sup>*Gil, M.*; <sup>2</sup>*Symonds, M.*; <sup>1</sup>*Hall, G.*; <sup>1</sup>*de Brugada, I.*  
<sup>1</sup>University of Granada; <sup>2</sup>University of York
- [PIII-17]** A training study on false belief understanding through labeling objects  
*Serrat, E.; Serrano, F.; Amadó, J.; Rostan, A.; Carles Vallès-Majoral, E.*  
University of Girona
- [PIII-18]** ¿Ave o pájaro? The role of naming in inductive inference  
*Tarlowski, A.*  
University of País Vasco
- [PIII-19]** The role played by time on the mental representation of traffic sign information while emulating driving  
*Roca, J.; Castro, C.; Bueno, M.; Moreno-Ríos, S.*  
University of Granada
- [PIII-20]** Emotional influence on driving behavior in risky situations  
*Megías-Robles, A.; Cándido-Ortiz, A.; Catena, A.; Maldonado, A.*  
University of Granada
- [PIII-21]** The influence of highlighting and word length on eye movements during reading  
<sup>1</sup>*Leyland, L. A.*; <sup>1</sup>*Kirkby, J. A.*; <sup>1</sup>*Liversedge, S. P.*; <sup>2</sup>*Juhasz, B. J.*; <sup>3</sup>*Pollatsek, A.*  
<sup>1</sup>University of Southampton; <sup>2</sup>Wesleyan University; <sup>3</sup>University of Massachusetts
- [PIII-22]** Semantic interference in object and face naming  
*Marful, A.; Paolieri, D.; Bajo, M. T.*  
University of Granada
- [PIII-23]** Left and right coding of past and future in language: The mental timeline during sentence processing  
*Ulrich, R.; Ruiz Fernández, S.; Maienborn, C.*  
Eberhard Karls University
- [PIII-24]** The cingulate cortex is driven by performance: Behavioural, functional and connectivity evidence in different populations  
<sup>1</sup>*Branzi, F. M.*; <sup>2</sup>*Della Rosa, P. A.*; <sup>3</sup>*Keim, R.*; <sup>1</sup>*Costa, A.*; <sup>2</sup>*Abutalebi, J.*  
<sup>1</sup>Pompeu Fabra University; <sup>2</sup>Vita-Salute San Raffaele University; <sup>3</sup>Sanitaetsbetrieb Brixen
- [PIII-25]** The role of variability in word recognition: Bilinguals vs. Monolinguals  
*Roessler, A.; Sebastian-Gallés, N.*  
Pompeu Fabra University
- [PIII-26]** Spanish word frequency based on spoken language: A new corpus  
<sup>1,2</sup>*Barbón, A.*; <sup>1</sup>*González-Nosti, M.*; <sup>1</sup>*Cuetos, F.*; <sup>3</sup>*Brybaert, M.*  
<sup>1</sup>University of Oviedo; <sup>2</sup>University of Granada; <sup>3</sup>University of Ghent
- [PIII-27]** A set of high quality colour images with Spanish norms for seven relevant psycholinguistic variables  
*Moreno-Martínez, F. J.; Montoro, P. R.; Laws, K. R.*  
National University of Distance Education (UNED)
- [PIII-28]** Emotional pre-eminence on discrimination between human vocalizations versus > non human sounds  
*Lorca Marín, J. A.; Alameda-Bailén, J. R.*  
University of Huelva
- [PIII-29]** Allophonic perception in developmental dyslexia, a review  
<sup>1</sup>*López-Zamora, M.*; <sup>1</sup>*Luque Vilaseca, J. L.*; <sup>2</sup>*Serniclaes, W.*  
<sup>1</sup>University of Málaga; <sup>2</sup>René Descartes University

- [PIII-30]** Psychometric properties of a screening reading tests for children and adults  
*Goikoetxea, E.; Ferrero, M.*  
 University of Deusto
- [PIII-31]** The effects of bilingualism on attentional functioning: An investigation of conflict resolution and conflict adaptation  
<sup>1</sup>*Marzecova, A.;* <sup>1</sup>*Asanowicz, D.;* <sup>2</sup>*Kriva L.;* <sup>1</sup>*Wodniecka, Z.*  
<sup>1</sup>Jagiellonian University of Kraków; <sup>2</sup>Charles University of Prague
- [PIII-32]** The time course of masked transposition priming for letters and pseudoletters  
<sup>1</sup>*Muñoz, S.;* <sup>2</sup>*Perea, M.;* <sup>3</sup>*García-Orza, J.;* <sup>1</sup>*Barber, H. A.*  
<sup>1</sup>University of La Laguna; <sup>2</sup>University of Valencia; <sup>3</sup>University of Málaga
- [PIII-33]** Canonical word order and sentence comprehension: Cognitive and neurophysiological basis of processing demands  
<sup>12</sup>*Del Río, D. ;* <sup>3</sup>*López-Higes, R.;* <sup>13</sup>*Maestú, F.;* <sup>3</sup>*Martín-Aragoneses, M. T.;* <sup>13</sup>*Moratti, S.;* <sup>1</sup>*Gutiérrez, R.;* <sup>1</sup>*Maestú, C.;* <sup>1</sup>*Del Pozo, F.*  
<sup>1</sup>Polytechnic University of Madrid; <sup>2</sup>Camilo José Cela University; <sup>3</sup>University of Madrid
- [PIII-34]** Grapheme complexity effects during handwritten production of spanish words  
*Afonso, O.;* *Álvarez, C. J.*  
 University of La Laguna
- [PIII-35]** Inhibitory processes reduce interlingual intrusions in bilingualism  
*Román, P. E.;* *Bajo, M. T.*  
<sup>1</sup>University Jaume I; <sup>2</sup>University of Granada
- [PIII-36]** The time course of motor resonance in the comprehension of action sentences  
*Castillo, M. D.;* *De Vega, M. ;* *Moreno, V.*  
 University of La Laguna
- [PIII-37]** Functional neuroanatomy of rule learning in language: Role of prosodic cues  
<sup>23</sup>*Lopez-Barroso, D.;* <sup>123</sup>*Rodriguez-Fornells, A.;* <sup>6</sup>*Càmara, E.;* <sup>123, 4, 5</sup>*de Diego-Balaguer, R.*  
<sup>1</sup>Catalan Institution of Research and Advanced Studies; <sup>2</sup>IDIBELL; <sup>3</sup>University of Barcelona; <sup>4</sup>INSERM; <sup>5</sup>Normal Highschool of Paris; <sup>6</sup>University College London
- [PIII-38]** Cognitive control and automatization in monolinguals, bilinguals and professional translators  
*Togato, G.;* *Macizo, P.;* *Bajo, M. T.*  
 University of Granada
- [PIII-39]** Could inhibitory control mechanisms resolve the grammatical gender effect in bilinguals?  
*Morales, L.;* *Paolieri, D.;* *Bajo, M. T.*  
 University of Granada
- [PIII-40]** Translation ambiguity across-languages: The effect of number of translations, translation probability, concreteness, and cognate status in the performance of proficient bilinguals  
*Boada, R.;* *Sánchez-Casas, R.;* *Ferré, P.*  
 Universitat Rovira i Virgili
- [PIII-41]** Effects of degree of semantic similarity and stimulus duration in translation performance of highly competent Catalan-Spanish and Spanish-Catalan bilinguals  
*Moldovan, C.;* *Ferré, P.;* *Sánchez-Casas, R.;* *Demestre, J.*  
 Universitat Rovira I Virgili
- [PIII-42]** Differences between experts and novices in estimations of cue predictive power in crime  
<sup>12</sup>*Garcia-Retamero, R.;* <sup>3</sup>*Dhami, M. K.*  
<sup>1</sup>University of Granada; <sup>2</sup>Max Planck Institute for Human Development<sup>3</sup>University of Cambridge
- [PIII-43]** Insight and categorization theory: The effects of prototypical versus diagonal orientations on insight difficulty  
*Chu, Y.;* *Pap, H. A.;* *MacGregor, J.*  
 State University of New York

**[PIII-44]** Checking what is not the case: Understanding exclusive disjunctions

*Beltrán, D.; Santamaría, C.*

University of La Laguna

**[PIII-45]** Eeg-correlates of perceptual sequence learning

*Deroost, N.; Baetens, K.; Zeischka, P.; Coomans, D.*

Vrije University of Brussel

**[PIII-46]** Representation strength and salience of the unique features of similar stimuli in human perceptual learning

*Lavis, Y.; Hall, G.*

University of York

**[PIII-47]** Is reading lips like hearing voices? The role of modality in short-term memory (stm) performance

*Maidment, D. W.*

Cardiff University

**[PIII-48]** Effects of the cognitive interview on the recall and recognition of high and low typicality information

*Miqueleiz-Ballesteros, J.; Migueles, M.*

University of the Basque Country

**[PIII-49]** The effects of memory load in visual search are modulated by the similarity between the materials involved

*<sup>1</sup>Gil-Gómez de Liaño, B.; <sup>1</sup>Botella, J.; <sup>2</sup>Pascual-Ezama, D.*

<sup>1</sup>Autonomous University of Madrid; <sup>2</sup>Complutense University of Madrid

**[PIII-50]** Anxiety and false recognition: Modality effect and type of encoding on the monitoring processes

*<sup>1</sup>Beato, M. S.; <sup>2</sup>Gozalo, M.; <sup>3</sup>Pinho, M. S.; <sup>1</sup>Fernández Pulido, R.*

<sup>1</sup>University of Salamanca; <sup>2</sup>University of Extremadura; <sup>3</sup>University of Coimbra

**[PIII-51]** Attitude congruence: A moderating factor in motivated forgetting

*<sup>1</sup>Arias Orduña, A. V.; <sup>2</sup>Iglesias-Parro, S.*

<sup>1</sup>UNED; <sup>2</sup>University of Jaén

**[PIII-52]** Interference, inhibition and memory-based decisions in young and older adults

*Lechuga, M. T.; Iglesias-Parro, S.; Gómez-Ariza, C. J.; Pelegrina, S.*

University of Jaén

**[PIII-53]** Word association spaces for predicting false recognition and theme identifiability

*<sup>1</sup>Díez, E.; <sup>2</sup>Alonso, M. A.; <sup>1</sup>Fernández, A.*

<sup>1</sup>University of Salamanca; <sup>2</sup>University of La Laguna

**[PIII-54]** Directed updating and the sign of the recency effect

*Ruiz, M.; Elosúa, M. R.*

National University of Distance Education

**[PIII-55]** The effect of decoding task demands on comprehension and working memory

*Haenen J.; Riddell, P.; Williams, T.*

University of Reading

**[PIII-56]** Remembering and forgetting concrete and abstract words: A new window into semantic representation

*Avilés, A.; Carreiras, M. .; Muent, T.*

Basque Center on Cognition, Brain and Language

**[PIII-57]** The origin of the distance effect in numerical updating tasks

*Pelegrina, S.; Lendínez, C.; Lechuga, M. T.*

University of Jaén

**[PIII-58]** Selective preservation of addition: A case study

*<sup>1</sup>Colomé, A.; <sup>2</sup>Caño, A.; <sup>2</sup>Juncadella, M.*

<sup>1</sup>University of Barcelona; <sup>2</sup>Hospital of Bellvitge (Barcelona)

- [PIII-59]** Size congruity effects on multiplication verification: Testing the role of magnitude representation  
*Estudillo, A.; García-Orza, J.*  
 University of Málaga
- [PIII-60]** The mental time line is central and amodal  
*Raya, L.; Ouellet, M.; Santiago, J.*  
 University of Granada
- [PIII-61]** The contribution of unimodal cues to multisensory integration: Evidence of non-additive spatial bias in visual and auditory temporal order judgements  
<sup>1</sup>*Doug, J. K.*; <sup>2</sup>*Krumbholz, K.*; <sup>3</sup>*Susi, K.*; <sup>4</sup>*Bainesm, D.*  
<sup>1</sup>University of Leicester; <sup>2</sup>MRC Institute of Hearing Research, <sup>3</sup>University Park; <sup>4</sup>Nottingham Trent University
- [PIII-62]** Dissociating attentional effects on the n170 event-related potential for faces, houses, and hands  
<sup>1</sup>*Mohamed, T. N.*; <sup>2</sup>*Neumann, M. F.*; <sup>2</sup>*Schweinberger, S. R.*  
<sup>1</sup>FSU Jena Germany; <sup>2</sup>Sohag University
- [PIII-63]** The effect of perceived narrowness onto depth perception  
*Indino, M.*  
 University of Zurich
- [PIII-64]** Perceptual grouping modulates spatial flanker effects  
*Zeischka, P.; Deroost, N.; Coomans, D.; Soetens, E.*  
 Vrije University Brussels
- [PIII-65]** Why do we look on the tangent point when steering a bend?  
*Kountouriotis, G K. .; Merat, N.; Wilkie, R. .*  
 University of Leeds
- [PIII-66]** Do visual feedback and target position reliability help improve temporal precision in a reaching task?  
<sup>1</sup>*de la Malla, C.*; <sup>1,2</sup>*López-Moliner, J.*  
<sup>1</sup>University of Barcelona; <sup>2</sup>Institute for Brain, Cognition and Behaviour
- [PIII-67]** The effect of race and emotional facial expression in a trust game  
*Tortosa, M.; Ruz, M.; Lupiáñez, J.*  
 University of Granada
- [PIII-68]** Mechanisms of adaptation to asynchrony between multisensory signals  
*Navarra, J.; Velasco, I.; Spence, C.*  
<sup>1</sup>Sant Joan de Déu Foundation; <sup>2</sup>University of Madrid; <sup>3</sup>University of Oxford
- [PIII-69]** Influence of cognitive, metacognitive, motivational and emotional self-regulation on academic achievement – comparative and developmental aspects  
*Bakracevic Vukman, K.*  
 University of Maribor
- [PIII-70]** Effects of power in control attributions  
*Martínez, R.; Rodríguez-Bailon, R.; Moya, M.*  
 University of Granada
- [PIII-71]** Social perception of marital rights and duties in sexual relationships  
*Durán, M. M.; Moya, M.; Megías, J. L.*  
 University of Granada
- [PIII-72]** The face specific proportion congruent effect: Social stimuli as contextual cues  
*Jiménez-Moya, G.; Lupiáñez, J. .; Rodríguez-Bailón, R.*  
 University of Granada
- [PIII-73]** Tactile conceptual metaphors: Another source of embodiment for abstract domains  
<sup>1</sup>*Márquez, J.*; <sup>2</sup>*Valenzuela, J.*; <sup>1</sup>*Santiago, J.*  
<sup>1</sup>University of Granada; <sup>2</sup>University of Murcia

**[PIII-74]** Faces as emotional signals: Psychophysiological measures in an association task  
*Aguado, L.; Valdés-Conroy, B.; Román-González, F. J.; Rodríguez-Fernández, S.; Diéguez-Risco, T.; Fernández-Cahill, M.*

University of Madrid

**[PIII-75]** Mixed faces for mixed emotions: What do we see in mixed expressions of emotions?

*Fernández-Cahill, M.; Aguado, L.*

Autonomous University of Madrid

**[PIII-76]** Recognition, phenomenological judgments, and electrophysiological measures for emotional images

*Pérez-Mata, N.; Albert, J.; López-Martín, S.; Carretié, L.*

Autonomous University of Madrid

**[PIII-77]** Phobic Picture system (pps): An useful tool for the experimental study of phobic processes

<sup>2</sup>*Roselló, F.*; <sup>2</sup>*Sánchez-Nácher, N.*; <sup>1</sup>*Viedma-del-Jesus, M. I.*; <sup>2</sup>*Muñoz, M. A.*; <sup>1</sup>*Sánchez-Barrera, M. B.*; <sup>1</sup>*Fernández-Santaella, M. C.*; <sup>2</sup>*Montoya, P.*; <sup>1</sup>*Vila, J.*

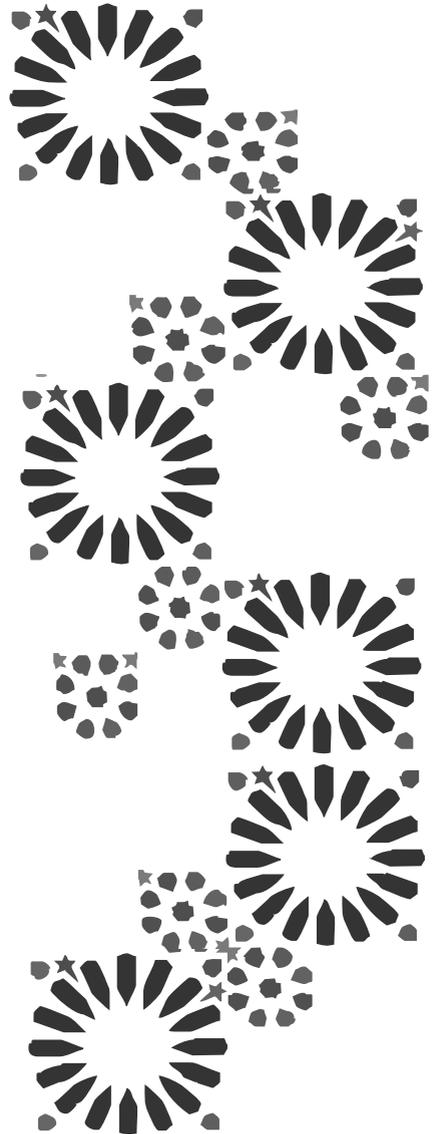
<sup>1</sup>University of Granada; <sup>2</sup>University of Islas Baleares

**[PIII-78]** Attentional capture and multisensory integration

*Sanabria, D. ; Tortosa, M. ; Sarmiento, B. R.*

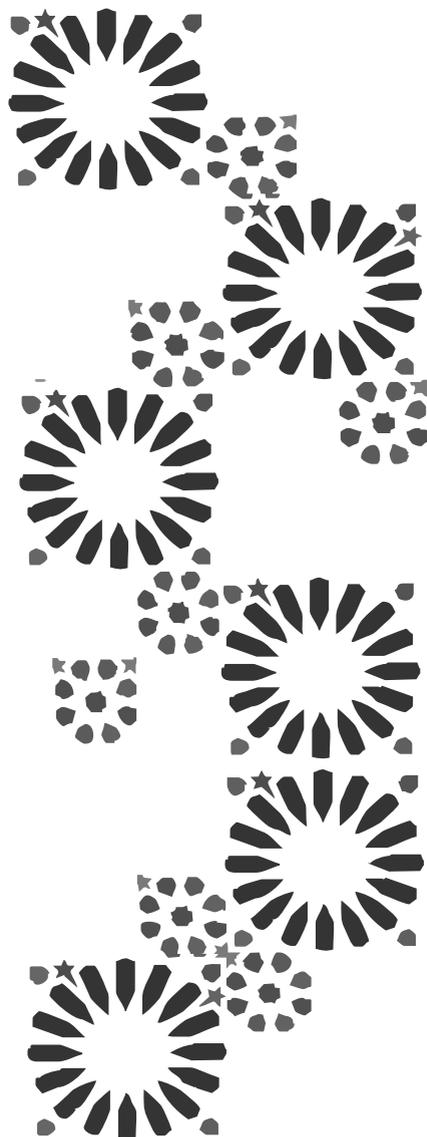
University of Granada

# ABSTRACTS





# KEYNOTE LECTURES





**Keynote lecture**

**Working memory deficits in slow learners: Risk factor or cognitive phenotype?**

**Susan E. Gathercole**

*University of York*

Poor skills in the temporary storage and manipulation of information – working memory - are associated with a range of developmental disorders including reading, language, and attentional deficits. Findings are reported from a programme of research on over 300 children identified solely on the basis of deficits of working memory rather than other learning or cognitive impairments. The children were characterised by a high risk of educational under-attainment (>80%) and classroom difficulties in following instructions and keeping track in complex activities. Their classroom behaviour was highly inattentive although their social integration was typical. Other deficits are also found in motor inhibition and sustained attention, and in basic information processing. Environmental factors such as SES have little impact on working memory, which appears to have a strong genetic basis although it may be open to modification through training. It is speculated that deficient working memory may be a cognitive phenotype for children without general learning difficulties who are slow to learn in school and may also overlap with the inattentive sub-type of ADHD.

**SEPEX keynote lecture**

**Sibboleth**

**Núria Sebastián-Gallés**

*Universitat Pompeu Fabra, Barcelona*

“Gilead then cut Ephraim off from the fords of the Jordan, and whenever Ephraimite fugitives said, 'Let me cross,' the men of Gilead would ask, 'Are you an Ephraimite?' If he said, 'No,' they then said, 'Very well, say Shibboleth.' If anyone said, 'Sibboleth', because he could not pronounce it, then they would seize him and kill him by the fords of the Jordan. Forty-two thousand Ephraimites fell on this occasion.”

The Bible tells us that 42,000 Ephraimites did not pass the fatal language-test. Why was it so difficult to say Shibboleth? While listeners perceive their first language in a fairly automatic manner, with a high efficiency and, seemingly, low computational cost, many (if not most) human beings (like the poor Ephraimites) face enormous challenges to perceive a foreign language, especially if learned late in life. A crucial difference between native and non-native speech perception is that the ultimate L2 performance level shows great variability even in the case of early acquisition. Why is it so difficult to understand a new language? One of the greatest difficulties when listening to a foreign language is segregating words, as the speech stream is perceived as an uninterrupted sequence of sounds. Indeed, it is much easier to understand the very same sentence if it is written than if it is spoken. Thus, there must be something in the speech signal that makes it particularly difficult to perceive. It cannot be the speech signal by itself, as if we reflect upon our own experience it is apparent that we learned our first language effortlessly and in a very short period of time; however learning to write took considerably more time and effort. In the present talk I review some proposals concerning why isolating words in continuous speech in the second language is so difficult and discuss some hypotheses about why some humans manage to master a second language (and thus pass the Jordan) while others do not (and thus pass away).

**EPS keynote lecture**

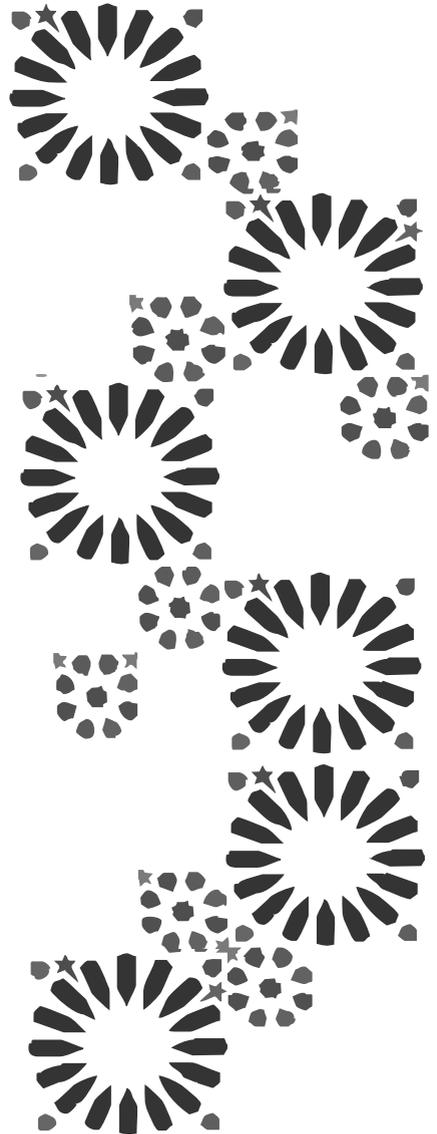
**Understanding the “social brain”: A developmental cognitive neuroscience approach**

**Mark H. Johnson**

*University of London*

As adults, we are able to recognise the identity, actions and intentions of other humans. A network of several different brain regions is known to be active during such tasks. I will address how this specialised “social brain” network emerges during development. Initially, I will compare and contrast three general viewpoints on human functional brain development: a maturational view (in which cognitive change is attributed to the maturation of underlying brain regions), a skill-learning view (in which the brain changes with cognitive development are viewed as similar to those seen when adults acquire new skills), and “interactive specialisation”. The latter view hypothesises that the functional specialisation of regions of the cortex becomes more finely tuned during development through interactions between cortical regions, between cortical and sub-cortical structures in the brain, and interactions between the developing brain of the baby and its social and physical environment. I will then review studies of face processing, eye gaze perception and social cognition in infants, children and adults that encourage the view that the social brain emerges from other networks through interactions between different brain regions, and interactions between the whole brain and its external environment – supporting the “interactive specialisation” view. In the second part of my talk I will focus on how the typical development of the social brain may go awry in some infants at-risk for autism spectrum disorders (ASD). Specifically, I will present evidence for differences in the neural processing of social stimuli during the first year in the baby siblings of older children already diagnosed with ASD.

# SYMPOSIA





**[2C4] Do the interactive effects between attentional networks vary as a function of WMC? An investigation utilising two versions of the ANT task**

**Ahmed, L.; de Fockert, J.**  
*Goldsmiths College*

Posner & Petersen (1990) have proposed that attention can be differentiated into three structurally and functionally distinct varieties: orienting, alerting, and executive control. The attention task (ANT) was devised by Fan et al (2002) to investigate variations in the three networks' independent efficiency within an individual. However, several recent studies utilising the ANT have reported an interaction between the networks in this task. The aim of the current studies was to investigate if the interaction between the networks varies as a function of individual differences in working memory capacity (WMC). It is well established that an individual's WMC predicts performance on executive attention tasks (e.g. Hetz and Engle, 2007). However whether this WMC-related variation in executive control functioning differentially affects the interactive effects between the networks is not known. The results from two versions of the ANT revealed that although, in line with previous findings, high WMC individuals' executive network was more efficient than low WMC individuals', and that alerting and orienting events (networks) reliably interacted with conflict resolution (i.e. the executive network), the magnitude of the interactive effects between the networks did not vary as a function of WMC. In other words the 'cost' of alerting events and 'benefit' of orienting cues on conflict resolution did not differ between low and high WMC individuals. We consider both paradigm insensitivity of the ANT to detect variations in such interactions, and engagement of controlled attention as a prerequisite to differentiate WMC-related performance, when interpreting these results.

**[7A5] Influence of positive and negative emotions over the eating behaviour in "emotional eaters"**

<sup>1,3</sup> Baños, R.; <sup>2,3</sup> Cebolla, A.; <sup>3</sup> Etchemendy, E.; <sup>1</sup> Felipe, S.; <sup>1</sup> Pérez, I.; <sup>2,3</sup> Botella, C.  
<sup>1</sup>University of Valencia; <sup>2</sup>Jaume I University; <sup>3</sup>CIBER

Eating Disorders and Obesity are serious health problems. In order to understand these disorders the emotions have been hypothesized as an important factor in their development and maintenance. Several psychological theories have related the emotions and the eating behaviour. In that sense, the focus has been mainly in the research of negative emotions (anxiety, sadness, etc...), being less studied the effect of positive emotions over eating. The objective of this paper is to analyze if the emotional valence (positive vs. negative) influence over the eating behaviour in a sample of participants with high scores (HEE) and low (LEE) in emotional eating, according to the cut-off points of the Dutch Eating Behaviour Questionnaire (DEBQ). Two groups of participants were selected with extreme scores (-high DS >35- and low -DS=0-) in the DEBQ. These groups were randomly assigned into two experimental conditions: joy induction versus sad induction. Later, eight different types of food (salty, sweet, low or high caloric) were presented. Participants had to select the most desirable food and afterwards they stay five minutes alone to eat whatever they want. This paper is in progress at this moment. It is expected to find that the HEE group will select high amount of food, and with higher calories compared with the LEE group. It is hypothesized that this behaviour will be affected by the emotion induced (happiness and sadness).

**[9E2] Cue-competition in contextual cue learning**

**Beesley, T.; Shanks, D. R.**  
*University College London*

When simultaneously presented cues predict the occurrence of an outcome or event, competition between them occurs. The mechanisms responsible for this cue-competition are not well understood, with some claiming that such findings in humans arise from processes of associative learning and reinforcement and others proposing that they are the product of higher-order reasoning (e.g., Mitchell, De Houwer, & Lovibond, 2009). We present data from an incidental learning task (contextual cuing) in which search for targets in visual displays is guided by repeated contexts made up of distractors. This task allows us to test the hypothesis that when the contribution of higher-order reasoning processes is reduced or eliminated, cue-competition should not be observed. The results are contrasted with the predictions of an associative model of contextual cuing (Brady & Chun, 2007). Brady, T. F., & Chun, M. M. (2007). Spatial Constraints on Learning in Visual Search: Modeling Contextual Cuing. *Journal of Experimental Psychology: Human Perception and Performance*, 33, 798 - 815. Mitchell, C. J., De Houwer, J., & Lovibond, P. F. (2009). The propositional nature of human associative learning. *Behavioral and Brain Sciences*, 32, 183-198.

**[5B1] Sub-cortical processing of imminent collision in humans**

<sup>1</sup>Billington, J.; <sup>2</sup>Field, D. T.; <sup>3</sup>Wilkie, R. M.; <sup>1</sup>Wann, J. P.  
<sup>1</sup>University of London; <sup>2</sup>University of Reading; <sup>3</sup>Leeds University

Detecting a looming object and its approximate time to collision (TTC) is imperative to survival and for most humans it is a fundamental aspect of daily activities such as driving, road crossing, and participating in sport. Cells in the pigeon optic tectum and nucleus rotundus have been found to respond to high rates of looming but it has so far been unclear whether sub-cortical areas of primates, such as the thalamic nuclei and superior colliculus (SC) perform a similar function. Here we use fMRI to demonstrate for the first time that, in the human, the SC and the pulvinar nucleus of the thalamus respond to looming stimuli yet do not respond to receding stimuli and control stimuli matched for low level visual properties.

**[9D1] The social brain in adolescence**

**Blakemore, S.**  
*University College London*

The brain has evolved to understand and interact with other people. We are increasingly learning more about the neurophysiological basis of social cognition and what is known as the social brain. In this talk I will focus on how the social brain develops during adolescence. Adolescence is a time characterised by change - hormonally, physically, psychologically and socially. Yet until recently this period of life was neglected by cognitive neuroscience. In the past decade, research has shown that the social brain develops both structurally and functionally during adolescence. I will describe recent functional imaging and behavioural research indicating that the social brain undergoes continued development during the period of adolescence.

**[2B1] Overview of cognitive robotics networks in Europe****Borghi, A. M.***University of Bologna*

According to the embodied view, concepts and words are grounded in sensorimotor system (Barsalou, 1999; Gallese & Lakoff, 2005; Glenberg, 1997), i.e. they imply a re-enactment of the neural pattern activated during interaction with objects. Accordingly, objects, and particularly manipulable ones, can be conceived of as patterns of potential actions, as observing them automatically activates previous motor interactions with them (Martin, 2007). In this perspective a new role has been assigned to the notion of affordance (Gibson, 1979; Tucker & Ellis, 1998; 2001; 2004). In the same vein, in the embodied cognition view language comprehension implies simulating the sensorimotor experiences words and sentences refer to (Borghi et al., 2004; Buccino et al., 2005; Fischer & Zwaan, 2008; Pecher et al., 2003; Zwaan, 2004). The aim of both networks participating in the symposium (iTALK-VALUE and ROSSI) is to study affordances and language starting from an embodied cognition perspective. Both networks aim to provide new behavioural and neurophysiological evidence and insights into the grounding of human concepts and language. At the same time, both networks aim to build robots that are able to respond appropriately to object affordances by interacting with different kinds of objects and entities in their environment as well as to process simple commands (words referred to actions acting upon objects and specifying objects). The underlying assumption is that that building robots endowed with a sensorimotor system similar to that of humans can be a powerful instrument for validating embodied cognition theories on affordances and language.

**[4D3] What do nonword rejection times tell us about the orthographic code?****Brysbaert, M.; Keuleers, E.***Ghent University*

Lexical decision megastudies provide researchers with reaction times and accuracy data for thousands of words. Thus far researchers have tried to understand the variables that determine performance on the word trials. However, each lexical decision task also provides performance data for thousands of nonwords. In this talk we will discuss the variables that affect these times in three megastudies based on three different languages: Dutch, French, and English.

**[6D3] Can childhood frequencies replace age-of-acquisition ratings?****Brysbaert, M.; Keuleers, E.***Ghent University*

Research on age-of-acquisition (AoA) has been hindered by the lack of AoA-measures for each and every word. Although important efforts have been made to collect ratings for thousands of words, we still lack measures for the tens of thousands remaining words. A possible alternative would be to use childhood frequencies instead of AoA ratings. We will report the results of three analyses: (1) Are the English Elexicon times better predicted by AoA than by the Zeno primary school children frequencies, (2) are the French Lexicon lexical decision times better predicted by AoA ratings than by the Manulex childhood frequencies, and (3) are the Ghent lexical decision times better predicted by AoA ratings than by a recently compiled childhood frequency measure? The implications for AoA and word frequency research will be discussed.

**[2B3] Neural structures for language-mediated perception and action**

**Buccino, G.**

*University of Parma*

The embodied approach to language assumes that in order to process and comprehend language, individuals rely on the same neural structures responsible for the sensory and motor content to which language refers. For example, to understand a sentence like “He grasps a cup”, individuals recruit the same neural structures normally involved in the execution of that action. A number of studies have shown that this is the case at least for verbs. By means of different neurophysiological and brain imaging techniques it has been demonstrated that during processing verbs referring to mouth, hand and foot actions, different sectors of motor/premotor cortex are involved. The neural basis for this involvement are most likely mirror neurons. It has recently been forwarded that their involvement could be present not only for verbs, but also for nouns. Within the premotor cortex there are neurons, the so called canonical neurons, which discharge when the monkey performs an object directed action but also when it just observes an object on which that action can be performed. Modulation of the motor system is strictly related to the pragmatic features of an observed object. When, for example, its handle is broken, then there is no activation within the motor system. Moreover, very recent experimental findings show that processing nouns referring to objects normally used with the hand specifically modulates the activity of hand motor representation. These studies support the theoretical framework assuming mirror neurons and canonical neurons as the neural correlates for verbs and nouns, respectively.

**[4B5] Detrimental impact of delay is mediated through trial structure information in human causal learning**

**Buehner, M. J.; Greville, W. J.; Hohansen, M.; Cassar, A.**

*Cardiff University*

There have been a plethora of studies investigating humans’ ability to judge event contingencies. However a key consideration that is often overlooked in many such experimental paradigms is whether the underlying trial structure is made apparent. This may play a critical role in the mediation of empirical cues such as action-outcome delay. In a 2x2 design, we employed a free-operant procedure using a trial-based format to investigate the effect of trial length and trial structure information. Trial lengths were either 2s or 5s, while trial structure was either made apparent – by signalling the end of each trial with an auditory tone – or not noticeable, with no additional information provided. Significant main effects of both delay and structural information were found, along with a significant interaction, thus demonstrating that making trial structure apparent removes the effect of delay. Two follow-up experiments ruled out potential alternative explanations for this finding, namely that the auditory signal served to increase the salience of the outcome, or helped participants to keep better track of time.. Our work suggests that by making trial structure apparent, the induction processes reduces to a simple contingency decision, which is unaffected by delay. The implications are discussed with regard to associative and computational models of causal learning.

**[7C1] Executive control and complex emotions in children: switching predicts the experience of regret****<sup>1</sup>Burns, P.; <sup>1</sup>Beck, S. R.; <sup>2</sup>Riggs, K. J.***<sup>1</sup>University of Birmingham; <sup>2</sup>London Metropolitan University*

Feelings of regret rely on a comparison of current reality to what might have been, i.e., a comparison with a counterfactual world. Previous work has shown that inhibitory control predicts the ability of children to answer counterfactual conditional questions (Beck, Riggs & Gorniak, in press). In this study we present evidence that the developmental emergence of the feeling of regret is related to further domain general improvements in executive control. Four-to-seven-year-olds completed a battery of executive measures along with a game which assessed whether or not they experience regret at lost opportunities. A logistic regression revealed that the experience of regret in this age group was predicted by switching (a measure of attentional flexibility), but not by working memory or inhibitory control. We interpret these findings in the context of our broader thesis that the emergence of adult like counterfactual thinking in children is underpinned by domain general improvements in executive function. Furthermore, the findings that abstract cognitive processes such as executive control are developmentally related to the experience of complex emotions argues against an ‘affective primacy thesis’ of emotion and is consistent with the broader cognitive approach in the philosophy of emotion (Griffiths, 2003).

**[6A3] Capturing within-person variability in face representations****Burton, M.; Jenkins, R.***University of Glasgow*

Some representational schemes for faces (including those used in engineering) code a canonical image for each known face. In previous work, we have suggested such a scheme, based on the average of many images of the same person. Here we ask how variability within a person’s appearance may be represented. We will present experiments exploring the range over which images can depict the same person. We will also describe physical analyses of within-person variation, importing techniques normally used to discriminate between people. The aim is to derive a fuller representation of a particular face: not just a mean, but also a confidence interval. For example, we aim to ask ‘what counts as an image of Paul McCartney?’

**[6C2] Understanding the real value of fractions****Butterworth, B; Iuculano, T.***University College of London*

Here we use a computerized version of number line tasks (Siegler & Opfer, 2003), to explore the understanding of four types of number notations – fractions, integers, decimals, and money – in adults and children. In the Number to Position task, subjects are instructed to place a mark on a line that corresponds to the target number (e.g. 25, .25,  $\frac{1}{4}$ , or 25p). Alternatively, in the Position to Number task, participants report the number corresponding to a pre-placed mark on a line. Results show that, although adults are faster and more accurate than 10 to 11 year old children, both groups show a comprehensive understanding of the real value of these four types of number notations. However, both adults and children are slower to make judgments about fractions, suggesting that additional mental demands are required when processing fractions. Additionally, this was more pronounced in children who were significantly less accurate in these tasks. A linear modelling of responses significantly better fit these data than a logarithmic function in most notations. These results suggest that, at least for the Number to Position task, if there is a developmental trend from a logarithmic to a linear representation of numbers as has been claimed for integers (Siegler & Opfer, 2003), it has already taken place for all these notations by the age of 10 to 11 years.

**[7A4] Anxiety-related interpretative biases in older adults**

**Cabrera, I.; Montorio, I.; Herrera, S.**  
*Autonoma University*

Background: A substantive body of literature suggests that individuals with high levels of anxiety show a tendency to interpret ambiguous situation in a threatening fashion. Cognitive models suggest that these interpretative biases are associated with heightened anxiety vulnerability, and an increased susceptibility to developing anxiety disorders (Mathews and MacLeod, 2002). Studies have typically used samples of younger adults, and knowledge regarding the presence of anxiety-related interpretative biases in the elderly population remains neglected. However, age-related changes in anxiety (i.e., reduced incidence of anxiety disorders in this population) and emotional functioning might change cognitive mechanisms underlying anxiety vulnerability. Objective: The present research replicated the methodology used by MacLeod and Cohen (1993) to explore the presence of interpretative biases in a sample of older adults with low and high levels of trait anxiety. Method: Ninety six community-dwelling older adults aged 60 and over participated in the study. The sample was split up based on the trait anxiety median scores measured by the STAI. The interpretative biases were measure using RSVP paradigm. The task consists of reading short sentences under self-paced conditions. The sentences were all ambiguous with one emotionally negative and one neutral interpretation, followed by a continuation sentence consistent with only one interpretation. Results: The analysis of the comprehension latencies shows that high anxiety individuals consistently imposed the more negative interpretation on the initial ambiguous sentence, whereas the low anxiety subjects consistently imposed the neutral meaning on these ambiguous sentences ( $F(2,93) = 3.3, p < .05$ ). Conclusions: This study replicated with older adults the results founded with young samples and represents other evidence that high levels of trait anxiety are associated with an increased tendency to interpret ambiguous information in a threatening manner.

**[6A4] Mechanisms underlying the perception of gaze direction**

**Calder, A. J.; Keane, J.**  
*University of Cambridge*

We have previously shown that prolonged exposure (adaptation) to a series of faces gazing in the same direction (e.g., left) produces a marked tendency to perceive gaze in the adapted direction (left), but not unadapted direction (right), as gazing directly at the viewer. This accords with single-cell recording research in non-human primates which has identified separate cell populations in temporal cortex tuned to different gaze directions. A large proportion of these cells were also sensitive to the same direction signalled by head or body orientation. In the current experiments we addressed whether adaptation to a particular head orientation would influence perception of gaze direction in the same direction. Our results showed significant adaptation from heads to gaze, but to a lesser extent than that observed between stimuli of same stimulus category (i.e., adapt to gaze, test gaze). We conclude that perception of others' gaze direction involves at least two perceptual mechanisms — category specific representations coding gaze specific gaze directions and more abstract representations tuned to the same direction or orientation irrespective of stimulus category.

**[3C3] Are children able to reject false memories?**

<sup>1</sup>Carneiro, P.; <sup>2</sup>Fernández, A.  
<sup>1</sup>University of Lisboa; <sup>2</sup>University of Salamanca

The DRM paradigm is one of the most powerful procedures to generate false memories by associative processes. It implies the presentation of lists of associates with the omission of their converging words, thus creating the illusion that those converging words were actually presented. In the present study we analyzed whether children of different ages are able to reject false memories by giving explicit warnings of the DRM effect and by slowing the presentation rate of the associates. The results showed that although in general older children produced more false memories than younger children, they are also more able to use monitoring strategies to suppress them.

**[5C1] Distraction improves memory**

<sup>123</sup>Cashdollar, N.; <sup>1</sup>Lavie, N.; <sup>13</sup>Duzel, E.  
<sup>1</sup>University College London; <sup>2</sup>National Hospital for Neurology & Neurosurgery of London; <sup>3</sup>Otto-von-Guericke University

It has been well established that the maintenance of visual representations become more susceptible to interference from distraction when the capacity of working memory is quantitatively 'loaded' by increases of discrete information. However, in contrast to current theories, we found that task-irrelevant distraction during delay periods improved working memory performance in patients with Bilateral Hippocampal Sclerosis (BHS). This memory enhancement was robust enough to raise the BHS patients' performance to the same level of college age healthy controls. Additionally, we show that in similar conditions where healthy participants maintain a 'noisy' working memory representation, as in the case of extended delay period lengths, task-irrelevant distraction can increase performance in participants to such an extent that any delay period impairment is abolished. The bilateral synchronization of frontal brain regions within the theta frequency band are a characteristic hallmark of maintaining increases of discrete visual information in working memory. Using Magnetoencephalography we establish that, paradoxically, the persistence of visual information is impeded when this bi-frontal theta maintenance process exceeds a time dependant optimal efficiency. In such cases, disrupting this coupling mechanism with task-irrelevant distraction allows for a more accurate long-term memory signal to persist, thereby improving performance.

**[9C4] Effects of format, operation and size in calculation strategies**

**Colomé, A.; Bafalluy, M. G.; Lorite, R.**

*University of Barcelona*

Arithmetic problems can be solved either by directly retrieving their result from long-term memory or by procedural strategies. The strategy selected seems to depend on several factors such as the kind of operation, its format, or the size of the operands. Two experiments are presented in which the mechanisms used for solving multiplications and subtractions were investigated. The format of presentation (auditory, Arabic digits) was also manipulated. In Experiment 1, participants had two numbers presented sequentially and followed by a third. Depending on the trial, participants had to decide whether the third number was the result of multiplying the former ones (multiplication task) or whether it fell between the two of them (comparison task). In some trials, a fourth number was presented and participants had to decide whether it was one the two numbers they had seen at the beginning. Recognition times for this fourth number were compared for the multiplication and comparison trials. According to Thevenot, Fanget and Fayor (2007) et al., if the previous operations are solved through procedural strategies, concurrent activation of transitory results would cause a reduction in the activation of the original operands, making their recognition harder. In contrast, if their results are directly retrieved, no differences should be obtained in the recognition after comparison and multiplication trials. Two problem sizes were used: one-digit problems whose sums were smaller than ten or greater than ten. Results showed longer recognition times after multiplication than after comparison, but only in the greater problems. Both formats behave similarly. Experiment 2 used the same paradigm, but subtractions were tested instead of multiplications and two-digit operations were also included. Results showed differences in the recognition answers only in this last size. Again, no differences between formats were obtained. Data are discussed in the light of current models.

**[5C2] Age-related benefits of semantic encoding of associative memories is manifested in power modulations of alpha oscillations**

**Crespo-García, M.; Cantero, J. L.; Atienza, M.**

*University Pablo de Olavide*

Older adults show unaffected semantic knowledge but impaired episodic memory, especially at attributing the source to remembered information. It has been hypothesized that the episodic deficit may be related to declines in the ability to bind information together in memory during encoding. To test this hypothesis, we have followed two strategies: i) to study whether manipulation of semantic context facilitates encoding and subsequent retrieval of associative memories not only in young but also in elders; and ii) to investigate whether older adults use similar or different strategies than younger adults during encoding. To answer these questions we have recorded EEG data from young and healthy old participants while performing different tasks. During the study phase, famous and non-famous faces were presented at a particular location preceded by either a congruent or incongruent biographical cue. Subjects were asked to determine whether or not the face matched the cue. Next, they performed a conceptual priming task, to evaluate automatic access to semantic information, and a visual-spatial memory task, to evaluate their ability in recollecting the location of the face. Although older adults showed impaired source memory as expected, they also showed enhanced recollection for faces encoded under semantically congruent contexts. Results from analysis of EEG activity in the time-frequency domain suggest that modulations of theta power may account for deficits in the global episodic memory whereas changes in the alpha frequency indicate that older adults may be using different strategies than younger adults during semantic encoding of associative memories.

**[7B4] A world of my own: The emergence of ownership effects in childhood**

Cunningham, S. J.;  
*University of Aberdeen*

Ownership is a prominent feature of young children's social environment, which evokes strong emotional ties with objects. The importance of ownership at this stage has been linked with children's emerging sense of self, as young children tend to rely on concrete concepts like possessions to define themselves. The incorporation of owned objects into the self-concept means that manipulating children's feelings of possession may be a useful method of exploring early self-processing biases like memory enhancement. Such manipulations are especially important in developmental research because the self-evaluation paradigms widely used to explore adult self-referential cognition are unsuitable for testing young children. Accordingly, the current study used ownership to ascribe self-relevance to objects, and assessed their subsequent memorability. Pairs of four to six year old children (N=64) were asked to sort picture cards depicting toys into two baskets, one of which belonged to each child. The children were asked to imagine that they owned all the contents of 'their' basket. A subsequent recognition test revealed that there was a significant memory advantage for toys owned by self, by children across the age range. However, there was also a correlation between age and the size of the advantage for self-owned over other-owned items, with young children showing a larger bias for self-owned items. These findings suggest that even at an early stage, children's memory performance is shaped by self-processing biases, which may be especially influential when children are at the highly egocentric early childhood stage of development. The implications of these findings for our understanding of the mechanisms that support enhanced self-referential memory are discussed.

**[6D1] Spanish oral reading is flexible and influenced by lexical factors like age of acquisition**

<sup>1</sup>Davies, R.; <sup>2</sup>Barbón, A.; <sup>2</sup>Cuetos, F.

<sup>1</sup>*University of Oxford Brookes*; <sup>2</sup>*University of Oviedo*

Oral reading in Spanish is affected by a mix of lexical-level (e.g. Age-of-Acquisition (AoA)) and sub-lexical factors (e.g. word length in letters) (Cuetos & Barbon, 2006 [Word naming in Spanish. *European Journal of Cognitive Psychology*, 18, 415-436.]). Observation of the AoA effect in Spanish is surprising because spelling-sound mappings are highly consistent so that little scope for the influence of lexical knowledge should be expected. It may be that the Spanish AoA effect indicates involvement of semantic resources, in line with analyses distinguishing frequency-dependent and frequency-independent AoA effects. However, an alternate possibility is that the Spanish AoA effect was somehow induced by list composition characteristics. This is because manipulations of stimulus list composition can modify the direction or size of word attribute effects. There is limited research assessing such interactions in Spanish therefore we completed an investigation of potential interactions between effects of stimulus block and effects of word attributes, including AoA. Stimulus blocks were organized by word length, an attribute routinely found to affect reading in transparent orthographies. We hypothesized that differences in ease of stimuli would either push participants to adopt reading strategies: (1.) more reliant on lexico-semantic resources, for blocks composed of long words where phonological coding is expected to be effortful; or (2.) more reliant on sub-lexical orthography-to-phonology mappings, for blocks of short words where reading coding is expected to be easy. We observed word naming of 2764 words by 75 participants. 25 participants saw words in mixed blocks and 50 participants saw words in pure blocks of just short or just long words. Linear mixed-effects models indicated the AoA effect did not interact with the block effect but length effects were modified by block mix. We conclude that adult oral reading strategy in Spanish is flexible but AoA reflects long-term properties of reading system architecture.

**[9E5] Against better judgment: Looking for non-propositional learning**

**de Houwer, J.**  
*Ghent University*

It is now generally accepted that associative learning can be based on propositional reasoning processes. Disagreement still exists about whether association formation is also a source of associative learning. Assuming that implicit measures are less susceptible to propositional reasoning than more traditional measures of learning, we conducted a series of studies in which we used implicit measures in an attempt to reveal learning effects that cannot be due to propositional reasoning. We either failed to observe learning or obtained effects that were in line with the predictions of propositional models. In sum, as of yet, we have not observed replicable learning effects that provide unique support for association formation models of learning.

**[7D4] Monitoring the penalization of ambiguity in vector model representations**

**de Jorge-Botana, G.; Olmos, R.; León, J. A.**  
*Autonoma University of Madrid*

The ambiguity of words and their disambiguation has proved fascinating to researchers from different disciplines. In psycholinguistics, the study of the ambiguity has focused on models for representing polysemy. Some models defended separate entries for polysemic words, where each meaning has a differentiated entry. However, Williams (1992) finds an asymmetry in priming for both meanings of a list of polysemic words, suggesting a representation which is at the very least shared. This led other authors to propose models that defend the existence of a common or “core” representation, together with a specific part representation for each meaning. Other authors have defended a single representation for polysemic words (Kintsch, 1998) and the fact that the context activates each meaning dynamically. Based on this last idea, and using a vector space model of language, in this study we propose that the vectors of ambiguous words are penalized in order to semantically activate other content, owing to their own distributional properties. This study was carried out in three stages. I) Within the vector space model offered by LSA, trained with the Lexesp corpus (Sebastián et al., 2000), artificial words were introduced, some monosemic and some polysemic, the latter with equally probable meanings or with one dominant meaning. Their behavior was analyzed in two ways: Studying the vector itself and consigning the type of relationships formed with other terms. Secondly, the same analysis was carried out on real words, both polysemic and monosemic. Lastly, we checked whether a group of real abstract and concrete words behave in the same way as those in the previous stage, as abstraction may be considered vectorially as a variance of ambiguity. The results show that the simulated words, the real polysemic words and the abstract words are penalized, in that their semantic relationships with other terms are not so close.

**[4C4] Does the addition of hypnosis to pain-modifying suggestions create an altered state of consciousness?**

**Derbyshire, S.**

*University of Birmingham*

The status of pain conditions such as fibromyalgia that are commonly categorized as 'psychosomatic' or 'functional' remains controversial. These disorders are variously assigned biological or psychological aetiology and are occasionally suggested as fabricated. The status of hypnosis also remains controversial. Hypnosis is variously described as an altered state of consciousness or a continued state of normal consciousness and is occasionally described as mere role playing. Activation of brain structures dependent upon subjective alterations of pain using suggestion with and without a hypnotic induction could address both controversies. To this end, suggestions following a hypnotic induction and the same suggestions without a hypnotic induction were used to increase and decrease the subjective experience of fibromyalgia pain and heat pain in control volunteers. Suggestion with and without hypnotic induction resulted in significant changes in reported pain experience in both patients and controls; the hypnotic induction had only a minor influence on reported pain experience. Functional magnetic resonance imaging with fibromyalgia patients revealed bilateral activation of the midbrain, cerebellum and thalamus, and midcingulate, primary and secondary sensory, inferior parietal, insula and prefrontal cortices as correlates of changes in fibromyalgia pain when hypnotised. These activations were generally attenuated when suggestions were given without hypnosis and significant differences were found in the subgenual cingulate, insula and prefrontal cortices. Our results thus indicate that a network of areas widely associated with the pain 'neuromatrix' is more strongly influenced by hypnotic suggestion to alter fibromyalgia pain. These findings provide direct evidence that regional activation is specifically and actively involved in the modulation of fibromyalgia pain and also suggest that the hypnotic induction qualitatively alters the neural response to suggestion. Although behavioural measures of suggestion are minimally altered by the hypnotic induction, the greater neural response indicates support for hypnosis inducing an altered state of consciousness.

**[4C5] The 'cold control' theory of hypnosis**

**Dienes, Z.**

*University of Sussex*

I argue that hypnotic responding involves strategically targeted lack of awareness of the executive intentions that create the hypnotic actions, actions that thus appear to the subject to happen by themselves. I look at preliminary evidence of the relation between hypnotisability and the tendency to have or control accurate higher order thoughts. The data derive from the effect of applying rTMS to regions thought to be responsible for accurate higher order thoughts; they test the prediction of the theory that capacities dependent on first order states are not altered by hypnosis.

**[4D4] The recognition of mirror-letters and mirror-words: Insights from the masked priming paradigm.**

<sup>1</sup>Duñabeitia, J. A. , <sup>1</sup> Molinaro, N.; <sup>1,2</sup>Carreiras, M.

<sup>1</sup>Basque Center on Cognition, Brain and Language; <sup>2</sup>IKERBASQUE. Basque Foundation for Science

At early stages of object identification humans process correctly-oriented and mirrored versions of an object similarly. However, in letter and word perception, such tolerance to mirror reversals is harmful for efficient reading. In spite of this, do readers successfully develop blindness mechanisms for mirror-letters and words? We present two event-related experiments testing unconscious recognition of words containing mirror-letters and of mirror-words with the masked priming paradigm. Our results show that at initial stages of word recognition readers perceive mirror-letters and mirror-words as correct.

**[2B4] The deeply immersed brain conjecture: embodiment in the visual system**

Ellis, R.

*University of Plymouth*

There are good reasons for supposing that perception and action are inseparable in the case of most human behaviours. For instance, that brain states represent visual objects by virtue of their being assemblies of visual and motor responses. It follows that a represented visual object (seen or imagined) will potentiate actions that are associated with it: Seeing a grape will facilitate a precision grip. Equally preparing a motor response will facilitate perception of objects associated with it. The intention to make a precision grip will facilitate the detection of a grape. At what level in the brain are these relationships established? A reasonable working assumption is that it is associated with relatively late (and high-level) processes corresponding to the achievement of object recognition. We will question this assumption, arguing that there is emerging evidence, including Lateralised Readiness Potential data, that the responses in early sensory pathways are modulated according to the action associations of stimuli. Both covert and overt attentional mechanisms support the notion of early action mapping. We suggest that the human brain is entirely immersed in action intentions and possibilities.

**[6E5] The neural correlates of Fitts's law in an action observation task: an fMRI study**<sup>1</sup>Eskenazi, T.; <sup>2</sup>Rotshtein, P.; <sup>3</sup>Grosjean, M.; <sup>1</sup>Knoblich, G.<sup>1</sup>Radboud University; <sup>2</sup>University of Birmingham; <sup>3</sup>Leibniz Research Centre for Working Environment and Human Factors

Previous neuro-imaging studies support the assumption of a strong link between perception and action, demonstrating that the motor system is involved when others' actions are observed. The motor system contributes to observation of actions by simulating the action in terms of the observer's internal models. One question that is still open to debate is which aspects of observed actions are simulated by the motor system. Proposed alternatives include movement kinematics and the context of a movement. The present fMRI study used Fitts's law to disentangle these movement aspects. Fitts's law is a motor law that captures the speed-accuracy tradeoff of biological movement. It postulates that the difficulty of a movement (ID) is a function of the distance to the target object of the movement (A) and the target width (W). Fitts's law not only holds for all produced movements, but also has been shown to hold for imagined and observed actions. In this study, the ID of observed actions was manipulated orthogonally to W (by using 5 different As). The results revealed activity in primary motor cortex, supplementary motor area, and basal ganglia in response to increasing ID levels. This pattern of activity in observation of biological motion parallels previous findings, where motor cortex is engaged in perception of action specifics. The present study demonstrates that simulation can add specific motor parameters such as the difficulty of a movement to the dynamic perceptual information derived from the stimuli. In other words, we use our motor system, not our perceptual system, to determine how difficult and effortful observed actions are for others.

**[2C6] Attention deficits in Alzheimer's disease and dementia with Lewy Bodies**<sup>1</sup>Fernández, P. J.; <sup>1</sup>Campoy, G.; <sup>2</sup>Antequera, M.; <sup>1</sup>García-Sevilla, J.; <sup>1</sup>Antúnez, C.; <sup>2</sup>Fuentes, L. J.<sup>1</sup>University of Murcia; <sup>2</sup>Hospital Virgen de la Arrixaca Murcia

Attention deficits seem to be at the core of neuropsychological performance that exhibits both, patients diagnosed with dementia with Lewy bodies (DLB) and Alzheimer's disease (AD). However, few studies have compared attention functioning in the two types of dementia, and when it has been done separate tasks have been used to test different attention abilities. That approach precludes any interaction among the different attention components to be assessed. In this study we used a task, the Attention Network Test (ANT), in which the alerting, orienting and executive attention networks, and their interactions, can be assessed in a single experiment. Three groups of participants were tested, patients diagnosed with DLB, patients diagnosed with AD and healthy controls (HC). All participants a version of the ANT in which a tone was used as the alerting signal and the target and the distractors were framed to help target location. The alerting signal improved orienting attention and increased conflict effect in HCs, but they had no effect on these networks in AD patients. DLB patients only showed preserved orienting and conflict effects when the alerting signal was present, indicating that there was regulation of the orienting and executive attention networks by the alerting signal. Thus, the most important differences among the three groups were observed in the attention network interactions, where alerting played a more relevant role in DLB than in AD patients. Under alerting states, DLB patients showed evidence of certain regulation in the orienting and executive attention networks.

**[7C3] The role of understanding of expectations and counterfactual thoughts in children's understanding of emotions**

<sup>1</sup>Ferrell, J. M.; <sup>2</sup>Guttentag, R.

<sup>1</sup>London Metropolitan University; <sup>2</sup>University of North Carolina at Greensboro

Previous research has shown that adults base judgments of affect not only on the objective outcome, but also on the mental experiences of expectations and counterfactual thoughts (McGraw, Mellers & Tetlock, 2003; Medvec, Madey & Gilovich, 1995). Less research has been conducted to demonstrate how this understanding develops. Research on children's understanding of counterfactual emotions such as regret, relief, disappointment and elation has indicated that this understanding becomes more complex throughout childhood with a complete understanding of these complex emotions not existing until after 9 years of age (Ferrell, Guttentag & Gredlein, 2009; Guttentag & Ferrell, 2004; Guttentag & Ferrell, 2008), however more research is still needed to uncover the full picture of children's use of counterfactual reasoning and understanding expectations to understand emotions. This presentation will discuss a series of studies that have been conducted using scenarios including character comparisons with variations of expectations, counterfactual closeness and outcome. The overall results of these studies indicate that children 7 years of age and younger base emotion judgments primarily on outcomes, and even 9 year old children do not appear to take expectations and counterfactual closeness when judging emotions into account in the same manner as did an adult comparison sample. An ongoing study using children's own behavioural and affective responses (as opposed to judging characters' emotional responses in scenarios) will also be discussed.

**[2B5] Studying the interplay of overt, covert and linguistic attention for action**

Fischer, M. H.

*University of Dundee*

In an attempt to inform the computational modelling of human-robot interactions, we examined language-induced attention allocation towards real-life manipulable objects. We studied eye-movement characteristics and the effect of language cues in a novel motor affordance paradigm. In a single trial participants viewed two household objects. A task-irrelevant word (noun or verb referring to one object) was presented auditorily during an initial 800ms preview of the objects; thereafter one of the objects was presented in green, signifying the requirement for a manual response, left or right, according to the category to which the target object belonged (kitchen or garage). Critically, each object had a graspable handle which was oriented either to the left or right, and was therefore either congruent or incongruent with the required response. Motor affordance theory predicts response facilitation for congruent targets but interference when the non-target object conflicts with preparing the correct action. This prediction was supported in the reaction time data. Importantly we also show that object related words amplified motor affordances, and document the oculo-motor parameters mediating this effect. These findings help delineate the time course of linguistic attention and support the development of artificial intelligent interfaces which simulate human interactions with the environment.

**[5C3] Neural reactivation of context-specific information in associative recognition memory**<sup>12</sup>Fuentemilla, L.; <sup>3</sup>Penny, W. D.; <sup>1</sup>Jafarpour, A.; <sup>1</sup>Bunzeck, N.; <sup>13</sup>Düzel, E.<sup>1</sup>University College London; <sup>2</sup>University of Barcelona and Institute of Advanced Studies in Biomedicine of Llobregat; <sup>3</sup>Otto von Guericke University

A long-standing idea in memory research is that the recollection of a previous episode involves the reactivation of specific information associated with that episode at encoding. Here, we directly tested this hypothesis by applying a multivariate pattern classifier algorithm to Magnetoencephalography (MEG) recordings obtained during an associative recognition memory task for word-scene and word-face pairs. Pattern classifier algorithms were trained at encoding using oscillatory neural activity elicited by scene and face images paired with words. In the testing phase, only words were presented; subjects made an old/new discrimination followed by a judgement about how vividly the associated face or scene image could be recollected. We used the pattern classifiers from the encoding phase to track face and scene specific neural reactivation at recognition. We observed image specific neural reactivation when subjects recognized the associated-word. Critically, the amount of reactivation was related with the subjective vividness of picture recollection. These findings strongly support the reactivation hypothesis of recollection. The possibility of studying neural reactivations at millisecond level enables us to investigate how information reactivation during contextual recollection is coordinated and related to the well known components of recognition memory in the N400 and Late Positive Component time windows.

**[6C3] Processing fractions and negative numbers****Ganor-Stern, D.***Achva Academic College and Ben-Gurion University of the Negev*

A series of studies exploring the processing of negative numbers and fractions will be described in the present talk. The main question was whether such numbers are represented in terms of their whole values or in terms of the values of their components. A representation of the whole value should meet the following two conditions. First, the group of negative numbers or fractions should be perceived as being smaller than the group of numbers 1 to 9. Second, there should be a perceived continuum between the negative numbers or fractions and the numbers 1-9. The presented series of experiments used the numerical comparison task, and showed a different picture for negative numbers and for unit fractions. In both cases however, the representation was context dependent. For negative numbers, the mode of presentation seemed to be of critical importance. The two conditions for a holistic representation were met only when the numbers were presented sequentially but not when they were presented simultaneously. For fractions, when the numbers were presented simultaneously none of the criteria for a holistic representation was met. When they were presented sequentially, there was evidence that fractions were perceived as smaller than the numbers 1-9. However, there was no any evidence for a perceived continuum for fractions and the digits 1 to 9, and there seemed to be very little differentiation between the perceived magnitudes of the different unit fractions. The processing of fractions was also found to be dependent on the range of numbers included in the experiment, with better differentiation between the unit fractions the narrower the range of numbers included in the experiment. Finally, preliminary results on the processing of decimals and the way they differ from unit fractions will be presented.

**[6C4] Position coding in two-digit Arabic numbers**

<sup>1</sup>García-Orza, J; <sup>1</sup>Valle, L.; <sup>2</sup>Perea, M.  
<sup>1</sup>University of Malaga; <sup>2</sup>University of Valencia

One key issue to identify Arabic numbers is to accurately process not only the identity but also the position of a number's constituent digits. If not, Arabic numbers like 6957 and 9657, or 18 and 81, would not be distinguished. Despite the obvious relevance of position coding in Arabic number processing, these perceptual processes have been not thoroughly investigated, and models of Arabic number recognition remain silent regarding this process. Digit position coding in two-digit Arabic numbers was examined in two experiments. In Experiment 1, participants had to decide whether the stimuli presented was a two-digit Arabic number (e.g., 67) or not (e.g., G7). Target stimuli could be preceded by a masked prime which 1) shared one digit in initial position (e.g., 13-18), 2) shared one digit but in different position (e.g., 83-18), 3) was transposed number (e.g., 81-18). Two unrelated control conditions, equalized in terms of the distance between primes and targets with the experimental conditions were also included (e.g., 79-18). Results showed a (facilitatory) priming effect only when prime and target shared digits in the same position. Experiment 2 employed a same-different matching task with a masked priming paradigm –a task that reflects early processing. Results showed faster response times when prime and target share digits –including the transposed-digit condition– relative to the control conditions. Thus, the identity of each digit in the early stages of visual processing is not associated with a specific position in 2-digit Arabic numbers.

**[7B5] Blowing up Teddy: Implications of unique identity and ownership on cognitive biases**

**Gjerroe, N. L.; Hood, B. M.**  
*Bristol University*

Seventy percent of young children in western societies have a sentimental toy to which they are especially attached. Recent surveys (2007, 2008 and 2009) show that these objects are usually kept even in adulthood among 1st year university undergraduates. Study 1 explores 3-year-olds' conceptualization of these items using a Gelman & Markman (1986) induction task. When asked to compare, young children think of their attachment objects as more like animals, with thoughts and feelings, than they are like more similar looking stuffed toys belonging to other people. Interestingly, this effect does not occur with the child's other favourite toys. Thus attachment objects offer a unique opportunity to explore how objects are processed when they are owned, in a real sense, and when they are considered special and unique. In Study 2 we presented 4-year-olds with a box that made exact replicas of everything put into it. Although preferring to take home the identical copy of other toys, both their own and other people's, all participants were adamant that they keep their original attachment toy. We explain this finding in terms of children understanding unique identity as an internal essence that is immutable and non-replicable, regardless of physical appearance. The results will be discussed in terms of early developing cognitive biases associated with long-term ownership. Gelman, S. & Markman, E. (1986). Categories of induction in young children. *Cognition* 23, 183-208.

**[4D5] Modeling priming effects in visual-word recognition with the diffusion model**<sup>1</sup>Gomez, P.; <sup>2</sup>Perea, M.<sup>1</sup>DePaul University; <sup>2</sup>University of Valencia

Priming in word recognition usually refers to an increased sensitivity to a target word due to prior experience of a priming stimulus. The goal of this research is to explore, beyond the mean RT, the effects of different types of priming. To this end, we present diffusion model fits to identity priming (masked and unmasked) and semantic priming (masked and unmasked). Not surprisingly, the size of the priming effects is different across all of these experimental paradigms. The differences are not just quantitative; the parameters of the diffusion model are differentially affected. Masked priming seems to affect mainly the encoding time, while unmasked priming affects the rate of accumulation of evidence. These findings pose some important problems for those models that assume that masked and unmasked priming reflect the same underlying processes (e.g., the memory-recruitment model proposed by of Bodner & Masson, 1993).

**[4D1] A dual-route theory of orthographic processing**

Grainger, J.

CNRS &amp; Aix-Marseille University

I will describe a new theory of orthographic processing that draws a critical distinction between a coarse-grained and a fine-grained orthographic code. The two routes do not represent different points on a “coarseness” dimension or different levels in a processing hierarchy, but rather two fundamentally different types of orthographic coding. Processing along the coarse-grained route optimizes selection of the correct word identity given limits in available bottom-up information. Minimal sets of letter identities are selected that optimize processing given constraints on letter visibility and the relative informativeness of different sets of letters. These minimal sets of letter identities code for approximate within-word letter position independently of letter contiguity. Processing along the fine-grained route, on the other hand, is sensitive to the precise ordering of letters, as well as to position with respect to word beginnings and endings. This enables the identification of frequently occurring contiguous letter combinations (chunking). Frequency of occurrence is therefore used in opposing ways in the two routes. In the coarse-grained route, low-frequency elements are selected for their informational saliency. In the fine-grained route, on the other hand, frequently co-occurring elements are chunked to form units of relevance for mapping orthography onto meaning (morpho-orthographic representations such as prefixes and suffixes) and orthography onto phonology (graphemic representations). This dual-route architecture bifurcates out from an initial location-specific coding of letter identities that is shared by both routes, where letter identities are coded for their position relative to eye fixation and independently of their position in the stimulus. Empirical evidence in favor of the theory will be presented.

**[4B1] Temporal predictability facilitates human causal learning**

**Greville, W. J.; Buehner, M. J.**

*Cardiff University*

When encountering repeated instances of causes and effects, we also experience multiple cause-effect temporal intervals. Where this interval remains constant across trials, it becomes possible to predict when the effect will follow from the cause. A distinction can thus be made between temporal predictability and variability. Three experiments investigated the extent to which temporal predictability contributes to the inductive processes of human causal learning. We demonstrate that a) causal relations with fixed temporal intervals are consistently judged as stronger than those with variable temporal intervals; b) that causal judgments decline as a function of temporal uncertainty; and c) that this distinction remains undiminished with increasing learning time. The results therefore clearly indicate that temporal predictability facilitates causal learning. We consider the implications of our findings for various theoretical perspectives including associative learning theory, the attribution shift hypothesis and symbolic representation of causal structure.

**[2E4] Habituation to shock: roles of direct and associative activation**

**Hall, G.; Symonds, M.**

*University of York*

Habituation of rats to a footshock was monitored by measuring the suppression of ongoing behaviour that normally occurs in the few seconds after a shock has occurred. This unconditioned response (UR) wanes with repeated presentation of the shock. In two experiments it was demonstrated that habituation, so defined, occurred more readily when shock presentations were reliably signaled by some other event. This loss of effectiveness was maintained on tests in which the signal was no longer presented; it also proved to be independent of the associative strength of the context in which the test occurred. We conclude that our training procedures produce changes in the effective salience of the shock itself, and argue that these changes depend on habituation processes evoked both by direct application of the shock and by associative activation of its central representation.

**[7B3] The object of my attention: An ERP study of self-relevant information processing**

**Handy, T. C.**

*University of British Columbia*

Ownership of possessions is universal to the modern human experience, and beginning at a very early age we develop a strong sense of attachment to what qualifies as “ours”. Surprisingly, however, there has been comparatively little effort towards understanding the neurocognitive underpinnings of ownership. Here we present the results of an ERP experiment aimed at investigating whether one’s sense of ownership is rooted in self-referential processing. In particular, recent ERP studies have demonstrated that the processing of self-relevant biographical information is associated with increased cognitive analysis as measured via the P3 ERP component - a component sensitive to the prevailing context of incoming information. Towards understanding whether ownership is akin to self-referential processing, the question we specifically addressed here was whether the establishment of ownership results in a comparable increase in the depth of cognitive analysis as indexed by the P3. To address this question we presented 15 participants with photographs of items found in grocery stores, half of which were assigned to self and half to other by way of a color-coded ownership cue. We observed a significant positive deflection in the P300 component on self owned relative to other owned trials. These results suggest that similar mechanisms are engaged in the encoding of temporary ownership to those reported during the processing of information and items previously associated with self.

**[5D5] Backpropagation and holographic coding: an empirical correspondence**

Hannagan, T.; Dandurand, F.; Grainger, J.

*University of Provence*

We consider a feed-forward network trained to recognize words in a location-invariant way, and we ask whether the solution found by the network using backpropagation learning amounts to a form of holographic slot coding. Holographic slot coding is a recently proposed distributed version of a widespread string encoding scheme, and essentially postulates that a string representation consists of location and letter vector pairs bound and chunked together. We will present a number of simulations to test this hypothesis. Clustering analyses on hidden network patterns provide evidence that the network has developed semi-location invariant representations, akin to the letter/location bindings involved in holographic slot coding, which are then combined to produce any arbitrary string code. We proceed to test some predictions of this correspondence, asking how similarity rankings from both parts compare on a benchmark of string transformations (e.g. deletions, additions, transpositions), and whether these rankings are affected in the case of anagrams. By offering a simple interpretation of backpropagation learning, this investigation could ultimately provide a new way to think about how location invariance is achieved by the string encoding system.

**[6C5] Semantic processing in the production of numerals across notations**<sup>1</sup>Herrera, A.; <sup>2</sup>Macizo, P.<sup>1</sup>*University of Murcia*; <sup>2</sup>*University of Granada*

It is widely agreed that word numerals are processed similar to other words and thus, they can be named without semantic mediation (Dehaene, 1992). However, there is no consensus about Arabic digits. Although digits seem to have a preferential link to magnitude representation, there is some evidence indicating possible asemantic route to access phonological information. Thus, the naming of digits might involve semantic processing (Brysbaert, 1995) or not (Noël & Seron, 1993). The present study aimed to explore whether the production of numerals across notations implies semantic processing. In different experiments, participants were asked to name digits, number words, dice faces, and dot patterns. These stimuli were presented along with pictures from semantic categories (furniture, body-part, animal, and vehicle). We used a semantic blocking paradigm in which the participants named the stimuli under two conditions: In the mixed context, numerals were intermixed with exemplars from different categories while in the blocked condition numerals and other exemplars were grouped by category. The results showed that participants named more slowly pictures, dot-patterns and dice faces when they were presented in a blocked context than when they appeared intermixed. However, Arabic digits and number words were named faster in the blocked condition than in the mixed condition. These results suggest that semantic processing is mandatory for numerals in different notation but that Arabic digits and number words as other words can be named bypassing semantic access. In our last experiments, we further corroborate this suggestion by presenting Arabic digits and number words along with words from different semantic categories. The participants were again faster in the blocked condition with Arabic digits and number words suggesting that they can be named without semantic mediation.

**[2E1] Encoding specificity in associative learning**

**Honey, R. C. ; Lin, T-C. E.**  
*Cardiff University*

Learning and memory are often characterized as a set of processes that operate on stimulus traces that are distinguished by their longevity. Formal models of associative learning in animals (e.g., Wagner, 1981) share the following assumption: while the nature of the short-term memory traces present during acquisition can have a profound influence on what is stored in long-term associative memory, the resulting long-term memories are themselves blind with respect to the origin of this influence. We present evidence from both behavioural and neuroscientific investigations that is inconsistent with this prevalent assumption. This evidence suggests that long-term associations encode the nature of the short-term traces that were present during the acquisition of associative knowledge.

**[6D5] Cue utilisation and judgments of learning: What can we learn from an integrative approach?**

**Illman, I.; Morrison, C. M.**  
*University of Leeds, UK*

Judgments of Learning (JOLs) are predictions of the likelihood that one will later recall information. According to Koriat (1997), these judgments are based on three classes of cues: intrinsic, extrinsic and mnemonic. However following Koriat's article few studies have systematically assessed the combined influence of these cues on JOLs and recall. The present research aimed systematically to assess the role of lexico-semantic word features on subsequent mnemonic processing. In particular, we focused on the role of word age of acquisition (AoA). Using a standard cue-target paradigm, we replicated the robust delayed-JOL effect and used a novel items analysis approach to examine the relationship between intrinsic word features, JOLs, recall and reaction times (RT). We found a range of correlations between these variables, and regression analyses highlighted some discrepancies between JOLs and recall. For example, target AoA predicted JOL RT, while cue AoA predicted recall RT. These results provide novel evidence for the role of AoA as a key lexical variable in both memory and metacognition, as well as recognising the mnemonic basis of JOLs. References Koriat, A. (1997). Monitoring One's Own Knowledge During Study: A Cue-Utilisation Approach to Judgments of Learning. *Journal of Experimental Psychology*, 126, (4), 349-370.

**[9C3] Cultural differences in calculation and estimation strategies**<sup>1</sup>Imbo, I.; <sup>2</sup>LeFevre, J-A.<sup>1</sup>University of Huelva; <sup>2</sup>Carleton University

We tested cultural differences in arithmetic strategy use in two studies. In both studies, the choice/no-choice method was used to obtain independent measures of strategy selection, strategy efficiency, and strategy adaptivity; and the selective interference paradigm was used to investigate the role of phonological and executive working-memory resources. In the first study, Belgian, Canadian, and Chinese university students solved complex addition problems (e.g.,  $28 + 43 = 71$ ). The Chinese were faster and made fewer errors than the Belgians and the Canadians. The Chinese also needed fewer working-memory resources than the Belgians and the Canadians. However, the Belgians and the Canadians chose more adaptively among the available strategies than did the Chinese. In the second study, Belgian and Chinese university students estimated complex multiplication problems (e.g.,  $28 \times 43 \approx 20 \times 40 = 800$ ). In contrast to the first study, participants in this study were explicitly asked to choose the best strategy (rounding down or rounding up) on every single trial. The Chinese were more accurate but not faster than the Belgians; but the Belgians were more adaptive than the Chinese and especially so under executive working-memory load. We will discuss several possible explanations for the observed cultural differences, such as differences in early educational experiences (drill and training in Asian countries vs. exploration and flexibility in non-Asian countries), differences in focus of attention (on specific task properties vs. on alternative strategies), the structure of the number language, variations in emotions (math anxiety vs. motivation), and the effects of cultural norms and standards.

**[6D4] Simulating age/ order of acquisition effects in word production and comprehension through cumulative learning of foreign words in the lab**<sup>1</sup>Izura, C.; <sup>2</sup>Pérez, M. A.; <sup>1</sup>Agallou, E.; <sup>1</sup>Wright, V.; <sup>2</sup>Marín, J.; <sup>3</sup>Ellis, A. W.<sup>1</sup>Swansea University; <sup>2</sup>University of Murcia; <sup>3</sup>University of York

Early acquired words are processed faster than later acquired words in lexical and semantic tasks. Demonstrating such age of acquisition (AoA) effects beyond reasonable doubt is difficult because of the natural correlation between AoA and other word properties such as frequency and imageability. We present three experiments in which participants learned foreign words, with some ('early') words trained from the outset while other ('late') words were introduced some time later then interleaved with the early words. Order of acquisition effects were observed in picture naming, lexical decision and semantic categorization, persisting for several weeks after the end of training. The results imply an important role for order of acquisition in the formation of lexical representations that is independent of other factors such as frequency and imageability, and is also independent of the chronological age of the language learners.

**[5B2] An ecological/dynamical analysis of perception-action couplings and changes therein**

**Jacobs, D. M.**

*Autonomous University of Madrid*

The present study tentatively explores the use of difference equations as a tool to analyze learning and calibration in dynamic touch. On the basis of previous studies (Jacobs & Michaels, 2007; Michaels, Arzamarski, Isenhower, & Jacobs, 2008) it is assumed (1) that learning goes together with changes in the informational basis of perception and action, (2) that such changes can be described as movements through an information manifold, and (3) that the movements through the information manifold themselves are specific to information for learning. The purpose of this study is to obtain a more precise description of the information that guides this type of learning as well as of the information that guides calibration. Difference equations are used to describe the link between changes in performance (trial-to-trial steps through the information manifold) and information for learning and calibration (defined over multiple trials). The present analyses indicate that observers use four previous trials for learning and one previous trial for calibration. More than to this speculative conclusion, however, I want to draw attention to the methodology, which provides a precise illustration of the hypothesis of direct learning (Jacobs, Silva, & Calvo, 2009).

**[6E4] The role of low- and high-level social cues in anticipating other's actions**

**Jellema, T.; Palumbo, L.**

*University of Hull*

When other's actions are accompanied by social cues, as typically is the case, then the processing and integration of these social cues can induce distortions or biases in the visual perception of the actions. Social cue processing is further thought to play a role in the involuntary understanding of the behavioural intentions underlying these actions, which may lead to an anticipation of other's immediate future actions. One example is the distortion in the perception of facial expressions that occurs when these are embedded in dynamic action sequences. We examined the low- and high-level processes that generate such perceptual biases, and the role these biases may play in understanding and anticipating other's actions. In these experiments video clips were presented of dynamic facial expressions that morphed from a maximally happy or angry expression to a neutral expression. Participants explicitly evaluated the expression depicted on the last frame of each clip and consistently judged these as slightly angry in the happy-to-neutral condition, and as slightly happy in the angry-to-neutral condition (overshoot bias). In principle a number of low-level visual factors, such as adaptation, contrast effects, and extrapolation, could have accounted for the overshoot bias. On the other hand, the results are also consistent with a high-level emotional anticipation process, which might involve embodied simulation underpinned by mirror neuron systems. In a series of experiments we attempted to disentangle the contributions of these various components to the perceptual bias and the understanding of the action.

**[9D2] Genotype/phenotype relations****Karmiloff-Smith, A.***Birkbeck Centre for Brain & Cognitive Development*

One of the most important and often ignored issues about genotype/phenotype mapping is the age at which the genetic and brain/behavioural data are collected. Hitherto, such mapping has mainly been done on the basis of the adult genotype/phenotype. But, given changes in gene expression over time and the fact that genetic deficits initially affect very basic processes in infancy, which may impact differentially on emergent cognitive domains, it is crucial to trace phenotypic outcomes back to their origins in infancy. Taking as an example Johnson's important work on brain development in face processing<sup>1, 2</sup>, I will show how progressive specialisation and localisation of brain function does not occur in the neurodevelopmental disorder, Williams syndrome, despite proficient behavioural scores on standardised face processing tasks<sup>3</sup>, and trace this back to impairments in saccadic eye movement planning in infancy<sup>4, 5</sup>. I will argue that developmental time counts at every level of analysis, that animal models of genotype/phenotype relations must compare like with like at the cognitive level, and that domain-specific outcomes may stem from domain-general origins. Finally, I shall point to future directions. 1 Johnson, M. H. (2001). Functional brain development in humans. *Nature Reviews Neuroscience*, 2, 475–483. 2 Johnson, M. H., Halit, H., Grice, S. J., & Karmiloff-Smith, A. (2002). Neuroimaging and developmental disorders: A perspective from multiple levels of analysis. *Development and Psychopathology*, 14, 521–536. 3 Karmiloff-Smith, A., Thomas, M., Annaz, D., Humphreys, K., Ewing, S., Brace, N., et al. (2004). Exploring the Williams Syndrome face processing debate: The importance of building developmental trajectories. *Journal of Child Psychology and Psychiatry*, 45, 1258–1274. 4 Brown, J., Johnson, M.H., Paterson, S., Gilmore, R., Gsödl, M., Longhi, E. & Karmiloff-Smith, A. (2003) Spatial Representation and Attention in Toddlers with Williams Syndrome and Down Syndrome, *Neuropsychologia*, 41, 1037-1046. 5 Karmiloff-Smith, A. (2009) Nativism vs Neuroconstructivism: Rethinking Developmental Disorders. Special Issue on the Interplay of Biology and Environment, *Developmental Psychology*, 45, 1, 56-63

**[4C2] Fixational eye-movements during hypnotic induction**<sup>1</sup>Lamas, J. R.; <sup>2</sup>Blanco, M. J.<sup>1</sup>*University of La Coruña*; <sup>2</sup>*University of Santiago de Compostela*

Our eyes are continuously moving, even when we fixate our gaze on a point. These fixational eye-movements consist of slow drifts occurring independently in both eyes, interrupted by fast binocular microsaccades at a rate of one or two per second. The function of these microsaccades is not yet clear. It is believed that they are involuntary but it is well known that they tend to disappear when the visual fixation task demands attention and high acuity. A common feature of many hypnotic induction techniques is that they require subjects to fixate their gaze on a point or small object, while they are given suggestions of tiredness, relaxation and sleep. High hypnotizable subjects tend to close their eyes faster than the low hypnotizable. However, we still don't know whether both groups differ in the way they fixate their eyes. Also, it is still not known whether hypnotic suggestions can modulate fixational eye movements. The aim of our research is to investigate the relationship between fixational eye-movements, hypnosis and hypnotizability. To our knowledge, this is the first study of this kind. Fixational eye-movements of high- and low-hypnotizability subjects were recorded by video-oculography (Eyelink II). In the first experiment, eye-movements were recorded during a typical eye-fixation hypnotic induction and at a no-hypnosis control condition. In the second experiment, high hypnotizable observers performed a visual task demanding high acuity with and without hypnosis. The task consisted in detecting a target that appeared within a rapid-serial-visual-presentation (RSVP) of alphanumeric characters. The implications of the results with regards to common claims of different attentional abilities of high and low hypnotizable are discussed.

**[9E4] Attentional biases in human learning: Controlled or automatic?**

**Le Pelley, M. E.**

*Cardiff University*

Many studies of human contingency learning have demonstrated that differences in the previously-experienced predictiveness of cues influence what is learnt about those cues in future. This influence of “learned predictiveness” seems to be mediated by attention, and can lead to non-normative biases in learning, such that what is learnt may not accurately reflect the experienced statistical relationships between cues and outcomes. One possibility is that attention acts at a relatively automatic level, biasing the rate at which cue–outcome associations are formed. This suggestion of a low-level influence of attention is supported by the observation of similar effects of predictiveness on learning in animal studies. However, an alternative view is that attentional effects on learning in humans at least are necessarily mediated by conscious propositional knowledge (De Houwer, Beckers & Vandorpe, 2005). I will describe a number of experiments that address the issue of whether attention always acts at a controlled level, or if sometimes it might bias learning at a more automatic level. De Houwer, J., Beckers, T., & Vandorpe, S. (2005). Evidence for the role of higher order reasoning processes in cue competition and other learning phenomena. *Learning & Behavior*, 33, 239-249

**[5D4] Eye movements of second language learners when reading spaced and unspaced Chinese text**

<sup>1</sup>Liversedge, S. P.; <sup>2</sup>Shen, D.; <sup>2</sup>Tian, J.; <sup>2</sup>Zang, C.; <sup>2</sup>Cui, L.; <sup>2</sup>Bai, X.; <sup>2</sup>Yan, G.; <sup>3</sup>Rayner, K.  
<sup>1</sup>*University of Southampton*; <sup>2</sup>*Tianjin Normal University*; <sup>3</sup>*University of California*

We explored the effect of spacing in relation to word segmentation for four groups of non-native Chinese speakers (American, Korean, Japanese, and Thai) who were learning Chinese as second language. We used Chinese sentences with four types of spacing information: unspaced text, word spaced text, character spaced text, and nonword spaced text. Also, participants' native languages were different in terms of their basic characteristics; English and Korean are spaced, whereas the other two are unspaced. Japanese is character based whereas the other three are alphabetic (though Korean is comprised of alphabetic blocks that have the appearance of characters). Thus, we assessed whether any spacing effects were modulated by native language characteristics. Reading times and regression measures all showed least disruption to reading for word spaced text, longer for unspaced, then character spaced text, and longest for nonword spaced text. These effects were uninfluenced by native language (though reading times differed between groups due to Chinese reading experience). Demarcation of word boundaries through spacing reduces non-native's uncertainty about the characters that comprise a word, thereby speeding lexical identification, and in turn, reading. More generally, the results indicate the word, not the character, is the primary unit of information in Chinese reading.

**[5B3] A Bayesian approach of interceptive timing**

**López-Moliner, J.**  
*University of Barcelona*

Abstract Objects' retinal image entails uncertainty due to its inherent ambiguity for it can represent a small close object or a farther, larger one. How do we deal with this uncertainty when timing our actions? One solution is to bypass image interpretation and to extract timing information from retinal flow. Alternatively, fine action timing could be mediated by a Bayesian interpretation of the optic flow. The latter predicts systematic errors if the actual environment deviates from the optimal statistical estimate about what is causing the retinal image. Here we provide evidence that action initiation of interceptive responses and their completion times develop sensitivity to the prior probabilistic structure of physical size and approaching velocity respectively. Despite feedback of successful actions being consistent with the correct time signaled by optical information, subjects favour the interpretation which leads them to reduce variability at the cost of committing larger systematic errors.

**[9E3] When there is no time to think cues augment each other rather than compete**

**Matute, H.; Vadillo, M. A.**  
*University of Deusto*

Competition that occurs when two or more cues are presented together as predictors of a common outcome is generally explained by low level associative mechanisms, but recent research shows that cue competition often results from higher-level reasoning processes. According to the associative view, if inferential processes are prevented from operating and only low level, automatic associative processes are engaged, then the opposite of competition, that is, the spread of activation from one cue to its companion (augmentation) should occur. We tested this hypothesis by manipulating time to think in an associative learning task. When participants behaved under time pressure, augmentation, rather than competition, was observed.

**[4B3] Children's use of temporal information in making causal structure judgments**

**McCormack, T.; Frosh, C.; Lagnado, D.; Burns, P.**  
*Queen's University Belfast*

In a previous study (Burns & McCormack, 2009), we have shown that older children and adults will use temporal information when judging whether a 3-element causal system (ABC) is a causal chain system, with A causing B which causes C, or is a system in which A is the common cause of B and C. In a subsequent study, we have established that when they are made aware in advance of the possible causal structures of a system, 5-year-olds will also use such temporal information, although less reliably than older children. We found that 4-year-olds did not discriminate between causal structures on the basis of their temporal characteristics, although they did do so if the systems were simplified so that were only two events which occurred either sequentially or simultaneously. We will also report the findings of a study which examines whether children will preferentially weight temporal information over covariation information in making causal structure judgments when the two types of information are in conflict. Taken together, these findings inform us about the important role of temporal information in making causal judgments.

**[4C3] The valencia model of waking hypnosis: Theory and experimental basis**

**Mendoza, M. E.; Capafons, A.**

*University of Valencia*

We report a new model of hypnosis, which abandons difficult concepts such as trance, using instead insights drawn from socio-cognitive and cognitive-behavioural positions. Our approach emphasises the continuity between the behaviours and experiences of everyday life with those of hypnosis. Without any need to evoke the concept of trance there is no “going to sleep”, so we use the term ‘Waking Hypnosis’. The model suggests three procedures to establish good rapport and hence effective hypnosis: the cognitive-behavioral presentation of hypnosis, clinical assessment of hypnotic suggestibility, and a didactic metaphor about hypnosis. Two induction methods of waking hypnosis are developed from these procedures, namely, Rapid Self-Hypnosis and Waking-Alert Hypnosis, the latter also known as Alert-Hand Hypnosis. The ultimate goal is to enable patients to activate therapeutic suggestions in those everyday situations in which they need them. Even though this model is very structured and hence suitable in a research role, its sequence is sufficiently flexible to be adapted to a patient’s needs.

**[9D3] Early word learning and the developing brain.**

**Mills, D. L.**

*Bangor University*

The first three years of life yield dramatic advances in language development. Yet the changes in language-relevant brain systems that precede, accompany or follow these achievements are not well understood. I will present a series of event-related potential studies in typically developing infants 6-months to 2 years of age showing how the experience of learning language shapes the organization of brain activity linked to vocabulary development. Additionally, I will examine how language-specific, social, and domain-general cognitive processes and their development, influence changes in the organization of brain activity for communicative functions.

**[5B4] Dynamical factors in action selection: The selection of head and eye movements when controlling reaching movements.**

**Mon-Williams, M.; Wilkie, W.**

*Leeds University*

Reaching-and-grasping is a fundamental human action. Skilled reaching requires visual information to: specify the location of the object relative to the hand; indicate the properties of the object (properties that affect the spatial and temporal patterns of the movement); and guide the hand to the object. The importance of visual information means that head and eye movements are required in most reach-to-grasp actions so that objects of interest fall within foveal vision. Skilled reaching therefore depends not just on movement of the hand(s) but also movements of the head and eyes. It follows that reaching-and-grasping depends upon the coordination of the eyes, head and hand(s). The eye-head-hand coordination patterns observed in reach-to-grasp behaviours can sometimes be predicted if one knows the task, the properties of the target object(s) and the location of the objects relative to the actor. Thus, the visual information suggests a task configuration that 'affords' a particular action (involving reaching-to-grasp), and that action is often observed when the task is so configured. Nevertheless, the behaviour is not simply a function of the task configuration but is also affected by the history of the individual (including the previous action completed by the individual). This characteristic can be described as 'hysteresis'. In systems that exhibit hysteresis there is no way to predict the output of the system without knowing the system's current state, and there is no way to know the system's state without looking at the system's history. It is therefore important to study task configuration when trying to understand the selection of a particular behavioural pattern but it is also necessary to consider the effects of hysteresis. These issues will be discussed with reference to reach-to-grasp actions (and possibly other behaviours if the audience are well behaved).

**[9E1] Direct measures of associative cue competition as evidenced from priming studies**

**Morís, J.; Cobos, P. L.; Luque, D.; López, F. J.**

*University of Málaga*

Verbal judgments are the most widely employed measure in human contingency learning paradigms. The type of judgments and the different questions used to elicit them have been shown to modulate the different effects that can be found, especially in studies of cue competition. Thus, the use of more direct measures of the information learnt and its representation will clearly benefit the understanding of the origin of cue competition effects. In the present series of experiments, we present results derived from such more direct measures. Specifically, the measures are obtained using a recognition memory test that included different priming stimuli before target stimuli were presented. This memory test served to measure the associations learned in a previous contingency learning task. The characteristics of the test prevented the engagement of high order processes during retrieval. The results obtained showed acquisition of cue-outcome associations as well as cue competition effects such as forward and backward blocking. Overall, these results evidenced that the associative memories of the cue-outcome relationships learnt after a standard contingency learning task were as predicted by associative models of cue competition.

**[2B2] The integration of action and language in cognitive robots**

**Morse, A.; Cangelosi, A.**  
*University of Plymouth*

Recent theoretical and experimental research on action and language processing in humans and animals demonstrates the strict interaction and co-dependence between language and action. These studies have important implications for the design of communication and linguistic capabilities in cognitive systems and robots. Amongst the various approaches some treat language as an integral part of the whole cognitive system. The agent's linguistic abilities are grounded in other behaviours and skills, thus supporting the bootstrapping of the agent's cognitive system, e.g. through the transfer of properties of action knowledge to that of linguistic representations, and vice versa. We will review a series of cognitive agents and robotics models of action and language learning. These models share the following properties: (i) symbols are directly grounded in the agents' own sensorimotor and cognitive abilities and (ii) the communicative/linguistic behaviours are acquired (evolutionarily and developmentally) through the interaction of agents in their physical and social environment. Categorical perception and synthetic brain imaging are used to analyze the sensorimotor bases of linguistic structure. We will present recent studies on micro-affordance learning and action/language integration with the humanoid robot platform iCub. The robot reproduces phenomena observed in humans, such as Stimulus-Response Compatibility. In a subsequent study the iCub robot is trained to understand motor instructions using a grounded approach. These studies will be discussed within the computational framework of developmental robotics and the scientific and technological implications that such an approach has for the understanding of action and language integration in natural and artificial cognitive systems.

**[3C1] Incidental recognition memory in developmental amnesia**

**<sup>1</sup>Munoz, M.; <sup>2</sup>Chadwick, M.; <sup>3</sup>Perez-Hernandez, E.; <sup>4</sup>Mishkin, M.; <sup>5</sup>Vargha-Khadem, F.**

*<sup>1</sup>UCL Institute of Child Health; <sup>2</sup>Wellcome Trust Centre for Neuroimaging; <sup>3</sup>Developmental and Educational Psychology; <sup>4</sup>Complutense School of Education; <sup>5</sup>The National Institute of Mental Health*

Incidental recognition memory is the spontaneous ability to discriminate novel objects from familiar ones. This type of recognition is reflected in the automatic attraction of one's gaze by novel objects, i.e. novelty preference, a behaviour consistently observed across species, including humans, monkeys, and rodents. However, whereas animal research points to the importance of the hippocampus for incidental recognition, evidence in humans is more circumscribed. To test whether, like episodic memory, this type of memory requires the hippocampus in humans, we evaluated patients with developmental amnesia (DA), a syndrome caused by early episodes of hypoxia-ischemia and characterized by selective hippocampal damage and severe impairment of everyday memory, but with relatively preserved IQ. Patients with DA and normal controls were examined in a visual paired comparison task. In each of the 64 unique trials of this task, a pair of identical stimuli was presented for familiarization and, after a variable delay of 0, 5, 30, or 120 s, the familiarized stimulus was presented again but this time paired with a novel one. Preferential looking at the new stimulus, measured by monitoring eye fixations, signals recognition of the previously presented picture as "familiar". Patients and controls had similar mean looking times during familiarization trials. In contrast, although preferential looking to novel stimuli by patients equalled that of controls at 0 and 5 s delays between familiarization and test, it was impaired relative to the controls' preferential looking at 30 and 120 s delays, falling to chance levels ( $p > 0.01$ ) for both stimulus types. The results indicate that the integrity of the hippocampus is required for delayed incidental recognition in humans. They also suggest that neural plasticity during development does not allow other structures or circuits to substitute for the damaged hippocampus in enabling this form of incidental recognition memory.

**[4C1] Hypnosis, hallucinations and hemispheric differences****Naish, P.***The Open University*

In general, people in hypnosis produce only what they are led to believe is 'hypnotic' behaviour. The apparent absence of any spontaneous hypnosis-related effects has been taken as evidence against the presence of a special underlying mental state. However, data will be presented showing that, in those who are able to generate vivid hallucinations, hypnosis causes a marked distortion of time judgement; the 'inner clock' appears to run more slowly. From the above a number of interesting parallels may be explored. Thus, sufferers from posttraumatic stress disorder experience hallucinatory 'flashbacks' and also time distortion. There is evidence that these patients exhibit a shift to predominantly global or right-hemisphere processing. They are also more than averagely hypnotizable. Similarly, schizophrenia patients experience hallucinations and exhibit significant timing deficits. Much evidence suggests that they have unstable lateral dominance, and scores on scales of schizotypy correlate with hypnotic susceptibility. Lastly, recent fMRI evidence (Lewis & Miall, 2006) places a significant element of the 'clock' in the right hemisphere. The preceding observations hint at right hemisphere involvement in both anomalous experiences and time distortion. This has been explored for hypnosis, using a temporal order judgement task. Data will be presented showing that a right hemisphere shift is indeed present in hypnosis; further, there are differences between those who are hypnotizable and those who are not, even before hypnosis. Lewis PA & Miall RC (2006). A right hemispheric prefrontal system for cognitive time measurement. *Behavioural Processes*, 71 226-234.

**[2E2] 6-hydroxydopamine lesions to the nucleus accumbens shell and core, comparison with the effects of amphetamine on latent inhibition and overshadowing****Nelson, A. J. D.; Thur, K. E.; Spicer, C.; Marsden, C. A.; Cassaday, H. J.***University of Nottingham*

Latent inhibition (LI) is demonstrated when non-reinforced pre-exposure to a to-be-conditioned stimulus retards later learning. Learning is similarly retarded in overshadowing, in this case using the relative intensity of competing cues to manipulate associability. Systemic amphetamine and electrolytic/excitotoxic lesions to shell accumbens reliably abolish LI. Thus 'hyperassociability', manifest as increased conditioning to stimuli that should normally be ignored, has gained widespread acceptance as a model for schizophrenic attention disorder. Here a conditioned emotional response procedure was used to demonstrate LI and overshadowing under comparable conditions, to examine the role of dopamine within accumbens. Experiment 1 tested the effects of 6-hydroxydopamine-induced lesions of dopamine terminals within the core and medial shell subregions of accumbens. Analysis by HPLC confirmed that the lesions were clearly different according to the injection placement in that the injection targeted on shell was restricted to shell. Infusion of 6-hydroxydopamine into the core produced significant DA depletion within core and shell accumbens. Both shell- and core- (plus shell-) lesioned rats showed normal LI and overshadowing. Experiment 2 confirmed the sensitivity of the LI parameters to systemic amphetamine, but there was no effect on overshadowing (at 1mg/kg intra-peritoneal). Experiment 3 compared the effects of amphetamine micro-injected at shell and core co-ordinates, again using the same behavioural procedure. LI was abolished by 10µg amphetamine injected in core; overshadowing was unaffected by injection of the 10µg dose. However, overshadowing was abolished by 5µg amphetamine injected in core, whereas LI was unaffected by injection of the 5µg dose. These results suggest: (1) the electrolytic/excitotoxic lesion-induced abolition of LI is not readily reproduced by regionally restricted dopamine depletion within accumbens; (2) core rather than shell accumbens mediates amphetamine-induced abolition of LI; (3) core accumbens similarly mediates amphetamine-induced abolition of overshadowing; however (4) amphetamine effects on LI and overshadowing are nonetheless dose-dependently dissociable.

**[2E5] Extinction does not generally change context processing.**

**Nelson, B.**

*University of the Basque Country*

The present talk presents new data and current ideas regarding mechanisms of the “Renewal Effect;” the recovery of an extinguished conditioned response with a change in the background where extinction occurred. Rosas and Callejas-Aguilera (2006) suggested that when a stimulus becomes ambiguous in meaning, as in extinction, attention is aroused to the context so that it is processed both while extinction is occurring, and during subsequent learning. The result of that processing was suggested to be that learning will be context specific. Four experiments, two with rats and two with humans, are presented that refute the generality of that suggestion. In two appetitive-conditioning experiments with rats, responding to a tone was shown to transfer better to a new context when it was conditioned concurrently with the extinction of another stimulus, begging the question as to whether the effects reported by Rosas and Callejas-Aguilera were specific to humans. In a behavioral task with humans incorporated into a video game that produces robust renewal (Experiment 1), conditioning an effortful keyboard response to a visual stimulus while another was concurrently undergoing extinction had no observable effect on the transfer of learning to a new context (Experiment 2).

**[6C1] A spatial orientation of the number magnitude in preschoolers**

**Noël, M. P.**

*University of Louvain*

Number magnitude representation is supposed to be spatially oriented with, in our occidental cultures, small numbers associated to the left and large numbers to the right. Several explanations have been proposed for this spatial bias. According to one of them, this spatial bias would be related to the reading direction, as a reverse spatial orientation of number representation has been observed in oriental cultures with right-to-left reading systems. In this study, we wanted to investigate the development of this spatial numerical bias in young children who have not yet learnt to read. Four and five years old preschoolers were presented with different numerical tasks such as enumeration of a linear collection, seriation of collections, adding a token to a collection ... The spatial bias was measured in those settings. Furthermore, we also measured the child’s numerical development and his/her sense of reading habits. Results showed the presence of an early tendency to associate small numbers with the left. The presence of this spatial bias was not correlated with general development of numerical abilities but was associated with the child’s sense of reading habits.

**[3C5] The development of inhibitory control of memory: Evidence from retrieval-induced forgetting**<sup>1</sup>Ortega, A.; <sup>1</sup>Luque, C.; <sup>2</sup>Román, P. E.; <sup>3</sup>Gómez-Ariza, C. J.; <sup>1</sup>Bajo, M. T.<sup>1</sup>University of Granada; <sup>2</sup>Jaume I University; <sup>3</sup>University of Jaén

Results from behavioral and neuroimage studies support the account of retrieval-induced forgetting (RIF) in terms of an aftereffect of executive inhibitory control. Thus, they seem to be in conflict with results from individual differences studies that show preserved RIF in populations with deficits in executive control. We think, however, this is not necessarily the case if executive control is not thought as an all-or-nothing matter. Variations in inhibitory functioning may result from differences in the ability to control attention as well as differences in the setting demands. Therefore, selection at retrieval could require moderate levels of control that might still be available to people known to show inhibitory deficits in more demanding tasks. We tested this hypothesis by manipulating the level of attentional control required by a concurrent task during retrieval practice. If executive control is more easily disrupted in children and older people, a concurrent task demanding low-moderate level of control should lead to observe RIF in young adults but not in children and older adults. Our results support both an inhibitory explanation of RIF as well as the hypothesis of developmental changes in the ability to control memory interference.

**[2C1] Anxiety, attention and processing styles****Pacheco, A.; Acosta, A.; Lupiáñez, J.***University of Granada*

Our studies investigate the relationship between attention and anxiety from a wide perspective. We will present 3 experimental series comprising different tasks in order to specify how anxiety relates to the functioning of the attentional mechanisms and affective processing. In the first experimental series, our objective was to investigate how the attentional networks proposed by Posner (1990) interact with anxiety depending on whether trait, state or pathology is considered. We administered the Attention Network Test – Interaction (ANTI) without affective information. Results showed a double dissociation: trait-anxiety was related to a reduced executive control, while state-anxiety was associated to overactive alerting and orienting. Patients with anxiety disorders showed greater interference (reduced control) and a larger cost to disengage attention from irrelevant stimuli compared to the control group. The aim of the second experimental series was to investigate whether emotional valence affects the functioning of attentional control mechanisms required for response inhibition. Perceptual load was manipulated in a Go/No-Go task and emotional faces were used as distractors. Results showed only the low state-anxiety group adopted an efficient response style, while participants with high state-anxiety levels did not use the available information to adjust their performance according to the task demands. Finally, in the third experimental series, participants with different state-anxiety levels were asked to perform two tasks with different processing styles: a robber face recognition task, as a measure of global processing, and a picture differences detection task that demanded a local attentional focalization. Results showed that positive mood state facilitates a global processing style (greater performance in face recognition) while a negative mood promoted a more local processing state thus making easier the detection of differences. The overall pattern of results is discussed in the context of the relationship between anxiety (state, trait and pathology) and attention.

**[9D4] Changes in face processing during the first year of life**

**Pascalis, O.**

*Peirre Mendès University*

Faces are crucial for nonverbal communication. From the first moments of life, newborn infants prefer to look at human faces over almost any other form of stimuli. To account for newborns' face preference at birth, Morton and Johnson (1991) have proposed that a subcortical visuomotor system termed CONSPEC exists at birth and serves to orient the newborn towards face-like patterns. The primary function of CONSPEC is to ensure that facial input is maximized during the first 2 months of life before a second system termed CONLERN comes "'online'." CONLERN is located cortically and develops as a result of the cortex's exposure to faces, which, as described above, is ensured by CONSPEC. Exactly which components of the face processing system are present at birth, which develop first, and at what stage the system becomes adult-like are still hotly debated topics. I will review our current knowledge and understanding of the development of the face processing system during the first year of life, how experience influences it and how it relates to the adult system. Morton and Johnson, 1991. J. Morton and M. Johnson , CONSPEC and CONLERN: A two process theory of infant face recognition. *Psychological Review* 98 (1991), pp. 164–181.

**[5D3] Orthographic priming effects in eye movements while reading**

<sup>1</sup>**Paterson, K.**

*University of Leicester*

Research on the influence of word processing on eye movements while reading has generally focused on how the lexical characteristics of individual words influence eye movement behaviour. In this talk, I will present novel evidence that lexical relationships that exist between words in a sentence can influence processes involved in the identification of words and that this too influences eye movement behaviour while reading. In presenting this evidence, I will focus on findings from several recent experiments, including a study reported by Paterson, Liversedge, and Davis (2009), which show that the experience of processing a word's lexical neighbour a few words earlier in a sentence can carry over intervening words to affect word identification, and that this, in turn, has a rapid influence on eye movement behaviour. I will argue that the fact that this effect occurs between words in sentences read normally indicates that eye movements are sensitive to intra-sentential, inter-lexical influences that occur naturally within sentences. This finding is discussed in relation to accounts of lexical processing in current models of eye movement control and a possible role for episodic memory in word identification during reading. Reference Paterson, K. B., Liversedge, S. P., & Davis, C. J. (2009). Inhibitory neighbor priming effects in eye movements during reading. *Psychonomic Bulletin & Review*, 16, 43-50.

**[3C4] Developmental changes in overcoming proactive interference: Behavioral and neural correlates**<sup>1,2</sup>Paz-Alonso, P. M.<sup>1</sup>University of Granada; <sup>2</sup>University of California

We sometimes experience difficulty distinguishing memories pertaining to the present from memories pertaining to the past, such as where we parked the car today. The ability to overcome interference from previously encountered information is a key component of executive functioning. Age-related increases in the ability to limit interference in working memory have been documented across childhood and adolescence. Here, we will report results from behavioral, ERP, and fMRI studies aimed at investigating age-related changes in overcoming proactive interference from long-term memory in children aged 7-12 and young adults. We designed a modified version of a continuous recognition task previously used to characterize temporal context monitoring deficits in confabulating patients. In this task, participants must indicate whenever an image is repeated within a run, which becomes more difficult as familiarity with the images increases from run to run as a result of the repeated exposure to the same items. Participants were administered a total of four memory monitoring runs. Behavioral results revealed that the ability to correctly discriminate between true (Hits) and false memories (Lure endorsements) significantly varied with age and from run to run. Younger children (7-10) exhibited significant discriminability decreases from run to run after Run2. In contrast, older children (11-12) only showed significant discriminability reductions from Run3 to Run4. Finally, adults' discriminability did not diminish significantly after Run2. Preliminary ERP data reveals two frontal effects in different pre-response periods related to memory monitoring and post-retrieval processes. Preliminary fMRI data suggest a functional dissociation between lateral and medial orbitofrontal cortex (OFC). Whereas lateral OFC was involved in correctly identifying image repetitions within runs (Hits), medial OFC engagement was associated with correctly identifying initial image presentations within runs (Lure correct rejections). Maturational changes in OFC and other PFC structures during middle childhood may determine developmental improvements in overcoming proactive interference.

**[9C5] The origin of the distance effect in numerical updating tasks**

Pelegrina, S.; Lendínez, C.; Lechuga, M. T.

*University of Jaen*

In numerical updating tasks a number maintained in memory has to be substituted by other number. In these tasks, numerical operations are often used as a criterion to update the information (e.g. Garavan, 1998, Oberauer, 2002, 2003). Depending on the numerical operation, the two numbers involved in an updating trial may be more or less distant. We present three experiments to investigate the role of the numerical comparisons and numerical distance on updating. In the first experiment numerical comparisons are used to determine when a number has to be updated. Results show that close numbers (i.e., 25) to the number maintained in memory (i.e. 24) are updated faster than more distant numbers (i.e. 29). This result cannot be accounted for the distance effect observed in studies on numerical comparisons in which comparisons with close numbers are performed slower than comparisons with distant numbers (e.g. Dehaene et al., 1990). The second experiment replicates the distance effect with a task in which no numerical operations are used as criterion to update the information. This result confirms that the distance in updating tasks is not due to the numerical operation. An alternative explanation is that shared features (i.e., codes) between the numbers involved in updating have an impact on performance: the greater number of shared features (as in close numbers) the faster the updating is. The third experiment is aimed to determine in what extent shared features between the numbers influence the updating process. Results indicate that updating is faster when the two numbers (that one maintained in memory and that one to be memorized) share more features. The nature of the features which might play a role in this effect is discussed.

**[6A5] Eye-gaze aftereffects in autism: Further evidence of weakened adaptive mechanisms**

<sup>1,2</sup>Pellicano, E.; <sup>2</sup>Rhodes, G.

<sup>1</sup>University of London, <sup>2</sup>University of Western Australia

Perceptual mechanisms are generally flexible or “adaptive”. The consequences of adaptation are seen in perceptual aftereffects: distortions that arise following prolonged exposure to a stimulus. We have reported previously that children with an autism spectrum disorder (ASD) show reduced adaptation to changes in facial identity compared to typical children, suggesting that adaptive face-coding mechanisms may be disrupted in autism. Here, we examined whether weakened adaptation in autism extends to perceptual coding of another social attribute: eye-gaze direction. Twenty-four typical children and 24 ASD children were administered a developmentally-sensitive eye-gaze adaptation task. In the pre-adaptation phase, children judged whether faces showing subtle deviations in eye-gaze direction were looking leftwards, rightwards, or straight-ahead. There were no group differences in gaze acuity. In the adaptation phase, children were adapted to faces gazing in one consistent direction (25° leftwards/rightwards) followed by another gaze discrimination task. Adaptation to consistent leftward or rightward eye-gaze resulted in a loss of sensitivity to the subsequent perception of eye-gaze directed to that side – for both groups of children. Nevertheless, the eye-gaze aftereffects of children with ASD were significantly smaller than those of typical children, suggesting that the neural mechanisms coding social information are less flexible in autism.

**[4D2] The search of an input coding scheme: Transposed-letter priming in Arabic**

<sup>1</sup>Perea, M.; <sup>2</sup>abu Mallouh, R.; <sup>2,3</sup>Carreiras, M. .

<sup>1</sup>University of Valencia; <sup>2</sup>Basque Center on Cognition, Brain and Language; <sup>3</sup>IKERBASQUE. Basque Foundation for Science

Two key issues for models of visual-word recognition are the specification of an input coding scheme and whether these input coding schemes vary across orthographies. Here we report two masked priming lexical decision experiments that examine whether the ordering of the root letters plays a key role in producing transposed-letter effects in Arabic –a language characterized by concatenate morphology. In Experiment 1, letter transpositions involved two letters from the root, while in Experiment 2, letter transpositions involved one letter from the root and one letter from the word pattern. Results showed a reliable transposed-letter priming effect when the ordering of the letters of the root was kept intact (Experiment 2), but not when two root letters were transposed (Experiment 1). These findings support the view that the order of the root letters is only allowed a minimum degree of perceptual noise to avoid the negative impact of activating the “wrong” root family.

**[5D2] Inhibitory effects of exterior letter frequency on visual word recognition: differential patterns across English and Greek****Pitchford, N. J.; Ktori, M.; van Heuven, W.***University of Nottingham*

Skilled readers of English (a deep orthography) identify letters that appear frequently in the initial and final positions of words faster than letters that are uncommon in these positions (Pitchford, Ledgeway & Masterson, 2008). However, for skilled readers of Greek (a transparent orthography) this relationship is restricted to the initial letter, suggesting that differences in orthographic structure influence the nature of processes adopted for letter position encoding (Ktori & Pitchford, 2008), which may also influence lexical access. We investigated if differential performance patterns would be observed across English and Greek readers on a lexical decision task in which word and nonword stimuli were manipulated orthogonally for exterior letter frequency. For each orthography, a set of 80 word stimuli was created (all five-letters and matched for word, internal letter, and bigram frequency): 20 with high frequency exterior letters (e.g., ACTOR), 20 with high frequency initial but low frequency final letters (e.g., ALIEN), 20 with low frequency initial but high frequency final letters (e.g., BOXER), and 20 with low frequency exterior letters (e.g., BACON). A matched set of orthographically legal and pronounceable nonword stimuli was created. Age and education matched groups of monolingual English (N=24) and Greek (N=24) readers and a group of bilingual Greek-English readers (N=24) took part in the study. Results revealed an inhibitory effect of letter frequency on lexical decisions. Both English and Greek readers were faster at recognising words and nonwords with low compared to high frequency initial letters, suggesting initial letter frequency may be encoded prelexically. In contrast, only English readers were faster at recognising words (and not nonwords) with low compared to high frequency final letters, suggesting this effect arises from lexical processes. These findings show that orthographic structure modulates exterior letter processing in visual word recognition and have important implications for theories of lexical activation.

**[5C4] Oscillatory activity during the maintenance of verbal-spatial bound representations**

<sup>1</sup>Poch, C.; <sup>2</sup>Campo, P.; <sup>3,4</sup>Parmentier, F. B. R.; <sup>5</sup>Ruiz-Vargas, J. M.; <sup>3</sup>Elsley, J. V.; <sup>2</sup>del Pozo, F.; <sup>1</sup>Maestú, F.

<sup>1</sup>Complutense University of Madrid; <sup>2</sup>Polytechnic University of Madrid; <sup>3</sup>University of the Balearic Islands; <sup>4</sup>University of Plymouth; <sup>5</sup>University Autonoma of Madrid

In two experiments we examined the oscillatory neural activity underpinning the maintenance of verbal-spatial bound information. In the first experiment we demonstrated implicit verbal-spatial binding effects that were dependent on the task-relevant feature. We used MEG to measure brain activity underpinning the maintenance of verbal and spatial features in two recognition tasks, based on a letter-location paradigm previously used in binding studies. Both tasks were identical in terms of their perceptual characteristics and only differed with respect to the instructions given. Thus, in the verbal task participants attended consonants, while in the spatial task they attended locations. We observed that maintaining the identity of verbal information resulted in the concurrent processing of task-irrelevant location information. Critically, the reverse relationship does not hold true, supporting the notion of associative asymmetry. This implicit binding was linked to a specific effect described as a greater oscillatory activity over prefrontal regions in “classical” frequency bands during the first half of the retention period. In the second experiment we contrasted the neural oscillatory activity associated with incidental letter-location binding with those associated with an intentional letter-location binding. Participants performed two tasks, identical to those in experiment 1, but in this case one of the tasks forced participants to adopt an intentional letter-location binding strategy, while in the other, participants were instructed to memorize only the consonants, thereby discouraging intentional binding. We found binding effect in both tasks and we observed that, despite not differing in accuracy or reaction times, there were differences in the patterns of oscillatory activity between tasks. Specifically, we observed a greater involvement of anterior prefrontal areas during the intentional binding task, mainly in gamma frequency band. These results are in agreement with the proposal that executive processes related to intentional cognitive processes on information are linked to anterior prefrontal regions.

**[2C2] Development of attention networks and their interactions during childhood**<sup>1</sup>Pozuelos, J. P.; <sup>1</sup>Paz-Alonso, P. M.; <sup>1</sup>Combita, L. M.; <sup>2</sup>Fuentes, L. J.; <sup>1</sup>Rueda, M. R.<sup>1</sup>University of Granada; <sup>2</sup>University of Murcia

Posner's neurocognitive model considers attention as related to three different brain networks. Alerting network is in charge of the changes in the attentional states, Orientation network is in charge of orienting and selective attention, and the Executive Attention Network is in charge of the control and regulation of cognitive processes. Within this framework, the Attention Network Task (ANT) is an experimental method developed to examine efficiency of attentional functions. This task has been adapted to children and used to study the development of attentional functions. The aim of our study was twofold: 1) modify the ANT task in order to improve the measurement of attentional functions and their interactions; and 2) trace the developmental course of the attentional networks during elementary school. A total of 256 children recruited from local schools in Murcia and Granada, performed a modified version of the child ANT. Modifications included 1) separation of alerting and orienting cues in order to examine the interaction between these functions, 2) manipulation of the inter-trial interval, and 3) manipulation of the validity of the orienting cue. Results show the typical main effects of alerting (larger RT for trials with no cue), orienting (larger RT for invalidly cued trials) and executive attention (greater RT for incongruent trials) as well as interactions between alerting and orienting, alerting and executive attention and orienting and executive attention. Only alerting and executive attention interacted with age in our study, indicating maturative changes in these two functions in the ages studied. Moreover, none of the interactions among networks interacted in turn with age. We also observed the internal reliability of the task to be significant for all three network scores. These results provide a better understanding of the developmental course of the attention throughout childhood.

**[7C4] When the alternative had been better - counterfactual reasoning and the emergence of regret**

Rafetseder, E.; Perner, J.

*University of Salzburg*

Counterfactual reasoning about how events could have turned out better is associated with the feeling of regret. Developmental studies, however, show a discrepancy between the onset of counterfactual reasoning (at 3 years) and the feeling of regret (at 6 years). One hypothesis is that the tasks used to elicit regret are too complicated suggesting that children actually experience regret earlier than 6 years. The second hypothesis is that children's correct answers to counterfactual questions might not be based on counterfactual reasoning but on other reasoning strategies suggesting that the onset of counterfactual reasoning is later than 3 years. In two conditions 3-14 year old children had to choose one out of two boxes and they could keep the content of the chosen box. In condition 1, they were asked how happy they are with what they got before and after they had seen what they could have got. In condition 2 children were only asked after they had seen what they could have got. Results revealed: (1) double questioning (condition 1) creates false positive indications of regret and (2) when regret is assessed more directly children still do not show regret before 10 years of age. Results support the second hypothesis: children up to 6 years (or even older) are still missing the prerequisite for counterfactual reasoning (comparing the actual state of affairs, e.g. what they got, with an imagined state, e.g. what they could have got).

**[6D2] Strategic control and age of acquisition effects in visual word recognition**

**Raman, I**  
*Middlesex University*

The influence of context on AoA is explored in a series of single-word naming experiments. Participants were asked to name target words critically manipulated on AoA embedded in lists containing filler items of varying frequency and imageability. Findings demonstrate that AoA is differentially affected by context and that visual word recognition is under the strategic control of readers. Moreover, frequency (a lexical variable) and imageability (a lexical-semantic variable) appear to influence AoA to the same extent, at least in a transparent orthography such as Turkish. The implications for theoretical models are discussed.

**[6A2] Adaptive norm-based coding of faces, or why faces don't all look the same**

**Rhodes, G.; Jaquet, E.; Jeffery, L.; Evangelista, E.**  
*University of Western Australia*

Faces provide a wealth of social cues that guide interpersonal interactions, and most individuals readily distinguish thousands of faces despite their perceptual similarity. Somehow the brain sees past the shared configuration that is common to all faces to focus on subtle details that distinguish one face from another. We will argue that the brain takes an efficient approach to this problem, using intrinsic, learned reference points, called norms, to focus on subtle variations in the shared face configuration that differentiate one face from another. We present evidence from a variety of face aftereffects, showing that identity is coded relative to face norms, which are continuously updated by experience and tuned to distinct perceptual categories like sex and race. More generally, these results demonstrate that the face-coding system uses perceptual structure in the input to efficiently represent how faces differ.

**[5D1] Using rotation to determine the reading grain size for regular and irregular English words**

**Riddell, P.; Pye, R.; Gibbons, W.**  
*University of Reading*

Purpose: The Psycholinguistic Grain Size theory suggests that readers of a regular orthography (e.g. Spanish, German) can decode words at a smaller grain size (morpheme-grapheme unit) than readers of less regular orthography (e.g. English). In this study, random rotation of letters within a word was used to determine whether different grain sizes are used to decode regular versus irregular words within an orthography. We predicted that regular words would be read at a smaller grain size and so would be more resistant to rotation than irregular words. Methods: Groups of 40 undergraduate students were tested in either a lexical decision task, or in a word reading task. In each task, lists of regular or irregular words of 1, 2 and 3 syllables were rotated by a random amount ranging up to 0° (baseline), 60°, or 120°. Results: For the lexical decision task, in addition to main effects of word type, word length and rotation on reaction time, there was a significant interaction between word type and rotation  $F_{2,61} = 7.3$ ,  $p = 0.002$ . This showed that regular words were read more slowly with increasing rotation. For word reading, again, there were significant main effects of word type, word length and rotation on reading time and an interaction between word type and rotation  $F_{2,36} = 4.50$ ,  $p = 0.018$ . In this case, reading time for regular words was less than for irregular words at baseline, but this difference disappeared with rotation. This suggests that regular words were again more affected by rotation than irregular words.

**[2C3] Detecting infrequent targets while measuring the three attentional networks**

<sup>1</sup>Roca, J.; <sup>1</sup>Castro, C.; <sup>2</sup>López-Ramón, M. F.; <sup>1</sup>Lupiáñez, J.  
<sup>1</sup>University of Granada; <sup>2</sup>National University of Mar del Plata

In the study of human attention, interest has recently been generated in the development of a task aimed at obtaining a quick and easy measure of the different functions of attention. The most promising and fruitful proposals have been those based on Posner and Petersen's model of three attentional networks (Alerting, Orienting, and Executive Control). Different tasks have been developed to obtain an individual measure of the functioning of each network, such as the Attentional Networks Test (ANT) by Fan and collaborators (2002) and the Attentional Networks Test–Interaction (ANTI) by Callejas and collaborators (2004). Generally, these tasks measure the functioning of the Alerting network by means of a phasic alertness task, i.e., measuring the reduction in reaction time provided by a warning signal in comparison to when this signal is not available. However, this measure may provide only a partial estimation of the functioning of the Alertness network, as the vigilance function of attention is not analysed in these tasks. The present work modifies the original ANTI task to add a measure of vigilance, thus attempting to obtain a more complete estimation of the functioning of the Alertness network. Participants now have to detect an infrequent event while performing a variation of the ANTI task so that some indicators of vigilance can be obtained. These data are analysed according to the STD (Signal Detection Theory) and the measures of  $d'$  and  $\beta$  for sensitivity and decision processes are obtained throughout the time taken to perform the task. In addition, the usual Alerting, Orienting and Executive Control network measures are obtained, together with the usual interaction. The results are compared with those found in the original task.

**[2C5] The functioning of the attentional networks and the interaction between them, in patients diagnosed with Parkinson's Disease.**

<sup>1</sup>Rodríguez, L. A.; <sup>1</sup>Funes, M. J.; <sup>2</sup>Escudero, J.; <sup>1</sup>Lupiáñez, J. (presenting author:Lupiáñez, J.)  
<sup>1</sup>University of Granada; <sup>2</sup>Hospital General de Valencia.

The study on attentional deficits in Parkinson's disease (PD), has been mostly based on the isolated analysis of each attentional process and measured in very different experimental contexts. In the present study we have used the ANT-I task (Callejas et al., 2004), to obtain a measure of three different attentional systems (the Alerting, Orienting and Executive Control Networks) and the interaction between them, within the same task and experimental session. The performance of 24 patients with PD was compared with a group of 20 older healthy controls, equated in age and educational level. We observed the usual significant effects of the three attentional networks and their interactions. Importantly, we observed a larger flanker interference effect (i.e., a deficit in Executive Control) in the PD group compared to the control group, while both groups showed similar effects of Alerting and Orienting. In addition, we obtained a significant interaction between Alerting and Executive Control for the control group, showing the typical effect of larger interference in the presence of an alerting tone. This effect was however absent for the PD group. Finally, in order to study the time course of the deficits shown by the PD group, we divided it in two subgroups, depending on the years of evolution of the disease from the diagnosis. The inclusion of this variable revealed a deterioration of the Executive Control network for both PD groups. We therefore conclude that the deterioration of the executive attention network is already present at the initial stages of the disease.

**[7A2] Is there a mood congruent effect in cognitive processing beyond awareness? Empirical evidence for implicit memory biases in depression using a lexical decision task**

**Romero, N.; Vázquez, C.; Sánchez, A. . (Presenting author: Vazquez, C. )**  
*Complutense University of Madrid*

There is extensive empirical evidence on the presence of explicit memory biases for negative information in depressed patients (Matt, Vázquez & Campbell, 1992). Yet, there are few studies that have studied memory in an implicit level, and moreover, these studies have shown mixed results (Barry, Naus y Rehm, 2004). The aim of the present study was to analyze whether automatic processes, associated to implicit memory, are negatively biased towards negative information in depressed participants. A sample of 150 undergraduate students was clinically evaluated using an adapted version of the DID (Diagnostic Inventory of Depression, Zimmerman, Sheeran y Young, 2004) to assess a Major Depressive Disorder (MDD). We identified a final sample of 12 participants with MDD which was compared to a control group of 23 'never depressed' participants on an implicit memory task (i.e., a Lexical Decision Task). In this task participants must decide whether different strings of letters presented in a computer screen were lexically valid or not. The list of words included three different emotional contents: 24 positive, 24 depressive, and 24 neutral ones. Prior to the appearance of each word, either the same word or a meaningless string of letters was subliminally presented (28 msec). We analyzed whether the previous subliminal presentation generated a facilitation effect reflected on faster reaction times on response when there was congruence between the emotional content of priming and emotional state of participants. Our results partially confirmed our hypotheses. There was a significant interaction Group x Subliminal Condition for depressive words. More specifically, depressive participants were the only group that showed faster responses when depressive words were subliminally preceded by negative priming than when these words were preceded by a string of letters.

**[6A1] Human faces are represented holistically: Evidence from gaze-contingency**

<sup>1</sup>Rossion, B.; <sup>1,2</sup>Van Belle, G.; <sup>1</sup>Busigny, T.; <sup>1</sup>Lefèvre, P. , <sup>2</sup>de Graef, P; <sup>2</sup>Verfaillie, K.  
<sup>1</sup>Université Catholique de Louvain, Louvain-la-Neuve; <sup>2</sup>Katholieke Universiteit Leuven

The nature of the representation of faces in the human mind is still highly controversial. On the one hand, recordings of eye fixations on faces (e.g., Yarbus, 1967) and response classification experiments (e.g., Haig, 1985) suggest that a face is represented in terms of its individual components, or facial features (mouth, eyes, nose, ...). On the other hand, there is strong behavioral evidence for interdependence in the processing of separate facial features of a face (e.g., Sergent, 1984; Young et al., 1987; Tanaka & Farah, 1993), rather supporting a Gestaltist view of face perception and representation (Galton, 1879; Sergent, 1986). To clarify the nature of face representation, we used an original gaze contingent stimulus presentation in which an observer's view was restricted to one facial feature at a time in the central visual field (window condition) (Van Diepen et al., 1994). In this viewing condition, forcing a feature-by-feature analysis, performance at an individual face matching task was significantly decreased as compared to when faces were presented at full view. However, having to analyze the face feature-by-feature did not affect the above-chance level performance of a brain-damaged prosopagnosic patient (PS, Rossion et al., 2003), and did not decrease performance for inverted faces in normal observers. We then covered only the fixated feature of the face by means of a gaze-contingent mask (mask condition), this time forcing the observer to rely on the whole of the face outside of central fixation. We found that normal observers' performance was less affected than in the window condition. In contrast, the prosopagnosic patient was massively impaired. In this condition, normal observers also had an increased inversion effect. Altogether, these observations indicate that our expertise in face recognition does not rely on the ability to see detailed features analytically, thus supporting the view that individual faces are represented holistically in the human mind.

**[9D5] Neurocognitive development of attention****Rueda, M. R.***University of Granada*

The study of attention has benefited greatly from the emergence of the field of cognitive neuroscience. Within a neurocognitive framework, attention has been related to three networks of brain areas involved in alertness, orienting and selectivity, and the regulation of cognition and action (Posner & Petersen, 1990). Using tasks adapted from the adult literature, the development of these attentional functions has been traced during infancy and childhood, and the brain mechanisms underlying such development have been explored using imaging and electrophysiological methods (Posner & Rueda, in press). Across development, attention abilities appear to be subject to significant individual differences. These appear to depend upon efficiency of brain mechanisms that are determined by both genetic variability and experience. In this presentation data on the developmental course of attentional functions will be reviewed, as well as evidence showing the role of genes and experience on such development. In addition, the importance of attention for socio-emotional regulation and schooling will be discussed. References: Posner, M. I. & Petersen, S. E. (1990) The attention system of human brain. *Annual Review of Neuroscience*, 13: 25-42. Posner, M. I. & Rueda, M. R. (in press). Development of attentional networks. To appear in: P. D. Zelazo (Ed.) *Oxford Handbook of Developmental Psychology*. Oxford University Press. Oxford, UK,

**[3C2] Error-detection and self-regulation throughout development****Rueda, M. R.; Checa, P.***University of Granada*

Children show gradual improvement in an array of situations involved in the conscious control of thoughts and behavior. Detection of self-made errors constitutes a pre-condition for correcting actions or showing increased attentional control in subsequent trials, and therefore it has been related to self-regulation. The error-related negativity (ERN) is an electrophysiological response that arises around 100 ms after the commission of an error. The ERN is followed by a positivity (Pe) that is larger for erroneous compared to correct responses. Usually, similar components can also be observed when feedback of a negative outcome is provided to the individual. These ERP components appear to be generated by activation of a part of the executive attention network. Larger amplitudes in these components indicate better efficiency of the regulatory system. In this research, we first studied the developmental course of brain responses to error and feedback in children aged 4-7, 7-10 and 10-13 years and young adults. Then, we examined the relationship between the various ERP components related to errors and feedback and measures of self-regulation. Results showed that adults and older children showed the ERN and Pe components in response to errors, whereas younger children did not. Additionally, we found that the amplitude of the Pe was significantly related to measures of interference and impulsivity at the cognitive level of analysis as well as the percentage of delay choices in the DoG task. On the other hand, temperamental measures of self-regulation were associated to the Pe amplitude elicited by unexpected feedback of correct but too slow responses. Our results indicate that young children have a limited capacity for the early detection of self-made errors. Furthermore, individual differences in the brain response to errors are related to performance of tasks requiring self-regulatory abilities at different behavioral dimensions.

**[9C1] Dissociation between arithmetic operations**

**Salguero-Alcañiz, M. P.; Alameda-Bailén, J. R.**

*University of Huelva*

Introduction. There are several patterns of execution and/or impediment of the arithmetical operations described in the literature, that is, the arithmetical operations can function independently, which allows to infer that the cognitive processes involved in the different arithmetical operations might be different. Objective. To determine the different processes involved in the resolution of arithmetical operations, addition, subtraction and multiplication were explored in two brain-damaged participants. Patients. MNL (47 years old, male) suffered an infarct in the middle cerebral artery of the left hemisphere, and he presents a disexecutive syndrome. PP (54 years old, male) presents damage to the left temporo-parieto-occipital lobe and shows linguistic alterations. Results. Addition and multiplication were preserved in patient MNL, however, he presented difficulties in subtraction. On the contrary, the patient PP showed an impaired in addition and multiplication but he conserves the skills for subtraction. Discussion and conclusion. This double dissociation confirms the postulates of the anatomical functional model of Dehaene and Cohen (1995, 1997). This model considers the existence of a double route for the resolution of arithmetical simple operations, capable of getting damaged of selective form and therefore to function independently. On the one hand, there would be a linguistic route, which allows to recover numerical information learned automatically (of memory) and would be used for the solving of additions and multiplications. On the other hand the mechanism of semantic elaboration would be in charge of the resolution of the operations of subtraction, and would need to gain access to the magnitude that the numbers represent.

**[7A3] Do we pay attention to the positive because we are happy, or is it the other way around?**

**Attentional biases and mood regulation: an eye-tracking study**

**Sánchez, A.; Vázquez, C.; Romero, N.; Hervás, G.**

*Complutense University of Madrid*

Research on selective attention has shown that attentional biases to negative emotional information play a role in the onset and maintenance of affective disorders, such as depression (Caseras et al, 2007). However, research analyzing the role of mood in attentional biases, and research on these processes in healthy people are still rather scarce. Our principal aim was to analyze the possible effect of different moods in generating attentional biases to information with different emotional contents in healthy population. A sample of 126 undergraduate students agreed to participate in the study. They were randomly assigned to one of three different mood induction procedures (positive, neutral or negative mood). Immediately after the mood induction, participants completed an attentional task. On a computer screen, we presented a series of 84 different pairs of emotional faces (extracted from Karolinska Directed Emotional Faces Database; KDEF, Lundqvist et al, 1998). Each pair consisted on two side-by-side pictures of the same person: one expressing an emotion (happy, angry or sad) and one showing a neutral expression (28 trials for each type of emotion). For each pair (presented during 3.500 milliseconds), participants' eye movements were monitored with an ASL Eye Tracker Model 504, providing a real-time measurement of selective attention. After completion of this task, we assessed again participant's current mood after. Our results showed the presence of a general attentional bias to positive faces regardless of participants' mood. Yet, we found that participants under a negative mood induction didn't show some of these biases to positive faces, which appeared in the other mood induction conditions. A series of regression analyses showed that a bias to positive faces predicted higher levels of positive mood at the end of the experimental session. This finding provides support to the hypothesis that a pattern of "positive processing" could be a possible adaptive mechanism (Isaacowitz, 2005).

**[2E3] The role of GluA1 in recognition memory****Sanderson, D. J.***University of Oxford*

Recognition memory in rodents can be assessed by using a stimulus-specific test of habituation. An account of habituation proposes that separate short-term and long-term memory processes contribute to habituation and under certain conditions these processes may compete with one another (Wagner, 1976). Consistent with this theory it recently been shown that mice lacking GluA1, a subunit of the AMPA receptor that is a key mediator of hippocampal synaptic plasticity, fail to show short-term spatial recognition memory, but do show long-term spatial recognition memory that is superior to controls (Sanderson et al., 2009). To further examine the role of GluA1 in recognition memory mice were tested on a non-spatial novel object preference task. Mice received a 10 min exposure phase to an object and then, 2 min later, received a test in which they were allowed to explore the previously exposed, familiar object and a novel object. It was found that knockout mice show a normal preference for the novel object over the familiar object. However, this null result was confounded by the fact that knockout mice showed greater exploration of the familiar object in the exposure phase. When exposure phase exploration was yoked to controls, knockout mice were impaired and fail to show object recognition memory. These results provide further evidence that GluA1 is necessary for certain forms of recognition memory. The role of short-term, recency based memory and long-term context-dependent memory in habituation will be discussed. Sanderson, D.J., et al., (2009). Enhanced long-term spatial memory and impaired short-term memory in GluA1 receptor knockout mice: Evidence for a dual-process memory model. *Learning and Memory*, 16, 379-386. Wagner, A.R. 1976. Priming in STM: An information processing mechanism for self-generated or retrieval-generated depression in performance. In *Habituation: Perspectives from child development, animal behavior, and neurophysiology* (ed. T.J. Tighe and R.N. Leaton).

**[9C2] Effects of TMS induced disruption to right and left parietal cortex on addition and Multiplication****<sup>1</sup>Semenza, C.; <sup>2</sup>Salillas, E.; <sup>1</sup>Basso, D.; <sup>3</sup>Vecchi, T.; <sup>4</sup>Siegal, M.***<sup>1</sup>University of Padova; <sup>2</sup>University of Texas; <sup>3</sup>University of Pavia; <sup>4</sup>University of Sheffield*

Whether or not mathematical operations are dependent on verbal codes in left hemisphere areas - particularly the left intraparietal sulcus - remains an issue of intense debate. Using single pulse transcranial magnetic stimulation directed at horizontal and ventral regions of the left and right intraparietal sulcus, we examined disruption to reaction times in simple computations of addition and multiplication. Our results indicate that computational efficiency is not specifically dependent on left hemisphere regions, and that exact calculations in multiplication are also associated with activation in the ventral region of the intraparietal sulcus in the right hemisphere considered to be critical for motion representation and automatization.

**[7A1] Inhibitory control in memory in mental disorders**

**Soriano, M. F.; Ros, M. J.; Bajo, M. T. (Presenting author: Bajo, M. T.)**

*University of Granada*

From early definitions of psychotic disorders (e.g. Schizophrenia) there has been a strong emphasis on the cognitive deficits associated to many psychotic symptoms. However, possible cognitive disfunctions have been scarcely studied in other mental problems, like affective or personality disorders. For example, patients with personality disorders have been classically considered to have preserved intelligence and good cognitive functioning. On the other hand, most patients with a severe mental illness have important difficulties in their general daily functioning. We have hypothesized that cognitive deficits can be observed in most mental disorders, and that these deficits may underlie some of the symptoms, and poor global functioning. In a series of studies, we have investigated cognitive deficits across different disorders. We have focused in inhibitory control in memory. We have studied the suppression of irrelevant content from memory under the assumption that deficits in these inhibitory processes may explain some of the symptoms in different mental disorders, as distractibility, discourse tangentiality or intrusions. First, we have focused in schizophrenia. Results showed that schizophrenic patients have clear deficits in inhibitory processes in memory, measured with different tasks. Second, we studied patients with bipolar and personality disorder, and we found a similar pattern of results. These results suggest that certain fundamental cognitive problems may be present in a variety of disorders. Hence, we believe that the study of cognitive function can provide valuable information about differences and similarities between mental disorders.

**[4B2] Real-time causal inference**

**Speekenbrink, M.; Lagnado, D.**

*University College London*

The close relation between time and causality is undisputed, but there is a paucity of research on how people use temporal information to inform their causal judgements. One aspect of causality is that a cause should make the time at which an effect occurs more predictable than a non-causal factor. We present data from an experiment supporting this notion. The experiment was conducted in a real-time setting, in which potential causes and effects occur as a stream of events. The delay between the actual cause and effect was variable and the magnitude of this variability differed between conditions. In addition, the experiment investigated whether participants were sensitive to the presence of a hastener that reduced the delay between cause and effect without changing the contingency. The results showed that higher causal ratings were given to cause-effect pairs with less variable delays, but that conditions with an active hastener actually reduced participants' ratings of the cause. The latter finding can also be explained in terms of people's sensitivity to variability, because an undetected hastener leads to greater variability in experienced delays. We discuss the implications of these results for a contingency based view of causal inference.

**[6E2] Perspective taking in children and adults- the Level-1/ Level-2 distinction provides a limit on efficient perspective taking**

**Surtees, A. D. R.; Apperly, I. A.**  
*University of Birmingham*

Flavell and colleagues (Masangka et al., 1974; Flavell et al., 1981) drew a distinction between Level-1 perspective-taking (determining what objects someone can see) and Level-2 perspective-taking (determining how someone sees objects in common ground). Children at least as young as 2-years-old (Moll & Tomasello, 2006) can successfully perform Level-1 perspective-taking tasks. However, below the age of 4 they consistently fail Level-2 tasks (Flavell et al., 1991). Little is known of the cognitive characteristics of successful perspective-taking, which could be vital in understanding the Level-1/ Level-2 distinction. We tested children aged 6-11 and adults using computer-based Level-1 and Level-2 visual perspective-taking tasks. In our Level-1 task (based on Samson et al (in press)) participants saw a picture of a room containing an avatar and a number of dots; on some trials they judged the number of dots that they themselves could see, on others they judged the number seen by the avatar. In our logically equivalent Level-2 task participants judged how numbers and letters looked to themselves or a cartoon avatar on the opposite side of a table. Our Level-1 task showed persisting and stable egocentric interference when making explicit judgements of another's perspective and evidence of an implicit mechanism for perspective-taking (through interference on self trials). Whilst our Level-2 findings show analogous egocentric interference effects, there is no evidence of an implicit process for taking the level-2 perspective of others. This supports the suggestion of Apperly and Butterfill (2009) that the Level-2/ Level-1 distinction may be a limit to an efficient perspective-taking mechanism.

**[7B2] Exploring the neural substrates of self-ownership and memory**

**Turk, D. J.**  
*University of Aberdeen*

Previous research (including studies presented in this symposium) have presented evidence that object-ownership is a useful mechanism with which to study aspects of self-relevant information processing. Here we present data on the neural substrates of self-ownership and memory. We collected functional MRI data while 19 participants undertook a shopping task. Adapting methodology from previous ownership research, shopping items were projected onto a screen inside the magnet room and participants placed items into self- and other-owned shopping baskets by way of a lateralized button press. Ownership was cued by the presentation of a color patch above the shopping item. Consistent with previous research, we observed a significant memory advantage for self-owned relative to other-owned objects in line with previous studies. Brain activation for self-owned relative to other-owned objects was characterized by increased activation in a network of regions in medial caudal frontal areas, bilateral insular cortex, and bilateral supramarginal cortex. Further analysis showed that the memory bias for self-owned items correlated with neural activity in a subset of these regions (i.e., caudal midline, right insula and left supramarginal cortex). This pattern of activation is discussed in terms of the enhanced attentional processing of self-relevant information, the affective nature of positive reward associated with self-ownership and the potential for use associated with owned objects. We will discuss these findings in the context of the current imaging literature on self-referential encoding and memory.

**[7B1] Minimal ownership: cognitive effects and underlying mechanisms**

**Van den Bos, M.**  
*University of Aberdeen*

The self has a strong influence on cognition, as demonstrated by the extensive self-referencing literature. A frequent finding is that information encoded with reference to self is retained better than information encoded with reference to another person. However, this effect is based on explicit evaluation of the self-concept, the activation of which can then support subsequent recognition. Through examination of ownership effects, we assess whether the self also influences cognition through less evaluative means. Ownership creates a link between external objects and the self, and indeed owned objects may be processed as psychological extensions of self. This talk will describe evidence that through this link, ownership elicits the memory biases associated with evaluative self-referential cognition. We use a 'minimal ownership' paradigm in which ownership is manipulated by asking participants to put items of shopping into baskets owned either by themselves or another referent. Participants' memory for both self- and other-owned items is then assessed. In Expt. 1 we found that, as expected, this ownership paradigm elicits a memory advantage for items encoded as self-owned. In Expt. 2, we showed that this memory advantage shares the characteristics of evaluative self-reference effects on memory (i.e., an increase in episodic recollection, but not familiarity). The mechanisms that might support these patterns of memory performance will be discussed, alluding to both the elaborative and organisational support of the self-concept, and lower-level affective and attentional response to self-relevant stimuli.

**[4B4] Models of elemental diagnostic reasoning**

**Waldmann, M. R.; Meder, B.; Mayrhofer, R.**  
*University of Göttingen*

We present a rational analysis of diagnostic reasoning – the process of reasoning from effects to causes. Whereas the traditional normative benchmark for diagnostic reasoning from effects to causes is provided by purely statistical norms, we here approach the task from the perspective of rational causal inference. The core feature of the presented model is the assumption that diagnostic inferences are constrained by hypotheses about causal structure. As a consequence, the model's predictions systematically deviate from classical, purely statistical norms of diagnostic inference. In particular, the analysis reveals that diagnostic judgments should not only be influenced by the probability of the cause given the effect, but also by causal strength. This prediction is tested in three studies. The obtained pattern of diagnostic reasoning is at variance with the traditional statistical norm but consistent with a model of rational causal inference.

**[6E1] Automatic level-1 visual perspective taking in adults- do the effects go beyond subitizing and information selection?**

**Wang, J. J.; Apperly, I. A**  
*University of Birmingham*

Classical theory of mind findings suggested that children cannot infer one's mental states until they celebrate their fourth birthday (e.g., Wimmer & Perner, 1983). However, recent studies on young infants (e.g., Onishi & Baillargeon, 2005) and non-human animals (e.g., Tomasello, Call & Hare, 2003) have demonstrated successful performance in false-belief-like tasks. This suggested that they have a theory of mind capacity that draws few demands on executive control processes. The current study examined adults' level-1 visual perspective taking capacity as a potential explanation to the discrepant findings in the developmental and animal studies. We have inspected the capacity and limits on adults' automatised visual perspective taking (Samson et al., in press) with additional enumeration and information selection load. Basic egocentric intrusion and altercentric intrusion were replicated from Samson and colleagues' finding (in press), suggesting that adults do automatically process self and other's visual perspective. Moreover, such mechanism is not restricted to efficient enumeration within the number range described by subitizing effect (Kaufman, Lord, Reese & Volkman, 1949); both egocentric and altercentric intrusions were found in "unsubitizable" numbers. Adults also have the cognitive capacity to select the relevant perspective content from the irrelevant information, only processing genuine self and other perspective content. The present study demonstrated an automatic, flexible and purposeful visual perspective taking mechanism that adults have access to. This provides a piece of evidence that converges with the infant and non-human animal studies, showing a common capacity that does not rely heavily on executive control processes.

**[7C2] Choosing to Regret: The effect of choice on children's early experience of regret and relief**

**Weisberg, D. P.; Beck, S. R.**  
*University of Birmingham*

Counterfactual thinking ("what might have been") is a powerful learning mechanism that can trigger regret or relief, a comparison of a current state of affairs to a better or worse imagined possibility. We explored when children experience regret and relief and whether these experiences are affected by whether they were able to experience self-blame (e.g., Bell, 1982). 139 participants (5;11 – 8;10) played a game in which they received a prize of some stickers determined by choosing one of two unseen cards. They rated how happy they were with their prize, before finding out what the alternative prize would have been. They then re-rated themselves. There were three conditions: (1) Choice: participants chose which card they would receive. (2) No Choice-Child: participants' throw of a die determined which card they received (3) No Choice-Experimenter: the experimenter threw the die. Participants had four trials: regret-win (win 2/3 stars, could have won 8), regret-lose (lose 2/3, could have won 3), relief-win (win 2/3, could have lost 3), relief-lose (lose 2/3, could have lost 8). There was little evidence of counterfactual emotions in the no choice conditions. However, older children aged 6-8 demonstrated regret and relief when they made a choice, but not when the outcome was determined by the throw of a die. Children, like adults, only experience counterfactual emotions when it is possible to blame their own action.

**[5B5] Dynamic gaze patterns for dynamic actions: The role of head and eye movements in controlling locomotor steering.**

**Wilkie, R. M.; Kountouriotis, G. K. , Woodgate, P.; Hostler, T.**  
*Leeds University*

Locomotor control is fundamental for humans to interact with their environment and perform tasks essential for survival: finding food and a mate whilst avoiding predators. Investigating how humans control locomotion has traditionally been examined by determining how well participants gauge their direction of motion (their 'heading') in the presence of optic flow patterns. While this work is tightly controlled, and reveals the sensitivity of the visual system to components of the flow field, it is somewhat divorced from the real-world task of actively controlling steering with a mobile head and eye. Our approach has been to generate large field-of-view virtual environments through which participants steer whilst synchronously recording their head- and eye-movements. We can then examine where participants look in the scene to sample the information that is most useful for controlling locomotion. Here I will discuss the way in which humans coordinate their head- and eye-movements to sample visual information across a range of steering tasks, and the temporal relationship with the steering output generated. The relationship between these dynamic inputs and the dynamic action of steering will be discussed within the framework of the Wilkie, Wann & Allison (2008) 'active-gaze' model of locomotor steering.

**[7C5] Counterfactual thinking and the amplification of regret**

**Zeelenberg, M.**  
*Tilburg University*

When people generate counterfactuals for negative decision outcomes, emotional reactions to these outcomes are amplified. We examined whether this amplification is a function of the amount of counterfactuals generated or a function of the ease with which these counterfactuals were generated. Three experiments, in which participants were instructed to generate few or many counterfactuals, revealed that generating many counterfactuals was considered difficult and resulted in attenuated regret. These results suggest that judgments of regret are based on the experiential information about the ease of generation. Experiment 3 showed, in addition, that when the informational value of the experienced ease of generation was discredited, the effect disappeared. The results are discussed in relation to experiential psychology and the assessment of counterfactuals and emotions in real life.

**[6E3] The influence of observing others on visuo-spatial perspective taking and gaze following**

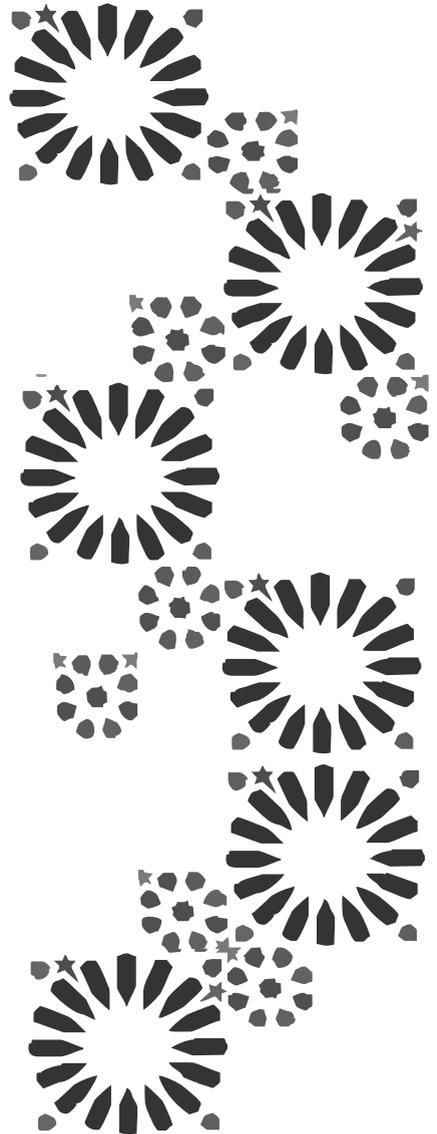
**Zwicker, J.; Müller, H. J.**

*Ludwig-Maximilians University*

Recent reports showed that observing another person leads to adoption of the visuo-spatial perspective of the observed person. It was tested whether similar effects could be found for objects that show movements which suggest human-like behavior but bear no visual similarity to humans. To this end the Frith-Happe animations were used in which two triangles show self-propelled movements. Some of these animations typically lead to an interpretation that associates the movements with human behavior while other animations are typically described in terms of their physical movement properties. It was tested whether the former but not the latter animations would lead to visuo-spatial perspective taking. Participants were asked to judge whether a dot that appeared during the movies was located to the right or left of one triangle. If visuo-spatial perspective taking occurs judgments from the perspective of the participants and the triangle can be the same (congruent) or different (incongruent). A significant difference in RT between congruent and incongruent conditions was found but only in conditions in which the movements of the triangles typically evoke anthropomorphic descriptions. Therefore, visuo-spatial perspective taking also occurs with objects which are not visually similar to humans. In a second experiment we show that the perspective of an observed person is spontaneously taken into account. This is reflected in eye movements to objects that seem to be attended by the observed person. Gaze-following to the point of attention of a person occurs even in complex scenes and when neither the person nor the focus of the person is made prominent by the task instruction or scene composition. These experiments show that agent detection plays a special role in visual processing.



# THEMATIC SESSIONS





**[1D1] Letter or graphemes? An examination of basic coding units in visual word recognition**<sup>1</sup>Acha, J.; <sup>2</sup>Perea, M.<sup>1</sup>*Basque Center on cognition, brain and language;* <sup>2</sup>*University of Valencia*

One widespread assumption in the literature on visual word processing is that letters are the basic coding units in the identification of printed word. Here we examine the role on graphemes (i.e., pairs of letters that belong to one phoneme) in visual-word recognition, by using a transposed-letter manipulation (e.g., Acha & Perea, 2008). For instance, are *mochila* and *recluso* coded the same way? Bear in mind that most input coding schemes in visual-word recognition assume that the letter – rather than the grapheme– is the critical unit (e.g., SERIOL model, SOLAR model, open-bigram model, overlap model). To examine this issue, we designed three lexical decision experiments in which we analyzed whether the Spanish graphemes CH and QU were sensitive to transposed-letter and relative position effects. In Experiment 1, a target word was preceded by a nonword prime in which the components of the grapheme were either transposed (*mouqeta*-*MOQUETA*) or replaced (*movgeta*-*MOQUETA*). In Experiment 2, the grapheme was split in the prime, due to the transposition of the second constituent with the next letter in the word (*moqeta*-*MOQUETA*), or replaced by two letters (*mogevta*-*MOQUETA*). Results showed that the transposed letter condition produced a similar transposed-letter effect as the transposition of a two letter cluster that did not form a grapheme (e.g., *sagardo*-*SAGRADO* or *sargado*-*SAGRADO*). Finally, in Experiment 3, the prime consisted of the deletion of the second constituent of the grapheme (*moqeta*-*MOQUETA*), or the replacement of that constituent (*mogeta*-*MOQUETA*). Experiment 3 revealed that the deletion condition did not generate any priming, independently of whether the deleted letter was part of a grapheme or not (*sagado*-*SAGRADO*). We will examine the implications of these findings for the front end of models of visual word recognition.

**[2A2] Specificity in autobiographical recall: Associations with episodic and short-term memory and with problem solving**<sup>1</sup>Aizpurua, A.; <sup>2</sup>Koutstaal, W.<sup>1</sup>*University of the Basque Country;* <sup>2</sup>*University of Minnesota*

In this study, we examined the relation between retrieval specificity in a free recall autobiographical memory (AM) task and the performance of older vs. younger adults on three different semantic tasks: (a) the flexible remembering task, asking for episodic memory decisions at an item-specific versus category-based level, (b) the conceptual span task, a measure of short-term semantic memory capacity, and (c) the compound remote associates task, an associative word problem-solving task. Older adults recalled more semantic details and less episodic (specific) information during autobiographical memory retrieval than did younger adults. More importantly, across age groups, we found that the greater the reliance on semantic information on the item-specific trials in the flexible remembering task, the lower the ability to retrieve event-specific information on the AM task; additionally, the number of semantic details recalled in the AM task was negatively correlated with conceptual span and performance on the remote associates task. Age-related and individual differences in conceptual processing may similarly contribute to autobiographical remembering and diverse memory and problem solving tasks.

**[1C2] Recognition by familiarity in Parkinson's and Lewy-Body disease patients**

<sup>1</sup>Algarabel, S.; <sup>2</sup>Rodríguez, L. A.; <sup>3</sup>Escudero, J.; <sup>1</sup>Fuentes, M.; <sup>3</sup>Peset, V.; <sup>1</sup>Pitarque, A.; <sup>2</sup>Cómbita, L. M.; <sup>3</sup>Mazón, J. F.

<sup>1</sup>University of Valencia; <sup>2</sup>University of Granada; <sup>3</sup>General Hospital of Valencia

The retrieval deficit hypothesis states that the lack of deficit in recognition often observed in patients with Parkinson's disease is due to its low retrieval requirements. To explore the merits of this hypothesis and examine recognition performance in Parkinson's patients, this study analyzed familiarity usage in a yes-no recognition task in different groups of young and old healthy participants, patients with early non-demented Parkinson's disease, advanced non-demented Parkinson's disease patients, demented Parkinson's disease and patients with dementia with Lewy Bodies. The estimation of familiarity was made by manipulating the effect of letter composition of the words studied and observing its effect on performance in yes-no recognition (Algarabel et al., 2009; Parkin et al., 2001). The results indicate that familiarity was used at the same level by controls, patients with early Parkinson's disease and patients with dementia with Lewy Bodies. Although late Parkinson patients also used familiarity, its effect was only marginally significant. Patients with Parkinson' disease and dementia were not capable of using familiarity in recognition memory. We interpret the results as an endorsement of the retrieval deficit hypothesis.

**[1B3] Critical roles for right OFA and right pSTS in distinct face-processing tasks: An rTMS double dissociation**

<sup>1</sup>Atkinson, A. P.; <sup>2</sup>Dzhelyova, M. P.; <sup>1</sup>Ellison, A.

<sup>1</sup>University of Durham; <sup>2</sup>University of St. Andrews

Two face-selective regions of cortex, the right occipital face area (OFA) and right posterior superior temporal sulcus (pSTS), are known to have distinct roles in face perception: right OFA processes structural cues, whereas right pSTS processes changeable properties, including changes of expression. We thus hypothesized distinct, critical roles for right pSTS and right OFA in judging the trustworthiness and sex of faces, which we tested by applying event-related repetitive transcranial magnetic stimulation (rTMS) over the right OFA and right and left pSTS of 12 healthy volunteers. Participants judged whether individually presented faces were female or not female and, in a separate session, whether they were trustworthy or not trustworthy. Participants were significantly slower to judge the sex of faces when rTMS was delivered over right OFA, compared to sham stimulation, but not when it was delivered over right or left pSTS. In contrast, participants were significantly slower to judge the trustworthiness of the same faces when rTMS was delivered over right pSTS but not when it was delivered over right OFA or left pSTS. This double dissociation is evidence that evaluations of the trustworthiness (affective valence) and sex (facial morphology) of faces rely on functionally distinct cortical regions.

**[6B5] The role of the posterior parietal cortex in the remapping of touch**<sup>1</sup>Azañón, E.; <sup>3</sup>Longo, M. R.; <sup>3</sup>Haggard, P.; <sup>24</sup>Soto-Faraco, S.<sup>1</sup>University of Barcelona; <sup>2</sup>Pompeu Fabra University; <sup>3</sup>University College London; <sup>4</sup>Institució Catalana de Recerca i Estudis Avançats (ICREA)

Tactile perception is not a straightforward experience, but the result of an integrative process that updates postural information and allows us to accurately retrieve the location of touch in external space. However, the neural circuits underlying this process of tactile remapping are still unknown. Here we have investigated the physiological basis of the human remapping of touch, by disrupting the posterior parietal cortex (PPC) with transcranial magnetic stimulation (TMS). Participants compared the vertical positions of touch on the forearm and on the face. The forearm was passively moved up and down between trials, forcing them to remap touch into external space in order to compare locations. Single pulse TMS was applied over the right intraparietal sulcus or a control site (vertex) after touch on the arm. Parietal TMS significantly increased the just noticeable difference in the vertical tap location, relative to control, suggesting disruption of tactile remapping process. Parietal TMS also shifted the point of subjective equality (PSE), with participants underestimating the elevation of the forearm. Control experiments showed that both proprioceptive localization of the arm and tactile localization on the skin were not affected by TMS over the parietal cortex. These results indicate that PPC disruption selectively impaired remapping of touch into egocentric space. This also suggests, for the first time, that tactile remapping is a distinctive, unitary process that involves a specific brain module, putatively the Ventral Intraparietal Area. This module is independent from, but receives input from modules for tactile localization on the skin surface and proprioceptive localisation of limb position.

**[8E3] How far we can see? The apparent horizon and the inherent geometry of the Visual Space****Aznar-Casanova, J. A.***University of Barcelona*

The maximum distance in depth that we are capable of seeing depends on the elevation of our horizon line. The horizon is a transverse plane that determines the points of isoelevación with regard to the pupils' centre, when the observer is facing in a parallel direction to the ground. Thus binocular vision serves as foundation to a Visual Space which properties are defined by a geometry that, according to Luneberg (1947), is a Riemannian geometry (curved), not Euclidean. Nevertheless, the question about the Geometry of the Visual Space continues being an opened problem. In order to give support to a psychophysical theory of the Visual Space, in the present study, we examine the variations of the estimations of the apparent horizon manipulating the viewing conditions: 1) the elevation of the vantage point; 2) the slope of the plane of observation. The results reveal that the apparent height of the horizon adjusts to a power function. This non-linear function explains the compression of the space that recedes in depth (foreshortening) and allows predicting the extents (relative distance) depending on the egocentric distance (absolute distance) and observer's elevation. The form of such a function suggests that the remote visual space is elliptical.

**[6B1] The Horizontal-Vertical Illusion in the haptic modality across lifespan**

<sup>1</sup>Ballesteros, S.; <sup>1</sup>Mayas, J.; <sup>1</sup>Reales, J. M.; <sup>2</sup>Heller, M. A.

<sup>1</sup>Universidad Nacional de Educación a Distancia (UNED); <sup>2</sup>Eastern Illinois University

Previous studies by Heller and collaborators (2008) have shown that the horizontal-vertical illusion (HV) for tactually explored raised-line shapes is independent of visual status, since similar overestimation of the vertical occurs in early blind, late blind and low vision participants. The present study investigated whether the haptic (HV) illusion for curved rise-line shapes changes from adolescence to old age. We were also interested in finding out whether the HV illusion developed similarly in adolescence in vision and touch. In the study, four age-groups (adolescents, young adults, middle-age adults and older healthy adults) explored a series of horizontal and vertical raised-line curves of different sizes. Curve height was always equal to width at the base. The task consisted of judging the size of the curves using two sliding rulers. Mode of exploration was unimanual or bimanual in counterbalanced order. The results showed that young and older adults showed a similar illusory overestimation of the vertical but adolescent showed a minimal illusion. However, when adolescents explored the raised-line curves visually, they overestimated the vertical showing the HV illusion. The present results suggest that the illusion is independent of age from adulthood to old age. However, adolescents showed an overestimation of the vertical when the stimuli were presented visually but minimally when presented haptically. This finding suggests that the illusion develops earlier in vision than touch. We concluded that adolescence may be a critical period for the acquisition of the HV illusion. (Supported by the European Commission, FP6-2005-NEST-Path, Ref. 043432).

**[8C1] How to distinguish between knowledge-based and recognition-based decisions: Discrimination Index**

**Beaman, C. P.; Smith, P. T.**

*University of Reading*

A fundamental rule for applying simple heuristics is, if all else fails, choose the familiar option (Goldstein & Gigerenzer, 2002). This basic rule of thumb, known as the Recognition Heuristic (RH), is surprisingly effective when making such judgments as who will win particular sporting fixtures (e.g., Serwe & Frings, 2006) or which stocks and shares will yield the best returns (Gigerenzer, Todd, and the ABC Research Group, 1999). A fundamental difficulty arises, however, in identifying if this rule is being followed or if participants are choosing the recognized option for other reasons (i.e., they not only recognize the option, they also have further reasons for believing the recognized option to be a good choice). In the absence of this information, the psychological reality of the RH is uncertain and the experimental evidence for its effectiveness is questionable. We show that, by calculating  $p(\text{Correct}|\text{RH}) - p(\text{False}|\neg\text{RH})$  - a discrimination index we term  $DI^*$  - it is possible to identify participants whose performance is characterized by recognition plus knowledge rather than mere recognition. Analysis and simulation show that when the RH is utilised  $DI^*$  equals zero. Simulation of an alternative model making recognition-consistent choices which are actually informed by further knowledge produces  $DI^*$  values significantly greater than zero. Applying the measure to existing experimental data we are also able to show that  $DI^*$  is a more effective means than self-report of determining whether recognition plus knowledge or recognition alone is used in judgment and decision-making.

**[3B6] Eye movements in Aspergers Syndrome for complex scene inspection**<sup>1</sup>Benson, V.; <sup>2</sup>Castlehano, M.; <sup>1</sup>Au Yeung, S.; <sup>3</sup>Rayner, K.<sup>1</sup>University of Southampton; <sup>2</sup>Queens University; <sup>3</sup>University of California

It is well known that there are processing deficits in many domains in people with Aspergers syndrome (ASD). Given the tight relationship between eye movements and on-line cognitive processing, cognitive processing deficits should be reflected in disordered eye scanning. For example it has recently been shown that people with ASD do not selectively sample a complex scene according to top down instruction (Benson et.al. 2009 Neuropsychologia). In the experiment reported here we addressed whether ASD participants can discriminate between 'odd' and 'normal' scenes. We presented similar scenes to those used in a recent report on eye movements for 'odd' versus 'normal' scene inspection conducted with typically developed (TD) participants (Rayner et al. 2008). ASD and TD participants were presented with pairs of scenes for two different tasks. Task A required the participants to 'spot the difference' between the two pictures. Task B required the participants to indicate which of the two scenes was 'odd'. Because people with ASD do not process social information in the same way as TD people, then expected to find a difference in the way they sample both normally presented and abnormally presented social information. This was revealed in the pattern of eye scans and eye fixation durations. In addition, because ASD is also known to reflect literal understanding of material, then we also expected to find that the categorisation of the 'odd' scene was faster for TD participants in terms of the manual response and the time taken to fixate the 'odd' feature. This was not always the case for ASD participants. The findings aid the understanding of processing dysfunction in ASD and reveal an interesting dissociation between eye movement patterns and perceptual awareness for scenes in ASD.

**[5A2] Can 'Pure' Implicit Memory Be Isolated? A Test of a Single-System Model of Recognition and Repetition Priming**<sup>1</sup>Berry, Ch. J.; <sup>1</sup>Shanks, D. R.; <sup>1</sup>Li, S.; <sup>1</sup>Rains, L. S.; <sup>2</sup>Henson, R. N. A.<sup>1</sup>University College London; <sup>2</sup>MRC Cognition and Brain Sciences Unit, Cambridge

Implicit memory is widely regarded as an unconscious form of memory. However, evidence for what is arguably a defining characteristic of implicit memory—that its contents are not accessible to awareness—has remained elusive. Such evidence of —pure implicit memory would also constitute evidence against a single-system model of recognition and priming which predicts that priming will not occur in the (true) absence of recognition. In three experiments, we attempted to replicate some recent evidence for pure implicit memory. We found no evidence of priming in the absence of recognition; rather, when priming was absent, recognition was also absent (Experiments 1 and 2), and when priming was reliably greater than chance, recognition was similarly greater than chance (Experiment 3). The results are consistent with the model, and also with the notion that the memory driving priming is accessible to awareness.

**[7E1] The Venus effect in paintings, photographs, and real rooms**

**Bertamini, M.; Lawson, R.**

*University of Liverpool*

The Toilet of Venus is the subject of many paintings. Typically Venus appears with a small mirror in which Venus' face is visible. Observers tend to say that Venus is admiring herself in a mirror, even when the location of the mirror makes this impossible. Although originally described in the context of picture perception, we found that the Venus effect is not specific to paintings and it occurs in real life (Exp 1) and in photographs (Exp 1-3). The original description of the effect also implied that observers describe Venus as seeing in a mirror what they (the observers) see. We used different photographs to compare the responses when the person in front of the mirror can or cannot see herself, and when the image of her face is or is not visible to the observer. Observers tend to state that a person can see her own reflection when she appears near a mirror, whether or not her face is visible in the mirror. However, the presence of the reflected face makes this tendency stronger. A task based on a top-down view of a room confirmed that people lack sensitivity to the role of the viewpoint (Exp 4). We discuss this in relation to other errors that people make regarding mirrors.

**[3A1] What is contingency information used for? A study on preparation behavior**

**Blanco, F.; Matute, H.; Vadillo, M. A.**

*University of Deusto*

It has been traditionally assumed that the function of contingency learning is (a) to allow animals to predict relevant outcomes, which in turn (b) is a mean to prepare effectively for their occurrence. Nonetheless, studies with humans show that people do not use contingency information to predict the outcomes, but to judge the causal, or predictive value, of the cue. The additional assumption, b, was that animals use contingency information to prepare for the occurrences of the outcome, as Pavlov's dog salivates upon the presentation of the cue that precedes the food. In two experiments, we provide data suggesting that human participants indeed base their preparation judgments and their preparation (nonverbal) behavior on the contingency between cues and outcomes, whereas they do not use this information to predict the outcomes. We propose that preparation behavior, be it verbal or not, is actually mirroring the predictive value of the cue, not the prediction of the outcome, and thus it is dependent on contingency information. These results have important implications concerning the functional aspects of contingency learning.

**[8C3] Goal-directed behaviour in human drug users**

**Blundell, P.**  
*University of Leeds*

Instrumental behaviour is under the control of both goal-directed and habit systems (Adams & Dickinson, 1981). When behaviour is goal-directed, it is sensitive to the outcomes that actions earn, suggesting that the identity and value of the outcome are encoded. When behaviour is controlled by the habit system, it is insensitive to changes within the environment, and may be maladaptive. There are many factors that influence which system controls behaviour, including experience of the reward, degree of training of the action-outcome relationship, and the schedule of reinforcement (Adams, 1982). By changing the value of a reward we can determine which system is controlling behaviour. Pre-feeding to produce sensory specific satiety reduces the value of a reward, and if behaviour is goal-directed, reduces the degree of responding. However, if the behaviour is controlled by the habit system (sometime referred to as habitization), pre-feeding has little effect on responding (Dickinson & Balleine, 1998). In rats, amphetamine sensitisation (Nelson & Killcross, 2006), and experience of cocaine (Schoenbaum & Setlow, 2006) changes the responsiveness of animals to food devaluation, suggesting that use of drugs of abuse may itself reduce the ability of the organism to act in a rational and goal-directed way. This experiment investigated whether experience with drugs of abuse produced a similar lack of sensitivity to goal value in humans. We trained participants on an instrumental task similar to that used in Tricomi et al., 2009. Participants learned to associate a specific stimulus, with a specific action and a specific reward. The reward was then devalued by satiety. We compared the sensitivity to the satiety manipulation in people who had previously used drugs of abuse, with those who have not.

**[3E1] The attentional blink as reflected by illusory conjunctions**

**Botella, J.; Privado, J. ; Gil-Gómez de Liaño, B.**  
*University of Madrid*

The Attentional Blink (AB), an impairment of performance for the second of two targets when presented within 200-500 msec from the first target, is usually analyzed by means of the hits rate on the second target (T2). A variety of explanations are on the basis of the several models proposed to account for the U-shaped function usually observed in the percentage of hits in T2, conditionalized to a hit in T1. Illusory Conjunctions in RSVP tasks appear when the response feature reported pertains to a different stimulus than the stimulus containing the target-defining feature. The temporal distribution of the origin of the features reported can be manipulated as a function of several factors, and is deeply influenced along the time-course of the AB. Several new experiments, in which the participants have to identify the letters in a specified color, are reported. The results, together with several other previously published, support models of the AB based on two different mechanisms. The AB is produced when the continuity of the stream is interrupted, but the depth and length of the blink is a function of the processing demands of the first target and the presence of task-switching between the targets. The different time-courses of the T2 hits and the origin of the errors reveal the two mechanisms.

**[1E5] The distribution of exogenous and endogenous attention in visuo-spatial working memory**

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In this study we examined how the disjoint distribution of spatial attention in two locations affects visuo-spatial working memory (VSWM), depending on whether attention is orienting either exogenously or endogenously, i.e., after peripheral vs. central cues. More specifically, by combining a cuing paradigm with a change detection task, we studied two attentional effects and their consequences on VSWM storage: 1) the meridian effect, given by accuracy and RT costs when a crossing of the vertical and/or horizontal meridian is involved and 2) the distance effect given by a decrement of the cuing effect with distance between cue and target. In a previous study by using a single cue we found a dissociation between exogenous and endogenous orienting mechanisms in terms of both meridian and distance effects (Botta, Santangelo, Raffone, Lupianez and Olivetti Belardinelli, in press). In this case apart from examining how distance and meridian crossing affect VSWM performance, by taking into account the relative location of the target from the cues, we also analyzed whether and how these attentional effects modulate the disjoint distribution of attention. To do so, we analyzed the effect of the distance between the two cues, and whether the two cues were in the same vs. different quadrants when they were presented in adjacent positions. Results clearly showed that meridians affects performance only when attention is endogenously oriented after central cues, both when they were interposed between the cue and the target and when they were interposed between the two cues. Moreover the disjoint distribution of attention differently biased performance when central or peripheral cues were used. Particularly performance was affected by the splitting of the attentional focus, only in the endogenous cuing condition but not in the exogenous condition. Results are discussed in reference to different mechanisms underlying exogenous and endogenous attention.

**[2D4] Inferences in language comprehension: Speed-accuracy-tradeoff experiments on Gricean implicatures**

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What is communicated can be broken down into what we say and what we imply (Grice, 1969). We present three experiments that investigate how we process implications in language comprehension. The experiments used scalar quantifiers, e.g., “some”, that often generate a scalar implicature, e.g., “not all.” We tested whether there is a processing cost associated with generating a scalar implicature and what type of cost that might be. All three experiments used a speed-accuracy-tradeoff procedure (based on McElree & Nordlie, 1999) in which participants had say whether under-informative sentences, like “Some elephants are mammals” (see Bott & Noveck, 2004), were true or false. Experiment 1 found that participants interpreted sentences with scalar implicatures at a slower rate than the same sentences without implicatures. Experiment 2 found that implicature sentences were interpreted at a slower rate than explicit equivalents, such as “Only some elephants are mammals”. Experiment 3, however, found no significant rate difference between the underinformative sentences without an implicature and an explicit equivalent, such as “At least some elephants are mammals”. These results suggest that there is a cost associated with scalar implicatures and that this cost is not restricted to the time needed to evaluate the more complex proposition involved in implicature sentences. More generally, these experiments illustrate how Gricean implicatures are incorporated into sentence representations.

**[6B2] Developmental of visual and proprioceptive contributions to perceived hand position in early childhood**

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We examined the visual capture of perceived hand position in 5- to 7-year-olds, using Holmes et al.'s (2004) mirror illusion task. In this task, participants see their left hand on both the left and right (by virtue of a mirror placed at the midline facing the left arm, and obscuring the right). The accuracy of reaching was measured when proprioceptive and visual cues to the location of the right arm were put into conflict (by placing the arms at different distances from the mirror), and also when only proprioceptive information was available (i.e., when the mirror was covered). The mirror illusion resulted in the children in all age-groups (and adults) making reach errors in accordance with the visually-specified illusory starting position of their hand indicating a visual capture of perceived hand position. Visual capture developed non-monotonically, increasing sharply between 5 and 5¼ years, and subsequently reducing to a level comparable with adults by 6½ years. These findings are interpreted with respect to the development of optimal integration of multisensory cues to spatial representations of the limbs in early childhood.

**[1C5] A heritable verbal memory impairment in four living generations of the same family: Evidence from cognitive and neuroimaging analyses**

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<sup>1</sup>University of Bristol; <sup>2</sup>University College London

Evidence is scarce for the genetic basis of the development and function of specific, characteristically human, cognitive processes. Here we describe an impairment of verbal memory found in a large extended family of four generations. This study reports the initial identification of selected (proto-affected) cases as identified by clinical interview, and investigated their memory and language function to determine the probability of affected status. Remarkable coherence in the cognitive profiles of eight individuals (six females, two males, age range = 8-75 years) found impairments in associative word learning, sentence and prose recall that were indicative of affected status in the selected individuals. General intelligence and visuospatial memory skills appeared spared, and were superior in several affected family members. Verbal memory (delayed) scores derived from the Wechsler Memory Scales (WMS-III & CMS) were lower than Verbal Intelligence Quotients (WISC-III & WISC-IV) in the majority of affected cases, with two cases reaching significance, implying a verbal amnesic profile. Supplementary analysis of language tasks will be discussed, as will preliminary findings from a voxel-based morphometry analyses of MRI brain scans from seven affected cases and controls. From a cognitive developmental perspective, the apparent modality-specific nature of their verbal memory impairment would imply weak semantic knowledge, yet performance across a range of semantically-loaded tasks appeared relatively intact. It is concluded that a common affected phenotype was shared by all proto-affected cases and is best described as a primary verbal memory impairment to date, although the role of semantic memory will be discussed in relation to findings from cognitive and neuroimaging analyses.

**[4A3] Representational pseudoneglect in an auditory-driven spatial working memory task**

<sup>1,2</sup>Brooks, J.; <sup>1</sup>Logie, R.; <sup>1</sup>McIntosh, R.; <sup>1</sup>Della Sala, S.  
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Two experiments explored lateralized biases in mental representations of matrix patterns formed from auditory descriptions. Healthy participants listened, either monaurally or binaurally, to verbal descriptions of 6 by 3 matrix patterns, and were asked to form a mental representation of each pattern. In Experiment 1, participants were asked to judge which half of the matrix, left or right, contained the greatest number of filled cells, and to indicate the certainty of their judgement. They showed significantly greater certainty when judging patterns that had more filled cells on the left than on the right. This tendency was particularly strong for left ear presentation. In Experiment 2 participants were again asked to judge their certainty as to which side contained more filled cells, but were also asked to replicate the matrix pattern for that side. Participants were again more certain in judging patterns that had more filled cells on the left, but were no more accurate in remembering the details from the left of the matrix than from the right. These results suggest that the left side of the mental representation carries greater 'representational weight', though it may not be remembered more accurately. We refer to this lateralised bias as 'representational pseudoneglect'. Results are discussed in terms of the extent to which covert attentional orienting mechanisms might influence visuo-spatial representations in working memory.

**[1A4] Deterioration of the lexical representation in bilingual patients with dementia**

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<sup>1</sup>Pompeu Fabra University; <sup>2</sup>University of Barcelona; <sup>3</sup>Bellvitge University Hospital; <sup>4</sup>General Hospital of Granollers; <sup>5</sup>Institució Catalana de Recerca i Estudis Avançats

The aim of this research is to investigate the deterioration of the first (L1) and second (L2) language in bilingual patients with different degree of cognitive decline. In particular, to study the effect of cognitive decline on lexical representation of L1 and L2 in a group of patients diagnosed with an Alzheimer disease (AD) and mild cognitive impairment (MCI). Twenty-five Catalan-Spanish bilingual patients (11 with MCI, 9 with mild AD, 5 with moderate AD) were tested in three linguistic tasks, both in the L1 and in the L2: picture naming, auditory matching and word translation (forward and backward). In the picture naming, MCI patients performed similarly in L1 (95.7%) and in L2 (94.1%), whereas mild AD patients performed significantly better in L1 (91.5%) than in L2 (84.1%). Moderate AD patients showed the same impairment for L1 (73.3%) and for L2 (76.1%). Also in word translation it was found a difference in the performance for moderate AD patients (forward: 82%; backward: 91%), but not for the other groups of patients. No difference was found for the auditory matching task respect to the language and the groups of patients. These preliminary data suggest that the lexical representation of L1 and L2 is differently affected by the degree of the cognitive decline, especially for the speech output. A follow-up study with the same patients will shed light on how language degenerates along the progression of the cognitive decline

**[1B4] Neural repetition suppression is abolished by other-race faces**

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*University of Glasgow*

Almost a hundred years ago Feingold (1914) reported that it is common experience among human beings living in different geographical locations to perceive individuals belonging to “other-races” as all looking alike. This high-level “perceptual illusion” constitutes the core facet of the other-race effect (ORE): a marked impairment showed by humans in recognizing other-race compared to same-race unfamiliar faces. However, despite the impressive number of studies on the ORE, the neurophysiological correlates of the all look alike phenomenon have surprisingly never been directly investigated. To this end, we recorded high-time resolution electrophysiological scalp signals in East Asian and Western Caucasian observers while presenting subsequently two East Asian or Western Caucasian faces (i.e., adaptor and target) of either same or different identities. Neural activity in stimulus-sensitive regions is reduced when a stimulus is repeated, a phenomenon referred to as repetition suppression (RS). Conventional electrophysiological RS measures (i.e., amplitude differences on target faces) failed to show any effect. However, following the postulate that RS relates to neural response reduction associated to the subsequent presentation of a pair of stimuli, we developed a novel approach. We subtracted the signal elicited by the target face to the adaptor independently for each trial. As expected, single-trial RS responses showed in both group of observers larger RS for same-race faces of the same identity, which indicates an effective coding of identity for same-race faces on the electrophysiological face-sensitive N170 component. Strikingly, however, other-race faces elicited identical RS responses regardless of a change of facial identity, showing that other-race face exemplars all look alike to the neural populations underlying the N170. These results show that same- and other-race faces discrimination begin early at the perceptual level and, after nearly one hundred years of investigations, they provide the first neurophysiological explanation of the all look alike perceptual experience.

**[3A4] Perception of contingency in classical conditioning: From associative learning to psychophysics**<sup>1</sup>Carnero, S.; <sup>1</sup>Acebes, F.; <sup>2</sup>Morís, J.; <sup>1</sup>Solar, P.; <sup>1</sup>Loy, I.<sup>1</sup>University of Oviedo; <sup>2</sup>University of Málaga

The reported work investigates, in terms of the principles of psychophysics, how we perceive cause-effect relationships. Classically, the associative learning account has assumed the rule established by Rescorla (1968) which introduced the key concept of contingency in causal learning studies. According to this view excitatory conditioning will be effective when the probability of the unconditioned stimulus in the presence of the conditioned stimulus ( $p_1$ ) is larger than the probability of the unconditioned stimulus in the absence of the conditioned stimulus ( $p_2$ ), or lower for inhibitory conditioning. Several experiments have challenged this rule by showing that the magnitude of the difference between  $p_1$  and  $p_2$  that is necessary for effective conditioning is not constant, but is proportional to the magnitude of these probabilities. Hence, a certain value of  $\Delta p$ ,  $p_1 - p_2$ , can be sufficient to support effective conditioning when the values of  $p_1$  and  $p_2$  are low, but not when they are high. This finding is consistent with the classic principle of psychophysics, the Weber-Fechner law. The experiments to be described explore this issue using Pavlovian conditioning with non-human animals. The results are analysed in terms of usual associative learning theory, and in terms of methods of psychophysics such as Signal Detection Theory.

**[3A2] Gender differences in a virtual Morris water task**

<sup>1</sup>Chamizo, V. D.; <sup>1</sup>Artigas, A. A.; <sup>1</sup>Sansa, J.; <sup>2</sup>Bantera, F.  
<sup>1</sup>University of Barcelona; <sup>2</sup>University of the Basque Country

In two experiments a new virtual preparation for humans of the Morris water task was used. The subjects were students of Psychology. They were trained to locate a safe platform in the presence of four landmarks, which were spaced at the same distance around the edge of the pool. At the end of training one test trial was given, without the platform, and the time the students spent in the platform quadrant was registered. In Experiment 1 the test trial was in the presence of one or two landmarks, which could be either relatively near or far from the platform quadrant, in order to see 1) if the proximity of the landmark/s to the platform differentially affects men and women, and 2) how the landmarks are encoded -either elementally or configurally- in the two genders. The test trials revealed, both in men and women, a preference for searching in the quadrant where the platform should have been in the presence of the near landmarks (whether it was one or two); also, the participants' performance was better with two landmarks than with only one landmark (either near or far from the platform quadrant). When the landmarks tested were located far from the platform quadrant, neither men nor women differed from chance in the presence of a single landmark, but interestingly, men clearly outperformed women with two far landmarks. This last result was replicated in Experiment 2. The findings of both experiments will be discussed within a model that predicts a dissociation between proximal and distal cues between men and women.

**[4E2] Memory for emotional pictures depends on the distribution of central information in the scene**

**Chapman, P.**

*University of Nottingham*

Studies looking at memory for emotional pictures have generally shown advantages in memory for emotional information, and often show both qualitative and quantitative differences in memory between negative, neutral, and positive items. One problem for this field is that the structure and quantity of information in pictures may itself be related to their affective status. A particular issue here is the often-reported attention focusing effect of negative affect that implies that memory for central and peripheral information will be differentially influenced by emotional arousal. Unfortunately, the actual distribution of central and peripheral information in stimuli has rarely been systematically measured or manipulated. The present study explored memory for one of the most commonly used stimulus sets, the International Affective Picture System (IAPS), (Lang, Bradley & Cuthbert, 2001). In a first experiment participants were asked to select with a cursor a rectangle that contained the central information from each picture. The participants reliably selected larger central areas in both negative and positive pictures from the IAPS than from neutral ones. To explore the degree to which this distribution of central information might be responsible for differences in memory, two picture sets were created. Each set contained positive, neutral, and negative pictures, but in one set the distribution of central information was matched across the three valences, while in the second set the distribution was chosen to be representative of the full IAPS stimulus set. A subsequent recognition test showed a significant interaction between emotion and picture set, with the emotional advantages being very substantially reduced when the pictures were matched for central content. The results suggest that many emotional effects in memory may tell us more about the structure of the environment than they tell us about emotional influences on information processing.

**[3B4] Socially modulated inhibition of return**

<sup>1</sup>Cole, G. G.; <sup>2</sup>Skarratt, P. A.; <sup>3</sup>Kingstone, A.

<sup>1</sup>University of Essex; <sup>2</sup>University of Hull; <sup>3</sup>University of British Columbia

Inhibition of return (IOR) has been shown to occur in an individual who observes a second individual performing a visual search task (e.g., Welsh et al., 2005). Specifically, participants are slower to reach to a location that has previously been responded to by another person. The present study describes a series of experiments that examine this highly novel effect. We show, for instance, that the effect occurs both when the observer has to infer where the other person has responded as well as when they actually see the response being made. We also show that the effect is based on an object as well as a spatial representation. The effect is discussed in the context of social attention. Reference: Welsh, T. N., Elliot, D., Anson, J. G., Dhillon, V., Weeks, D. J., Lyons, J. L., & Chua, R. (2005). Does Joe influence Fred's actions? Inhibition of return across different nervous systems. *Neuroscience Letters*, 385, 99-104.

**[3E5] Consolidation of implicit sequence knowledge**

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*Vrije University of Brussels*

Consolidation, i.e. the process through which experiences are anchored into stable memories, of implicit sequence knowledge has recently become an important research topic. However, previous studies have mainly focused on the consolidation of implicit motor sequence knowledge. Whether perceptual sequence knowledge is also consolidated was, to our knowledge, not yet examined. In the current study, the consolidation of motor and perceptual sequence knowledge was investigated within a similar paradigm, with participants performing two sessions of an adapted serial reaction time (SRT) task. In the SRT task, a task in which sequenced information is implicitly learned, a target letter pair ("OX" or "XO") was presented in one of four locations. While target identity changed randomly, target location was structured according to a probabilistic sequence. In the motor condition, participants responded to the location of the target letter pair (relevant sequenced location dimension). Participants in the perceptual condition, on the other hand, responded to the randomly varying target identity (irrelevant sequenced location dimension). Following the initial acquisition session, participants were retested after 1, 4 or 24 hours delay in order to assess consolidation of sequence knowledge. The results indicate that motor sequence knowledge was preserved after 1 and 4 hours, but declined after 24 hours. Interestingly, perceptual knowledge was preserved after 1, 4 and 24 hours. Accordingly, our results suggest that perceptual sequence knowledge is retained at least as much as motor sequence knowledge. Implications for models concerning sequential representations in implicit learning will be discussed during the presentation.

**[8A5] Neuropsychology of temporal preparation: frontal lesions, fibromyalgia and aging**

<sup>1</sup>Correa, A.; <sup>1</sup>Miró, E.; <sup>2</sup>Triviño, M.; <sup>1</sup>Capizzi, M.; <sup>3</sup>Vallesi, A.; <sup>1</sup>Lupiáñez, J.

<sup>1</sup>University of Granada; <sup>2</sup>San Rafael University Hospital, Granada; <sup>3</sup>International School for Advanced Studies, Trieste

The ability to anticipate and prepare efficient responses to forthcoming events, temporal preparation, is important for many tasks including language, attention and motor control. However, temporal preparation has rarely been evaluated in clinical settings, probably because this function and the cognitive tasks to measure it are not well known so far. We will present a 10-minute computer task that is sensitive to lesions in the prefrontal cortex, fibromyalgia syndrome and aging. The task is sensitive to a selective deficit in the controlled component of temporal preparation (endogenous temporal orienting of attention), while the automatic component (sequential effects) remains rather preserved in all groups. This behavioural deficit that is common to the three cases may be due to a dysfunction in frontal brain networks typically involved in attentional control and timing. Our findings support the view that temporal preparation involves multiple processes, which can be classified along a continuum ranging from primary automatic to more sophisticated controlled mechanisms. The high sensibility, speed and ease of administration makes this temporal preparation task viable for diagnosing higher cognitive function.

**[3E2] Does attention move or spread when tracing lines?**

**Crundall, D.**

*University of Nottingham*

How do we trace lines? Early studies suggested that lines can be traced covertly and in an analogue fashion, with targets placed further along a line taking longer to reach. There is a debate however about the nature of this covert tracing operator. Initially the operator was assumed to be similar to a spotlight of attention moving along the line, however research demonstrated that the operator was less akin to a moving focus, and more like a spreading of attention throughout the line. I will report a number of my studies that contradict this spreading attention model and instead argue in favour of the moving focus hypothesis. In addition I will respond to very recent evidence that is about to be published which criticises my findings and argues once more for a spreading attention model. I will provide new data that will hopefully defend the moving-spotlight model of line tracing.

**[7D3] The comprehension of deictic sentences is modulated by the reader's location**

**de Vega, M.; Castillo, M. D. , Junco, J.**

*University of La Laguna*

Deictic verbs in Spanish and other languages involve a point of view (e.g., to came, to go). In narratives the protagonist's explicit location determines which deictic verb is most appropriate to describe a motion event. Thus, in "John was in the living room and his friend came /went out to say him hello" the verb came is coherent with John's perspective, whereas went out is not. In a classical study, Black, Turner, & Bower (1979) demonstrated that readers are sensitive to the protagonist's deictic perspective, as their sensibility rates and reading times showed. In narratives, deictic perspective is usually set up by the narrator who describes the protagonist in a given place. However, in spontaneous oral communication deictic perspective is implicit and the speakers determine it pragmatically. In this study readers were given sentences with a deictic verb either consistent with their geographical localization (Tenerife) or inconsistent with it (Las Palmas). For instance "My friend likes Carnival very much, so she came /went to Tenerife /Las Palmas to celebrate it". Reading was slower in sentences with inconsistent combinations of verb and place (go /Tenerife and come /Las Palmas) than with consistent combinations (come /Tenerife and go / Las Palmas). Sensibility ratings, on the other hand, were higher for deictic proximal verbs (come, bring) than deictic distal verbs (go, take). The results suggest that in absence of an explicit deictic centre in narratives, readers assume their own geographical localization as deictic centre.

**[7D2] Predictive inferences activation during reading: Analysis of the causal powers components in global coherence**

**Escudero, I.; León, J. A.**

*<sup>1</sup>Nebrija University; <sup>1</sup>Autonoma University of Madrid*

Predictive inferences play an essential role on reading comprehension processes. Nevertheless, this type of inference has been object of a great controversy about its nature (on-line vs. off-line). The main objective of this work is to deepen in the nature of these inferences. In the experiment we present here, we tried to analyze some of the responsible factors in its generation, with the purpose of clarify its nature. More specifically, we analyze the causal powers of the antecedents that take part in their generation. 120 subjects participated in this study. They read 12 texts. The critical sentence had four versions. First three versions were sentences that generate the same predictive inference (the same target) with a high likelihood (higher to 0,8, between 0,7 and 0,8, and between 0,6 and 0,7). The fourth version was a neutral sentence, which was not inviting the generation of any inference. The results indicate that the different causal powers (antecedents) do not produce the same effect in the generation of the studied inferences, still being the same target or inference. This variable seems to be determinant in their on-line or off-line activation. These data raise, among other questions, the increasing necessity to review the current definitions of inferences.

**[1B2] Specificity of face processing impairments in children with autism spectrum disorders**

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<sup>1</sup> University of Western Australia; <sup>2</sup>Institute of Education, London

Individuals with an autism spectrum disorder (ASD) show difficulties in social reciprocity and behavioural flexibility. They also demonstrate problems processing faces, including poor recognition memory and discrimination ability, relative to typical individuals, leading some theorists to suggest that such problems arise from a primary deficit in processing social information specifically. In recent years, however, there has been some evidence supporting the notion that these difficulties may signal a broad difference in perceptual processing rather than a face-specific or social-specific impairment. Limitations in aspects of experimental design and sample characteristics in the relevant research entails that the true nature of face-processing impairments in ASD remains unclear. The current study systematically examined the specificity of face-processing deficits in a high functioning sample of children with ASD (n=22) by comparing recognition memory and discrimination ability for upright faces, inverted faces and a non-face object category (cars) in children with ASD and typically developing children (n=22) aged between seven and fifteen years. Our results showed that children with ASD performed significantly more poorly than typical children across all three object categories, not just upright faces, and across both memory and discrimination tasks. This leads us to conclude that, contrary to the suggestion that the face processing difficulties of children with ASD are related directly to a primary social impairment, face processing difficulties in ASD may result from a more thoroughly pervasive atypicality.

**[2D5] More than the sum of the parts: the combined effect of connectives and word frequency on poor readers' text comprehension**

Fajardo, I.; Ávila, V.; Tavares, G.; Ferrer, A.

University of Valencia

The effects of connectives and word frequency on different levels of text comprehension according to the Construction-Integration Model of Kintsch (1988) were compared for students with Intellectual Disabilities. Nineteen participants, mild intellectually disabled people with low levels of reading comprehension (measured with standard tests), were asked to read 4 versions of short journalistic texts: original, frequency revised, connectivity revised and frequency plus connectivity revised. For the frequency revision, low frequency words (according to the participants' vocabulary level) were substituted with high frequency words. For the connectivity revision, markers between propositions (e.g. "however", "for that reason", etc.) were added to the texts. After reading the texts, participants were asked to answer literal and inferential questions. For literal comprehension, there were no differences between original and revised texts (around 80% of correct answers in all conditions). However, students' inferential comprehension was significantly higher in the combined revision than in the rest of conditions where comprehension scores were leveled. This effect suggests that unless students are familiar with the vocabulary of a text, they cannot benefit from the coherence markers to make inferences. Alternatively, the augment of text word frequency does not improve the inference making process by itself but it needs to be aided by the use of connectives. For the design of texts for intellectually disabled students, this result implies that lexical and coherence elements of the text must be considered simultaneously in order to achieve deep levels of text comprehension.

**[8D4] Semantic information influences the recognition of newly learned words overtime**

**Ferreira, R.; Ellis, A. W.**

*University of York*

This study investigated the extent to which the provision of semantic information can influence the processing of newly learned words. In two experiments, we manipulated the amount of semantic information accompanying novel words during training. In Experiment 1, 21 native English speakers learned 30 novel words over two days whose meaning corresponded to real but unfamiliar objects. The novel words were divided into 3 sets, embedded in sentences and accompanied by visual stimuli. Each set occurred in a different condition (rich consistent meaning, poor consistent meaning, or no meaning). Participants were tested one day after the end of training and again 7 days later. They were required to complete 4 tasks: speeded word naming, recognition memory, semantic categorisation, and word production in response to definitions. Semantic richness did not affect word naming latencies either a day or a week after training. Semantic information did influence recognition memory speed, but only 7 days after the first training session when novel words trained with either rich or poor meanings showed significantly faster responses than novel words trained without meaning. This can be interpreted as words trained with meaning show consolidation over time while words without meaning seem to remain the same or fade with the passing of time. This effect may reflect consolidation of word forms with their associated meanings. Experiment 2 aimed at investigating differences between the rich and poor meaning conditions and did not include a naming task. The results of Experiment 2 replicated the findings of Experiment 1 with similar performance for the two semantic conditions in the memory recognition task, but superior performance for words with rich semantic representations in the categorisation and production tasks. The findings shed light on the process of word learning and the role of semantics in lexical processing.

**[7D1] The role of question format and text availability on Reading Comprehension Assessment**

**Ferrer, A.; Vidal-Abarca, E.; Mañá, A.; Llorens, A. C.**

*University of Valencia*

Reading comprehension is usually assessed asking readers to read a text and then answer some questions. This procedure differs among tests in two ways: (a) the availability of the text to answer the questions (i.e. available vs. non-available) and (b) question format (i.e. open-ended vs. multiple-choice). Our study tested the effect of these two variables on comprehension scores and whether or not text availability had an impact on the first reading of the text. Junior high school students participated in the study. They read two texts and answer eight questions per text. Students were allowed to refer back to the text to answer the questions (text-available condition) in one text, whereas they were not in the other (non-available-text- condition). The order of the conditions was counterbalanced. In each condition, half of the questions were open-ended while the other half was multiple-choice. We measured questions performance and online variables in the first reading of the text (i.e. reading time, reading speed and number of re-readings). Students performed the experiment on a computer using software that records online reading variables. Results showed no effect of question format but a significant effect for text availability on questions performance. Participants who had the text available scored higher than those who did not. We also found a format x availability interaction effect, indicating that text availability increased scores when questions were open-ended, but not when they were multiple-choice. Regarding first reading of the text, students in non-available-text- condition spent more time reading the text than those in text-available condition, which was due to the increase of the number of re-readings but not to decreasing reading speed. These results have both theoretical and applied interest for the analysis of reading strategies, and the design of reading comprehension tests, respectively.

**[4A5] Greater distractor processing under high cognitive load can lead to better task performance**

**Fockert, J. W.; Bremner, A. J.**

*University of London*

There is growing evidence that cognitive control mechanisms, such as working memory, are involved in limiting distraction in selective attention tasks. This is usually shown by means of a performance cost when working memory is loaded, such as greater interference effects from irrelevant distractors while processing a relevant target. However, high working memory load should lead to better performance if processing of the distractor is beneficial for the task at hand. Here we show two examples of such an effect. First, the negative priming effect, which is the performance cost when a previously ignored item has to be attended, was eliminated by high cognitive control load. Second, inattentional blindness, which is the inability to detect an unexpected item during processing of another visual task, was greatly reduced by high working memory load. Together, these findings support the idea that the unavailability of working memory results in greater distractor processing, even if this leads to better performance.

**[8C5] Simpson's paradox in a web experiment: The impact of cognitive focus, sample size, and trend information on social inference**

**<sup>1</sup>Frauendorfer, D.; <sup>23</sup>Reips, U. D.**

*<sup>1</sup>University of Zurich; <sup>2</sup>University of Deusto; <sup>3</sup>Basque Foundation of Science*

Most of the time, correlations between two events are ambiguous, because correlations can often be (partially) explained by a third variable. Therefore, the substance of many correlations is reduced after careful examination of causally relevant variables (Fiedler, Walther, Freytag, & Nickel, 2003). Using Simpson's Paradox as an instrument in an experimental design to detect social inference, Schaller (1992) found that the sample size in data from two racketball players reveals a remarkable impact on whether participants take into account a possible third variable or not. This sample size effect has proven to be quite robust and thus is an ideal test case for Web-based experimental methodology. Furthermore, the present study aimed to investigate whether prior knowledge and trend information may influence social inference on the basis of Simpson's Paradox. Two experiments were generated and conducted with the online tool WEXTOR. Experiment 1 (N1=181) investigated the impact of prior knowledge (high; low), sample size (large; small) and trend information (trend: yes; no; control) on judging the poker abilities of two players (2 x 2 x 3 between-subjects design). The results show that sample size had a significant effect on social inference. Participants provided with a large sample size were much more prone to take the third variable into account than participants provided with a small sample size. Experiment 2 (N2=256) investigated the impact of job perspective (doctor; health minister) and trend information (yes; no) on the comparative judgment between two medications (2 x 2 between-subjects design). With this experiment the impact of an implicit third variable (cognitive focus in terms of job perspective) was under investigation. The results revealed a significant main effect of cognitive focus. Participants who imagined practicing as a doctor did take the third variable (gender) more likely into account than participants who imagined working as a health minister.

**[3D1] Pictures speak louder than numbers: on communicating medical risks to immigrants with limited non-native language proficiency**<sup>1,2</sup>García-Retamero, R. ; <sup>3</sup>Dharmi, M. K. .; <sup>2</sup>Galesic, M.<sup>1</sup>University of Granada; <sup>2</sup>Max Planck Institute for Human Development; <sup>3</sup> University of Cambridge

Risk communication has been studied infrequently in immigrants with limited non-native language proficiency, even though they may be at greatest risk of illness and death. In a study, we examined to what extent Polish immigrants to the UK have difficulties understanding treatment risk reduction expressed as ratios of the number of treated and non-treated patients who died after taking the treatment (i.e., numerators) and the overall number of treated and non-treated patients at risk (i.e., denominators). This information was presented either in their native language (Polish) or in a non-native language (English). We further investigated whether this population can be especially aided by using visual displays to enhance comprehension of risk communication. Results in the study showed that participants often paid too much attention to the number of treated and non-treated patients who died (i.e., numerators) and insufficient attention to the overall number of treated and non-treated patients (i.e., denominators). This denominator neglect was especially noticeable when treatment risk reduction was not expressed in participants' native language. We showed, however, an effective method to eliminate denominator neglect: Providing visual aids in addition to numerical information about risk reduction drew participants' attention to the overall number of treated and non-treated patients and helped them to make more accurate risk estimates. Our findings have important implications for medical practice as they suggest suitable ways to communicate health-risk information to immigrant populations. Physicians could be trained to communicate risks accordingly.

**[2D2] Implications of theory of mind and general intelligence on language comprehension in schizophrenia**

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Background: Theory of Mind (ToM) is the natural capacity to attribute mental states to oneself and others in order to explain and predict behaviour in social interaction. There is considerable support for the conception that ToM is reduced or impaired in schizophrenia. Although different studies have found that basic Language Comprehension (LC) is intact in this disorder, some authors have found a correlation between impairments in ToM and figurative LC in patients suffering schizophrenia. Our aim in this study is to explore how deficits in ToM affect LC capacity in schizophrenia controlling for intellectual ability (IQ). Method: A total of 22 Spanish-speaking inpatients and 22 healthy controls matched in age, sex, education and language dominance were assessed using 3 ToM tasks and 6 LC tasks (covering lexical, syntactic, and semantic-pragmatic language processing levels) in order to establish the implication of ToM in LC. Correlational analyses were done to establish the nature of the association between ToM, LC and IQ. A discriminant function analysis has been carried out as well, to examine the relative contribution of each variable to discriminate between patients and controls. The independent variables included in the analyses are those that evaluate ToM (9 measures, 3 for ToM-critical items and 6 for ToM-control items), those that evaluate LC (3 measures for figurative LC -metaphors, ironies, and proverbs- and 3 for standard LC tasks with words, sentences, and paragraphs) and general intelligence. Results: Preliminary correlational analysis showed a connection between impairments in ToM and difficulties in LC. Discriminant function analysis showed that the variables that best discriminate between patients and controls are those corresponding to the 3 ToM-critical items and to the 3 figurative LC tasks. Conclusions: Impairments in ToM compromise LC mainly in the semantic-pragmatic processing level and this association appears to be genuine, non dependent on IQ.

**[8E5] Is substitution masking reduced for long duration items because identity information is available in VSTM or because target and mask objects are better individuated?**

**Gellatly, A.; Guest, D.; Pilling, M.**

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Gellatly et al (2010) reported a series of experiments in which an object substitution masking (OSM) technique was applied to a target item in a search display presented for a brief (e.g. 17 ms) or a long (e.g. 500ms) duration. In both conditions, the location of the target was cued for the same duration prior to target offset (i.e. 17ms in this example). Although robust OSM effects were obtained with briefly presented displays, the effects were greatly reduced or totally eliminated with longer displays. The reduction in OSM for long duration targets could be due to information about target identity being stored in visual short term memory (VSTM). Alternatively, it might come about because the target and mask are more likely to be individuated (assigned separate object tokens) the longer the interval between their onsets. We report several experiments in which the task was to report the location of a gap (left, right, up or down) in a square target presented amongst distractor squares that also contained gaps. In the first experiment display items either appeared initially as placeholders (complete squares) or already contained a gap at onset. In subsequent experiments the placeholders were either briefly turned off or briefly occluded. Results from all the experiments support an individuation account of OSM (Lleras & Moore, 2003) and its reduction in long duration displays. Gellatly, A., R.H., Pilling, M., Carter, W. & Guest, D. (2010) How does target duration effect object substitution masking? *Journal of Experimental Psychology: Human Perception and Performance*, in Press. Lleras, A. & Moore, C.M. (2003). When the target becomes a mask: Using apparent motion to isolate the object component of object-substitution masking. *Journal of Experimental Psychology: Human Perception and Performance*, 29, 106-120.

**[3B2] The dice are cast: The effects of intended versus actual contribution on responsibility attributions**

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How much are people's responsibility attributions affected by intended versus actual contributions in group contexts? A novel experimental game paradigm allowed dissociating intended from actual contributions: good intentions could result in bad outcomes and bad intentions in good ones. Participants acted as external judges and attributed responsibility to individual players for their group's performance. On each round, three computer programmed 'players' formed a group. Each player chose to roll one of three dice. These dice differed in terms of price and probability distribution which were both common knowledge. The cheap die was biased towards lower outcomes, the medium die was fair and the expensive die was biased towards higher outcomes. The group won if the sum of the players' outcomes exceeded a fixed threshold. In case of a win, prize money was equally distributed between the players. Each player's payoff was hence a function of the price for the chosen die and whether the group won or lost. The employed payoff scheme created a social dilemma: for any given group outcome, the expected individual payoff of choosing the cheapest die was highest but the probability of winning given that each player had chosen that die was very low. The results showed that participants' responsibility attributions were influenced by both intended contribution, reflected in the choice of die, and actual contribution, reflected in the outcome of rolling the chosen die. Importantly, there was an interaction effect revealing that participants' ratings were differentially affected by the outcomes of the different dice. While responsibility ratings substantially varied according to outcome for the cheap die, the outcome hardly mattered for the expensive die. Thus, making a sacrifice for the good of the group saves players from blame even when the outcome is negative. However, would-be free riders better hope for a positive outcome.

**[9A5] Stress awareness and the acquisition of the orthographic stress in Spanish**

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This work focuses on the knowledge and use of the orthographic stress, a complexity of Spanish orthography that is acquired very late. Given this complexity has to do with the lexical level of prosody, it would be expected that prosody awareness at that level (or stress awareness) to be related to the correct use of the orthographic stress. In order to test this prediction, we used children from 3rd to 6th grade that participated in a cross-sectional study in which cognitive abilities (intelligence, memory and attention) and phonological awareness were controlled for. They performed linguistic (stress awareness) and non-linguistic (rhythm) prosody tasks, and reading aloud and spelling tasks. Results showed that stress awareness accounted for a significant amount of the variance in those tasks. This result is discussed in terms of how prosody awareness may affect the acquisition of the prosodic aspects of reading and writing, of which the orthographic stress is an example.

**[8A1] Visuomotor feedback training results in long term improvements in activities of daily living in patients with hemispatial neglect**

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<sup>2</sup>Jackson, H.; <sup>3</sup>Hogg, C.; <sup>3</sup>Castle, P.; <sup>4</sup>Learmonth, G.; <sup>5</sup>Rossit, S.  
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Hemispatial neglect is defined as the inability to spontaneously report, respond or orient towards events on the contralesional side of space. It has been previously reported that visuomotor feedback training improves neglect symptoms (e.g., Harvey et al., 2003). In the present study a group of neglect patients were again asked to reach, lift and balance rods at the centre (visuomotor feedback training), whilst the control group were asked to reach and lift the right-hand side of the rod only. The immediate and long-term effects of the training were explored with neglect measures but we also assessed the training's impact on activities of daily living (e.g., the Stroke Impact Scale). We found that, as before, the intervention group improved in neglect measures but also more importantly in their activities of daily living, as assessed by the caregivers. Crucially, we also observed that these improvements were long-lasting, up to 4-months post-training. As far as we are aware this is the first time that a neglect rehabilitation training has improved the patients' quality of life more generally. We postulate that the grasping movements towards objects involved in this form of rehabilitation allow 'leakage' of information of the object via the unaffected dorsal visual stream. Acknowledgments: This work was funded by a grant (SFRH/BD/23230/2005) from the Portuguese Foundation for Science and Technology to S Rossit.

**[8B4] Executive functioning in children with specific language impairment**

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Specific Language Impairment (SLI) is a common developmental disorder where language proficiency does not match an individual's other abilities. SLI appears to have significant consequences for concurrent and future functioning. Our research has been concerned with the relations between executive functioning (EF) and SLI, with a particular interest in whether children with SLI have impairments on both verbal and non-verbal measures of EF, i.e. a general or specific cognitive impairment. Forty children, with SLI, 10-14-years of age, were recruited and included in the sample, based on impaired performance on at least three out of four subtests administered from the CELF-4 (Semel, Wiig, & Secord, 2006), together with average non-verbal IQ (BAS-II matrices). These children were then assessed using a range of EF measures, many from a standardised test battery (Delis-Kaplan Executive Function System). The performance of children with SLI was compared with the performance of similar numbers of chronological age-matched (CA) and language age-matched (LA) control groups, controlling for non-verbal IQ. The children with SLI showed significant deficits relative to CA controls on executive-loaded working memory and fluency; some deficits in planning and inhibition; but no difficulties with set shifting. Children with SLI showed EF impairments on a number of non-verbal and verbal assessments. The implications of these findings for the relations between executive functioning and SLI will be discussed.

**[1A2] Bilingual advantage on executive control in absence of conflicting information**

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It has been repeatedly shown that bilingualism aids executive control involved in resolving distraction from conflicting information present in Stroop-like tasks (e.g. Bialystok & Martin, 2004; Costa et al., 2008, 2009; Hernández, et al., 2009; Martin-Rhee & Bialystok, 2008). This bilingual effect has been associated with the use of language control mechanisms that prevent interference from the unintended language when bilinguals perform language processing tasks. In the present investigation we address the question of whether bilingualism also aids executive control processes involved in preventing distraction from non-conflicting irrelevant information. In order to address this question we compare 41 young early highly-proficient Catalan-Spanish bilinguals with 41 young Spanish monolinguals in two visual search conditions varying the nature of the representation that elicit distraction. In the working memory (WM) condition, distraction was elicited in a top-down fashion by irrelevant objects held in WM. In the singleton condition, attention was elicited in a bottom-up fashion by including a unique distracting object in the search array. The results showed that bilinguals were overall faster than monolinguals in both conditions, replicating previous findings that bilinguals can be more efficient than monolinguals in the deployment of attention. Interestingly, bilinguals were less distracted than monolinguals by irrelevant information held in WM, but both groups were equally affected by unique singletons in the search displays. These observations suggest that bilingualism aids top-down guidance of attention, and in this case it can facilitate processes that keep separate representations in WM from representations that guide visual attention.

**[4E3] Individual differences in early imitation are associated with temperament**

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Since Meltzoff and Moore's seminal paper (1977) reporting imitation in early infancy, numerous papers have supported or contested their claims (Anisfield, 1996; Jacobson, 1989; Jones, 1996; Meltzoff, & Moore, 1983; 1989; Reissland, 1988). Theories of imitation have focussed on two contrasting explanations for these observations. According to nativist theories, newborn infants are capable of imitating because a supramodal representational system allows them to represent and evaluate perceived and executed actions in a unified format from birth. According to learning theories, imitation is based on learned associations between perceived and executed actions. In this view, early imitation is a spurious observation, explained by very specific exploratory behaviours in response to environmental stimuli. Both theories focus on group performance, despite evidence of variability at the individual level, and recent reports that variability in imitation may be associated with meaningful aspects of development (Chen, Striano Rakoczy, 2004; Ferrari et al., 2009; Field, Woodson, Greenberg & Cohen, 1982; Kugiumutzakis, 1999; Meltzoff & Moore, 1977, 1983). We investigated individual differences in imitation and temperament in a longitudinal study of infants at 2, 3 and 4 months. Auditory-oral matching behaviour was measured using an experimental paradigm developed by Chen, Striano and Rakoczy (2004) which compares mouth movements in response to sounds. Temperament was measured using the Infant Behavior Questionnaire-Revised (IBQ-R). Imitators had higher scores on two aspects of temperament: Vocal Reactivity and High Intensity Pleasure. Our results indicate that early imitation is dependent on both innate capacities and individual differences in stimulation and exploration.

**[7E3] Searching scenes for targets: The effect of scene priming on eye movements.**

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The "gist" of a complex scene – a coarse understanding of the spatial and conceptual layout of the scene – can be determined after very brief exposures to the scene. Following a method introduced by Castelano and Henderson (2007), we briefly presented a masked full scene to prime the scene's gist, then the name of a target object, and then the scene again while the participant sought the target. While searching, the scene was either presented fully (full-scene-search) or through a small gaze-contingent window (windowed search). Windowed search forced observers to rely almost exclusively on the previously acquired gist of the scene for guidance, and so comparing eye movements in full scene search versus windowed search isolated the role of gist in guidance of eye movements. Other effects of gaze-contingent windows were ruled out by comparing full scene search and windowed search through displays that were not primed.

**[1E1] The role of cue-to-target translation in attention switching**

**Houghton, G.; Grange, J. G.**  
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Both in everyday life and in experimental tasks our attention is often directed to a target by an external symbolic cue, say a word or icon related to the target (e.g., road signs). In this work we investigate the effect of the "transparency" of the cue-target relationship on the process of switching attention. We will present data from a number of studies indicating that transparent cues facilitate switching by providing more direct access to target representations. Less transparent cues require more exogenous control in the form of activation of task rules (cue-target mappings). When rapid switching is required this process should be aided by the inhibition of the current rule. We provide support for this idea in a series of studies showing modulation of Backward Inhibition (BI, a cost incurred when returning to just-abandoned task) according to the transparency of the cue-target relationship. We also present data from ERPs recorded during cue presentation that BI is associated with a reduction in the amplitude cue-related processing.

**[9A4] Further evidence for automatic activation of inner speech in silent reading**

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The "inner voice" or "voice in the head" is a common phenomenon experienced by readers when silently processing text (e.g. Huey, 1908/1969) and is more likely to occur in beginning readers or when fluent readers encounter difficult text (e.g. Coltheart, Besner, Jonasson, & Davelaar, 1979). The precise nature of this phenomenon is unclear. While early work characterised it as subarticulation (e.g. Watson, 1919), more recent work has investigated the possible mental representations involved and is converging on the view that representations are phonological and speech-like (e.g. Abramson and Goldinger, 1997; Lukatela et al., 2001, 2004; Alexander & Nygaard, 2008). The evidence for this conclusion derives in the main from stimuli contrasting in vowel length, which depends on whether the final consonant is voiced (e.g. as in plead/pleat). This constrains potential stimuli to some degree. The first experiment reported here used a new set of stimuli created according to speakers' intuitions about which word pairs offered a contrast in terms of spoken length (e.g. dear/dead). Lexical decision responses were slower for the words and nonwords previously categorised as phonetically longer, thus providing further confirmatory evidence that visual word recognition entails a component with some of the phonetic properties of spoken words. In two follow-up studies, participants listened to either English or Chinese auditory stimuli while performing the lexical decision task, and the phonological word length effect was abolished in both cases.

**[9B1] Audio-visual sensory interaction dissociates magno- and parvocellular processing**

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A fundamental dissociation within the primate visual system is the distinction between the magnocellular (M-) and parvocellular (P-) pathways. Although it is commonly held that audio-visual sensory integration can modulate perceptual performance on visual tasks, multisensory interactions have not been explicitly assessed in the context of the M- and P- visual streams separately. In the present study we employ a psychophysical paradigm that reveals spatial contrast signatures of each pathway. We find contrast thresholds are reduced when accessory sounds are presented with flashed, low-frequency Gabor-patch stimuli and thus favour the M- system but not when detection thresholds are primarily attributed to P- pathway processing. These results demonstrate detection task advantages resulting from sensory integration are mainly articulated by the magnocellular system and therefore suggest that such enhancement may aid in processes subserving automatic goal-directed actions.

**[8D2] Polysemy advantage: automatic process or sensitive to grammatical context?**

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Using the word-recognition paradigm, Rodd, Gaskell, and Marslen-Wilson (2002) found that words with many related senses (polysemous words, e.g. 'hook') are recognized faster than words with few senses. Rodd et al. (2002) proffered several explanations for the polysemy advantage. Two of these theories (words in isolation and differences in attractor basins) predict that the polysemy advantage disappears if words are embedded in context. The other two (semantic richness and context availability) allow for two possibilities: automatic beneficiary effect of senses, or an effect that is sensitive to external factors. The current study investigated whether the polysemy advantage and the homonymy disadvantage are sensitive to grammatical context. Participants in the first experiment performed a word-recognition task for words from the Rodd et al. study (2002) that were embedded in a stimuli set of equal numbers of nouns, verbs, and adjectives. In the second experiment participants did the same, but this time all filler words were nouns. Since high numbers of senses result from a combination of different types of senses (nouns, verbs, adjectives), this grammatical context should result in absence of the polysemy advantage if only the noun senses are activated. The polysemy advantage was found in both experiments. It was further replicated in a third experiment in which both the target words and the filler words were concrete nouns. These findings indicate that the sense advantage is an automatic effect that cannot be modified by grammatical context. The next step shall be to investigate whether the polysemy advantage is also immune for semantic context, and whether it can be found using different tasks (for example a semantic decision task).

**[9A3] Differences in the production and comprehension of compound words**

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The study of compound words (e.g., windmill) has been used by researchers in the fields of word comprehension and production to gain insight into the role of morphology in the mental lexicon. However, studies in these two fields have yielded contrasting results. Whereas comprehension studies using the lexical decision task generally show effects of the compound's constituent measures (e.g., Duñabeitia, Perea, & Carreiras, 2007; Hyönä & Pollatsek, 1998; Juhasz, Starr, Inhof, & Placke, 2003; Kuperman, Bertram, & Baayen, 2007), a recent word production study by Janssen, Bi, & Caramazza (2008) using the picture naming task revealed no effects of the compound's constituent measures. In the current study we investigated whether these contrasting results reflect methodological differences between the various studies (e.g., different languages, materials, analyses), or whether they reflect genuine differences in the processing of compounds between production and comprehension. In Experiment 1, 28 native English speakers named a large set of pictures (N = 150) with compound names. In Experiment 2, visual lexicon decision latencies were collected from the English Lexicon Project (Balota et al., 2002) for a statistically equivalent subset of the pictures from Experiment 1 (N = 96). Mixed effect and item based regression analyses revealed an effect of the compound's surface frequency in Experiments 1 and 2, but only an effect of the compound's constituent frequency, entropy, and family size in Experiment 2. These results rule out that only methodological differences cause the previously found contrast, and in turn, have important implications for how compounds are stored in the lexicon. Specifically, we argue that the observed contrast either reflects the existence of two different representational types for compounds in production and comprehension, or that, more likely, compounds are stored without morphological structure, and that tasks interact with compounds in different ways.

**[4A1] How does processing affect storage in working memory tasks? Evidence for both domain-general and domain-specific effects**

<sup>1</sup>Jarrold, C.; <sup>2</sup>Tam, H.; <sup>2</sup>Baddeley, A.; <sup>2</sup>Harvey, E.

<sup>1</sup>University of Bristol; <sup>2</sup>University of York

Three studies are presented that examine why the processing demands within working memory tasks lead to forgetting of the memoranda. In each, separate groups of adult participants ( $n = 15$  in each group in each experiment) were asked to carry out either verbal or nonverbal operations on exactly the same processing materials, while maintaining verbal storage items. In addition participants in each group received both ‘complex span’ and ‘Brown-Peterson’ versions of the memory task in which processing was respectively split between successive presentations of each memoranda or blocked following presentation of the memoranda. A delayed span task was also given in which presentation of the memoranda was followed by an equivalent unfilled delay. The imposition of verbal processing tended to produce significantly greater forgetting than did nonverbal processing, despite the fact that verbal processing operations consistently took no longer to complete than nonverbal processing operations. However, nonverbal processing did cause forgetting, relative to delayed span conditions. Analysis of the time taken by participants to complete the processing operations within each task showed that all individuals slowed their responses in complex span tasks relative to those produced in Brown Peterson tasks. This was particularly the case for the first response produced in each processing interval, and the degree of this slowing increased with the serial position of the processing block in a given complex span trial. These data suggest that individuals in both processing groups slowed their responses in order to ‘refresh’ the memoranda. Taken together the results imply that processing has a domain-general effect on working memory performance by impeding refreshment of memoranda, but can also cause effects, which appear domain-specific, either by blocking rehearsal or as a result of interference. In addition, the balance of these effects depends on the structure of the working memory task employed.

**[2D1] Specific Language Impairment as a phonological processing deficit: Evidence from data and computational modelling**

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Nonword repetition has been used extensively to examine phonological knowledge in children with Specific Language Impairment (SLI). Contrasting predictions between two influential explanations of the SLI deficit were obtained by constructing nonwords that varied in both length and lexicality (i.e. the level of lexical and morphological components in a nonword). There were clear effects of both variables: children with SLI repeated nonwords with greater accuracy when they were short in length and when they were high in lexicality. However, although comparisons to typically-developing children showed repetition deficits across all lengths for low lexicality nonwords, this was not true of the high lexicality nonwords. The results support a phonological processing deficit whereby repetitions of high lexicality nonwords are supported by long-term lexical phonological knowledge. Furthermore, a computational modeling account of the learning of novel sound sequences, EPAM-VOC, is able to simulate the performance of children with SLI by decreasing the model’s ability to encode phonological sequences. The SLI study shows how manipulations to lexicality can tease apart phonological processing and working memory accounts of the SLI deficit. The computational model shows how a parsimonious account of the learning of novel sound sequences can help us to understand the SLI deficit.

**[3E3] The role of individual differences in distractibility upon visual selection attention under high and low perceptual load**

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Performance on visual attention tasks has been reported to be modified by individuals' susceptibility to distractibility in everyday life and the perceptual load of the task. We examined the extent to which individual differences in distractibility impacted on visual attention performance under both high and low load conditions. Fifty participants completed a semantic response-competition task in which they made category decisions to target words whilst ignoring congruent or incongruent flanker words. Perceptual load was manipulated by varying the case of the target and flanker words; on high perceptual load trials, target words were presented in mixed case (MiXeD cAsE) and on low load trials target words were presented in same case. Participants' distractibility in everyday-life was measured using the Cognitive Failures Questionnaire (CFQ). Our results revealed the typical flanker effects (i.e. faster responses on congruent than incongruent trials) for the sample overall, but different patterns emerged in the low and high distractibility groups. The low distractibility group showed a significant congruency effect for same case stimuli, but not for mixed case suggesting that under high perceptual load distractor interference was eliminated due to the increase in demands on their attention system. However, the high distractibility group, did not show significant congruency effects, but there was a non-significant trend towards a congruency effect for mixed case stimuli. These results suggest that participants with higher reported levels of distractibility in everyday life may still process distractor information under high load conditions and that these groups may use different modes of attention. The findings are discussed in light of their implications for theories of cognitive control.

**[8D3] Early word learning in nine-month-olds: Dynamics of picture-word priming**

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How do infants learn words? Most studies focus on novel word learning to address this question. Only a few studies concentrate on the stage when infants learn their first words. Schafer (2005) showed that 12-month-olds can recognize novel exemplars of early typical word categories, but only after training them from nine months on. What happens in the brain during such a training? With event-related potentials, we studied the effect of training context on word comprehension. 24 Normal-developing Dutch nine-month-olds ( $\pm 14$  days, 12 boys) participated. Twenty easily depictive words were chosen based on parental vocabulary reports for 15-month-olds. All trials consisted of a high-resolution photograph shown for 2200ms, with an acoustic label presented at 1000ms. Each training-test block contrasted two words that did not share initial phonemes or semantic class. The training phase started with six trials of one category, followed by six trials of the second category. We manipulated the type/token ratio of the training context (one versus six exemplars). Results show more negative responses for the more frequent pairings, consistent with word familiarization studies in older infants (Torkildsen et al., 2008; Friedrich & Friederici, 2008). This increase appears to be larger if the pictures changed. In the test phase we tested word comprehension for novel exemplars with the picture-word mismatch paradigm. Here, we observed a similar N400 as Mills et al. (2005) did for 13-month-olds. German 12-month-olds, however, did not show such an effect (Friedrich & Friederici, 2005). Our study makes it implausible that the latter is due to an immaturity of the N400 mechanism. The N400 was present in Dutch 9-month-olds, even though some parents judged their child not to understand most of the words. There was no interaction by training type, suggesting that type/token ratio does not affect infants' word recognition of novel exemplars.

**[1B1] Categorical perception for unfamiliar faces: effect of covert and overt face learning**  
**Kikutani, M.; Roberson, D.; Hanley, J. R**  
*University of Essex*

A categorical perception (CP) phenomenon occurs when a continuous perceptual change comes to be perceived as a series of discrete regions separated by sharp boundaries between labelled categories ('stripes' in the rainbow). This phenomenon has been observed for morphed face continua, which are blended faces that change linearly from one face to the other. A sharp discrimination boundary for a series of equally-spaced morphed faces indicates that observers have discrete categories for the original faces. Kikutani, Roberson and Hanley (2008) suggested that categories could be rapidly established for previously unfamiliar faces if the original faces were learned with given names, and so, that acquiring category labels might be crucial for CP. Subsequent studies used the same unfamiliar faces, to investigate the influence of covert and overt learning on the development of CP for the continuum between the two faces. In the training, participants made judgements for a set of 300 famous or unfamiliar faces. The faces later used for morphing appeared 20 times in the set, while distractor faces appeared once or twice. In covert regime, participants judged fame of the faces, and therefore, they were not made aware of the repetitions of the critical faces. In overt training regime, participants judged whether each face had been encountered before, either because the face was famous or because it had been presented already in the experiment. Here, the participants were made aware of the repetitions of the critical faces. In a morph discrimination task followed the training, only the participants in the overt regime showed CP. This suggests that new labels for the learned unfamiliar faces were generated during the training, and the labels were used for categorizing the morphs. Furthermore, those new labels might be generated only when the observers pay sufficient attention to the repeatedly presented faces.

**[9A2] Audiovisual speech integration: Visual attention to articulation affects brain responses in 6-9 month old infants.**

<sup>1</sup>Kushnerenko, E. ; <sup>1,2</sup>Tomalski, P.; <sup>2</sup>Ribeiro, H.; <sup>1</sup>Potton, A.; <sup>1</sup>Axelsson, E.; <sup>1</sup>Moore, D. G.  
<sup>1</sup>University of East London; <sup>2</sup>University of London

Audiovisual speech integration (AVSI) is based on the brain's ability to predict auditory input from facial articulation cues, which appear milliseconds before the speech sound arrives. Our recent study in 5-month-old infants has demonstrated that an audiovisual mismatch (AVMM) brain response is elicited when anticipated audio-visual phoneme relations are violated (Kushnerenko et al, 2008). In the vast majority of infants significant AVMM was elicited only when a salient visual cue /ba/ was dubbed onto an auditory /ga/ ('combination effect'). However, in a small proportion of infants an AVMM was also observed in response to visual /ga/ auditory /ba/, which is known to be perceived as an illusory /da/ in adults ("illusion effect"). In this study we test our hypothesis that this inter-individual variability is due to differences in visual attention to mouth articulation. For sixteen infants (mean age 7.2 months) we recorded event-related potentials (ERPs) and, subsequently, using a Tobii T120 eye-tracker (ET) examined face scanning patterns during their perception of four stimuli with matching or conflicting audio-visual speech cues. Two matching stimuli represented canonical /ba/ and /ga/ syllables, and the two conflicting stimuli were generated by crossing the auditory and visual components. For each participant we established preference (looking times) either for eyes or mouths and used this category [eye-preference (EP) vs. mouth-preference (MP)] as a between-subject factor for ERP analysis. The results indicated that in MP infants the AVMM in response to the "illusion" audiovisual pair was significantly larger than in EP infants ( $p=.02$ ). We propose that infants' increased visual attention to mouth articulation results in enhanced brain processing of conflicting AV pairs, which is likely to prevent their fusion into an illusory percept. This study shed a new light to inter-individual variability in audiovisual speech integration.

**[3B1] A causal network model of alibi evidence**

**Lagnado, D.**

*University College London*

Alibi evidence is common in criminal cases, but is treated with suspicion. This is because an alibi can be explained away by inferring that the alibi provider is lying to protect the suspect. We present an alibi model that represents the network of causal relations in typical alibi situations. The model implies that when an alibi is discredited by other evidence this can incriminate the suspect along two separate routes: (a) showing that the suspect was at the crime scene, (b) showing that the alibi provider lied in their statement. Furthermore, the activation of these routes depends on the status of the alibi provider. If the suspect gives the alibi, then its discredit incriminates the suspect along both routes; if someone who does not know whether the suspect is guilty gives the alibi, then its discredit only incriminates via route (a). To test this model participants were presented with a crime scenario, and judged the guilt of a suspect at three stages: (1) given background information, (2) given an alibi, and (3) after the alibi was refuted by CCTV evidence. The status of the alibi provider was varied between-subjects: either given by the suspect, the suspect's mother or a stranger. It was made clear to participants that the latter two providers did not know whether the suspect was guilty. There was also a control condition, in which participants were not presented with alibi evidence, but made judgments given the CCTV evidence alone. The results confirmed the alibi model. When the suspect's alibi was refuted by CCTV evidence, guilt judgments were higher than for CCTV alone. In contrast, when the mother's or stranger's alibi was refuted, guilt judgments were no higher than for CCTV evidence alone. This suggests that simple causal networks can capture people's reasoning about alibi evidence.

**[3E4] Stimulus competition for attentional capacity: perceptual load vs. dilution**

**Lavie, N.; Torralbo, A.**

*University College London*

Tsal and Benoni (2010) recently report reduced response-competition effects from a peripheral distracter during performance of a search task with a high search set-size and a singleton-color target (compared to low search set size). They attribute this effect to a low-level visual interference, a form of visual dilution. We present experiments testing an account for these findings in terms of perceptual load. In tasks of low perceptual load spare capacity spills over allowing for the perception of additional items. In displays of high search set size with a colored target perceptual load is low but search nontargets compete with the peripheral response-related distractor for the remaining attentional capacity. Peripheral distractor processing (and its response competition effects) will be reduced under conditions in which the search nontargets receive the spillover of capacity instead of the irrelevant distractor. We present three experiments testing this prediction. Experiments 1-2 show with both direct (explicit reports) and indirect measures (response competition effects) that when peripheral distractor processing is reduced, it is the search nontargets nearest to the target that are perceived instead. In Experiment 3 response-competition effects from the peripheral distractor are restored in displays of high set size when the strongest-competing search nontargets (those nearest to the target) are removed. These findings rule out accounts in terms of lower-level visual interference (or mere "dilution") for the reduced distractor processing under conditions of low load with a high search set size while providing a new line of evidence consistent with Load Theory.

**[3D3] Hands on the future: selective increase of cortico-spinal facilitation when reading the future tense of hand-related action verbs**

Leone, B.; Carreiras, M.; Candidi, M.; Aglioti, S. M. ; Barber, H. A.

*University of La Laguna*

In the motor system the discovery of the mirror neurons activity has been found in humans during the execution and the observation of a grasping movement. Moreover, recent studies indicate that perception and action systems map a number of anticipatory behaviours. Similarly, the language system could be considered as another modality to comprehend and interact with external stimuli and predict the best reaction. Here we investigated the hypothesis of a possible role for the language system to associate an anticipatory movement with action verbs that express future actions. Using Transcranial Magnetic Stimulation (TMS) in a silent reading task, we recorded Motor Evoked Potentials from relaxed hand (FDI) and leg (TA) muscles 600 ms after subjects were presented with hand- or foot-action, mental or sensorial (non-somatic) verbs conjugated either in future or past tense. When recording from FDI, cortico-spinal facilitation was selectively observed during reading of future tense of hand-action verbs with respect to past ones. Conversely, future and past tense of leg-action verb did not modulate the excitability of leg muscles. Future and past tenses did not modulate FDI or TA muscles' reactivity when reading mental or sensorial verbs. The pattern of results showed that the cortico-spinal activity of the hand muscles selective increased for the action verbs related with the hand movements when they expressed a future action. We interpreted the data on that the language influences the motor system, which may show by the anticipation of hand movement.

**[3A3] Blocking of conditioned inhibition in human causal learning: Effects of different outcome continua**

<sup>1</sup>Lotz, A.; <sup>23</sup>Vervliet, B.; <sup>1</sup>Lachnit, H.

<sup>1</sup>*Philipps-Universität Marburg*; <sup>2</sup>*University of Leuven*; <sup>3</sup>*University of Amsterdam*

In the Rescorla-Wagner model, conditioned inhibition is conceptualised as the symmetrical opposite of conditioned excitation. A crucial test for this presumption is to compare learning phenomena in both. If inhibition and excitation are best described as symmetrical processes, then we should be able to find corresponding effects. A series of human causal learning experiments investigated one well-known learning effect, blocking. In contrast to blocking of excitation, which is probably the most investigated cue competition phenomenon, blocking of inhibition is rather poorly investigated. In our experiments, participants had to learn the relationship between the consumption of several foods and changes in the level of a hypothetical hormone. Depending on the experimental setting, the outcome (i.e., the hormone level) could take on two or three different values. Our results show that blocking is evident in inhibition. Furthermore, recent empirical results in excitatory blocking suggest that the magnitude of blocking effects might be influenced by ceiling effects. If inhibition is the symmetrical opposite of excitation then we should also be able to find equivalent influences of floor effects on blocking of inhibition. Our data show preliminary evidence for such influences.

**[5A5] Applying Type-2 Signal Detection Theory to Investigate Differences Between Regular Gamblers and Non-Gamblers**

Lueddeke, S. E.; Higham, P. A.  
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Research is discussed that investigated how individuals make decisions under uncertainty when faced with different payout structures in the context of gambling. In particular, two experiments compared sensitivity to manipulations of bias between regular, non-problem gamblers and non-gamblers in a novel probability-based gambling task. Type-2 signal detection theory was successfully applied to the data to separate three main performance parameters: accuracy, metacognitive monitoring, and bias (e.g., Higham, 2002). The results indicated that both regular gamblers and non-gamblers responded to the changes of rewards for correct responses and penalties for errors in setting their gambling criteria, but that regular gamblers were more sensitive to these manipulations of bias. Regular gamblers also set gambling criteria that were more optimal. The results are discussed in terms of an expertise-transference hypothesis.

**[1A1] Examining linguistic and contextual factors on the processing of two-digit number words**

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<sup>1</sup>University of Granada; <sup>2</sup>University of Murcia; <sup>3</sup>University Jaume I

Speakers of languages such as Spanish, English or Italian where two-digit Arabic digits and number words are written similarly (languages with non-inversion property: decade-unit order in both number formats) tend to focus on the decade digit while dismissing the unit digit. This paper studied the generality of this effect and some factors that might determine the mayor role of decades in languages with non-inversion property. To this end we explored the unit-decade compatibility effect in several two-digit number comparison tasks. The mayor role of decades was corroborated across languages with monolingual speakers of Spanish, Italian and English (reverse compatibility effect), while German monolingual speakers processed the decade digit and the unit digit (regular compatibility effect). In addition, the relevance of decades in the second language of two groups of bilinguals (German/English bilinguals and Spanish/English bilinguals) was found regardless of their first language (German or Spanish). Moreover, the mayor role of decades with non-inversion (e.g., Spanish) was independent of the decade-unit presentation of numbers since the same reverse compatibility effect was obtained when Spanish words were presented in unit-decade order. However, the relevance of decades was modulated by the experimental context: When within-decade comparisons increased progressively from 20% of the trials to 70% of the trials, the role of units also increased. Together, this pattern of results indicates that speakers of non-inverted languages pay more attention to decades but that they are flexible and the processing of numbers can change according to task requirements.

**[4A4] Autobiographical memory for trauma**

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One study was conducted to analyse phenomenological characteristics of memory for trauma compared with positive valenced memories. 228 autobiographical memories about traumatic events, with negative valence, and about happy events, with positive valence were recollected. A specific questionnaire (Manzanero y López, 2007) based on the Memory Characteristics Questionnaire (Johnson et al., 1988) and on the Trauma Memory Quality Questionnaire (Meiser-Stedman et al., 2007) was used. In addition, data were analysed using high dimensional visualization (HDV). In general and in relation to positive memories, results showed that memories for trauma were not as special as previously suggested. Traumatic memories were more complex, more damaged and more difficult to verbalise. Memories for trauma also were less accessible. In contrast, no differences were found between positive and negative memories on sensorial information, spatial location, vividness, fragmentation, remember perspective, doubts about the accuracy of the memory, and multiple retrieval. There are no data that allows us to confirm the existence of repressed, and then recovered, memories for trauma. Virtual HDV systems showed memory for trauma was distinguishable from positive memories when all variables were considered.

**[2A5] Face naming and retrieval inhibition**

**Marful, A.; Paolieri, D.; Sanches, C.; Bajo, M. T.**  
*University of Granada*

This study deals with the mechanisms involved in the retrieval of personal information. Our difficulties recalling a well known person (e.g. the actor Antonio Banderas) can be caused by the intrusions of the memory representations of related people (e.g., the actor Javier Bardem). This interference may be solved by inhibitory control mechanisms triggered to reduce competition. We tested this hypothesis in face naming (Experiment 1) and face recognition (Experiment 2) employing the Retrieval Practiced Paradigm (e.g. Anderson, Bjork, & Bjork, 1994). Participants were shown lists of photographs and names of famous people categorized by their occupation (e.g., actors, politicians). Later, SS repeatedly retrieved the names (Experiment 1) or recognized the faces (Experiment 2) of half of the famous of half of the categories. Finally, the photographs of all the famous people were presented for naming (Experiment 1) or recognition (Experiment 2). Results showed retrieval induced forgetting, that is, non practiced exemplars from practiced categories had lower probabilities of being named (Experiment 1) or recognize (Experiment 2) than non practiced exemplars from non practiced categories. These data demonstrate that inhibitory mechanisms can solve difficulties caused by intrusions during face naming and face recognition.

**[1A3] Highly-proficient bilinguals reconfigure semantic expectations faster than monolinguals during sentence reading**

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<sup>1</sup>Pompeu Fabra University; <sup>2</sup>University of Bangor

The main goal of the present study was to investigate if being bilingual affects the way people anticipate words to come when they read sentences in their first language. Using Event-Related Potentials (ERPs), DeLong and collaborators have shown that reading an anticipated word at the end of a sentence elicits greater N400 amplitudes than words that are not anticipated, albeit being semantically congruent with the sentence context (DeLong et al., 2005). Interestingly, anticipatory effects were also observed on the article preceding the final word, i.e., the N400 was more negative for the article 'an' when the most expected final word started with a consonant, and inversely for the article 'a' when the most expected final word started with a vowel (DeLong et al., 2005). Here, we investigated anticipation effects in highly proficient English-Welsh bilinguals and English monolingual controls. Participants were asked to read English sentences while undergoing 64-channel ERP recording. Sentences ended with an expected or unexpected noun starting with a vowel or a consonant. In monolinguals, we found a significant anticipatory effect both on the final noun and the preceding article, replicating the results obtained by DeLong et al. (2005). The N400 modulation elicited by the article was similar in bilinguals and monolinguals. The final noun failed to modulate the N400 in bilinguals but elicited a significant P600 effect for unanticipated (but semantically congruent) final nouns. We interpret these results as evidence that highly proficient bilinguals anticipate the noun ending a sentence as monolinguals do. Once deceived by the actual article presented in the unanticipated condition, bilinguals seem to reset their expectancies faster than monolinguals, thus showing no modulation of the N400 elicited by the noun. DeLong K.A. et al. (2005) *Nature Neuroscience*, 8(8), 1117-1121.

**[4A2] Mental rotation in a dynamic spatial test: SDT 2.0**

<sup>1</sup>Martínez-Molina, A.; <sup>2</sup>Contreras, M. J.; <sup>1</sup>Shih, P. C.; <sup>1</sup>Colom, R.; <sup>1</sup>Santacreu, J.  
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The aim of the present study is to analyze in a dynamic context a basic spatial process, Mental Rotation (MR). An updated version of the Spatial Orientation Dynamic Test (SDT 2.0; Santacreu, 2006) was designed and performed to assess MR through three types of Angular Discrepancy (AD) items, 90°, 180°, 270°. Other common cognitive factors in the study of spatial abilities, as Working Memory (WM) and Fluid Intelligence (Gf), were also assessed to examine their relation with MR in the dynamic context. Participants were 317 university graduates from different educational areas (214 males and 103 females; Mean age = 28.5; SD = 6.1, who individually completed a set of computerized tests. The fluid intelligence test was situated in the first place (TRASI) and took 35 minutes on average to complete. The Spatial dynamic test SODT 2.0 with the tree angular conditions were presented in the second place. Finally, Working Memory tests (Computation Span and Dot Matrix) were presented with a standard limit of 10 minutes each one. The MR index showed a high reliability value (.85) and performed in the same way as the traditional mental rotation measures. A one-way within subjects ANOVA (repeated measures) tested the effect of DA in the dynamic test. The results indicate that participants made more mistakes and needed more time to respond (RT) items with higher DA; MR Wilks' Lambda = .663,  $F(2, 315) = 80.19$ ,  $p < .001$ ; and RT Wilks' Lambda = .487,  $F(2, 295) = 155.27$ ,  $p < .001$ . Finally, a structural model was tested with the MR, Working Memory and Fluid Intelligence factors. Model fit indices are good:  $\chi^2(17, N= 317) = 19.30$ ,  $p = .312$ , CMIN/DF = 1.14, RMSEA = .021, CFI = .997. The latent variables Gf and WM show similar regression weights to the MR in the dynamic test. The present study was funded by the Spanish Experimental Psychological Society (SEPEX) and the PSIØ research team to A. Martínez-Molina.

**[5A4] Memory for radio advertisements: effect of program congruence, typicality and divided attention**

**Martín Luengo, B.; Migueles, M.**  
*University of Basque Country*

This study examined the effects of congruence between advertisements (ads) and the program in which were embedded. For instance, a bike ad is congruent if it is embedded in a sport program, but is incongruent if it is embedded in a cooking program. Moreover, we were interested in the effect of divided attention in order to study the memory for ads in a more ecological setting. Lastly, we manipulated the typicality of the to-be-remembered information. One high typicality feature of a restaurant ad is the offer of different types of menu. One low typicality feature is that in the restaurant you can organize a wedding. Participants listened four short radio programs. One of them included a congruent advertisement and the others included incongruent ads. After a distractor task, participants completed a true/false test indicating the level of confidence in the given answer. The results showed that there were less hits for elements with low typicality in the divided attention group. There were also more false alarms for the congruent ads and elements of high typicality. In addition, A' and B''D showed a better discrimination and a stricter criterion for the incongruent and for the low typicality elements. There were more confidence in the no divided attention group. As conclusions, the memory for ads was easier to distort when they were embedded in congruent programs. On the other hand, introducing low typicality features does not seem to be the best strategy to promote a better memory of the product. Finally, the metamemory evaluations seems to be influenced by the inference that the memory will be worst if we do several things at the same moment.

**[1A5] Immersion in L2 and expertise in professional translation determine language activation and language selection**

**Martín, M. C.; Macizo, P.; Bajo, M. T.**  
*University of Granada*

The nonselective activation of the bilinguals' two languages is not always observed and it depends on a set of factors. The present study evaluate whether two of these factors (immersion in L2 environment and expertise in professional translation) modulates not only language activation but also inhibitory processes needed to select the language in use. To this end, we compared three different bilingual populations: Spanish-English bilinguals, Spanish-English translators and Spanish-English bilinguals immersed in their second language. The participants performed a semantic relatedness judgment task in which we used Spanish-English interlexical homographs as critical stimuli (e.g., pie meaning foot in Spanish). The Spanish-English bilinguals group and the translators group were slower to respond to homographs than to control words (first trial). This result suggests the participants experienced interference because of the non-selective activation of both languages. No interference effect was found for the immersion group. Interestingly, after responding to homographs, only the Spanish-English bilinguals slowed their responses to the English translation of the Spanish homograph meaning (second trial). This result indicates that participants needed more time to respond to the translation because they had to overcome the inhibition of the irrelevant homograph meaning. The different pattern of results found for the three groups of bilinguals reflects differences in languages activation and the use of control processes according to their previous experience with them (language environment and professional experience with their two languages).

**[1C1] Attention effects on long-term memories during retrieval: A study with young and older adults**

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Previous research with young and older adults has shown that implicit memory requires attention at encoding (Ballesteros et al., 2006; 2007; 2008). In this study we investigated whether attention also affects both implicit and explicit memory at retrieval. Younger and older adults were presented with pictorial stimuli on the center of the screen. In the study phase, subjects had either to name the color (blue or green) of the pictures (Experiment 1), or to attend to the pictures explicitly (Experiment 2). Attention effects were assessed at the test phase through a cuing task. Targets could be presented at cued or uncued locations with short or long cue-target intervals (100, 900 ms SOA). In Experiment 1, subjects carried out a picture-naming task (implicit memory) in which pictures presented at the study phase were intermixed with new pictures. In Experiment 2, subjects carried out an old-new recognition task (explicit memory). In general, younger and older adults did not differ in the implicit task performance, but older adults were worse than younger adults in the explicit task. Importantly, both the validity effect at the short SOA and the inhibition of return effect at the long SOA affected performance in both experiments, and similarly in both groups of subjects. Thus, attention not only modulates memory at encoding, but also at retrieval.

**[8B1] Children's understanding of counterfactual alternatives**

**McCloy, R.; Strange, P.; Mason-Apps, E.**

*University of Reading*

In two experiments, we examined how children integrate information about counterfactual alternatives in making judgments. Previous research in adults had shown that they make judgments on the basis of comparisons between factual events and counterfactual alternatives. We suggest that children adopt a summative strategy instead, where they focus on the presented outcomes, both real and counterfactual, and base their judgments on the overall affective quality of these outcomes. In a first experiment, we varied the number and nature of counterfactual alternatives presented to groups of 7-year-old and adult participants in a counterfactual judgment task and showed that children do tend to use a summative strategy as opposed to the comparative strategy adopted by adults. These results were further supported by participants' justifications of their judgments, which were alternative focused for the adults, but outcome focused for the children. In a second experiment, we explored the development of comparative as opposed to summative strategies across a range of different age groups (5-6, 8-10 and 11-13 year-olds and adults) and looked at predictors for this development in a range of individual differences measures. Analysis suggests that children make two important steps when progressing from childlike to adult-like responses on these tasks. Firstly they must acknowledge that the alternative is separate to the factual outcome, before they then compare this alternative and the factual outcome in the correct manner, and respond in an adult-like fashion. The results of these two experiments are discussed in relation to complexity-based theories of the development of human reasoning, and the role of inhibition in counterfactual judgments.

**[8E2] The psychometrics of photographic cropping**

**McManus, C.**

*University College London*

A good photograph has what Cartier-Bresson called, "a precise organisation of forms", with decisions about good organisation being made, "in very nearly the same time it takes to click the shutter, at the speed of a reflex action". Photography provides an ideal experimental paradigm for aesthetics, for photographic images aesthetically rich and complex, and participants are used to using cameras and assessing images, recognising that some photographs are, in an ill-defined way, somehow better than others. The first part of this paper will consider the psychometrics of photographic cropping, in which subjects select a portion from a larger photographic image. Cropping therefore implements Fechner's Method of Production, but without subjects needing high levels of technical skill, simply 'pushing the button'. In the task, which is intuitive, natural and straightforward, subjects moved a computer mouse to crop a full-screen 1024 x 768 pixel image to a 512 x 384 pixel image, while making the cropped image look, "as good as possible". Subjects differ from one another in their croppings, but are individually reliable. Perhaps crucially, some subjects are better at cropping than others, their cropped photographs being systematically preferred to other subjects' croppings, when assessed by separate groups of subjects. The second half of the paper will consider the theory of composition proposed by Rudolf Arnheim which assesses 'balance' in images, psychological balance being considered in quasi-physical terms, dark being 'heavy' and light being 'light'. The centre of mass of an image can be computed, and Arnheim argues that it should be on one of the major image axes (mid-horizontal, mid-vertical or diagonals). The theory will be evaluated both in terms of a large sample of several hundred master photographs from *The Photo Book* (Phaidon, 1997), and in relation to the experimental images produced by subjects when cropping photographs.

**[1E4] Links between working memory capacity and gesture rates**

**Melinger, A.; Keehner, M.**

*University of Dundee*

When people speak, they often produce gestures that are temporally and semantically coordinated with the concurrent speech. However, rates of gesture production vary depending on the situation, the content of speech and the individual who is speaking. Several factors have been shown to influence within-speaker variation including the degree to which the elicitation task taxes the working memory system. This suggests that the processing capacity of individuals might influence between-speaker differences in gesture rates. In the present study, descriptions of room plan and path-like stimuli were elicited from native English speakers. Speakers could not see their interlocutors; hence communicative gestures were minimal. Each speaker was additionally assessed on verbal and spatial short term memory span as well as their complex working memory capacity. Stimulus descriptions were transcribed and the gestures coded and counted. Multiple regression was used to determine whether performance scores for the working memory tests predicted gesture rates. Initial results revealed that both spatial and verbal short term memory span negatively predicted gesture rates, suggesting that gestures can be compensatory for maintenance of information when short term memory capacity is limited. The strength of the gesture-spatial STM correlation differed for the two types of stimuli, which relied upon spatial representations to varying degrees. In striking contrast, complex working memory scores positively predicted gesture rates, implying that gestures also reflect greater processing available to individuals with higher complex working memory capacity (cf. Melinger & Kita, 2007). This pattern of results is interpreted in terms of models of working memory that distinguish content domains from processing domains (e.g., Oberauer, 2003). Implications for models of gesture production will also be discussed.

**[1B5] Culture impacts on extrafoveal information use for faces but not for visual scenes**

**Miellet, S.; Caldara, R.**

*University of Glasgow*

Culture shapes how people gather information from the visual world. We recently showed that Eastern observers deploy central fixations during face recognition despite using information from the eye region. This observation indirectly suggests a more effective use of extrafoveal information for this group of observers compared to Westerners. However, the extent to which such perceptual bias influence visual perception in Easterners remains to be directly established. To this aim, we monitored eye movements of Western Caucasian and East Asian observers during face recognition and animal search in natural visual scenes with a gaze-contingent technique that parametrically restricts central vision information: the Blindspot. In both task, we used both natural vision and restricted conditions with Blindspot sizes of 2°, 5° or 8° dynamically centered on observers' fixations. Interestingly, during face processing Westerners deployed a strategy that shifted progressively towards the typical East Asian central fixation pattern with increasing Blindspot size. In contrast, Easterners maintained their culturally preferred central fixation location pattern, showing better performance under unnatural viewing conditions relative to Westerners. These findings show that restricting foveal information induces an Eastern-style strategy amongst Westerners for faces. These observations show that the central fixation pattern used by Easterners relies on a better use of extrafoveal information for faces. For natural scene processing, we processed eye-tracking data using an unbiased, data-driven approach based on fixation maps and novel spatio-temporal analyses. Both groups of observers showed comparable animal identification performance which decreased as a function of the Blindspot sizes. Importantly, dynamic analysis of the exploration pathways revealed identical oculomotor strategies for both groups of observers. Culture does not impact on extrafoveal information use during the ecologically-valid visual search of animals in natural scenes. Critically, however, cultures shapes how people look at faces and sculpts extrafoveal information intake for this biologically relevant visual input.

**[3D2] The asymmetric nature of agreement computation: Evidence from Spanish**<sup>1</sup>Molinaro, N.; <sup>2</sup>Barber, H. A.; <sup>1</sup>Mancini, S.; <sup>12</sup>Carreiras, M. .<sup>1</sup>*Basque center on cognition, Brain and Language;* <sup>2</sup>*University of La Laguna*

Agreement has been described by lexicalist theories as a symmetrical phenomenon: partial information comes from both agreeing constituents, and as long as this information is mutually consistent, a unification process merges the features. On the other hand, derivational theories consider agreement as an asymmetrical phenomenon: purely formal grammatical features of one Probe constituent has to match with the ones of a corresponding Goal constituent where they could be interpreted semantically. We tested these two opposite views in an ERP study: we presented 22 Spanish speakers with subject-verb number agreement violations (*El presidente /Los presidentes firmó/firmaron un tratado en París*). We focused on possible electrophysiological differences between the processing of Plural-Singular (PS) violations compared to Singular-Plural (SP). In this frame, a lexicalist approach assumes the same ERP pattern for the two violations, since feature composition depends equally on partial information by subject and verb; a derivational approach, on the opposite, predicts asymmetric effects in the two cases, since number is interpreted on the subject noun and copied on the verb: in line with the plural markedness effect reported by Eberhard (1997), a plural subject noun should elicit more processing difficulties on the mismatching verb, compared to a singular one. ERPs showed in both the SP and the PS condition a Left Anterior Negativity starting at 300 ms followed by a long lasting P600 effect after 500 ms. Critically, statistics performed every 100 ms showed interaction between Number (Singular vs. Plural) and Violation (Control vs. Violation) in the 500-700 ms time intervals: the frontal portion of the P600, in its earlier stage, was larger for the PS condition. The different processing difficulties for the two violations is more consistent with the derivational approach to agreement, and it highlights the pivotal role of the subject in feature interpretation.

**[8C4] Perception of battered women with priming experimentation**

Montilla, G.; Aranda, M.; Montes-Berges, B.

*University of Jaén*

Violence against women we mean as a manifestation of discrimination, inequality and power relations of men over women (Law on Integral Protection Measures against Gender Violence, 2004). Thus, it is analyzed as a multicausal phenomenon in which genesis play an important role beliefs and sexist attitudes and tolerance for the use of violence. To understand the social pressure that the women victims of gender-based violence suffer, it is necessary from the discrimination they are subjected to by the rest of society. This project aims to meet the psychosocial variables that may be influencing the phenomenon known as double discrimination, that it to say, women discriminated against by the aggressor and the stigma of society itself by the fact of having been battered. Traditionally, there have been many different tools that have tried to measure and assess discrimination. The explicit measures (questionnaires and scales) are those that assess explicit attitudes which relate to processes deliberate, conscious (Eagly y Chaiken, 1998). However, there are numerous limitations of these methods of evaluation. An alternative to these, are implicit assessment methods (eg subliminal priming) in the assessment of attitudes is less conscious and more difficult to control (Greenwald and Banaji, 1995). We present an experimental research design to learn the implicit attitudes about battered women have the rest of the population. For this, previously conducted a pilot study to determine the stereotypes about battered women and the valence of the same ones. These stereotypes are used in research on priming. The main contribution of this work is the originality of the experimental approach in the study of double discrimination against battered women.

**[7E5] Interaction between intrinsic and extrinsic principles of perceptual grouping in vision**

**Montoro, P. R.; Luna, D.**

*UNED*

The study of the interaction between the Gestalt principles of perceptual grouping is a relative few explored field. In the present research we studied the relations between intrinsic (e.g., proximity, similarity) and extrinsic (e.g., common region, connectedness) grouping principles. In three experiments, the strength of intrinsic grouping principles (grouping by similarity in shape or in luminance) and that of extrinsic grouping by common region was measured when either principle operated alone or in combination with other principle. The results showed that the strength of grouping was maximal when intrinsic and extrinsic grouping principles were combined so that they cooperate and lead to stable perceptual organization. In contrast, grouping strength was minimal when intrinsic and extrinsic grouping principles were conjoined so that they conflict leading to unstable and ambiguous perceptual organization. Finally, the grouping strength of principles operating alone was intermediate between cooperation and conflict conditions. The compatibility of these results with additivity of grouping principles is discussed.

**[8E6] Dichromats basic colour categories use depends on red-green mechanism residual activity utilisation**

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People diagnosed as red-green dichromats (protanopes and deuteranopes) according standard procedures lacks: (1) A cone type in central retina and (2) red-green mechanism useful responses. On the other hand, it is known from Nagel's classical researches that such dichromats show red-green residual activity when responding to stimuli over 3 degrees visual angle. Our research analysed the influence of such residual activity in basic color categories use. The predictive accuracy of two theoretical models was also compared. Fifteen dichromats (7 protanopes, 8 deuteranopes) participated in the research. They performed two searching task using a carefully selected 102 stimuli sample (each stimulus size was 4º). One of the tasks (prototype search) required category best representative pointing. The other (mapping task) required to point all the stimuli that could be included in each category. Two models for predicting performance were compared. Model A assumed that dichromates can not differentiate between stimuli similar in transformed lightness belonging to the same confusion line. Model B assumed some activity in the red-green mechanism and, consequently, more capacity for differentiating stimuli the bigger the between stimuli distance in a confusion line. Results indicated that model B was better for predicting dichromates performance. Consequently, it can be concluded that this people do not use colour categories as expected in true dichromats. Key words: Colour. Basic colour terms. Dichromats. Naming.

**[8B5] Basic inference processes in premature children**<sup>1</sup>Moreno-Ríos, S.; <sup>2</sup>Roldan, M. D.<sup>1</sup>University of Granada; <sup>2</sup>University of Almería.

Some schoolchildren who were born prematurely have difficulty in integrating perceptual information. This happens, for example, in the Rey-Osterrieth complex figure test when copying a drawing with geometric pictures. However, this limitation could be related to other non-perceptual processes. The objective of this study is to test the simple inference processes of premature children in comparison with full-term children. The 7 year-old children performed an inference task with pictorial premises. They had to decide whether the location of three geometrical figures of different colours (conclusion) was possible given the partial information previously offered (premise) about only one of the figures. In the identification condition, the evaluation of the conclusion only required participants to identify the location and the figure indicated in the premise. In the inferential condition they had to consider the other figures not indicated in the premise. The results showed that full-term schoolchildren were faster and made fewer errors in the identification condition than in the inference condition. Preterm schoolchildren did not differ from full-term children in the identification condition but they responded faster and randomly in the inference condition. The results showed differences in the inference process between pre-term and full-term schoolchildren.

**[1D2] Force dynamics and causal and adversative sentences comprehension**

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Participants listened to causal or adversative two-clause sentences while watching a visual animation that matched or mismatched the sentence force dynamic. They performed two speeded tasks: A perceptual judgment on the animation, and a word choice that best completed the sentence. When the animation was introduced at the end of the sentence, participants' word choice depended on the animation force dynamic (accuracy). When the animation was introduced in the middle of the sentence participant's choices were faster in the sentence-animation force dynamics matching than the mismatching condition.

**[7D5] Looking what we are not told: Eye movements and the topic of negative sentences**<sup>1</sup>Orenes, I.; <sup>12</sup>Duñabeitia, J. A.; <sup>1</sup>Beltrán, D.; <sup>1</sup>Santamaría, C.<sup>1</sup>University of La Laguna; <sup>2</sup>Basque Center on Cognition, brain and language

Negation is a syntactic marker that reverses the meaning of a sentence without (in principle) changing its topic. The goal of this study was to explore the circumstances and time-course in which the topic of the sentence may change in the mind as a consequence of processing negation. For this purpose we manipulated affirmative (the figure is red) and negative sentences (the figure is not red) using an eye-movement technique (the visual world paradigm). While affirmation has a clear referent (red color), it is not the case for negation, (what color is not red?) We introduced two conditions in order to provide accessible and non-accessible actual states of affairs: in binary context (the figure could be either red or blue) the negation of one of the colors implies the affirmation of the other so the actual state of affairs is accessible, while in non-binary context (the figure could be red or blue or green) it is not. The 32 participants were presented four colored circles (for example, red, blue, green, and yellow) in the screen while they listened to the sentences. The results showed that the proportion of fixations to the target color was higher in the affirmative than in the negative sentences. It seems that participants changed the referent in the case on negation (not red). We also found differences into affirmatives and negatives depending on the context. In the case of affirmative sentences, the amplitude and temporal location of the peak in the binary condition was higher and earlier than in non-binary. Our results suggest that when possible the processing of negation leads to a switching of the topic of the sentences in the mind.

**[1D3] Subliminal semantic priming from novel prime words**

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Participants performed a semantic categorization task (animal vs. body-part) on visible word targets that were preceded by novel, unseen prime words that were presented for 33-ms and followed either immediately (Experiments 1-4) or after a delay (Experiment 1) by a pattern mask, with both subjective (Experiments 1-4) and objective measures (Experiments 2-4) of prime visibility being used. On 80% of the trials the primes and targets belonged to different categories (unrelated trials), whereas in the remaining 20% (related trials), they could be either strong (Experiments 1-4) or weakly-associated members (Experiments 3-4) from the same category. Reaction times were consistently shorter on related than on unrelated trials, but only when the primes were immediately followed by the mask, such that participants reported to be unaware of primes' identity. These facilitatory priming effects (a) proved to be unaffected by task practice, being significant even in the complete absence of stimulus repetition (Experiments 1-2); and (b) reached significance even for those participants that performed at chance in a prime visibility post-test, irrespective of whether presentation conditions during that test were identical (Experiment 4) or not (Experiments 2-4) to those used during the preceding priming task. The subliminal priming effects were also more robust for strong than for weakly-associated prime-target pairs (Experiments 3-4). Overall, these findings provide further evidence for unconscious semantic priming from novel unpractised words, and demonstrate that semantic relatedness between primes and targets is another potential moderator of subliminal priming.

**[5E5] Adjunctive behaviour is reinforced behaviour**

**Pellón, R.**  
*UNED*

Most theories of adjunctive behaviour claim a role for the reinforcers as discriminative stimuli. Intermittent presentations of food will serve as signals for the start of a period of low probability of reinforcement, thus drinking and other adjunctive patterns of behaviour would be controlled by stimuli related to the absence of the reinforcer. An alternative explanation based on the role of food as reinforcer of the different patterns of behaviour occurring within inter-food intervals is formally developed. The positive reinforcement hypothesis of schedule-induced polydipsia is the result of a number studies that have been conducted to address the consequences of the behaviour, the variables (including drugs) that affect behaviour, and the possible mechanisms of reinforcement involved.

**[4E4] Emotional Intelligence and attentional control processes: Temporal preparation in a go-nogo task**

**Pérez-Dueñas, C.; Acosta, A.; Correa, A.; Lupiáñez, J.**  
*University of Granada*

Emotional Intelligence (EI), in the Mayer and Salovey model (1997), is characterized by a set of related abilities, among which one we emphasize the emotional regulation. Given that the attentional control is a measure of the cognitive control which takes part in an integrated network involved in regulation of emotions, we think that EI and attentional control are related. However, it must be consider that different attentional control measures involve different attentional processes. In this work we research the voluntary controlled processes in a response inhibition task with spatial signals in adolescents with high and low EI. With this purpose, 254 students of the secondary school (aged 12-17), filled in the Spanish version of the TMMS-24 questionnaire about EI (Fernández Berrocal et al., 1998) and they made up the high EI and low EI groups according to the scores in it. The participants of both groups filled in the attentional control questionnaire of the Derribery and Reed (2002) and they did a go-nogo task with a predictive signal where the cue indicated the temporal moment in which the target appeared. Results suggest that participants of the high EI group compared with low EI group show higher levels of attentional control and they use temporal cues in the more flexible way when these cues indicate the temporal moment of the relevant information.

**[2A4] Memory and suggestion: influences of theory of mind and individual suggestibility**

**Pérez-Mata, N.; Moreno, A.; Diges, M.**  
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Relationships between theory of mind (ToM), memory and suggestibility in preschoolers are examined. Firstly, ninety-four preschoolers (44 boys and 50 girls), from 39 to 83 months ( $M = 58.9$ ,  $SD = 14.8$ ), were administered two scales: The Spanish adaptation of Wellman and Liu's ToM Scale (2004), which includes 6 tasks (in increased order of difficulty: Diverse desires, diverse beliefs, knowledge access, explicit false belief, belief emotion, and real-apparent emotion), that allows a quite precise estimation of children's mentalist capacity; and the Spanish adaptation of the Book Suggestibility Scale for Children (BBSC) of Melinder, Scullin, Gunnerod, and Nyborg (2005), which includes 14 suggestive questions and 4 true questions about a tale to provide an objective score of the children's individual suggestibility. Secondly, a week later, a different interviewer asked children free recall and recognition questions (memory measures) as well as suggestive questions (experimental suggestion acceptance) about activities performed in Session 1. The pattern of memory performance and suggestion acceptance shows a different role for ToM and individual suggestibility. In fact, ToM was a good predictor for memory measures, whereas suggestibility was a good predictor for experimental suggestion acceptance. So, in forensic contexts, professionals should pay special attention to preschoolers' memory limitations and their vulnerability to suggestions.

**[7E4] Visual awareness of objects and object features as revealed by an abrupt cueing task.**

**Pilling, M.; Gellatly, A.**  
*Oxford Brookes University*

Wolfe and colleagues (Wolfe et al., 2006) used an abrupt cueing procedure to determine observers' awareness of what was contained in a multi-item display. 20-35 simple items (red/green dots, left/right tilted bars) were presented on a screen then, after a variable time (500–1000ms), one was then abruptly covered by an occluder. The observer made a simple forced-choice report concerning the occluded item. Though only being asked to report about something that was just right before their eyes, observers were little better than chance in reporting any item's features (colour or direction of tilt) unless recently prior-cued to it. What this suggests is that, at any moment, observers have rather limited visual awareness of the features of the individual objects they see in front of them. We test this result and also test awareness of whether or not a location was filled with an object (without necessarily knowing what that object was) using a modified version of the abrupt cueing task. Displays consisting of 4-48 coloured shapes were presented. On some trials the occluder covered one of the items in the display, and on others covered an empty location. On all trials observers were required to report whether or not a certain specified item was present at the cued location before being covered. All experiments produced a similar result: errors increased proportionally with the number of relevant display items, but these errors were at similar rate at empty locations as at item locations. This suggests, somewhat surprisingly, that if we are visually aware that a location contains an object we are also aware of the feature-value(s) of that object. Wolfe, J. M., Reinecke, A., & Brawn, P. (2006). Why don't we see changes? The role of attentional bottlenecks and limited visual memory. *Visual Cognition*, 14, 749-780.

**[1D4] Relative clause attachment to emotion nouns: an ERP study**

<sup>1</sup>Piñero, A.; <sup>1</sup>Galdo, S.; <sup>1</sup>Fraga, I.; <sup>1</sup>Acuña, C.; <sup>2</sup>Comesaña, M.  
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We present the results of an ERP study in which 22 university students read temporarily ambiguous sentences that contained a relative clause (RC) occurring after two nominal antecedents. Half the sentences were desambiguated towards the first noun (NP1) and the other half towards the second noun (NP2). We aimed to study the electrophysiological correlates of the influence of emotion words in RC attachment and we chose two types of sentences: Neutral-Neutral (both nouns being emotionally neutral) and Neutral-Pleasant (where the second noun was highly pleasant and arousing). Our goal was to look for differences in the amplitude of the P600 component between sentences disambiguated towards either NP1 or NP2. A previous ERP study by Carreiras, Salillas, & Barber (2004) which used sentences with neutral NPs registered a greater amplitude for NP2 disambiguated sentences. This was interpreted as greater difficulty when reading this kind of sentences. Additionally, in a series of completion studies our research group has found that the RC is preferably linked to NP2 whenever this is both pleasant and high in arousal (Fraga, Piñero, Acuña, & Redondo, 2007; Fraga, Piñero, Redondo, & Acuña, 2008). This suggests that the emotional dimension of antecedents may also modulate the amplitude of the P600 component. Results showed a greater P600 amplitude for NP2 sentences, both in the Neutral- Neutral condition and in the Neutral-Pleasant condition. Thus, the Carreiras et al. results were replicated, as well as the preference for NP1 that has typically been observed in Spanish, both in off-line and on-line measures (e.g., Acuña, Fraga, García-Orza, & Piñero, 2009; Cueto & Mitchell, 1988). However, and contrary to what was found in our completion studies, the emotional dimension of the nouns did not seem to change the attachment decisions. A possible explanation of this discrepancy might be the different processes involved in comprehension vs production.

**[8A4] What paranoia has to do with depression? Avoidance of threatening faces is increased by depression-related primes**

**Provencio, M.; Vázquez, C.; Valiente, C.; Hervás, G.**  
*Complutense University of Madrid*

**OBJECTIVES:** There is a controversy on the contents of self-schema of people with persecutory beliefs. Although using explicit measures, paranoid persons seem to have a strong positive view of themselves and their capacities, implicit measures often reveal cognitive schemas similar to those found in depressed people (Bentall, 2001). The aim of this study was to test the hypothesis that, in people with high scores in paranoid ideation, depression-related primes (e.g., depressive words) may lead to attentional biases towards socially threatening information (e.g., angry faces). Attentional biases were assessed via the analyses of participants' eye-fixation patterns in a visual scan task. **METHODS:** Participants were 95 undergraduate students. Persecutory beliefs were assessed with the Paranoia Scale, (PS; Fenigstein & Vanable 1992). The experimental task consisted of presenting a semantic priming task followed by an eye-tracking visual task. Each participant was exposed to 96 trials. Each trial started with the presentation on the screen, for 300 milliseconds, of a self-descriptive question (i.e., Are you....?) which included four different types of emotional contents (i.e., neutral, positive, depressive and threat-related adjectives). Immediately afterwards, there was a screen depicting simultaneously a threatening and a normal face from the same actor (during 2500 milliseconds). Gaze patterns were recorded while participants freely viewed the pair of faces. We assessed both the location of initial fixation and global maintenance of attention to angry and neutral faces. **RESULTS:** Our data suggest that, as expected, self-referent depression-related information (i.e., depressive primes) activated a significantly different attentional pattern between high and low persecutory beliefs groups. Specifically, participants with higher persecutory beliefs significantly avoided to look at the threatening faces when the priming was related to depression. It seems that primes that are congruent with self-schemas are automatically processed inducing specific attentional patterns of avoidance.

**[8D1] Phonological priming in Tip-Of-the-Tongue states resolution: The role of syllabic position and word length in a European Portuguese study**

**Purezza, R.; Carvalho Soares, A. P.; Comesaña, M.**  
*University of Minho*

The Tip-Of-the-Tongue (TOT) state is an often common experience, usually coupled with a strong frustrating feeling caused by the incapacity of retrieving a familiar word. There are two major theories trying to explain TOT: The Blocking Theory (BT) (Jones, 1989; Jones & Langford, 1987) states that TOT is caused by competition between the target word and alternative words that come to mind simultaneously, at lemma level (syntactic and semantic features). BT is based on serial production models (Levelt, Roelofs, & Meyer, 1999), with top-down activation spread and no feedback activation. Alternatively, the Transmission Deficit Hypothesis (TDH) (Burke, Mackay, Worthley, & Wade, 1991) is centered on the Node Structure Theory (Mackay, 1987) and considers TOTs to be caused by an insufficient activation of the phonological nodes. The activation threshold of every node can be reached by top-down as well as bottom-up excitatory transmission. The main purpose of the present study was to test the role of phonology on TOT's resolution. TOT states were elicited in a lab context by a picture naming task, after which a lexical decision task was presented. In this task, phonological syllables (primes) of the target word (i.e., word that causes TOT) were inserted on pseudo-words. Prime syllable position (first, last or none) and target words length (two, three or four syllables) were manipulated. Results show a global TOT rate of 13,56%, and a phonological priming effect facilitating TOT's resolution. This effect was stronger for four-syllable long words and especially when the last syllable was presented. The results seem to give strength to the TDH as the most consistent explanation of the TOT state.

**[5E1] Internet-based experimenting: Methods and experiences**

**Reips, U. D.**

*University of Deusto*

Methods, techniques, tools, experiences, and validation experiments from fifteen years of Internet-based experimenting will be presented to provide the audience with an overview of the current state of the art with this method in Experimental Psychology. The presentation will introduce techniques of Internet-based experimenting, including the warm-up technique, sub-sampling procedures, multiple site entry, ways to check for motivational confounding and procedures to deal with non-response, like the high hurdle technique. The author will discuss principles of Internet-experimental design that are sometimes at odds with procedures familiar to laboratory experimentalists, such as (1) reduction of experimental control in favor of increased generalizability, (2) the evaporating necessity to use statistics and only report effect sizes as a consequence of the large power achievable in Internet-based research, and (3) voluntariness as a means to increase data quality (see below). The presentation will include a brief demonstration of <http://WEXTOR.org>, an interactive system for designing and conducting Web experiments online and/or in the lab. As a demonstration of the positive effect of the continuous voluntary participation achievable in Internet-based experiments, an experiment on reactance effects of forced response and distractive design will be presented. In line with Reactance Theory (Brehm, 1966) and previous quasi-experimental research by Stieger, Reips, and Voracek (2007) forced response induced a substantial increase in dropout. This effect was particularly pronounced for sensitive items. As expected, random response behavior decreased with increasing distance to the item where attempted item skipping took place. It can be concluded that reactance reduces data quality by generating more random answers in research that lacks continuous voluntary participation such as typical conditions in laboratory settings or forced response mode.

**[8E1] Is that blue or green? Categorical perception and discrimination thresholds for color**

**<sup>1</sup>Roberson, D.; <sup>1</sup>Hanley, J. R.; <sup>2</sup>Pak, H.**

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Categorical Perception (CP) is said to occur when a continuum of equally spaced physical changes is perceived as unequally spaced as a function of category membership. A common suggestion is that CP arises because perception is qualitatively distorted when we learn to categorize a dimension. Contrary to this view, we here report that English speakers show no evidence of superior discrimination thresholds at the boundaries between blue and green categories even though they display categorical perception at these boundaries in a supra-threshold task. Furthermore, there is no evidence of different discrimination thresholds between individuals from two language groups (English and Korean) who use different color terminology in the blue-green region. Our participants' just noticeable difference (JND) thresholds suggest that they retain a smooth continuum of perceptual space that is not warped by stretching at category boundaries or by within-category compression. At least for the domain of color, categorical perception appears to be a categorical, but not a perceptual phenomenon.

**[3D5] Speaker's alignment in spatial communication by pointing and direction words**

**Rodrigo, M. J.; de Vega, M.; Padrón, I.**

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To communicate object locations, people can use the deictic gesture of pointing or produce a sentence with a direction word that relates the target object to another object in the scene ("X is in front of Y"). In this study we explore how the producer and the addressee, using either pointing or language, represent the spatial scene. All participants learned a simple layout with 4 objects placed in the horizontal directions: front, back, right, left, and then they performed a speeded localization task, after changing their orientation by physical or imaginary rotation. Participants in the producer's role were given a target icon in each trial and they had to communicate its direction either by pointing or using a direction word. Participants in the addressee's role were given the direction cue (a pointing icon or a direction word) and they had to name aloud the corresponding target. The pattern of reaction times was modulated by physical and imaginary rotation differently in pointing and language. Most importantly, the same modulation was observed when participants played the producer's role and the addressee's role. The results strongly suggest that in spatial communication speakers align their representations not only in verbal communication but also when they use the deictic gesture of pointing.

**[3B5] Social cues modulate attentional control**

**Rodríguez-Bailón, R.; Jiménez-Moya, G.; Cañadas, E.; Lupiáñez, J.**

*University of Granada*

Stereotyping is a social categorization process by which individuals compare a set of persons and group them as identical if the degree of the differences among individuals (intra-class differences) are perceived as less than the differences between individuals of different groups (Turner, 1987). On the contrary, individuating involves forming impressions of others through an attribute-by-attribute consideration of isolated pieces of information (Anderson, 1974). Some authors have suggested that impression formation can be characterized as a continuum between these two modes, and the location on the continuum could depend on some motivational and social factors. Therefore, the stereotyping process, and the individuating one, could be gradual. On the other hand, recent research in the field of attention focuses on the role of context on attentional control (Crump, Vaquero, & Milliken, 2008). Results from these studies show that context learning and memory processes rapidly and involuntarily control attentional selection, so that attentional control can be outsourced to incidental or contextual properties of the task environment. The goal of the present set of experiments was to study the boundaries of these two social perception processes, by associating individuals (i.e., specific faces) and group (i.e., men or women) to either high vs. low proportion of congruency. By doing so we built an attentional measurement of the social individuation/categorization process. Using two different interference tasks (either emphasizing or not individual characteristics such as the name and surname) participants applied more or less attentional control depending on the proportion of congruency either associated to specific individuals or to the group as a whole, thus showing either individuation or social categorization of the presented faces. These results support the existence of a Social Context Specific Proportion Congruency Effect, and its usefulness in the social perception area.

**[9B2] Walking low level perception through the embodiment continuum**

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Using a lexical decision task, Meteyard et al. (2008) found that processing of words referring to motion up or down (as “climb”) was affected by low level perception of motion. When the directions implied by the word and by the perceptual motion mismatched, speakers were slower. This result is compatible with strong embodiment, where comprehending a word such as “climb” requires the motion system. We aimed to test the strong embodiment hypothesis through bilingualism. If sensory-motor processes are essential to understand language, the same facilitation effects would be observed in the first (L1) and second (L2) language of the speaker. If they are not that necessary, interference effects would not be observed in their L2. Using Meteyard’s procedure, we tested Spanish monolingual speakers, but we failed to find the interaction reported for the English speakers. The same null result was found for bilinguals Spanish-English, raising the possibility that the original effect may be smaller in different groups that show longer RTs because of the language (Spanish monolinguals) or because of bilingualism. To assess whether the lack of an effect was due to longer processing times in these groups we extended the length of presentation of the dots, but still we failed to find the critical interaction. On the basis of these results, we conclude that strong embodiment must be refuted because otherwise these interaction effects should be much stronger and present in all languages and in different groups of speakers. This is not to say that one has to reject any form of embodiment. Theories on semantic representation can be considered along a continuum from amodal to strong embodiment. While our results go against strong embodiment, they do not speak against other theoretical positions such as weak or secondary embodiment, both of which are equally supported by the previous literature.

**[5E4] Training and instructions modulate context processing in human predictive learning**

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Four experiments evaluated the role of the amount of training and instructions on context dependency of simple acquisition in human predictive learning. Cue X (a food name) was followed by an outcome (gastric malaise) in context A (a specific restaurant), while cue Y was presented without outcome in context B. After this training, responding to cues X and Y was tested both in contexts A and B. Experiment 1 found a decrease on responding to X and an increase on responding to Y when the cues were tested outside the contexts in which they received a short amount of training (4 Trials). These effects disappeared when the amount of training was increased up to 18 Trials. Experiment 2 revealed that context-switch effects depended on the outcome being presented only in one of the training contexts, suggesting that context switch effects in this situation depend on contexts being treated as predictors of the outcome. Experiments 3 and 4 found that the presence or the absence of context-switch effects could be reversed by instructing participants to pay attention to either the cues or the contexts during training. When participants receiving short training were instructed to pay attention to the cues, the context switch effect disappeared (Experiment 3). Alternatively, when participants receiving long training were instructed to pay attention to the context, the effects of context-switch reappeared (Experiment 4). These results suggest that context switch effects in human predictive learning depend on the attention that participants pay to the context during training, and that this attention may be modulated by factors such as the amount of training with the task or the instructions received by participants. These results are discussed within the framework of the Attentional Theory of Context Processing.

**[8B2] Situational self-awareness influences 3- and 4-year-olds' prosocial self-regulation**

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<sup>1</sup>University of Dundee; <sup>2</sup>University of Stirling

**Objectives:** In adults, self-awareness plays a role in the regulation of behaviour. High self-awareness leads to increased adherence to socially and personally prescribed norms, whereas low self-awareness is associated with anti-normative behaviour. This paper addresses whether changes in self-awareness also have an impact on preschool children's self-regulation. **Methods:** Two studies are presented. The first uses a within-subjects design to track 30 3- and 4-year-olds' adherence to a socially prescribed rule (Don't peek in the box!) under three conditions of self-awareness. The second uses a between subjects design to determine the effect of varying self-awareness on 90 3- and 4-year-olds' sharing and altruistic behaviour. In both studies, 'high self-awareness' was induced by asking the children to complete tasks in front of a large mirror and referring to them by name. In 'intermediate self-awareness' conditions children were referred to by name and the non-reflective side of the mirror shown. In 'low self-awareness' conditions children wore a disguise and were referred to by a generic title. **Results:** Varying situational self-awareness resulted in reliable changes in self-regulation. In the first study, children were more likely to adhere to the behavioural rule, and slower to break it, in high self-awareness conditions than intermediate or low self-awareness conditions. In the second study, children shared stickers most often in high self-awareness conditions, followed by intermediate, followed by low self-awareness conditions. Altruistic behaviour, as measured by choosing to earn a toy for an unfamiliar child, followed the same pattern. **Conclusions:** Preschool children showed more pro-social self-regulation when the self was made salient. As found for adults, it appears that self-awareness leads 3- and 4-year-olds to evaluate themselves against personal and social standards of conduct and adjust their behaviour accordingly. These results provide new evidence that self-awareness has a socially adaptive regulatory function from an early age.

**[4E5] Emotional conflict in economic games: An fMRI and HD-ERP investigation**

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Facial expressions of emotion are social cues that may influence decision making in interpersonal contexts. In the present study, participants played a modified version of the 'Ultimatum Game', in which they had to accept or reject economic offers made by several partners who displayed either happy or angry emotional expressions. Their goal was to accumulate more money than all their partners together. At the beginning of every trial, a cue informed participants of whether they could trust their partner's emotional expression or not. Trustworthy partners (low-conflict condition) with happy facial expressions were cooperative and those with angry expressions did not cooperate. Untrustworthy partners (high-conflict condition), on the other hand, cooperated when their expression was angry and did not cooperate when they displayed a happy emotion. Behavioral results showed that responses were faster for trustworthy than for untrustworthy partners. High-conflict partners activated the anterior cingulate and the right anterior insula, as well as the dorsolateral prefrontal cortex. Trustworthy partners, on the other hand, were associated with activations in the superior temporal gyri and left precuneus, which have been previously associated with Theory of Mind (ToM). In addition, the electrophysiological data showed that there were early interactions between emotion and conflict in the P1 and N170 potentials, as well as in the P300. Taken together, our results suggest that the emotion displayed by another person affects our decision-making in the Ultimatum Game. When emotional expressions are linked to their natural consequences, they engage ToM processes. In contrast, untrustworthy emotional expressions engage conflict-related brain regions during interpersonal interactions.

**[2D3] Reading and comprehension monitoring in autism spectrum disorders**

**Saldaña, D.; Rodríguez, I. R.; Moreno, F. J.; Luque, A.; Aguilera, A.; González, I.**

*University of Sevilla*

Individuals with Autism Spectrum Disorders (ASD) often show poor text comprehension. The specific reading processes that could be related to their difficulties are not yet clear. In this paper we explore the ability of readers with ASD and of readers with poor comprehension to their monitor text comprehension using an error detection paradigm. A group of adolescents with ASD, poor comprehenders without autism (PC) and typically developing readers (TD) were matched on non-verbal IQ and chronological age. Participants read stories that included pseudowords with meanings that could be inferred from the text (inferable condition) or not (non-inferable), and texts without pseudowords (explicit). After reading each story, they were asked to provide a judgment-of-comprehension (JOC) rating, a judgment-of-knowing (JOK) rating and to respond to a true-or-false inferential question. No differences in accuracy were found between groups, but were apparent between conditions. Participants in the TD group rated explicit texts higher than inferable and non-inferable texts both on judgments ( $p < .001$ ), and PC and ASD readers rated explicit texts more comprehensible than non-inferable texts on the JOC ( $p < .01$  and  $p < .05$ , respectively), but only the PC did so on the JOK task ( $p < .01$ ). A detailed comparison was also carried out on JOK and JOC scores between the items that each participant responded to correctly and those that he/she did not. Differences in both types of ratings between correct and incorrect items were significant in the TD group ( $p < .0001$ ), but not in the PC or the ASD group. The results point to difficulties in ASD readers' monitoring of written text comprehension which could lead to problems in initiating corrective strategies.

**[3B3] Desire for revenge against another person modulates the ability to take the other person's perspective in a simple visual perspective taking task**

**Samson, D.; Chipchase, S.**

*University of Nottingham*

In two experiments, we examined how the emotional state of a perspective taker and his/her appraisal of another person affects his/her ability to take the other person's perspective. The emotional state of the perspective taker was manipulated at the beginning of the experiment by a social exchange with another person who split fairly or unfairly £10. Participants were then asked to perform a visual perspective taking task which investigated the ease with which someone else's perspective is computed at an implicit and explicit level. Participants were told either that the person depicted in the visual perspective taking task was the person they were paired with in the social exchange (Experiment 1) or that the person was unrelated to the social exchange (Experiment 2). Participants were then asked to rate their feelings during the experiment. Desire for revenge as a result of the unfair social exchange compared to gratitude as a result of the fair social exchange increased the salience of the other person on the implicit measure of perspective taking but reduced the salience of the other person on the explicit measure. This was only observed in Experiment 1 but not Experiment 2 suggesting that it is the appraisal of the other person rather than simply the emotional state of the perspective taker that is at the origin of the modulation. We will discuss possible interpretations of the modulation effect.

**[8A2] ERP evidence of differences in visual verification for high schizotypal people**  
**Santamaría, C.; Orenes, I.; Naverrete, G.; Beltrán, D.**  
*University of La Laguna*

If we are told that There is a red car in the garage and find a green car when open the garage's door we feel somehow surprised. The reason is that most of us routinely verify linguistic expressions in the actual world. For that purpose, we should construct a representation of what might be the case if the expression is true and map it onto a model of what is perceived from the world. How we make to construct the model of the linguistic expression would influence on the visual processing of the world, that is, on the construction of our perceptual model. There must be individual differences affecting the process and the present ERP study aims precisely to test whether a population with schizophrenic-like traits (Schizotypy) fails to check reality in that way. To test this hypothesis, we selected 10 percent highest- and lowest-scoring participants on the SPQ (Raine, 1991) from a sample of 371 healthy people. Trials consisted of affirmative or negative sentences such as The circle is/is not red followed by colored circled that either corresponding or not with the color that would be the case if the sentence were true. To ensure that only one color could be the case for each negative sentence, an instruction was given declaring that only two colors (e.g. red and green) should be considered within specific blocks of trials. Results revealed an enhanced visual processing (P1 amplitude) of circles corresponding to what should be the case for preceding sentences in low-schizotypal participants. In contrast, high-schizotypal participants failed to show this improvement in early processing of the pictures. We propose that part of the perceptual difficulties associated to the spectrum of schizophrenia might come from anomalies in relating the internal representation with the world, rather than from specific perceptual deficits.

**[3D4] Attentional effects in conceptual metaphor congruency tasks: A test of the Coherent Working Models theory**

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<sup>1</sup>University of Granada; <sup>2</sup>University of Murcia

How can we think of abstract concepts, for which we cannot have any direct experience? The Solid Foundations View suggests that abstract concepts are represented in semantic memory via metaphorical mappings from more concrete concepts. Experimental support comes mainly from congruency tasks. In contrast with this view, we propose a processing model that promotes cognitive flexibility to the forefront, the Coherent Working Models theory, shifting the burden of explanation from semantic memory to working memory, and explicitly embracing a Flexible Foundations View of concepts. Detailed predictions are drawn from the model: congruency effects should be found only when the two conceptual dimensions (concrete and abstract) are simultaneously represented in working memory and the response is based on the dimension with a weaker activation level. Inclusion in the current model of the task and activation level depend heavily on attentional processes. These predictions are tested using Meier & Robinson's (2004) task, which was designed to assess congruency effects between vertical location and words' affective valence: emotion words were presented at upper or lower screen locations to be categorized as positive or negative. Experiment 1 devoided M&R's task of all factors calling attention to space by removing fixation cues and using vocal responding. No congruency effect was found. Experiment 2 induced voluntary attention to spatial location of words, and found the congruency effect. Experiment 3 reintroduced M&R's fixation cues, which were hypothesized to act as an automatic attentional cue to space, and again found the effect. Experiment 4 asked participants to categorize word location (up-down), instead of valence, and found no effect. Finally, Experiment 5 induced voluntary attention to word meaning, and reproduced the effect. Overall, the present experiments provide consistent support for the predictions of the Coherent Working Models theory and impose constraints to models of the processing of abstract concepts in congruency tasks.

**[9B4] The Effect of Context in Multisensory Events**

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<sup>1</sup>University of Granada; <sup>2</sup>Neuroscience and Behaviour McMaster University

Recent research on attention has showed that contextual properties of the task environment can modulate attentional control. These studies have used conflict situations related to congruency between stimuli in a particular dimension. In a typical experiment, congruent and incongruent trials are presented, and results are measured in terms of congruency effects: the difference in performance between congruent and incongruent trials, measured in reaction time and accuracy. A crucial manipulation refers to the proportion of congruent trials whereby two different task context are presented: high proportion of congruent trials and low proportion of congruent trials. Recent studies have demonstrated that the size of the congruency effect is modulated according to the context: the congruency effect is higher for blocks associated with a high proportion of congruency. This modulation is attributed to changes on attentional control set to resolve conflict, so greater control is applied in context of high proportion of incongruent trials. We applied this paradigm to a crossmodal interference situation, in order to investigate how this attentional control can influence audiovisual crossmodal interactions. During four blocks of high congruency proportion, and four blocks of low congruency proportion, participants were asked to discriminate the duration of a flash (short/long), while ignoring a synchronous white noise burst, that could have a short or long duration. The results showed the typical modulation of the congruency effect by the congruency context, which points that attention takes part on crossmodal interactions, as the same stimuli can be integrated or segregated as a function of context, in other words, as a function of attentional control. The next step was to present both contexts of congruency in the same block. The up and down part of the computer screen defined the two contexts of congruency (20%/80%). Data related to this on line experiment will be also presented.

**[1C3] A comparison of memory and executive functions in Alzheimer disease and frontal variant of frontotemporal dementia**

**Sebastian, M. V.; Hernandez-Gil, L.**

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This study examined memory and executive functions of switching and distributing attention in 25 Alzheimer patients (AD), 9 patients with frontal variant of frontotemporal dementia (fvFTD), and 25 healthy older people, as a control group, in three tasks: verbal digit span, Brown-Peterson (B-P) task, and dual-task. No differences were found in digit span. Qualitative analysis of errors in the B-P task indicated that both, ADs and fvFTDs, presented a higher number of perseverations, interpreted in this study as an index of executive dysfunction, compared to the control group. Even more, the ADs persevered more or the same as the fvFTDs. The dual-task's results showed that both AD and fvFTD had difficulties coordinating the two tasks simultaneously compared to the control group, but no differences were found between both patients. Although the presence of alterations in the executive functions of AD patients may suggest that these functions would depend on the correct functional integration of various cerebral areas, it would be of great interest to include neurological evidence in order to contrast these results in future research.

**[1E2] Attention enhances spatial and temporal resolution**

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<sup>1</sup>University of Hull <sup>2</sup>University of Essex

Many studies have shown that attending to a visual event enhances its subsequent processing. However, a series of influential studies have suggested that while observers are better when reporting the spatial characteristics of attended stimuli, they are poorer when reporting the temporal characteristics. This counterintuitive finding has recently been challenged on two grounds: 1) that the stimulus parameters of the spatial and temporal tasks are often quite different; and 2) disagreement in which baseline one should use to compare attended temporal performance. The present Experiment 1 used a precueing paradigm in which observers made either spatial or temporal judgments about the same target stimuli. Results showed that attention improved both judgment types, but overall speed and accuracy were poorer in the temporal task. Experiment 2 employed a staircasing method to encourage accuracy above 90% in both tasks, thus enabling overall performance to be closely matched. Results showed that once again, attention improved both judgment types. These findings strongly challenge the notion that attention improves spatial resolution but impairs temporal resolution.

**[7E2] Mechanisms underlying the development of probabilistic cuing in large-scale environmental search**

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Everyday search of our environment is informed by sensitivity to probabilistic information about the likely spatial position of target items. Cueing by target statistics has been primarily measured using the visual search paradigm, although there is good reason to doubt whether search processes observed on a monitor will be equivalent to those that operate during large-scale egocentric movement through space. We have recently reported (Smith et al., in press) that adults are indeed sensitive to probabilistic information in large-scale search, but only under certain environmental conditions. We here explore the development of that ability in a population of children aged between 8 and 14 years. Participants searched for a hidden target within an automated array of lights and switches embedded in the laboratory floor – 80% of targets appeared on one side of the array. Participants also completed a battery of individual differences measures. We found that the youngest children (like the adults) were able to learn about the probability distribution of target items. Modelling of their search paths indicates that exploration of the space becomes more optimal as children get older. Individual differences data suggest that these processes are related to spatial working memory, but not to executive or linguistic factors. Additional data from a cohort of children with Autism Spectrum Disorder are compared to a matched subsection of this group, and the data show an unsystematic and non-optimal search of space in this population. These findings have important implications for understanding the processes that underlie efficient search of our surroundings. References Smith, A. D., Hood, B. M., & Gilchrist, I. D. (in press). Probabilistic cueing in large-scale environmental search. *Journal of Experimental Psychology: Learning, Memory, and Cognition*.

**[8C2] Predicting group processes from personality dissimilarity**

**Solanas, A.; Manolov, R.; Leiva, D.; Andrés, A.**

*University of Barcelona*

Experimental social psychology often deals with predicting group processes from demographic and personality variables. As it has been supposed that group members' personality attributes are related to group performance, most research into this topic has focussed on the Five Factor Model. The main statistical problem arises from how to represent group composition. In general, researchers have used aggregated measures (e.g., minimum, maximum, mean, and variance). Although each aggregated measure was proposed to represent specific aspects of group members' properties, most indexes show typical pitfalls that do not recommend using them irrespectively of their statistical characteristics. Regarding the minimum and maximum values, both suppose that a single individual may determine group performance. Although the mean has been often used, it can only serve as a rough indicator since extreme scores may cancel each other and thus mask some effects. As regards variance, it measures group members' similarity with respect to an arbitrary point, that is, it is not based on individuals' distances. In addition, aggregated measures have not been useful to properly predict group performance, as these indexes are not founded on individuals' properties comparison. For the reasons mentioned above, we proposed a new index based on individuals' personality dissimilarities for measuring group features, since it is suggested that group performance is related to how alike group members are among them. The proposed index is a measure at global level and allows quantifying the degree of individuals' dissimilarity in personality characteristics. In order to enhance the applicability of the index proposed, an R package was developed. As previous experimental results have shown low group performance predictability, the index proposed was tested with data obtained from a social psychology experiment. The results show the index proposed enables researchers to improve group performance prediction in comparison to previous outcomes.

**[6B3] Tracking down the time course of spatial remapping of touch: Evidence from saccadic latencies and evoked potentials**<sup>14</sup>Soto-Faraco, S.; <sup>2</sup>Overvliet, K. E.; <sup>34</sup>Azañón, E.; <sup>4</sup>Calabresi, M.<sup>1</sup>*Institució Catalana de Recerca i Estudis Avançats (ICREA)*; <sup>2</sup>*University of Leuven*; <sup>3</sup>*University of Barcelona*; <sup>4</sup>*Pompeu Fabra University*;

Reacting to a touch on the skin, like swatting the mosquito that just landed on your forearm, involves localizing the tactile event in an external reference frame. It has been claimed that tactile spatial remapping, from somatotopic (skin referenced) into external coordinates, results from a quick and automatic integration of somatosensory input with information about body posture. However, most of the evidence so far comes from paradigms where the time course of remapping has been indirectly inferred from temporal order or spatial cueing tasks. To investigate the time course of the integration between touch and information about body posture, we analysed saccadic eye movements (Experiment 1) and evoked potentials (Experiment 2) to somatosensory stimuli delivered to the hands in a crossed or uncrossed arm posture. In the crossed arms posture the somatotopic and the external frames of reference are set in spatial conflict (i.e., a right limb is placed on the left side of the body midline). In this posture, a proportion of saccades where initially executed toward the wrong side and then quickly corrected online after about ~250 ms (or else, terminated in an error). These curved saccades typically had a shorter onset latency compared to straight saccades, and we assume that they reflect the transition between tactile reference frames. In the ERPs, we observed the typical somatosensory evoked potential (SEP) profile (P50, N80, P100, N140), but the potentials in crossed arms posture started to differ from the ones with straight arms at around ~80 ms, with the differences lasting up until 350 ms. The scalp distribution of these the differences was fronto-temporal and left-lateralized, regardless of the side of stimulation. From these complementary data on saccadic latencies and SEPs, we advance some potential features of the functional architecture of tactile remapping.

**[8B3] Task switching, Inhibition, and executive control in children with autism.**<sup>1</sup>Stoet, G.; <sup>2</sup>López, B.<sup>1</sup>*University of Leeds*; <sup>2</sup>*University of Portsmouth*

Task-switching performance is often used as a measure of executive control functions. We designed a novel task-switching paradigm to study executive control functions in children with autism spectrum disorder (ASD). We compared 19 children with ASD (9 to 16 years old) with an age and IQ matched control group. Children with ASD had increased difficulty with task switching only when memorizing arbitrary rules was required. When no arbitrary rules needed to be memorized, they performed accurately and quickly. Nevertheless, they showed less distraction from task-irrelevant stimulus features, suggesting that they represented tasks differently from the children in the comparison group. We conclude that executive control impairments in ASD are more complex than hitherto hypothesized due to mutual interactions between memory demand and task representations.

**[8E4] Saccade processing in hemispatial neglect**

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It was previously been reported, that the frontal lobe plays an important role in the inhibition of eye-movements (Olk & Kingstone, 2003) and that patients with frontal lesions show increased problems in suppressing unwanted pro-saccades (Everling & Fisher, 1998). Nevertheless, Butler et al. (2009) recently found evidence that patients with posterior lesions suffering from hemispatial neglect are also unable to perform correct anti-saccades. Here we investigated whether this deficit could be driven by an inhibition failure. We tested patients with hemispatial neglect after right hemisphere stroke and healthy elderly subjects in a pro-anti and fixation task paradigm: in the anti-saccade condition the patient was required to inhibit the stimulus driven saccade towards a target that appeared either to the right or the left side of the central fixation and to produce a voluntary saccade towards the opposite side. Patients were also asked to saccade towards these targets (pro-saccade condition) and finally (fixation condition) to ignore the target and maintain fixation on the central dot. For the anti-saccades, the neglect patients showed a bilateral impairment, in that they produced incorrect pro-saccades towards left and right stimuli. Prosaccades could be executed but their accuracy was reduced especially towards the left targets. In the fixation condition, patients showed an increased amount of false pro-saccades towards the right stimuli only. As previous argued (Butler et al, 2009) the data support the interpretation that with a right stimulus, the neglect patients code the location accurately, but fail to suppress the right pro-saccade in favour of the leftward anti-saccade. For the left target it may be that the target location is not coded accurately in the first place (even pro-saccades fall short of the target) thus precluding vector inversion.

**[9B3] Body parts are unlike faces: Behavioral evidence from the singleton paradigm**

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There is a debate in the literature showed that, faces are not the only category, can capture attention, and classified faster than other objects, but also body parts, showed the same advantages. However human bodies like faces carry important information about identity, gender and emotional status, and also facilitates the social communication. This integration between bodies' actions and facial expression is useful to transferee information from dispatcher to recipient. Theses human body parts are including different parts and there are common properties combined them together, for instant hands; legs and arms are the movement parts, whilst the other parts like as torso and shoulders are the static parts. In two Experiments, we utilize a modified visual search paradigm, to investigate i) whether body parts like faces can capture attention, and show the classification advantages compared to other objects ii) differentiate between Active (i.e. hand), and passive parts (torso) in classification advantages and attention capture. In the first experiment we presented either faces or body parts together with five different objects, but in the second experiment we presented active or passive with the same categories which we used in Experiment 1. Participants decided whether a randomly chosen target (surrounded by a green frame) belonged to a previously presented category. In half of the trials, an additional red frame surrounded a non-target singleton object was appeared. Consistent with earlier studies, participants responded faster to face and passive targets than to others, showing that there is classification advantages related to faces and human passive parts, but when faces appeared as singletons, they attracted attention and increased reaction times more than body parts or other objects, whilst no difference was observed between active and passive parts. These results indicate greater attention capture by faces, and present strong evidence that body parts are unlike faces.

**[3A5] Interferences between predictors and causes in cue competition**

**Thorwart, A.; Lotz, A.; Lachnit, H.**  
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Some recent studies of human contingency learning observed cue competition (blocking, overshadowing) in causal learning but not in predictive learning. We investigated whether the amount of cue competition differs when the causal and predictive stimuli are intermixed within one blocking task. In addition to the causal status of the stimuli (causal vs. predictive), we manipulated their functional status (blocking vs. to-be-blocked cue). Tests were conducted for both causal and predictive judgments. In contrast to former studies, we did not find more cue competition for causal stimuli in general. Instead, we found blocking to depend on an interaction of stimulus type and type of judgment.

**[2A1] The Edinburgh Virtual Errands Task (EVET): An experimental study of the complexities of everyday cognition**

**<sup>1</sup>Trawley, S.; <sup>2</sup>Law, A.; <sup>1</sup>Logie, R.**  
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What cognitive processes are important for multitasking? An influential model of multitasking performance (Burgess et al, 2000) predicts specific relationships between three latent cognitive constructs: planning, retrospective and prospective memory. However, the role of planning was not well supported by the cognitive data. In this talk we will present some recent progress in using virtual errands methodology (see McGeorge et al, 2001 and Law et al 2006) to create a virtual analogue of the Multiple Errands Task (Shallice & Burgess, 1991). The Edinburgh Virtual Errands Task (EVET) requires participants to attempt eight location based errands in a four storey virtual building (e.g., collect computer from room G4). The virtual building was created using the Valve Hammer Editor, a 3D map creation program provided with the computer game Half-Life 2. 157 participants (95 females, 62 males - mean age 19.6yrs) learned the errand list to criterion and made a plan before starting the test. In addition to the measures used to support the original model, we included independent measures of spatial and verbal working memory span, planning, retrospective and prospective memory. Multiple regression analysis showed that independent measures of spatial working memory span, planning ability and retrospective memory were significant predictors of EVET performance. Results are supportive of accounts that argue for domain-specific working memory processes, and highlight a role for spatial working memory capacity in multitasking. The role of planning and retrospective memory in multitasking was supported in this dataset and is in line with the Burgess et al model. However, data are in disagreement over the importance of prospective memory (as indexed by independent measure of PM).

**[5A1] Dissociating sequential effects from explicit expectancies: towards a model of sequential decision making**

**Tubau, E.; López-Moliner, J.; Supér, H.**  
*University of Barcelona*

Everyday tasks seldom involve isolated actions but sequences of them. We can see how previous actions facilitate the current one by exploring the response time to sequences of stimuli. Specifically, depending on the response-stimulus temporal interval (RSI) different mechanisms have been proposed to explain sequential effects in two-choice tasks. Whereas an automatic facilitation mechanism is thought to produce a benefit for response repetitions at short RSIs, at longer RSIs, subjective expectancies are considered to replace the automatic facilitation, producing a cost-benefit pattern: repetitions are faster after other repetitions but they are slower after alternations. Whether these effects can be modulated by knowledge of the specific sequence remains, nevertheless, unclear. By using a fixed sequence, a similar cost-benefit pattern was observed in both good and poor learners and in all learning blocks. Therefore, results suggest that cost-benefit patterns are the consequence of automatic mechanisms which operate independently of (and simultaneously with) explicit knowledge of the sequence or other subjective expectancies. Further analyses of reaction time as a function of runs of repetitions and alternations showed that the decrease of RT is well captured by a power function with a common exponent of -1 independently of knowledge, supporting the suggestion that all sequential effects emerge from low level automatic mechanisms. Interestingly, explicit knowledge is characterized by a reduced additive component of the RT. These results have implications for extending current models of RT in decision making to the sequential domain.

**[5E2] Cue-density effects on outcome prediction and causal judgment**

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<sup>1</sup>University of Deusto; <sup>2</sup>Blaise Pascal University; <sup>3</sup>Catholic University of Leuven

A consistent finding observed in many contingency learning experiments is that people's estimation of the strength of a cause-effect relation is systematically biased by a number of variables, such as the relative frequencies of the cause and the effect. Some studies have found, however, that these latter biases are highly dependent on the procedure used to assess participants' perception of the contingency: Specifically, these effects tend to occur more often when participants are requested a causal or contingency rating than when their contingency perception is inferred from their actual, trial-by-trial predictive behavior. This result has been taken as evidence for the higher complexity of the cognitive processes underlying causal or contingency judgments, relative to those involved in outcome prediction. Our experiments show, however, that the cue-density bias can be observed even when a predictive judgment is used as a dependent variable. This suggests that previous failures to observe biases with predictive trial-by-trial responses might not have been due to their predictive nature but to the specific response format and the moment when which these measures were collected (during training or after training) in those experiments.

**[6B4] Virtual lesions of right parietal cortex disrupt spatial compatibility effects**

<sup>1</sup>Valle-Inclán, F.; <sup>1</sup>Fernández del Olmo, M.; <sup>2</sup>Blanco, M. J.  
<sup>1</sup>University of La Coruña; <sup>2</sup>University of Santiago de Compostela

We investigated the effects of repetitive TMS over the right parietal lobe on a special case of spatial compatibility in which the spatial dimension of the stimulus is irrelevant (the Simon effect). Stimuli were Gabor patches (4 cycles per degree, 0.5° aperture, 100% contrast) with vertical or horizontal orientation presented at 3° at left or right of fixation. Subjects reacted by pressing a left- or right-located key with the corresponding hand. There were two conditions (160 trials each). In one of them, trains of 4 TMS pulses at 20 Hz were delivered over the right parietal cortex (P4, international 10-20 system) on half of the trials randomly selected; in another condition, the TMS coil was reverted so the subjects heard the noise associated with the TMS pulses, but were not stimulated (sham TMS). The order of the two conditions was counterbalanced across subjects. The results showed a clear compatibility effect (faster reactions when the responding hand and the stimulus location were on the same side) in the sham TMS condition, but in the real TMS condition, the compatibility effect was abolished only on those trials with TMS stimulation. These results imply the right parietal cortex in visuo-motor transformations (a well established fact) and complement the previous studies with TMS on the Simon effect that stimulated the prefrontal (Praasmtra et al., 2000) and the motor cortex (Sturmer et al., 2002).

**[8A3] Interference control in Parkinson's disease and freezing of gait**

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<sup>1</sup>Soetens, E.; <sup>2</sup>Kerckhofs, E.  
<sup>1</sup>Vrije Universiteit Brussel; <sup>2</sup>Catholic University of Leuven

Freezing of gait (FOG) in Parkinson's disease (PD) is not solely a problem of the motor system. Revealing cognitive differences between freezers (PD-F) and non-freezers (PD-NF) can be useful in order to gain further insight into the mechanisms of FOG. We assumed PD-F to be impaired in the executive control network, part of the Attention Network Task (ANT; Fan et al, 2002), compared to PD-NF and healthy controls. Moreover we expected PD-F to have more difficulties in suppressing interference arising from the automatic activation of salient responses (resulting in more fast direct-activation errors). Three groups (PD-F (n=8), PD-NF (n=8) and healthy controls (HC; n=6)) were matched for age, education and disease duration. General screening tools for dementia, global cognitive functioning and depression were administered. The ANT was used to assess the orienting, alerting and executive control network. Distributional analyses were conducted to compare the amount of fast errors between groups. According to our expectations PD-F displayed impairment in the executive control network (ANT) compared to both PD-NF and HC. Moreover, we could observe a marginal significant effect in the pattern of error rates suggesting that PD-F showed stronger initial, incorrect response activation. The orienting and alerting networks showed no significant differences between groups. These differences in conflict resolution and error rates show that FOG could be associated with a rather specific impaired cognitive profile.

**[5A3] Deciding how to use memory: The distinctiveness heuristic**

**Verde, M. F.**

*University of Plymouth*

Memory is not a passive retrieval process but one that requires a complex series of decisions. How much retrieved evidence is sufficient? Which evidence is most compelling or most useful? These decisions are guided by rules such as the distinctive heuristic, according to which memories are judged based on presence or absence of expected, distinctive qualities. A signal detection model of recognition suggests that bias and selection are two fundamental aspects of the decision process. Three studies manipulating the imagery and encoded strength of word lists show that both bias and selection underlie the distinctiveness heuristic. Moreover, they reveal that people possess a sophisticated understanding of the properties of their own memory.

**[1E3] What's in a name? Observers' name grab attention even subliminally**

**Vuong, Q. C.; Stranney, M. A.**

*University of Newcastle*

A person's name is perhaps one of the most important and socially significant stimulus which can capture his or her attention. To test the strong salience of a person's name, we combined an attentionally demanding conjunction search task with subliminal spatial cueing. Observers in our study searched for a target 'L' among distractor 'T's presented 500 ms after a brief 200 ms spatial cue display. The contrast of the cue display was below the threshold for perception. Importantly, this display contained the observer's own name or low frequency words matched for letter length. Although the spatial cue was not predictive of target location, we found that observers detected targets more slowly when their name cued a target location (target-valid trials) than when it cued a non-target location (target-invalid trials). There was no effect of target validity for low frequency words. We confirmed after the search task that observers detected their name in the subliminal spatial cue display at chance. The findings are suggestive of inhibition of return, in which observers' attention was captured by the subliminal name resulting in a delayed response when a target appeared at that cued location.

**[1D5] What information about pages of text is made explicit in the first steps of human vision?**

**Watt, R.**

*University of Stirling*

Vision may be a relatively neutral part of the process of decoding a page of text, simply supplying more cognitive levels of processing with a fair and adequate description of the image of the page to be interrogated and used appropriately. However, it is a possibility that even quite early visual processes such as low-level grouping may generate perceptual structures that already accomplish significant progress towards word segmentation, ordering and identification which are probably important steps on the route to comprehending the page. I report several computational and psychophysical studies designed to show that the fundamental visual processes of filtering, segmentation and grouping, without which vision would be meaningless, will yield structured representations of a page of text that can be related directly to the requirements of a reading task. I focus on the layout – the relative spatial positions – of letters, words and lines. Logically, the information required to decode a page is essentially qualitative: ordering in space (such as which letter is left of which in a word for example). This places relatively relaxed criteria on how that information is placed on the page. Visually, however, I show that the requirements on the spatial layout of information is considerably more constrained for efficient processing. Changes to typography that would result in poorer or inappropriate grouping and segmentation are explored computationally and psychophysically. These changes include contrast, orientation, spatial scale and alignment of printed structures. The results show that making disruptions to visual but not logical structures in pages of text can make certain reading tasks less efficient.

**[4E1] Perception of the duration of emotionally-evocative stimuli**

**Wearden, J.**

*University of Keele*

Some recent research has suggested that stimuli which provoke emotions (e.g., pictures of faces) appear to last longer than neutral stimuli (e.g., ovals), because the arousal they provoke "speeds up" the pacemaker of an internal clock. The present paper reports a series of experiments using images from the International Affective Picture System as emotionally-evocative stimuli. These pictures have already been rated for arousingness and valence. In a verbal estimation task, high arousal-high valence pictures were judged as lasting longer than red squares of the same duration, but low-arousal-high valence pictures were not. The results further suggested that the arousal effect was independent of duration, contrary to the "pacemaker speed" interpretation, which would predict more marked effects at longer durations. Data from experiments using bisection methods, and from attempts to condition emotional states to neutral stimuli, will also be reported.

**[9A1] Segmentation of spontaneous speech**

**White, L.; Wiget, L.; Rauch, O.; Sven L.; Mattys White, L.**  
*University of Bristol*

Speech segmentation research asks how listeners locate word boundaries in the ongoing speech stream. Previous work has identified multiple cues (lexical, segmental, prosodic) which affect perception of boundary placement (e.g. Cutler & Norris, 1988; Norris, McQueen & Cutler, 1995; Quené, 1992). Not all segmentation cues are exploited by listeners at all times, however. In optimal listening conditions, listeners rely on lexical identity and syntactic/semantic structure, and pay less attention to sub-lexical cues (Mattys, White & Melhorn, 2005). Where lexical and contextual information is unhelpful, sub-lexical cues become relatively more important, with segmental/acoustic cues such as phonotactics and initial lengthening dominant over stress, which, in English, seems to be a last-resort cue when other sources of information are compromised (Mattys, White & Melhorn, 2005). Studies of listeners' exploitation of segmentation cues have almost all been based on careful read speech; however, the realisation of boundary cues may be modulated by the interactive and contextualized nature of spontaneous speech. In particular, degree of articulatory effort – hyperarticulation vs hypoarticulation – has been held to vary as a function of communicative and situational demands (e.g. Lindblom, 1990). Cues that are highly salient due to hyperarticulation in non-contextualised speech may be reduced where lexical content is predictable. The hierarchy of weights that listeners afford to the range of available segmentation cues may consequently vary between read and spontaneous speech. We here report: (1) development of parallel corpora of English spontaneous and read speech that allow us to compare the realisation of word-boundary relevant information in the two styles; (2) results of cross-modal priming experiments that compare listeners' utilisation of the segmentation cues present in spontaneous and read speech. In particular, we consider the exploitation for spontaneous speech segmentation of cross-boundary phonotactic regularities and timing patterns, and of lexical predictability based on foregoing context.

**[5E3] Investigating stimulus novelty and familiarity using a three-stage procedure: Tests of lesions of the perirhinal cortex, and systemic scopolamine administration.**

**Whitt, E. J.; Robinson, J.; Jones, P. M.**  
*University of Nottingham*

The current experiments used a task with three stages. In the first stage, rats were presented with auditory stimuli, some receiving both A and B, and others B only. In the second stage, all rats received pairings of A and a brief footshock (to establish conditioned suppression). In the final stage, generalised conditioned suppression to B was assessed. The generalisation from A to B was greater for rats receiving both A and B during stage-1 training. This is consistent with the suggestion that preexposure of both A and B had rendered them more alike, based on their shared familiarity. In separate experiments, it was found that excitotoxic lesions of the perirhinal cortex, and muscarinic blockade (obtained by systemic scopolamine administration) affected this familiarity-based form of generalisation. These findings confirm the roles of the perirhinal cortex and muscarinic system in familiarity sensitivity seen in other recognition memory tasks. The current procedure also complements recognition memory tasks in the information it yields about rats' familiarity processing.

**[1C4] Long - term accelerated forgetting of verbal and non-verbal information in Temporal Lobe Epilepsy****<sup>1</sup>Wilkinson, H.; <sup>2</sup>Holdstock, J. H.; <sup>3</sup>Baker, G.; <sup>4</sup>Herbert, A.; <sup>5,6</sup>Clague, F.; <sup>2</sup>Downes, J. J.***<sup>1</sup>University of Chester; <sup>2</sup>University of Liverpool; <sup>3</sup>University Department of Neurosciences, Walton Centre for Neurology and Neurosurgery; <sup>4</sup>Devon Partnership NHS Trust; <sup>5</sup>Astley Ainslie Hospital of Edinburg; <sup>6</sup>University of Edinburg*

Abstract: We investigated whether pre-surgical patients with temporal lobe epilepsy (TLE) forget verbal and non-verbal, visuo - spatial, material faster than healthy controls over retention intervals of an hour and six weeks, and whether there were material specific memory deficits associated with the lateralization of hippocampal abnormality. A mixed factorial design compared the performance of 27 patients with TLE and 22 healthy control participants, matched for IQ, age and gender, on tests of story recall and complex figure recall at three delays: immediate, one hour and six weeks. Performance of the patient and control groups was matched at the immediate delay, which enabled comparisons of forgetting rate over the longer delays. We found material-specific effects at the one hour delay, with poor story recall associated with left hippocampal abnormality and poor Rey Figure recall associated with right hippocampal abnormality. At the six week delay, both groups of patients demonstrated less retention of both verbal and non -verbal, visuo-spatial, information than the control group, and also showed faster forgetting than the controls over this period. Retention over the six week delay was not associated with hippocampal pathology but was associated with seizure frequency. The findings provide evidence consistent with an extended period of consolidation for both verbal and non-verbal memories that can be disrupted by both left and right TLE. The material-specific effects at the one hour delay only, suggest that the initial consolidation of verbal and non-verbal, visuo -spatial, information depends on the integrity of the left and right hippocampus, respectively.

**[8D5] ERP evidence for differential effects of word length in the left and right cerebral hemispheres****<sup>1</sup>Wright, V.; <sup>1</sup>Fouquet, N.; <sup>2</sup>Mills, D. L.; <sup>1</sup>Izura, C.***<sup>1</sup>University of Swansea; <sup>2</sup>University of Bangor*

ERP evidence for differential effects of word length in the left and right cerebral hemispheres. Manipulating the length of words presented to the left and right visual fields has long been reported to elicit differing effects within each of the cerebral hemispheres (see Ellis, 2004 for a review). The basis for this observation is the fact that behavioural data from lateralised word recognition tasks typically demonstrate a right visual field advantage (RVFA), whereby the left hemisphere is thought to be relatively insensitive to the effects of increasing word length whilst both response latency and error rate increase as word length increases in the RH. The present study investigated the neural basis of the RVFA. Twenty right-handed English monolinguals performed lexical decision on short (4 letters) and long words (7 letters) presented to their left and right visual fields whilst ERPs were recorded from 64 scalp sites. Behavioural data showed the characteristic interaction between word length and visual field, with a greater effect of length in the RH than in the LH. ERP data revealed a first negative component (N1, ~150ms) contralateral to stimulus presentation, with a larger difference in amplitude between short and long words in the RH than the LH for several temporal and parietal electrodes. A later effect of length (~300ms) was also observed in the RH for several parieto-occipital sites, irrespective of where the stimulus was presented in the visual field. In the LH, processing for all words, irrespective of length and presentation location, was highly similar from ~190ms onwards in parieto-occipital regions. The results of this investigation offer electrophysiological evidence for differential effects of word length in each of the cerebral hemispheres under conditions of lateralised presentation. The implications will be discussed in terms of current models of word recognition.

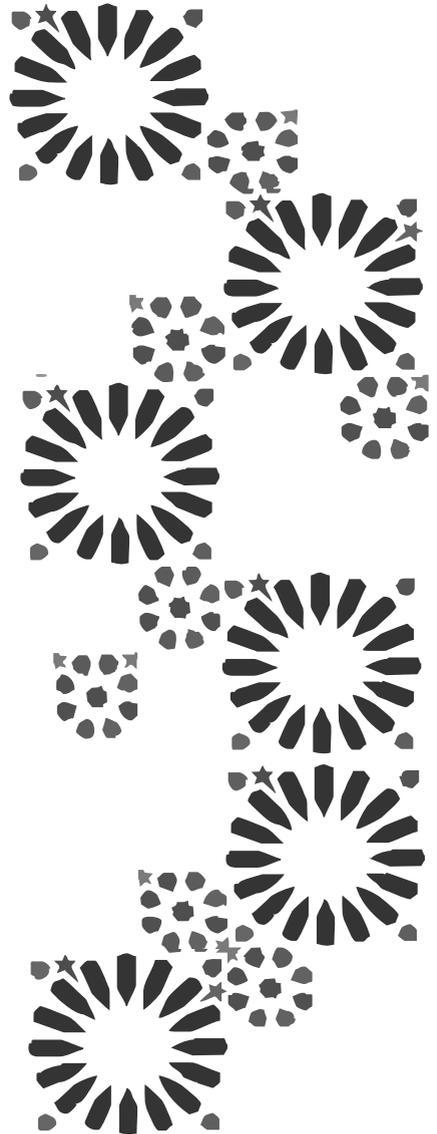
**[2A3] Do I have your memory? Joint memory effects on visual attention**

<sup>1</sup>Xun He; <sup>2</sup>Sebanz, N.; <sup>1</sup>Humphreys, G. W.

<sup>1</sup>University of Birmingham; <sup>2</sup>Radboud University Nijmegen

In everyday life tasks are often performed jointly. It has been established that when engaged in joint action, people will represent elements of others' tasks and be affected by others' actions. However, the effects of such shared task representations on wider aspects of cognitive performance have not been examined. In particular, if two people are concurrently involved in a memory task, do they represent information in memory that their co-actor must hold, even if it is not relevant to their task? Further, does any such information held in memory influence the subsequent guidance of attention – do we attend to what would be attentionally capturing to our co-actor? To assess these questions, we conducted a joint action version of the working memory and attention procedure, in which we presented to participant pairs tasks where they both had to hold particular stimuli in working memory, and either one or both participants carried out a visual search task. The results showed that participants were drawn to stimuli in search that matched their own memory, replicating the memory guidance effect on attention. Additionally, we found for the first time that participants' attention was influenced by a representation of what a co-actor had in memory: visual attention was drawn to the stimuli that the other participant held in memory, but only when both participants in a pair performed both stages of the task (memory and visual search). These data suggest that, depending on the overlap in task components, participants who engage in joint action represent in memory information relevant to their co-actor which then affects attention allocation accordingly.

# POSTERS





**[PII-32] Verbs and nouns in sli: Evidence from eye movements**<sup>1</sup>Andreu, L.; <sup>2</sup>Buil, L.; <sup>2</sup>Sanz-Torrent, M.<sup>1</sup>Oberta University of Catalunya; <sup>2</sup>University of Barcelona

The semantic representations of verbs and nouns have been considered an important factor that defines the different complexities between nouns and verbs. Moreover, several studies have shown that verb processing becomes more difficult as the number of arguments entailed within the verb's representation increases. In the present study, we registered eye movements for compare the time of visual recognition of nouns and verbs with different argument structure while subjects listened their spoken words. 25 children with Specific Language Impairment, 25 age-matched controls, 25 MLU controls and 31 adults took part in the study. Results showed significant an animacy effect in the visual exploration before the word was finished. Moreover, after word finished differences between nouns and verbs with different argument structure were found. In adults, when the number of verb's arguments increases, the recognition becomes slower and less accurate. Age-matched controls showed the same pattern of looks for nouns and one-argument verbs and other pattern of looks for two- and three-argument verbs. Although children with SLI and MLU group showed a pattern of looks that weren't related with semantic load of each word type. We suggest that this was due to an incomplete argument structure representation.

**[PI-60] Stimulus pre-exposure schedule and eye-tracking activity in a visual stimuli identification task**<sup>1</sup>Angulo, R.; <sup>2</sup>Di Stasi, L. L.; <sup>2</sup>Catena, A.; <sup>1</sup>Alonso, G.<sup>1</sup>University of the Basque Country; <sup>2</sup>University of Granada

An experiment is presented in which participants were asked to identify a target stimulus from a similar stimulus in a "same/different" judgment task without feedback. The stimuli employed were two nonsense Arabian letter compounds having 4 common letters and 1 distinct letter. The task was run after participants from different groups received a concurrent, alternated or blocked phase of pre-exposure to stimuli. Gaze position was recorded throughout the experiment (pre-exposure and testing phase), and analyses of the time and number of eye fixations on the distinctive and common letters of the stimuli as well as the first point of fixation, were made. Participants were better able to judge differences between stimuli after concurrent pre-exposure than after alternate or blocked pre-exposure. The first point of fixation was made on the distinctive letter in a greater proportion of participants in the concurrent condition. Furthermore, only the pre-exposure conditions that provided an opportunity for stimulus comparison (alternated condition, and particularly concurrent condition) was an increase in time and number of eye fixation on distinctive letters, and a decrease in time and number of eye fixation on common letters, observed with repeated experience. These results are discussed in relation to the Stimulus Differentiation theory of perceptual learning of Gibson (1969).

**[PII-61] Eye movements in autistic and typically developed individuals during a static versus dynamic false belief task**

<sup>1</sup>Au Yeung, S. ; <sup>1</sup>Kovshoff, H.; <sup>1</sup>Benson, V.; <sup>2</sup>Smith, T. J.  
<sup>1</sup>University of Southampton; <sup>2</sup>University of Edinburgh

A previous study by Speer, Cook, McMahon Clark (2007) have shown atypical eye movement behaviour in Autistic individuals compared to their typically developed (TD) counterparts during free-viewing of social dynamic scenes but not social static, isolated static and isolated dynamic scenes. This suggests that as the level of task complexity increases, information processing becomes increasingly difficult for Autistic individuals. Our study explored eye movements in these two populations when they viewed two versions of stimuli for a false belief task, one presented in a video and one presented in a sequence of static images. We hypothesized that more profound differences in patterns of eye movements between the two groups would be revealed in the dynamic condition as compared to the static condition, since the dynamic presentation of information is more complex. The findings are discussed with reference to cognitive processing impairments in Autism.

**[PIII-34] Grapheme complexity effects during handwritten production of spanish words**

**Afonso, O.; Álvarez, C. J.**  
*University of La Laguna*

Grapheme complexity effects during handwritten production of Spanish words Olivia Afonso<sup>1, 2</sup> and Carlos J. Álvarez<sup>1</sup> <sup>1</sup> Universidad de La Laguna <sup>2</sup> Basque Centre on Cognition, Brain and Language Although Spanish is essentially considered a shallow language, in some cases graphemes are constituted by more than one letter (for instance, the grapheme *gu* in the word *guerra*). These so-called complex graphemes (meaning phonemes which are represented by more than a letter) have been observed to affect the handwriting of French words (Kandel, Soler, Valdois & Gros, 2006). We addressed this issue in Spanish in order to test if the transparency of the language can modulate this effect. For this purpose we compare words containing complex versus simple graphemes. The main novelty of our experiment if compared with previous studies is the use of the same letter sequence in both conditions, avoiding as far as possible the potential effect of letter identity. For example, we compare the sequence *g+u* in the word *guinda* versus the same sequence in the word *guante*. In the word *guinda* the target sequence is linked to just one phoneme (the sound /g/), but in *guante* the letters *g* and *u* represent two different phonemes (/g/+/u/). Participants copied visually presented words on a sheet of paper placed over a graphic tablet connected to a laptop. Writing latencies, letters and inter-letters durations and whole-word durations were measured and analyzed. Results showed that grapheme complexity affected writing durations but not writing latencies, suggesting that sublexical phonological information is, at least, partially recovered during the writing process. This study support the idea of handwriting movements starting before the whole word had been fully processed, and reveals phonological effects in the latest moments of the writing production process.

**[PI-2] The effects of hypnosis on performance of executive control tasks in a patient with frontal lobe damage**

**Agis, I. F.; Daza, M. T.; del Águila, E. M.; Aguado, R.; Soriano, C.**  
*University of Almería*

Previous studies have shown that hypnosis can profoundly alter sensory awareness and cognitive processing (e.g. Raz, Shapiro, Fan & Posner, 2002; Egner, Jamieson & Gruzelić, 2005). The aim of this study was to assess the performance of a patient with frontal damage (MAA) on executive control tasks before and following hypnotic induction (not containing specific tasks-related instructions). We used a computerized version of the Stroop task (Fan et al., 2003), a version of the Eriksen flanker task (Eriksen & Eriksen, 1974) and a computerized version of the Sternberg task (Sternberg, 1966). For 7 consecutive weeks MAA performed the executive control tasks. In sessions 2, 4 and 7, the patient received hypnotic induction (with MCI technology) during 30 minutes and then performed the executive control tasks. In the study also participated two control subjects, a patient with frontal damage (with neuropsychological sequelae similar to MAA) and a healthy control matched for age and sex. The control subjects also performed the cognitive tasks for 3 consecutive weeks but never received hypnotic induction. The results showed that MAA improved his performance in the executive control tasks, especially in the post-hypnotic sessions (when the performance following hypnotic induction). However, the performance of the control subjects did not improve significantly. These results suggest that hypnosis could be a useful tool in neuropsychological rehabilitation of patients with brain damage.

**[PIII-74] Faces as emotional signals: Psychophysiological measures in an association task**

**Aguado, L.; Valdés-Conroy, B.; Román-González, F. J.; Rodríguez-Fernández, S.; Diéguéz-Risco, T.; Fernández-Cahill, M.**  
*University of Madrid*

Behavioral, ERP (event-related potentials) and EMG (electromyography) responses to expressive and non-expressive faces were obtained in different experiments in the context of an association task where the participants had to identify different individuals as being “friendly” or “hostile”, according to the emotional expression they showed. Differential facial EMG activity, measured over the zygomaticus and corrugator muscles, was observed both to expressive faces (happy or hostile) and to the neutral (non-expressive) face of the individual associated to each expression. Modulation of electrical brain activity was also observed to both types of faces. Specifically, modulation of the amplitude of the face-sensitive N170 component, detected over occipito-temporal electrodes and of early (120ms) frontal components were observed. Preliminary source localization analyses confirmed N170 source in the fusiform gyrus. Our experiments confirm previous results showing differential facial activation and modulation of different ERP components to different emotional expressions and show for the first time that these effects can be transferred, probably through a conditioning-like process, to the image of the neutral face of the individual showing each expression. These effects might be reflecting the action of mechanisms important for the formation of impressions and learning of affective reactions to our conspecifics in the course of social interaction.

**[PII-54] Producing false memories through the drm paradigm: The role of theme identifiability and word strength association**

**Albuquerque, P. B.; Resende, A.; Paulo, R.; Capelo, A.**  
*University of Minho*

The production of false memories through the DRM paradigm (Deese, 1959; Roediger & McDermott, 1995) is negatively related with the identification of the implicit theme associated to the word lists (Neuschatz, Benoit, & Payne, 2003). There is some evidence that the application of a strategy involving the extraction of the theme during the presentation of the words decreases the level of false memories. In our study we presented to the participants fifty backward association lists in order to manipulate the order of word presentation (three conditions: decreasing the association strength with the critical lure; increasing it; or at random). Results showed that the identification of the theme is facilitated in the decreasing presentation condition, although the identification of the theme needs to have some amount of association with the critical lure to occur. Results also showed that in the decreasing presentation condition the participants needed fewer words to extract the theme of the list, in comparison to the other two presentation conditions.

**[PI-66] Testing simulations of dichromate vision: A psychophysical method**

<sup>1</sup>Alvaro, L.; <sup>1</sup>Lillo, J.; <sup>1</sup>Durán, M. C.; <sup>2</sup>Moreira, H.  
<sup>1</sup>University of Madrid; <sup>2</sup>Universitary School Cardenal Cisneros

People lacking a cone type (dichromates) has reduced colour gamut. This reduction makes metamers (physically different stimuli produce the same perceptual experience) the stimuli that normal people only differentiate because the response in the cone the dichromate lack. No availability of a cone type also modifies dichromates' lightness perception. For two different dichromate types (protanopes and deuteranopes) a psychophysical procedure was used. It was designed for measuring colour vision simulations accuracy and was rooted in the following facts: (1) For each dichromate type there are two chromatic angles ( $H^*$ ) that produce achromatic experiences (they see greys what other people see as chromatic colours. Stimuli included in such chromatic angles are named "pseudoachromatic"). (2) For any stimulus it is easy to predict dichromate's lightness perception ( $LT^*$ ) and the difference between this parameter and its standard lightness ( $L^*$ ). Consequently, it was considered that (3) colour simulation accuracy increased as much as there was a reduction in the values of  $|HA^* - HT^*|$  and  $|LA^* - LT^*|$ . That is, it was considered that perfect simulation must produce no differences between the chromatic angles that generate simulated achromatic colours ( $HA^*$ ) and the equivalent result for real dichromates ( $HT^*$ ). A similar prediction was done for lightness. Three different simulation tools were compared using the psychophysical procedure described: (1) A software tool for transforming screen colours ("Coblis" <http://www.colblindor.com/coblis-color-blindness-simulator/>). (2) The glasses "Variantor", distributed by Cambridge Research Systems. (3) The 212 colour palettes (one for protanopes, another for deuteranopes) designed by Vienot. Sixteen observers collaborated in the evaluation (10 normals, 3 protanopes, 3 deuteranopes). Coblis and Variantor were considered not accurate simulations, especially because they produced high values for the  $|LA^* - LT^*|$  comparison. Key words: Colour. Visual simulations. Dichromats. Protanopes. Deuteranopes

**[PI-67] Interpersonal perception, personality, and academic achievement: An empirical study with undergraduate students****<sup>1</sup>Andrés, A.; <sup>1</sup>, <sup>2</sup>Solanas, A.; <sup>1</sup>Salafranca, Ll.***<sup>1</sup>University of Barcelona; <sup>2</sup>Institute for Brain, Cognition, and Behavior*

The aim of the present study was to explore whether dyadic and individual measures of interpersonal perceptions and personality could be related to academic achievement when dealing with project groups in a low structured academic setting. 88 undergraduate students formed 22 groups of four people to carry out a course report. After working together throughout the semester, participants filled in an Interpersonal Perception Questionnaire and NEO-FFI and the course report was assessed. Indices traditionally computed for quantifying group characteristics as mean or variance and dyadic indices were computed using the scores in the Interpersonal Perception Questionnaire and NEO-FFI. Specifically, skew-symmetry index for interpersonal perceptions and a dissimilarity index for personality traits. Results showed that some dyadic measurements of interpersonal perceptions are associated to the scores obtained in the course report. Furthermore, dyadic measures of interpersonal perception explained between 36.5% and 43.1% of group marks in the course report. These percentages of explain variance were obtained by means of non linear regression analyses. These results concur with previous results obtained in a laboratory context supporting the usefulness of the dyadic approach for the study of groups.

**[PI-61] Non-conventional TV advertising: Visual impact and viewer's visual behaviour****Añaños, E.; Mas, M. T.; Estaún, S.; Valli, A.; Padilla, A.; Jaén, S.; Jiménez, S.; Astals, A.; Jiménez, S.***Autonomous University of Barcelona*

The aim of the new TV Advertising formats analyzed -banners, shared screen and animation- is to make the individual to pay attention and to process the stimulus (commercials) shown in the screen. This stimulus appears as attention distractors of the spectator who does not want to pay attention to them while he is consuming TV content. The purpose of this study is to know the visual impact of these advertising formats and the viewers' behaviour. The participants watch TV program fragments which contain each of the analyzed advertising formats while their visual behavior is recorded by Eye Tracker. The particular Eye Tracker model used is not intrusive, as a part of the screen which integrates the eye tracker technology and works automatically, it does not contain any extra dispositive that could alter the subject attention, and allows his free mobility as if he was watching TV normally. The results show the real visual impact of each of the formats and the visual behavior of the participants when the stimuli (commercial) appear. This is due to the eye focusing in each of the points, the time that takes and the visual trajectory, as all of them are recorded. The results also show the attention value of each area of the screen depending on the advertising format (stimulus) inserted and its visual features: screen area where appears, shape, size and type of movement. The visual results obtained lead to the conclusion that the effectiveness of using these kind of advertising strategies on TV is very effective, as it has been proved in other researches about aided recall in advertising (stimulus).

**[PI-70] Priming use in studies on staff selection**

**Aranda, M.; Pérez-Cordón, L. G.; Montes-Berges, B.**  
*University of Jaén*

The priming as an experimental technique began to be implemented with the aim of showing how information is stored in memory even though participants could not remember (Grand & Segal, 1966; Koriat & Feuerstein, 1976; Segal, 1967). These first investigations differentiated between the types of memory, supporting the existence of implicit and explicit processes. This traditional employment of the priming gave place to other empirical approaches which study the underlying processes to prejudice, discrimination and stereotypy, especially, those ones with an implicit nature such as modern racism (McConahay, Hardee & Batts, 1981), or neosexism (Tougas, Brown, Bigot & Joly, 1995; Moya & Expósito, 2001). Psychological studies have shown that people's judgments and behaviors can be influenced by multitude of variables, such as stereotypes. Avoiding the bias that stereotypes provoke is particularly necessary in the area of making professional decisions. Different studies have shown that the evaluation of a job candidate can be influenced by the previous activation of stereotypes (e.g. Horcajo, Briñol & Becerra, 2009), giving place to discrimination based on sexist, classist or racist prejudices. For all these reasons, it's important to study the implicit variables in the decision to choose a candidate with an experimental procedure such as priming. Taking the experimental studies on staff selection which use the priming technique as a starting point, an experimental research was designed to analyze the effects of gender stereotype activation in the staff selection context. More specifically, we try to determine if the judgments formed about a candidate for a job may be affected by a prior activation of male or female stereotypes. The results support the hypothesis of which the decision-making on the candidate's selection could be biased by the previous activation of stereotypes.

**[PIII-51] Attitude congruence: A moderating factor in motivated forgetting**

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The strong retrieval cues established in response to encoding complex attitude information may be resilient to directed forgetting, because they might be used at retrieval to reduce or eliminate the costs of directed forgetting. The current study utilized the list-method directed forgetting paradigm using political attitude statements as the study materials. We recruited two distinct groups with divergent political viewpoints (Left vs. Right), and manipulated the study material to be either congruent (vs. incongruent) with their existing beliefs. The obtained results showed that participants were able to successfully forget information that expressed ideas that were incongruent with their own viewpoint, however, no directed forgetting was observed with congruent statements.

**[PI-12] Influences of prism adaptation on exogenous orienting of attention and inhibition of return**

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Neuroimaging and clinical data unequivocally support the notion of right hemisphere dominance in attentional functioning. For instance, hemispatial neglect, which is referred to as attentional dysfunction, is known to be deeper and more persistent following right hemisphere lesions. The symptoms of hemispatial neglect involve deficits in attentional disengagement from objects in the right visual field, as well as an impairment of inhibition of return (IOR) to the right visual field (RVF). Rosetti & Rode (1998) proposed a method of ameliorating neglect symptoms by means of visuomotor adaptation to a prism-induced rightward displacement of the visual field. Conversely, leftward prism adaptation causes a "neglect-like" after-effect in healthy, neurologically intact individuals. Recent evidence suggests that the prism adaptation affects attentional functioning; nevertheless, the precise nature of these effects is still unclear. We conducted three experiments in an attempt to disentangle how specifically the prism adaptation alters processes of exogenous orienting in case of after-effect "simulating" neglect in healthy participants. Posner's location-cuing task paradigm was used in order to differentiate processes of exogenous orienting and to assess the magnitude of IOR. Participants performed the cuing task before and after inducing prism adaptation effect. Results revealed that the leftward prism adaptation, which induces attentional bias to the right (analogous to the symptoms of neglect), impairs the IOR. This effect was detected only for the targets in the RVF (again, similarly to neglect symptoms). Hence, as a consequence of attentional bias triggered by leftward prism adaptation, participants were less efficient in inhibiting return of the attentional orientation toward the right. After the rightward prism adaptation, no such effects were observed. The results may cast new light on understanding the mechanisms underlying the hemispatial neglect.

**[PII-58] Is non-symbolic "number sense" related to formal mathematics ability?**

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There is growing evidence that humans have an inbuilt 'number sense' system, which supports approximate numerical operations. This system is present in infancy and adulthood, providing abstract approximate representations of numerosity, which can be compared and manipulated. Findings suggest that when we learn to deal with symbolic numerals, they may be mapped onto the pre-existing non-symbolic system. However, the relationship between 'number sense' and formal mathematics ability remains unclear. If symbolic arithmetic is aided by the use of a non-symbolic system, then children's understanding of number could be facilitated by improving mapping between systems. Halberda, Mazocco, & Feigenson (2008) measured the acuity of 14-year-olds' number sense in a non-symbolic comparison task and related this retrospectively to the children's performance on formal mathematics measures, which had been taken each year from the ages of five to eleven. They found a positive relationship between non-symbolic acuity and performance on symbolic mathematics assessments, controlling for various cognitive factors such as IQ and working memory. In the present study, participants were assessed for non-symbolic acuity, formal mathematics ability and IQ, among other measures. In contrast to Halberda et al., we found no relationship between formal mathematics ability and accuracy in a non-symbolic comparison task with large numerosities when controlling for IQ. Several possible sources of this discrepancy are discussed. Halberda, J., Mazocco, M. M., & Feigenson, L. (2008). Individual differences in non-verbal number acuity correlate with maths achievement, *Nature*, 455, 665-668.

**[PII-21] Reading acquisition in Albanian**

**Avdyli, R.; Cuetos-Vega, F.**

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The influence of orthographic transparency on reading acquisition has been studied in many languages. It is widely agreed that it is easier to learn how to read in languages with a shallow orthography such as Greek, Italian, Spanish, etc, compared to those with deeper orthographies like English, French or Dutch. Albanian is an Indo-European language with a shallow orthography, in which there is an absolute correspondence between graphemes and phonemes. In this study we asked 300 Kosovar children aged 6 to 12 years old to read aloud lists of words and nonwords. Accuracy and reading speed were measured and an analysis of errors was also conducted. The results in terms of reading accuracy and speed showed that Kosovar children are accurate readers before the end of the first year of school. As expected, time needed to read given words diminishes as they grow older. Analyses of the error patterns showed that letter replacement leading to new nonwords is the most common error type in word and nonword reading. The fact that this kind of error is more frequent in younger children reveals the use of the indirect (phonological) route by new readers. On the other hand, children start showing a better performance in word compared to nonword reading between 9 and 10 years old what suggest that the reading process starts relying on the use of word's orthographic representations. These data suggest that reading acquisition in Albanian follows similar patterns to other languages with shallow orthographies, although some peculiarities are present due to specific features of Albanian orthography.

**[PI-29] Effect of feedback on different levels of task-oriented reading skills**

**Ávila, V.; Vidal-Abarca, E.; Gil, L.; Llorens, A. C.**

*University of Valencia*

When students answer questions after reading a text being available, sometimes they decide to answer the questions without rereading the text. It happens because they wrongly estimate that their answer is correct. A great number of investigations on Judgments of Learning have shown that this phenomenon is due to comprehension monitoring difficulties which are relatively independent of readers' comprehension level. The present study aims to test the effect of two types of feedback on comprehension, and more specifically, their effect on comprehension monitoring. Eighty students of 10th grade, half of them with high-comprehension skills and the other half with low-comprehension skills, participated in the study. They were randomly divided into three groups according to the feedback they would receive after every wrong answer: Performance feedback (i.e., "you failed, re-reading the text will help you to answer correctly"), Locating Information feedback (i.e., "You failed, re-reading paragraph X will help you to answer correctly ") and no-feedback. In a second session two weeks later with no feedback at all transfer from the feedback session was obtained. The students performed the question-answering task on a computer using the software Read&Answer developed by our research group, which allows the recording of on-line readers' actions when they read a text and answer questions from it, providing the sequence of actions (i.e., decision to re-read a piece of text to answer a question) and time spent on each action. So far, we have analyzed the results related to the effect of feedback on performance. These indicate that general and location feedback are equally effective for both high and low comprehenders. Results related to the transfer of training and the reading and question-answering process on-line data will be available at the time of the presentation. Theoretical and practical implications will also be discussed.

**[PIII-56] Remembering and forgetting concrete and abstract words: A new window into semantic representation****Avilés, A.; Carreiras, M. .; Muent, T.***Basque Center on Cognition, Brain and Language*

Theories of semantics attribute differences between abstract and concrete words either to the amount of information associated with them or to qualitative differences in their representations. While associative links have been proposed for the organization of abstract words, semantic relations have been proposed for the organization of concrete words. Here we examined the neural basis of explicit (declarative) memory and implicit (priming) memory for concrete and abstract words. During the encoding phase participants were presented with pairs of words to memorize them. During the test phase participants were asked to retrieve the word that appeared with the cue in the study list or, when this was not possible, they were instructed to generate a new word. Immediately after they had to indicate if the generated word belonged to the study list or it was a new word. The critical events at test were the onsets of trials in which: a) studied cue words were generated, judged as old and the answer was correct (recollected items); b) studied words were generated, judged as new and the answer was correct (primed items); c) new words were generated and judged as new words (control items). Similarly, the critical events at encoding were the onset of word pairs corresponding to recollected items, primed items and forgotten items. The results clearly indicate a modulation of brain activity by the stimulus concreteness. Overall, abstract words increased activation over concrete words in the left dorsal inferior frontal gyrus (BA 44, 45). In turn, concrete words increased activated over abstract words in the bilateral ventral inferior frontal gyrus (BA 47), left posterior cingulate and bilateral medial temporal regions. Differences between abstract and concrete words in brain activation were also obtained when considering remembered words and new words. Results will be discussed in terms of models of semantic representation.

**[PII-82] The influence of domain and category rule on children's induction strategies****Badger, J. R.; Shapiro, L. R.***Aston University*

There is considerable disagreement as to whether children's default strategy when making induction decisions is based on perceptual or category information. Previous studies have used a wide range of stimuli and category rules (a single non-obvious feature change: a simple rule, or combinations of two non-obvious features: a complex rule), which could make a critical difference to children's strategy preference. We investigated the influence of category rule (simple vs. complex) and stimuli domain (living vs. non-living). We trained 403 children aged 4-9 years to categorise novel items (insects or diggers) following either a simple or a complex rule that pitted category membership against overall appearance. Only the children who passed these categorisation tasks (N = 311) completed the induction task: to generalise a hidden property of a target item to one of two test items (same category or perceptual distractor). We found a shift in strategy preference, from perceptual induction to category induction (as in Badger & Shapiro, submitted). Interestingly, the complexity of the rule influenced the age at which this shift occurred: for the simple rule condition, children shifted their preference at age 6-7; for the complex rule condition, children shifted their preference at age 7-8, a year later. The same pattern was found for both domains, suggesting the shift is domain-general rather than domain-specific. We found that the ability to focus on a single, non-obvious feature to make induction decisions developed earlier than the ability to focus on more complex feature combinations. Our findings suggest that young children's default is perceptual, and the ability to use non-obvious category cues develops from around age 6-7, with children gradually becoming more sensitive to complex category cues. Importantly, the ability to reason beyond the obvious is dependent on the development of general reasoning strategies rather than specific domain experience.

**[PII-47] Inhibitory deficits in bipolar disorders**

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Inhibitory Déficits in Bipolar Disorders Recent approaches to mental disorders have highlighted the cognitive deficits related to psychopathology. Cognitive deficits have been found in certain mental disorders, such as schizophrenia and, to a lesser extent, bipolar disorder. In this study, we studied inhibitory difficulties in episodic and working memory in patients with bipolar disorder. To this end, a directed forgetting task, and an updating working memory task, were employed. Bipolar patients showed no directed forgetting effect, compared to healthy control. Similarly, in the updating task, bipolar patients produced a greater number of intrusions than the control group. These findings reflect difficulties in the suppressing irrelevant information from memory in the bipolar disorder. We also found that bipolar patients showed a greater number of perserverative errors than controls in the Wisconsin Card Sorting Test, indicating poor executive functions. Therefore, bipolar patients have deficits in executive processes, and specifically in controlled inhibitory processes in memory. These deficits are similar to those found in schizophrenia, supporting the idea of a continuum between psychotic and affective disorders. Keywords: Cognitive deficits, inhibition, memory, executive function, Bipolar Disorder, Schizophrenia.

**[PIII-69] Influence of cognitive, metacognitive, motivational and emotional self-regulation on academic achievement – comparative and developmental aspects**

**Bakracevic Vukman, K.**

*University of Maribor*

This contribution aims to examine how different areas of self-regulation in learning process are related to academic achievement in adolescents and young adults. The study involved participants, drawn from following age groups: 14 to 15, 17 to 18 and 22 to 23. In order to get information about cognitive, metacognitive, motivational and emotional aspects of self-regulation, self-report questionnaires were used. To find out, if there are correlations between self-reported self-regulatory skills, and metacognitive accuracy in evaluation of performance (regarding as a step in (meta)cognitive self-regulation process), the specific procedure was used. After problem-solving task, the participants were asked to evaluate their performance on the task in reference to a seven-point scale. To get an indicator of metacognitive accuracy, we created self-evaluation accuracy index (SEAI) by combining actual performance with self-evaluation. Differences between age-groups revealed following tendency: there has been a decrease in all fields of self-regulation from age of 14 (end of primary school) to the age of about 18 years (end of secondary school), and then results slowly improved to the age of about 22 years (students of undergraduate studies). The results obtained are mirroring perceived competence of self-regulation and differ from the results concerning metacognitive accuracy. When comparing the metacognitive self-regulation, measured by self-report questionnaire and the metacognitive accuracy in problem solving (SEAI), the correlation is statistically significant - but not very high. Metacognitive accuracy or accuracy of self-evaluation of performance, which represents an important step in cognitive/ metacognitive self-regulatory process, proved that the metacognitive ability is actually improving during adolescence. Metacognitive self-regulation persists as an important predictor of school achievement at all developmental levels, and the motivational self-regulation has significant impact on performance in the first and second age-group.

**[PI-79] Identifying the same causal mechanism across different contexts**<sup>1</sup>Barbería, I.; <sup>2</sup>Baetu, I.; <sup>1</sup>Sansa, J.; <sup>2</sup>Baker, A. G.<sup>1</sup>University of Barcelona; <sup>2</sup>McGill University

Liljeholm & Cheng (2007) reported evidence that people use the construct of causal power (Cheng, 1997) to generalize causal efficacy across contexts with different outcome base rates. Their participants observed the effect of a generative cause in several contexts. In one condition, power was constant across contexts but other covariational measures ( $\Delta p$ ) varied. In another condition power varied across contexts. Participants were asked if the cause had the same influence in all contexts or if it interacted with some factor that varied. They reported an interaction only when power varied. These results were consistent with causal power. However, the methods and conditional probabilities may have biased the results. First, on each trial the participants knew if the context generated an effect before they observed the cause. In traditional causal discovery tasks participants observe the state of the effect in a situation in which it is ambiguous whether an effect is generated by the cause or the context so participants must attend to all trials. In Liljeholm & Cheng's procedure participants could ignore the trials in which the context was effective thereby reducing the task to simple covariation detection. Moreover when power was equal the probability of the outcome given the cause ( $P(O|C)$ ) was more similar, so participants might rely on this probability to detect an interaction. We found that both with Liljeholm & Cheng's procedure and with the conventional procedure people reported an interaction only when power varied across contexts. But with the traditional procedure, causal strength ratings in each context varied with both power and  $\Delta p$ . Furthermore, when  $P(O|C)$  was controlled independent from power, an interaction was reported when  $P(O|C)$  varied but not when power did. Thus it appears that the generalization of causal mechanisms relies on more than just Cheng's construct of causal power.

**[PIII-26] Spanish word frequency based on spoken language: A new corpus**<sup>1</sup>, <sup>2</sup>Barbón, A.; <sup>1</sup>González-Nosti, M.; <sup>1</sup>Cuetos, F.; <sup>3</sup>Brysbaert, M.<sup>1</sup>University of Oviedo; <sup>2</sup>University of Granada; <sup>3</sup>University of Ghent

Recent studies have shown that word frequency estimates obtained from films and television subtitles are better to predict performance in word recognition experiments than the traditional word frequency estimates based on books and newspapers. In this study, we present a subtitle-based word frequency list for Spanish, one of the most widely spoken languages with a completely transparent orthography as far as reading is concerned. The subtitle frequencies are based on a corpus of 41M words taken from contemporary movies and TV series (screened between 1990 and 2009). In addition, the frequencies have been validated by correlating them with the  $R_t$ s from two megastudies involving 2764 words each (lexical decision and word naming). The subtitle frequencies explained 6% more of the variance than the existing written frequencies in lexical decision, and 2% extra in word naming.

**[PII-31] Reading salt activates the gustatory cortex**

**Barrós-Loscertales, A.; Gonzalez, J.; Ventura-Campos, N.; Bustamante, J. C.; Costumero, V.; Cruz-Gómez, A. J.; Avila, C.**  
*Jaume I University*

Words are frequently used together with their referent objects and actions. Furthermore, they produce the ignition of specifically distributed binding circuits within the brain. A theoretical perspective (Pulvermüller, 2001) proposes that words are processed by distributed neural assemblies with cortical topographies that reflect aspects of their references. Our objective was to test whether words whose meaning have strong gustatory associations would activate the primary and secondary gustatory regions. Two experiments were conducted within two different samples which performed the same experimental task in an fMRI scanner. All subjects were instructed to carefully read words with and without gustatory connotations in a block-design fashion in a single run. These two sets, of 50 words each, were matched by valence, arousal, imaginability, frequency of use, number of letters and syllables, but differed in gustatory associations. Furthermore, strings of hash signs which matched word lengths in the other two conditions were presented during a baseline condition. During experiment two, a questionnaire with a 7-point Likert scale was applied to get rates on each of those word-related variables (gustatory, olfactory, visual and action associations). Results showed that the conjunction of brain activation in both groups from each experiment produced the activation of the left insula, the frontal operculum and the orbitofrontal cortex among other areas. Brain activation in the left orbitofrontal cortex was related to gustatory ratings. In summary, reading gustatory-related words activates primary and secondary gustatory cortices, and their activation seems to be related to subjective ratings on words' gustatory associations in some particular regions.

**[PIII-50] Anxiety and false recognition: Modality effect and type of encoding on the monitoring processes**

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The present paper describes the effect of anxiety on the false recognition obtained using the DRM paradigm (Deese/Roediger-McDermott). The trait anxiety level was assessed using the STAI (State-Trait Anxiety Inventory, Spielberger, Gorsuch y Lushene, 1982), creating two experimental groups: High-Anxiety and Low-Anxiety. The lists of words associated to a non-presented critical word were studied under two experimental conditions: Superficial encoding and Deep encoding. In Experiment 1, the presentation modality in the study and test was Visual. In contrast, in Experiment 2 the presentation modality in both phases (study and test) was Auditory. In both experiments, a final recognition YES/ NO test was used. The results indicated that no trait anxiety effects were found on true and false recognition. However, in both experiments, the results showed that true recognition was significantly higher in Deep encoding, as expected according to the Levels of Processing Theory. Similarly, in the two experiments there was a clear false recognition effect which differed depending on presentation modality and type of coding. Specifically, false recognition was significantly higher in the Deep encoding only when the presentation modality was Auditory. These results suggest that the encoding through mental images might hinder the effective monitoring processes only with an auditory presentation of materials. The visual presentation appears to protect participants from this negative effect on the effectiveness of monitoring processes. Keywords: Anxiety, Human Memory, False Recognition, Monitoring Processes

**[PIII-44] Checking what is not the case: Understanding exclusive disjunctions****Beltrán, D.; Santamaría, C.***University of La Laguna*

A sentence like “either the figure is a circle or it is red” is true for a non-red circular figure and for a red non-circular figure, but not for a red circle. Conversely, the sentence “the figure is a circle and it is red” has the mirror-image semantic properties (it is only true for a red circle). We took advantage of this circumstance to design two experiments where we explored how people check for the reference of linguistic expressions. In Experiment 1 we used a verification task. After reading a conjunctive or disjunctive sentence the participants were asked to verify it with respect to a two-word description of a figure (e.g. “red circle”). We measured reading times for each of these two words. Even though the first word is congruent both for conjunctions and disjunctions, and cannot determine the truth or falsity of the sentence, we found longer RTs for its reading after disjunctions. This finding suggests that the participants carry out an unnecessary inference when reading this first word. For example, after reading “either the figure is a circle or it is red”, if they read the word “circle” they seem to immediately infer “non-red” by cancelling one of the possibilities in their representation of the sentence. The verification time showed an interaction reflecting the advantage of true conjunctions and false disjunctions. The results were replicated in a second experiment with a different paradigm. In this case, instead of using a verification task we asked the participants to select an exemplar described in conjunctive or disjunctive sentences. Taken together our results seem to show up that participants considered the false case in disjunctions, so that difficulty is determined by the number of possibilities or situations rather than by the truth value of the expressions.

**[PIII-40] Translation ambiguity across-languages: The effect of number of translations, translation probability, concreteness, and cognate status in the performance of proficient bilinguals****Boada, R.; Sánchez-Casas, R.; Ferré, P.***Universitat Rovira i Virgili*

In a recent study with Spanish-English bilinguals, Tokowicz and Kroll (2007) have reported that noncognate words that had more than one translation across languages (e.g., glass-vaso) were translated more slowly than word with one-single translation (e.g., spider-araña). Furthermore, their results suggest that the presence of this effect was modulated by concreteness. The general aim of the experiments we report in this poster also examine the effect of number of translations, but using a translation recognition task and highly proficient Spanish-Catalan who had either Spanish or Catalan as their first language. In contrast to oral translation, in a translation recognition task participants are asked to decide whether the two presented words are translation equivalents or not. In addition, the experiments examined both cognate and noncognate translation. Forty bilinguals (20 Spanish dominants and 20 Catalan dominants) participated in two experiments where translation direction was manipulated (Spanish-Catalan vs. Catalan-Spanish). Critical stimuli consisted of two different lists, one including 80 Spanish-Catalan translation pairs, and the other including 80 Catalan -Spanish pairs. Within each list, half of the words were cognates and the other half were noncognates. Following previous findings, cognate translations (e.g., regalo-regal, present) were recognized faster and more accurately than non-cognates (e.g., cuchillo-ganivet, knife). The results from the two experiments showed that words with more than one translation (e.g., muñeca-nina, doll, that can also be translated as canell, wrist) were recognized more slowly and less accurately than words with one-single translation (e.g., queso-formatge, cheese). However, the effect of number of translations was significant in both cognate and non-cognate words. Further analyses suggested that translation probability, and concreteness did not seem to affect the pattern of effects. The results would be discussed in relation to the distributed conceptual feature model (De Groot, 1992; Van Hell and De Groot, 1998).

**[PIII-24] The cingulate cortex is driven by performance: Behavioural, functional and connectivity evidence in different populations**

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A hotly debated issue on cognitive control functions regards the nature of the mechanisms involved and its neural correlates. In this study, we have investigated this topic with a particular concern on the function of the anterior cingulate cortex (ACC). The ACC is tightly bound to the detection and the signalling of conflict and our idea is that this function is enhanced in bilinguals, since they learn from childhood on how to “switch” between two different competing languages. Indeed, behavioral studies report a cognitive advantage in the attentional domain for bilinguals. Here we report fMRI and connectivity evidence of the functional role of the ACC by comparing in an attentional task two different populations, that is, bilinguals and monolinguals. Focusing on those conditions where conflicting information is more embedded, we were able to uncover the relationship between the higher degree of conflict and the ACC’s activity in these two populations. We found that monolinguals are more affected by the presence of conflict than bilinguals, in terms of the ACC engagement and of the accuracy. On the other hand, bilinguals manage the conflict activating more strongly the DLPFC, whose activity may reflect an improved ability to represent task control. Furthermore, through the connectivity analysis we observed that the ACC differently interacts with control areas in bilingual and monolinguals. Our results show how the ACC monitors cognitive conflict in bilinguals and monolinguals, respectively using different neural pathways specific for each group of population.

**[PI-64] Automatic tactile remapping without space encoding**

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Tactile remapping takes place when spatial information in somatotopic coordinates integrates with body posture information in order to achieve an external representation of a tactile event. This is illustrated in cueing studies whereby an irrelevant touch presented to a hand facilitates responses to a spatially-coincident visual target, regardless of participant’s posture. Some researchers claim that remapping occurs automatically regardless of the task set. However, in the paradigms used to support this viewpoint, encoding external space was always relevant to perform the task. A critical need for evidence of tactile remapping using non-spatial tasks still remains. To address this point, we developed a tactile-visual cueing task in which spatial information related to targets selection and judgment was removed. In the first experiment participants made speeded colour judgements by pressing or releasing a foot-pedal, and tactile cues presented at the left or right hand facilitated responses to the visual target presented at the same spatial location. However, tactile remapping could have been triggered by the spatial information encoded to map the target onto foot pedal responses. In a second experiment we found significant (albeit reduced) cueing effects when participants responded verbally, so spatial information related to foot responses was removed. Still some spatial information may be encoded given that cues and targets were presented on the same or opposite sides indiscriminately, so that participants had to prepare for different spatial positions (where targets could be presented). We developed a new task where spatial uncertainty was eliminated. Subjects responded verbally to visual targets presented at a fixed spatial location, with the cues location also spatially blocked. We observed that the external location of the tactile cue still modulated participant’s response times, suggesting that spatial tasks are not necessary to trigger tactile remapping.

**[PII-52] Directed forgetting and the selective control of retrieval**

**Cano, E.; García, A. M.; García, Y.; Marín, A. A.; Martos-Luque, R.; Navarro, M. C.; Ortega, M. B.; Ruiz, M.; Iglesias-Parro, S.; Gómez-Ariza, C. J.**  
*University of Jaén*

The ability to intentionally forget just learned information is well known from the very first studies on directed forgetting (DF) with the list method. Through years, a variety of experiments have shown some basic phenomena found with this paradigm, such as the dependence of the DF effect on learning a second list of items or a better recall for the items learned after the instruction to forget. Recently, Delaney et al. (2009) introduced a variant of the directed-forgetting paradigm in where participants are instructed to forget part of the list 1. Interestingly, they found significant selective forgetting: an effect that goes against the context change account but supports the inhibitory explanation of list-method directed forgetting. However, it suggests that it is not the whole list-1 learning episode what is inhibited because suppression is selectively oriented. In our study, some of the basic phenomena of DF are readdressed by using the selective DF paradigm. To some extent, our results depart from those usually found with the standard procedure and point to the new paradigm as a powerful tool to further study motivated forgetting. Finally, the results are discussed on the grounds of selective rehearsal, context change and inhibition hypothesis.

**[PII-77] Inferred feelings vs. Real feelings of victims of child sexual abuse**

**Cantón-Cortés, D.; Moreno Ríos, S.**  
*University of Granada*

“If you were a victim of sexual abuse how would you feel about...” is a counterfactual conditional. Conditionals are represented as a simplified analogical mental model of that situation. This incomplete model is used to make inferences about the feelings of victims. Following different theoretical explanations, the attribution of feelings can be made by: 1) simulating that we are victims, by two processes: anchoring on this counterfactual mental model and making later adjustments. 2) Using our general knowledge about victims. If the attribution is made by 1), only non-victims make the inference from the counterfactual model. In this case, the over-simplified representation contains the fact of abuse as well as some other new and critical elements. Only in this case can we predict a systematic overestimation of the attribution of the influence of abuse by non-victims. Also, the kind of questions that could prompt the activation of the simulation process would increase the differences between victims and non-victims. In the present study 53 victims of Child Sexual Abuse (CSA) and another 53 participants who were not victims responded to a Questionnaire on CSA, used to assess the CSA experiences of participants. Feelings provoked by the abuse and the perceptions that non-CSA victims have about these feelings were assessed using the Coffey et al.'s (1996) scale. Regarding the perceptions of non-CSA victim participants, results showed that 88.7% of them think CSA victims feel that their trust in people was betrayed. Eighty-four point nine percent think CSA victims feel they are very different to other children due to the experience. Ninety-point six percent think they feel powerless. Eighty-three percent think CSA victims feel filthy due to this experience and, finally, 62.3% think they feel guilty. Consistently with the inference-simulation hypothesis, CSA victims expressed significantly lower feelings of betrayal, stigma, powerlessness, filthiness and guilt than non-CSA participants think they do.

**[PII-72] Social categories and attentional control**

<sup>1</sup>Cañadas, E.; <sup>1</sup>Rodríguez-Bailón, R.; <sup>2</sup>Milliken, B.; <sup>1</sup>Lupiáñez, J.

<sup>1</sup>University of Granada; <sup>2</sup>McMaster University

An exciting theme in recent research in the field of attention focuses on the role of context on attentional control (Crump, Vaquero, & Milliken, 2008). Recent results point to learning and memory processes that rapidly and involuntarily control attentional selection. In other words, it appears that attentional control can be outsourced to incidental or contextual properties of the task environment. A tool used to measure contextual control of attention is the context specific proportion congruency effect. In numerous interference tasks (Stroop, flankers, etc.) less interference is observed in a context that is associated with a high proportion of incongruent trials. In this study, our goal was to examine whether these context-sensitive learning processes could be shown to be sensitive to use of gender as a contextual cue. In particular, gender of faces served as a general context that was associated with a specific proportion of congruent/incongruent flanker trials. For example, male faces were associated with a high proportion of incongruent trials, while female faces were associated with a low proportion of incongruent trials. However, we also created stereotypical and counter-stereotypical members within each of these two general contexts. For example, three faces of one group (e.g., men) might have been associated with a high proportion of incongruent trials (stereotypical faces), whereas a fourth face of the same group would be associated with a low proportion of incongruent trials (counter-stereotypical face), and vice versa for the other group (e.g., women). Results showed a context (i.e., social category) specific proportion congruency effect that, importantly, was driven by social category, as the congruency effect was similar for stereotypical and counter-stereotypical members of the two gender categories. These results link basic attentional processes with social ones, showing the importance of attentional control when perceiving category (in)consistent individuals.

**[PI-11] Electrophysiological correlates of automatic and controlled temporal preparation**

Capizzi, M.; Correa, A.; Sanabria, D.

University of Granada

Behavioural and ERP measures were obtained in a dual-task paradigm to test the nature of the mechanisms involved in temporal preparation. While there is evidence for a controlled mechanism underlying temporal orienting, it is not clear whether sequential effects rely on common controlled mechanisms or they arise from automatic processes. To address this question, we compared participants' performance in a single-task condition with performance in a dual-task condition. In the single-task condition, symbolic cues (a short vs. long line) were randomly presented on each trial to inform participants about the most probable temporal onset (early vs. late) of a visual target stimulus. The target could appear after either valid (75% validity) or invalid time intervals (1000 vs. 2000 ms). In the dual-task condition, the temporal preparation task was combined with a demanding secondary task that required continuous updating of information in working memory. The behavioural results showed that only sequential effects, but not temporal orienting, survived to dual-task interference, thus suggesting the involvement of distinct underlying mechanisms. Both temporal orienting and sequential effects were found to modulate brain ERPs related to late perceptual and response selection processes (i.e., the N2 amplitude). Interestingly, such modulation was abolished by dual-task demands in a similar way for the two temporal preparation effects. Taken together, these preliminary findings suggest that although temporal orienting and sequential effects can be dissociated behaviourally, the ERP modulation shows that they can operate by means of common neural mechanisms at least at post-perceptual levels.

**[PII-64] The effect of auditory warning signals on temporal preparation: A dissociation between sound intensity and eye startle reflex**

**Cappucci, P.; Correa, A.; Guerra, P. M.; Lupiáñez, J.**  
*University of Granada*

Recent studies have shown that the intensity of auditory warning signals linearly decreases reaction times (RT) to a target stimulus (intensity effect), and that RT further decreases if the warning signal produces an eye startle reflex in a simple detection task (startling effect). On the other hand, temporal expectations about the duration of the preparatory interval between warning signal and target also enhances response preparation and decreases RTs (foreperiod effect). We carried out several studies aimed at looking into the effects of exogenous vs. endogenous sources of temporal preparation on RT. Exogenous temporal preparation was accomplished by manipulating the intensity of the warning sound and the elicitation of an eye startle reflex, whereas endogenous temporal preparation was manipulated by varying the duration of the foreperiod, i.e., the interval between the warning cue and the target. Task was manipulated across experiments in order to investigate how low vs. high control demands modulate the effects of endogenous temporal expectancy and exogenous alertness (intensity effect and startle reflex). The results replicated the beneficial intensity effect which has classically been associated with warning signals. However, this intensity effect depended on endogenous factors such as foreperiod duration and task demands. In contrast, the startle reflex interfered with RT performance independently of endogenous factors (foreperiod duration and task demands). The increase in tone intensity leads to faster TR up to the point of eliciting a startle reflex, in which case the effect reverses with a slowing in RT. This dissociation between intensity and startle effects of warning signals supports the existence of different exogenous mechanisms enabling temporal preparation.

**[PIII-36] The time course of motor resonance in the comprehension of action sentences**

**Castillo, M. D.; de Vega, M.; Moreno, V.**  
*University of La Laguna*

The study explores embodied meaning of action sentences by using a modified Action-sentence Compatibility Effect (ACE) paradigm. Participants read sentences describing a transfer away (I threw the tennis ball to my rival over the...) or towards the first person (My rival threw me the tennis ball over the...), performing a double-task. First, participants were prompted to press a button placed either distant or close to them by means of a visual cue attached to the transfer verb (e.g., threw). Second, they performed a semantic task choosing the best end to the sentence. This double-task paradigm allowed to distinguish how action language biases motion (response to the visual cue), and how motion biases language comprehension (response to the semantic task). For the matching conditions there was early sentence-action interference in the range of 200-300 ms after the verb onset, which supports the idea that the meaning of action sentences involves a motor resonance processes. This interference completely dissipates after 350 ms, establishing temporal limits to this resonance.

**[PI-71] Using subliminal priming in the gender discrimination**

**Castillo-Mayén, M. R.; Montes-Berges, B.**  
*University of Jaén*

Gender discrimination is an important social problem that still needs to be investigated. This phenomenon has been analysed from different perspectives, but actually social dominance theory (SDT) is one of the most relevant. SDT points out that discrimination is based on the establishment and maintenance of social hierarchies. The individuals' desire of based-group dominance has been conceptualized as the social dominance orientation (SDO), which could explain different attitudes and behaviour that promote hierarchies. Moreover, this theory postulates that men will show a higher level of SDO than women. Empirical results evidenced that SDO is an appropriate psychosocial variable to investigate gender discrimination. The major aim of this study is to analyze the possible influence of different variables related to gender and interpersonal relationships on this association between gender and SDO. For this purpose, we have used subliminal priming, an implicit measure that shows the influence of unconscious information in subsequent individual's behavior. Specifically, the prime stimuli were gender categories and the targets were gender stereotypes. Participants were divided into experimental and control groups. Both groups completed different scales during the pre- and post-test phases of the experiment, such as social dominance, sexism, gender identity, stereotypes' self-assignment and individualism measures, among others. Before post-test, experimental group carried out the subliminal priming task, in which they had to decide the target valence (positive or negative). This study allows to know, firstly, what effect could subliminal gender categories presentation produce on each measure and, secondly, which variables could modulate the invariance hypothesis. Moreover, this study permits to know if subliminal priming could modulate individual's response so that invariance hypothesis does not appear. A deeper understanding of gender discrimination is derived from the results of this experiment.

**[PIII-43] Insight and categorization theory: The effects of prototypical versus diagonal orientations on insight difficulty**

**Chu, Y.; Pap, H. A.; MacGregor, J. N.**  
*State University of New York*

Any object that we encounter can be categorized into a hierarchy of levels. Basic levels of categorization consist of horizontal and vertical lines. Higher levels of processing encompass diagonal lines because they are less common. The present study is taking the theory of categorization and applying it to three different insight problems, the Nine Dot problem, the Pig Pen problem, and the Five Shapes Problem. The problems were presented in two orientations, standard and rotated. It is hypothesized that the rotated orientations of the problems will have higher solution rates than standard orientations, because the lines in the solution are horizontal and vertical. Experiment 1 was in paper-and-pencil format and did not find a difference between the conditions. Experiment 2 was in a one-on-one setting and found that more solutions were attained in the rotated version of the Pig Pen problem than in the standard version, while the opposite was true for the Five Shapes problem. Explanations for the results and its implications will be discussed.

**[PIII-10] Ant, gaze-direction, emotional expression and anxiety: A preliminary analysis****Colmenero, J. M.; Ortega, A. R.; Ramírez, E.; García-Viedma, R.; Montes, R.***University of Jaén*

The main goal of this work is twofold: a) to replicate the basic results of the Attention Networks Test (Fan et al., 2002; Funes y Lupiañez, 2003) with schematic faces showing different emotion and gaze-direction and b), to evaluate whether individual differences on anxiety affect the attentional networks assessed on this task. Participants with low and high levels of anxiety run an adaptation of the ANT (Fan et al., 2002). However, directional arrows were substituted by schematic faces gazing right or left. Target stimuli can be neutral, angry or happy faces. First, the results showed the basic alerting, orienting and congruency effects observed in the “standard” version of ANT. Second, slowest TR and smallest accuracy were found with angry faces acting as target. Furthermore, individual differences on anxiety reflects on attentional networks, because the alerting effect was bigger in high than in low-anxiety group only when target and distractor faces were congruent. However, the orientation effect was smaller in high than in low-anxiety group. We also found larger orienting effect with high than with low-anxiety only when target stimulus was an angry face. Likewise, the orienting effect was smaller in high than in low-anxiety group only when target stimulus was a happy face. In sum, our results suggest that this adaptation of the ANT can be employed to isolate hypothetical emotional and anxiety-related differences on the attentional networks involved on ANT.

**[PIII-58] Selective preservation of addition: A case study****<sup>1</sup>Colomé, A.; <sup>2</sup>Caño, A.; <sup>2</sup>Juncadella, M. .***<sup>1</sup>University of Barcelona; <sup>2</sup>Hospital of Bellvitge (Barcelona)*

This work describes a patient (DDA) with a temporo-parietal lesion in the left hemisphere, who shows a specific preservation of addition. According to the Triple Code model (Dehane and Cohen, 1995) if additions are solved by retrieving their results from long-term memory, they should behave like multiplications. In contrast, if they are calculated by manipulating quantity representations, they should behave like subtractions. However, the performance of this patient is significantly better in additions than in those two arithmetical operations. A detailed study has been conducted to locate her deficits in subtraction and multiplication. Language difficulties might explain her inability to directly retrieve the arithmetical results from memory. As for calculation, several evidences allow us to discard that her impairment is located at the semantic representation of quantities. She also seems to have a good understanding of the operations’ meanings. In contrast, she has lost most of the rules leading the calculation process. Since she cannot benefit from this knowledge, she applies complicated error-prone strategies. Results are discussed in the light of current numerical models and the components they propose for the calculation process.

**[PII-74] An erp study with affective masked priming using arousing positive and negative words and emoticons: Are they the same?**

**<sup>1</sup>Comesaña, M.; <sup>1</sup>Soares, A. P.; <sup>2</sup>Perea, M.; Piñeiro, A.; <sup>3</sup>Fraga, I.; <sup>3</sup>Galdo, S.; <sup>1</sup>Pinheiro, A.**

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In the last decade, the interest by the processing of emotional input has gained strength in different scientific areas. In the area of communication mediated by computer, for example, the researchers has been interested in assess how people communicate their emotions using computers and explore whether this communication is similar to the emotional communication observed in face to face contexts (Derks, Fischer, & Bos, 2008). In psycholinguistics, researchers have been interested in study the type of processing that characterizes emotional input. Nevertheless, the majority of studies developed used pictures, photographs, tones, odors, and words as stimuli manipulating mainly its affective valence (positive vs. negative). One of the most highly used techniques to examine the emotional processing was the “affective priming paradigm”, although the results founded with emotional words were not always congruent and/or replicable (Hermans, Spruyt, De Hower, & Eelen, 2003). The present study aims to replicate the classical effect of affective priming (Fazio, Sanbonmatsu, Powell, & Kardes, 1986) using positive and negative arousing words as well as positive and negative arousing emoticons as primes in a sandwich-masking paradigm. Behavioral and electrophysiological data were collected from eighteen university students who carried out an affective categorization task (i.e. decide if a target word was positive or negative) in order to analyze whatever that effect would be similar to both stimuli (words and emoticons). Results were explained attending to the Spreading-activation theory of semantic processing (Collins & Loftus, 1975) and the Activation dependent inhibition model (Maier, Berner, & Pekrun, 2003).

**[PII-38] A normative database with rating values of emotional content for 6.000 spanish words**

**<sup>1</sup>Conrad, M.; <sup>1</sup>Spiegel, M. A.; <sup>1</sup>Hansen, L.; <sup>3</sup>Bajo, M. T. ; Carreiras, M. .; <sup>2</sup>Jacobs, A.**

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An increasing number of studies in experimental psychology - including research in the field of cognitive psychology – are focussing on the role of emotional proprieties of stimulus material. Language processing has been shown to be influenced by factors as the emotional valence of single words. Other potentially important emotional dimensions of words might be arousal, imageability, concreteness and familiarity. To facilitate research on how emotion might influence language processing in many different ways and how specific aspects of emotion or emotional dimensions might interact in the way we process words, we have made an extensive effort to collect and document rating values on the different dimensions mentioned above for more than 6.000 Spanish words in a normative database. This database, which should provide an important tool for future research on emotional processes using the Spanish language, will be presented putting special focus on apparent correlations between the different dimensions of words’ emotional content and on cross language differences regarding rating values for the same words in Spanish, English and German.

**[PI-42] Associative evocation explains a perceptual learning effect after short preexposure**<sup>1</sup>Contel, D. M.; <sup>1</sup>Artigas, A. A. <sup>1</sup>Sansa, J.; <sup>2</sup>Prados, J.<sup>1</sup>University of Barcelona; <sup>2</sup>University of Leicester

Several groups of rats were given different pre-exposure lengths to flavor compounds (AX, BX...), sharing a common element (X), under two conditions: Intermixed and Blocked. Using a "between" design Group Intermixed received alternated presentations of AX and BX; and Group Blocked received separate blocks of AX and BX presentations. Using a "within" design the animals received alternated presentations of AX and BX and a separate block of trials with CX. After pre-exposure all subjects were given a taste aversion conditioning to AX with the US (LiCl) and a generalization test aversion from AX to AN (compound formed by A and a novel flavor, N). Artigas, Sansa & Prados (2006) have suggested that the perceptual learning effects observed in these kinds of pre-exposure could be explained by two alternative mechanisms: after a short pre-exposure by differential salience modulation of stimuli as consequence its associative evocation (Hall, 2003); after a long pre-exposure by associative inhibition (McLaren & Mackintosh, 2000). The results are discussed with respect to the salience modulation mechanism. Reference: Artigas A.A., Sansa J., Blair C.A.J. Hall G. & Prados J. (2006). Enhanced discrimination between flavor stimuli: Roles of salience modulation and inhibition. *Journal of Experimental Psychology: Animal Behaviour Processes*. Vol.32, 173-77pp.

**[PII-50] Intelligence and working memory in different dynamic spatial test conditions**<sup>1</sup>Contreras, M. J.; <sup>2</sup>Martínez-Molina, A.; <sup>2</sup>López-Almeida, P. I.; <sup>2</sup>Shih, P. C.; <sup>2</sup>Santacreu, J.<sup>1</sup>National University of Distance Education (UNED); <sup>2</sup>Autonomous University of Madrid

The aim of the present study is to examine the Intelligence and Working Memory (WM) relations with dynamic spatial performance in two different test conditions. The Spatial Dynamic Test (SDT 2.0; Santacreu, 2006) was modeled and designed to assess spatial performance in two conditions. The first dynamic spatial condition (A) is simple; participants should orientate two mobile dots using the control panels located at the top of the screen. The second condition (B) is like the first one but increasing the difficulty; the participants have to complete the orientation task without visual feedback on screen, i.e. without seeing the mobile dots. The second condition requires Visualization plus Orientation in the dynamic context. A total of 296 Psychology undergraduates students (79.5% females and 20.5% males; mean age = 20.02, SD = 2.5) participated in the study and were assigned in two independent samples to fulfill a course requirement. The first sample comprised 213 participants, whereas the second sample comprised 83 participants. Assessing intelligence tests were Raven's APM, PMA-R and DAT-AR (fluid intelligence, Gf) and solid figures, PMA-E and DAT-SR (Spatial Intelligence, Gv). WM tests were Reading Span, Computation Span and Dot Matrix. The hypothesis that contrasts in the poster will focus on examining possible differences in dynamic spatial performance variables with intelligence and WM in each condition. The present study was partially funded by the Spanish Ministry of Education and Science, project number SEJ2007-64448/PSIC, the PSID research team and the grant SEPEX to A. Martínez-Molina.

**[PI-36] Face reality: Eye movements to real and photographic faces**

<sup>1</sup>Cooper, R.; <sup>2</sup>Cristino, F.

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Little is known about whether reported psychological effects described in experiments using photographic images of faces generalise beyond these stimuli. This is a limitation for face research in general but of particular importance when the research is measuring the effects of social signal (e.g., gaze direction) on a process such as attention. We report an experiment in which participants ( $n = 16$ ) view either a real face or a photographic image of a face while their eye movements are recorded. The faces are shown to participants for 0.5, 1, 2, or 8 seconds followed by the illumination of a peripheral target to which participants have to saccade. The observed face has its eyes either directed at the viewer or averted to the floor. Regardless of face type (real or photographic) and regardless of where on the face participants were looking when the target illuminated, participants took longer to saccade away from the face in the direct gaze condition. Differences in scan patterns were noted between gazing at a real face or at the monitor and will be discussed. These findings have important implications for research on face processing and attention.

**[PI-69] Psychology of learning effects and the gain-loss theory in social psychology**

Cristina Orgaz, C.; Matute, H.; Vadillo, M. A.

*University of Deusto*

Some theories seem to be typical of a specific psychological area but might inspire our research in other matters or be generalized to other subjects. This is the case of a theory typically studied in social psychology, the gain-loss theory, and its relationship with trial-order effects in associative learning research. The gain-loss theory, originally proposed within the area of interpersonal relationships, tries to explain the influence that rewards and punishments provided by other people have on our opinion about these people. This theory claims that the order in which a person receives these rewards and punishments affects the opinion that this person has about the person who provides the feedback. In a similar way, it is well known that, in many situations, the order in which feedback is given during a contingency learning experiment influences participants' final judgments of contingency. The aim of these experiments is to extrapolate the gain-loss theory and its methodology, close to social psychology, to the study of trial-order effects in contingency learning research and vice versa.

**[PI-25] Cross-linguistic models of reading: Comparisons between normal and impaired reading in English and Spanish****<sup>1</sup>Cuetos, F.; <sup>2</sup>Rodriguez-Ferreiro, J.; <sup>3</sup>Davies, R.; <sup>4</sup>Monaghan, P.***<sup>1</sup>University of Oviedo; <sup>2</sup>University of Barcelona; <sup>3</sup>Oxford Brookes University; <sup>4</sup>Lancaster University*

Computational models of reading have led debates over the cognitive structure of the reading system, and have shown how impairments to this structure can result in reading disorders, such as dyslexia (Coheart, Rastle, Perry, Langdon, & Ziegler, 2001; Harm & Seidenberg, 1999). However, much of this research has focused on reading and reading impairments in English (Hutzler, Ziegler, Perry, Wimmer, & Zorzi, 2004), yet patterns of reading difficulties are distinct in other languages. We present a comparative model of reading and reading disorders in English and in Spanish, and explore the extent to which similar impairments to the model result in distinct patterns of reading behaviour resulting from the properties of the language. In English, the mapping between spoken and written forms of words is quasi-regular, meaning that letters can be pronounced differently according to their context. So, “i” is pronounced differently in “pint” compared to “tint”. Dyslexia in English has been characterised by difficulties in reading irregular words, or problems reading nonwords, and this distinction has informed models of reading. Models either: propose separate routes for reading words and nonwords, with impairment to one or other route resulting in each dyslexia subtype; or show that different types of impairment to a single route result in the dyslexia subtypes. In contrast to English, Spanish is a highly-regular language, such that “i” is always pronounced the same way. Dyslexia tends to be manifested in terms of slower, more effortful reading, but with few errors (Davies, Cuetos & González-Seijas, 2007; Suárez & Cuetos, 2009). We simulated reading in English and in Spanish in a model based on Harm & Seidenberg’s (1999) connectionist model of reading. We demonstrate that similar principles of reading can apply to simulate reading cross-linguistically, and show that differences in the language properties result in different behavioural impairments in reading.

**[PII-71] Top-down modulations of the happiness advantage in emotional visual search****Damjanovic, L.; Wilkinson, H.; Lloyd, J.***University of Chester*

A commonly held view is that visual attention is rapidly drawn to the most salient perceptual feature in emotional visual search tasks, yielding a search advantage favouring happy facial expressions. Here, the authors investigated the resilience of a purely bottom-up account of emotion perception by introducing contextual factors to visual search performance. Participants were required to search for an angry or a happy face target against an array of emotional or neutral competing distractor faces whilst performing the task in the presence of pleasant, unpleasant or no odour contexts. Strawberry, vanilla and orange zest odours were used in the pleasant odour context, whereas fish odour was used for the unpleasant context. Post-experiment ratings showed that the odours sustained their perceived emotional valence throughout the course of the visual search task. Whilst the happiness advantage was relatively robust under the no odour context, analysis of the phasic characteristics of visual search performance reveals, for the first time, the malleable nature of the happiness advantage. Specifically, attention towards happy faces was optimized at the start of the visual search task for participants in the pleasant context, but diminished towards the end. This pattern was reversed for participants in the unpleasant odour context. We conclude that these cross-modal effects occur through the ability of the odour contexts to induce an emotional change in the participant, ultimately overriding the perceptual saliency of the facial stimulus in emotional visual search.

**[PIII-47] Is reading lips like hearing voices? The role of modality in short-term memory (stm) performance**

**Maidment, D. W.**  
*Cardiff University*

The modality effect is a short-term memory (STM) phenomenon referring to the finding that auditory presentation almost always results in higher recall in comparison to visual presentation (Conrad and Hull, 1964; Crowder and Morton, 1969). This effect is consistently found within recency; the superior recall for the last items of a to-be-remembered sequence. Although the origins of this effect are not agreed, it has been observed that auditory recency is still evident when rehearsal is prevented by articulatory suppression (e.g. Jones, Macken, and Nicholls 2004; Jones, Hughes, and Macken, 2006). This has led researchers to propose that the modality effect is the result of processes of auditory perceptual organisation (see Bregman, 1990; Nicholls and Jones, 2002). Accordingly, auditory recency is believed to be superior, relative to visual material, on the basis that list items presented last are perceptually salient, and thus improves recall accuracy. Nevertheless, a number of experiments have appeared to show that, despite no auditory trace, silently lipread stimuli also demonstrate comparable recency effects (e.g. Campbell and Dodd, 1980; 1982; 1984; Dodd, Hobson, Brasher, and Campbell, 1983; Spoehr and Corin, 1978). It is possible then, that this recall advantage is not just a hallmark of auditory processing. In an attempt to further explore the mechanisms that underpin the modality effect therefore, recall accuracy was compared for auditory, silently lipread and written modes of presentation, both in the absence and presence of suppression. In line with predictions, under suppression, accurate recall performance at the terminal position was greatly diminished when no auditory trace was available compared to when material was heard. As a consequence, the present findings are used to maintain arguments proposing that processes of auditory perceptual organisation support verbal STM.

**[PII-34] Visualizing polysemy structures using lsa and predication algorithm**

<sup>1</sup>de Jorge Botana, G.; <sup>1</sup>León, J. A.; <sup>1</sup>Olmos-Albacete, R.; <sup>2</sup>Escudero, I.  
<sup>1</sup>*Autonomous University of Madrid;* <sup>2</sup>*Antonio de Nebrija University*

Context is a determinant factor in language and plays a decisive role in polysemy words. Some psycholinguistic based algorithms has been proposed to emulate the management of the context that humans do in the assumption that the value of a word is evanescent and take sense when interact with other structures (e.g., Kintsch, 2001, uses a vector representation of the words that produce LSA for dynamically simulating the comprehension of predications). The objective of this study was predict unwanted effects that could be present in the vector-space models when extracting different senses to a polysemy word (Predominant content flood, Accurate-less and Low-level definition using a Spanish corpus). The results support the idea that this human-based computational algorithm as Predication can take into account features that ensures more accurate representations of the structures we want to extract.

**[PIII-66] Do visual feedback and target position reliability help improve temporal precision in a reaching task?****<sup>1</sup>De la Malla, C. ; <sup>1</sup>, <sup>2</sup>López-Moliner, J.***<sup>1</sup>University of Barcelona; <sup>2</sup>Institute for Brain, Cognition and Behaviour*

This study aims to show whether there is any improvement in temporal resolution when reaching static objects if proprioceptive and visual information are combined. When perceiving an object, the faster the motion, the higher the spatial error, because of the poor temporal resolution in the visual system. Alternatively, in motor behaviour the temporal variability is reduced for high-speed movements (although the spatial error increases). We want to know how the temporal resolution is modified by combining the temporal resolution information of these systems in a reaching task. Our setup enables subjects to use an on-line feedback control (subjects had both visual and proprioceptive information) or a forward control (they only had proprioceptive information). Targets were static during the trials but their position changed on a trial-by-trial basis. In different sessions we manipulated the reliability of the position: small deviation promoting better performance because of the lower uncertainty by combining position prior information and high deviation rendering prior information less reliable. By obtaining the Weber's fractions ( $\Delta mt/mt$ , where  $\Delta mt$  and  $mt$  denote the standard deviation and the mean of the movement time respectively) as a function of average hand velocity we see that is the reliability of targets' position and not the visual feedback what determines temporal precision. Reaction times analyses were consistent with subjects needing more time to programme their movements when the variability of targets' position was high.

**[PI-75] Context effects in judgments of happiness produced by reward****De Rivas Hermosilla, S. ; Álvarez-Bejarano, A.; Fernández-Dols, J. M.***Autonomous University of Madrid*

Positive psychology approach to human happiness has typically stressed positive subjective experiences. Positive is important, but ¿what about negative? Parducci's contextual theory of happiness (1995) takes into account habituation and contrast processes in relation to positive and negative events hence, the importance of both. It relates hedonic judgments to particular mathematical principles, a frequency principle and a range principle, establishing concrete predictions. In this sense overall happiness would be maximized when shaped by a negative skewed distribution of events and happiness derived from a particular event would be maximized when shaped by a positive one. In this study happiness was examined as a function of the level of reward given after a computer task and kind of context in line with Parducci's theory. An experimental design 2 (context: negative skewed distribution of events vs. positive skewed distribution) x 3 (reward: very high, medium, very low) was conducted. The sample consisted of sixty participants living in Spain, aged 18–59 years (mean=29), with 23 male and 37 female. Using ANOVA 2x3 analysis main effects and interaction effects were analyzed: context ( $F=11,267$ ;  $p<.0001$ ); reward ( $F=85,204$ ;  $p<.0001$ ) and interaction  $F=2,306$ ;  $p<.006$ ). Means were higher in the positive skewed context thus participants report to be happier given a reward within the positive skewed distribution context than given same reward within the negative skewed distribution context. The findings stress the importance of considering contextual theory of happiness and its implications. Awareness of happiness dynamics should lead us not to try to eliminate the negative per se. Negative is necessary as well as positive for one's happiness.

**[PI-48] The contribution of the temporal nature and familiarity of imagined scenes to episodic future thinking**

<sup>1, 2</sup>de Vito, S.; <sup>1</sup>Gamboz, N.; <sup>1</sup>Brandimonte, M. A.  
<sup>1</sup>Suor Orsola Benincasa University; <sup>2</sup>University of Edinburgh

The available experimental literature is generally consistent with the view that remembering past and imagining future (Episodic Future Thinking, EFT) are closely related activities and involve similar processes. In order to further disentangle the nature of the relation between past and future thinking, the present study explored the specific contributions that the temporal nature, self-relevance and familiarity of imagined scenes make to episodic future thinking. When individuals remember past or simulate future events, they imaginatively place themselves into specific and familiar scenarios that are temporal in nature, i.e. scenarios that pertain to their past and to their future. Therefore, the construction of temporally defined, self-relevant, familiar scenarios seems a core element of both past and future thinking. We analyzed phenomenal as well as other characteristics of imagined scenes differing with respect to temporal nature, self-relevance, and familiarity by means of 2 behavioural studies. Results revealed a relevant difference between familiar and unfamiliar scenarios. Moreover, we noticed a significant interaction between temporal nature and familiarity, in particular between temporally defined familiar and unfamiliar scenarios. However, the temporal, familiar condition (EFT) did not seem to differ from the non-temporal, familiar condition. These results have been discussed with respect to previous studies (Addis et al., 2009), which suggest that EFT might be considered as a general capacity of placing themselves in a hypothetical scenarios (Hassabis et al., 2007), rather than a specific cognitive process.

**[PIII-33] Canonical word order and sentence comprehension: Cognitive and neurophysiological basis of processing demands**

<sup>1, 2</sup>Del Río, D. ; <sup>3</sup> López-Higes, R.; <sup>1, 3</sup> Maestú, F.; <sup>3</sup> Martín-Aragoneses, M. T.; <sup>1, 3</sup> Moratti, S.;  
<sup>1</sup>Gutiérrez, R.; <sup>1</sup>Maestú, C.; <sup>1</sup>Del Pozo, F.  
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Processing difficulties in object-first sentences (vg. “the reporter that attacked the senator finally admitted his error” vs. “the reporter that the senator attacked finally admitted his error”) have been widely reported. These difficulties have been attributed to an increase in Working Memory demands or to a lack of adjustment of the sentence structure to the canonical word order of constituents (subject-verb-object). The aim of the present study is to investigate the role of both factors on sentence comprehension as well as to explore the cognitive brain networks involved in these processing demands. In the first experiment, we used a self-paced reading task to measure word-by-word reading times while subjects were reading Spanish sentences containing subject- and object-extracted relative clauses. Working memory demands for the establishment of syntactic dependencies and adjustment to canonical word order were manipulated. Results show that, aside from Working Memory demands, reading times increased in noncanonical sentences. In the second experiment, we used Magnetoencephalography to map brain activity while subjects were reading subject-first and object-first Spanish cleft sentences (“este es el periodista que atacó al senador/this is the reporter that attacked the senator” vs. “este es el periodista que atacó el senador/this is the reporter that the senator attacked”). Results show the involvement of a time-modulated frontal network during the processing of object-first sentences. This is attributable to the necessity of a sentence revision, overcoming bias to establish the meaning of the sentence in the basis of canonical word order. Taken together, the results highlight the role of canonical word order in sentence comprehension, as well as the putative role of frontal cognitive control mechanisms related to conflict resolution when canonical word order conflicts with other morphosyntactic cues to establish the meaning of the sentence.

**[PIII-45] Eeg-correlates of perceptual sequence learning****Deroost, N.; Baetens, K.; Zeischka, P.; Coomans, D.***Vrije University of Brussel*

Implicit learning, or the phenomenon that people are able to acquire structured knowledge about their environment in a seemingly automatic and unconscious fashion, remains one of the challenging topics in cognitive psychology. One of the most popular paradigms to investigate implicit learning is the serial reaction time task (SRT task). In the SRT task, participants have to react as fast as possible to a target by pressing a spatially corresponding response key. Unbeknown to them, the target is presented following a structured sequence. Implicit learning is derived from a superior performance for regular targets, following the sequence, as compared to deviant targets. Because visually presented targets are accompanied by corresponding motor responses, sequence learning in the SRT task can rely on perceptual or motor knowledge. In the present study, we investigated the EEG-correlates of perceptual sequence learning. Participants had to respond to the identity of a target letter pair ("OX" or "XO") that was presented in one of four horizontal locations, by pressing one of two response keys. The target's identity was random, but the irrelevant target location was structured according to a probabilistic sequence. Behavioral results show that participants responded faster to regular target locations than to deviant target locations, indicating perceptual sequence learning. EEG-analyses of perceptual sequence learning will be discussed during the presentation.

**[PII-78] Judgments of time to contact are affected by the rate at which fine-grained texture elements become visible****Díaz, A.; Jacobs, D. M.***Autonomous University of Madrid*

When an object is approaching an observer, several informational variables could be considered relevant for the perception-action coordination in order to catch the object or to avoid impact. The informational variable  $\tau$ , defined as the ratio of optical angle over optical expansion, specifies time to contact (given several boundary conditions; Lee & Reddish, 1981). Other variables that are frequently studied are optical angle on itself and optical expansion on itself (e.g., van der Kamp, Savelsbergh, & Smeets, 1997). This communication points out the influence of another informational variable: the appearance of visible texture. When the distance of a surface and the observer gets reduced, more fine-grained texture elements become visible, nested in the ones visible before. The communication illustrates with a schematic example that the inverse rate of the relative appearance of visible texture provides information about time to contact if the observer has a constant visual acuity and the texture has a certain scale-independent structure. In our task, participants were seated in front of a two-approaching-spheres scene over 60 trials. The rate of appearance of fine-grained texture on the surface of the spheres was manipulated, generating a fast texture appearance condition and a slow texture appearance condition. Participants were asked to make forced-choice time-to-contact judgments. Their judgments were affected by the rate of appearance of the texture. It is concluded that observers indeed exploit this type of information. Consequently, it seems that the perception of time to contact is affected by several types of information. References Lee, D. N., & Reddish, P. E. (1981). Plummeting gannets: A paradigm of ecological optics. *Nature*, 293, 293-294. van der Kamp, J., Savelsbergh, G., & Smeets, J. (1997). Multiple information sources in interceptive timing. *Human Movement Science*, 16, 787-821.

**[PIII-53] Word association spaces for predicting false recognition and theme identifiability**

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<sup>1</sup>University of Salamanca; <sup>2</sup>University of La Laguna

The latest advances in the development of computational methods to estimate concept semantic similarity, from textual corpora or association norms, are creating new opportunities to investigate the relationship between the structure of semantic memory and episodic memory performance. For example, the Word Association Space (WAS) model has demonstrated its predictive value in different memory phenomena, both in recall tasks (e.g., intrusions in free recall) and recognition tasks (e.g., semantic similarity ratings between test and studied items). In this study, a WAS has been built with data obtained from free-association normative data in Spanish. Subsequently, and using semantic similarity estimates derived from that associative space, we studied the model's ability to predict certain phenomena related to memory distortions, like false recognition or thematic identifiability of associated word lists. The results may help to clarify some theoretical and empirical issues related to the memory distortion phenomena that occur with the DRM paradigm.

**[PIII-61] The contribution of unimodal cues to multisensory integration: Evidence of non-additive spatial bias in visual and auditory temporal order judgements**

<sup>1</sup>Doug, J. K.; <sup>2</sup>Krumbholz, K.; <sup>3</sup>Susi, K.; <sup>4</sup>Bainesm, D.  
<sup>1</sup>University of Leicester; <sup>2</sup>MRC Institute of Hearing Research, University Park; <sup>3</sup>Nottingham Trent University

Two experiments investigated the relative effect of uni- and multimodal cues on judgements of temporal order (TOJ). Pairs of visual or auditory targets were presented to either side of a central fixation and separated by varying stimulus onset asynchronies (SOAs). On each trial, non-predictive visual, auditory or multimodal transients were used to cue the location of one of the forthcoming targets. Cues and targets were presented to the same location and participants were asked to report the identity of the target appearing first. Measures of perceived subjective simultaneity (PSS) revealed a consistent bias towards targets appearing at the cued location. For visual targets, unimodal cue-target combinations induced the largest and crossmodal cue-target combinations the smallest spatial bias. Bias associated with multimodal cues fell between that observed for unimodal and crossmodal cue-target combinations with differences between them reaching statistical significance. A similar pattern was observed for auditory targets though differences between cueing conditions were not significant. The results demonstrate robust changes in TOJ in response to uni- and multimodal cues. Cues presented in the same modality as the target produced the largest effects while multimodal cues produced subadditive effects for visual targets. The data are consistent with cascade models in which crossmodal selection reflects the propagation of spatial information between unimodal association cortices (e.g. Driver & Spence, 2000).

**[PII-65] Visual clarity and standard measurements: Comparing several methods for transforming photometric measurements****<sup>1</sup>Durán, M. C.; <sup>1</sup>Lillo, J.; <sup>2</sup>Moreira, H.; <sup>1</sup>Alvaro, L.***<sup>1</sup>University of Madrid; <sup>2</sup>Universitary School Cardenal Cisneros*

Visual clarity effects appear when photometrically similar stimuli (in terms of standard luminance, brightness or lightness CIE parameters) produce quantitative perceptual differences. People with normal colour vision took part in a research where two psychophysical procedures were used to measure, respectively, perceived contrast (AMLA method) and perceived lightness. Four chromatic angles (CIE H\*) were used (the ones corresponding to the screen primaries and the best yellow). Standard photometric accuracy for measuring perceived contrast was confirmed (stimuli combinations with no achromatic contrast were formed by stimuli with similar standard luminance values). On the other hand, perceived lightness showed important differences with CIE L\* value. So a clear visual clarity effect was found. Three methods for transforming lightness photometric measurements (L\*) were compared. Their goal was to get transformed lightness values (LT\*) more adjusted to perceived lightness. First method (chrome compensation) used C\* values (as defined in CIE L\* u\* v\* and CIE L\* a\* b colour spaces) to transform L\* values. The other two (yellow-blue and circadian methods) did a similar transformation but using, respectively, the yellow-blue or the circadian system inferred activity. Because the visual clarity effect magnitude depended on H\* identity, chrome compensation provided the worst results. Some qualitative differences appeared when comparing yellow-blue and circadian transformations. The theoretical implications of these results are commented. Key words: Lightness. Colour. Visual clarity. Photometric measurements.

**[PII-79] Social perception of traditional sexual roles: The role of rape myth acceptance and perpetrator´ sexist attitudes****Durán, M. M.; Moya, M.; Megías, J. L.***University of Granada*

Marital rape significantly deviates from what has been called the “real rape” stereotype in social psychology; as such, in many cases it is not considered an offence. Perceivers social perception is expected to be strongly affected by rape supportive attitudes, especially when the perpetrator (husband) is described as a benevolent sexist partner. Thus, the purpose of this study was to investigate the influence of rape myths acceptance and participants´ sex on social perception of marital relationships in which women refuse to have sex with their intimate partner. Participants completed the Spanish version of the “Acceptance of Modern Myths about Sexual Aggression” scale (AMMSA) (Gerger, Kley, Bohner & Siebler, 2007), a scale that subtly assesses modern myths about sexual aggressions. They then read two hypothetical marital scenarios and emitted their judgments about different aspects related to them (probability of sexual aggression from husband to wife, the perception about woman´s transgression of traditional gender sexual roles and the perception of forced penetration as rape). Results showed that both rape supportive attitudes and perpetrator´s variables are relevant in the comprehension of social perception of traditional sexual roles for men and women. These results are discussed in terms of their relevance to the maintenance of gender inequalities.

**[PIII-71] Social perception of marital rights and duties in sexual relationships**

**Durán, M. M.; Moya, M.; Megías, J. L.**

*University of Granada*

The present study addresses the question of how judgments made about marital rights of a husband and marital duties of a wife pertaining to sex, may be influenced by perceivers' cognitive variables as well as by situational variables. In this experimental study participants' rape myth acceptance as and the information given about a husband's sexist attitudes was manipulated. Participants' sex was also included as a predictor variable. Seventy-four university students from Granada, Spain, answered to questions about two hypothetical scenarios representing a marital relationship (without sexual aggression). Results showed that the information about the husband' sexist attitudes predicted the perception of marital rights and duties in the presented vignettes. Moreover, results showed a significant two-way interaction effect between information about the husband' sexist ideology and participants' rape myth acceptance. Our data provide evidence that some variables related to the observer (rape myth acceptance) and to the intimate relationships inhibit the idea that a woman has the right to reject any sexual relationship, facilitating the perpetuation of discrimination toward women. These findings highlight the relevance of both situational and observer factors in the social perception of traditional gender roles in sexual relationships and expand our understanding of them.

**[PI-1] The relationships between age, strength and movement dexterity**

**<sup>1</sup>Edwards, M. G.; <sup>1</sup>, <sup>2</sup>Martin, J. A.; <sup>3</sup>Ramsey, J.; <sup>4</sup>Hughes, C.; <sup>4</sup>, <sup>5</sup>Peters, D.**

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The literature consistently shows that with increased age, movements tend to become slower (or decrease in dexterity). Some papers suggest that the relationship results from reduced strength with increased age, as there is good evidence that strength also reduces with increased age. Surprisingly, it appears that the relationship between age, strength and movement dexterity has received little investigation, especially using accurate movement recording methods for upper-limb actions. In the data reported here, we tested 107 adults between 18 and 86 years of age on a variety of fine motor ability movement dexterity measures. In each dependent measure, we first tested the relationships between: (i) age and strength; (ii) age and movement performance, and; (iii) strength and movement performance, and then use multiple linear regression models to determine which of age and strength accounts for the greater variance. The results showed clear relationships between increased age and decreased strength, increased age and reduced movement performance, and decreased strength and reduced movement performance. Standard multiple linear regression analyses showed that both age and strength made significant contributions to the data variance. Moreover, post-hoc analyses showed that age explained more of the variance for steadiness and line tracking movement tasks, whereas strength explained more of the variance for aiming and tapping movement tasks. The data are discussed in terms of the relationships between age and strength on the resultant movement performance, and the importance of measuring strength when considering the effects of age on dexterity and movement performance.

**[PI-9] A brain-potential correlate of task-set conflict****Elchlepp, H.; Lavric, A.; Rumball, F.***University of Exeter*

Task switching experiments typically find that the performance decrement associated with a task switch relative to a task repetition ("switch cost") is reduced but not eliminated by preparation. The asymptotic ("residual") switch cost has been associated with greater task-set conflict on switch trials, as has a switch-induced brain potential (greater negativity for switch at 200-500 ms after stimulus onset). However, alternative accounts of this negativity exist and its accurate measurement is complicated in trial-to-trial switching by spill-over of switch-repeat differences from the pre-stimulus interval. Here, we examined the ERP correlates of task-set conflict in the absence of trial-to-trial task-switching. Participants classified digits (even/odd) presented alongside a letter or a symbol. To elicit task-set conflict on digit-letter trials, participants had to classify single letters (as vowel/consonant) in a previous session and in letter blocks that were interspersed with the digit classification blocks. Relative to digit-symbol trials, digit-letter trials were associated with slower responses, a reduced N1 and greater selection negativity, as well as greater negativity in the 300-500 ms range. A subsequent experiment, in which letters were never associated with a task, found the first two (perceptual) ERP differences, but not the later negativity; the interference effect of letters on digit-letter RT was also reduced. Thus, although the presence of the letter modulated perceptual components in both experiments, a late negativity similar to the previously documented switch-repeat negativity was only observed when letters were associated with a newly-acquired task, supporting the link between this ERP effect and task-set conflict.

**[PI-45] Recalling our past changes thoughts about the future: The effects of retrieving food memories on predicted enjoyment and choice****Eric Robinson, E.; Blissett, J.; Higgs, S.***University of Birmingham*

It has been suggested that when thinking about how enjoyable future experiences will be we rely on memory representations of similar experiences. However, little is known about the influence of food memories on thoughts about eating those foods in the future, despite the fact that this could be an important factor in food choice. The present study examined whether recalling a memory of eating a food (broccoli) influences hedonic predictions for eating that food. Additionally we examined whether recall influenced participants likelihood of choosing the food in the future. 95 undergraduate students (13 male, 82 female) were randomly assigned to one of four groups. The experimental group recalled an occasion in which they ate broccoli (broccoli recall group). There were three control groups: recall of eating a non-vegetable food (crisps), recall of a non-food memory and mere exposure to positive broccoli cues. Participants then completed measures assessing their predicted enjoyment of eating various foods (including broccoli and other vegetables) and their likelihood of choosing these items in a later study. 2 participants correctly guessed the aims of the study and were removed from analysis. The groups did not differ in age, BMI, gender ratio, self-reported frequency of consuming broccoli. Predicted enjoyment and likelihood of choosing broccoli and other vegetables was significantly higher in the broccoli recall group compared to all other groups. Recalling eating broccoli did not affect predicted liking and choice for non-vegetable food items suggesting the effect is specific for recall of the eaten food and similar items (vegetables). The results suggest that retrieving a food memory influences forecasts of enjoyment and likelihood of choosing that type of food. Future research will investigate the effect of recalling food memories on intake behaviour.

**[PIII-59] Size congruity effects on multiplication verification: Testing the role of magnitude representation**

**Estudillo, A.; García-Orza, J.**  
*University of Málaga*

The role of numerical magnitude (semantic) representation on single-digit multiplication solving remains controversial. According to some models magnitude representations play a central role on multiplication solving (e.g., McCloskey, 1992). Other models suggest multiplications are retrieved using verbal representations, claiming that magnitude representations, in the best case, would play a role in the process of re-coding the presented problem into a more familiar representation before accessing the corresponding verbal form (i.e.:  $9 \times 2$  can be re-coded as  $2 \times 9$ , that is a more familiar representation) (Dehaene, 1992). This study explores whether numerical magnitude representations are activated in the context of multiplication problems and its role in this task. Thirty eight undergraduates participated in a verification task that uses single-digit multiplications (e.g.: are the following problems correct?  $2 \times 3 = 6$ ;  $2 \times 3 = 7$ ). The physical and numerical magnitude of the operands within each problem could be congruent (the operand with bigger numerical magnitude appears in bigger size than the operand with lower numerical size), incongruent (the Arabic number with lower numerical magnitude appears in bigger size than the operand with bigger numerical size) or neutral (both operands appears in the same physical size). Problem-size and the order of the operands (big x low vs. low x big) were also manipulated. Results showed slower response times in the incongruent condition and no differences between the neutral and the congruent conditions. Although main effects of problem-size were found, no interactions were observed between this and congruity nor between congruity and order. It is concluded that magnitude representations are automatically activated even in the context of multiplication problems, however, as suggested by the lack of interaction effects, it is argued that this activation is not related to the multiplication solving process.

**[PIII-11] Attention network functioning in mild cognitive impairment with subcortical vascular features**

**<sup>1</sup>Fernández, P. J. .; <sup>1</sup>Fuentes, L. J.; <sup>1</sup>Campoy, G.; <sup>2</sup>Antequera, M.; <sup>1</sup>García, J.; <sup>2</sup>Marín, J.; <sup>2</sup>Antúnez, C.**  
*<sup>1</sup>University of Murcia; <sup>2</sup>Universitary Hospital Virgen de la Arrixaca (Murcia)*

Mild Cognitive Impairment (MCI) is a transitional stage between normal aging and early dementia. However, MCI is a heterogeneous diagnosis with multiple aetiology and different clinic manifestations that remain unclear. It is not unusual for MCI patients showing brain vascular damage in magnetic resonance image (MRI), and it is well-known that vascular disease is involved in cognitive impairment as attention problems or executive functions deficits. The presence of subcortical vascular hyper-intensities in MRI and executive dysfunction are the principal criteria for subcortical vascular mild cognitive impairment diagnosis (svMCI), although attention functioning is not included. Here we used a task in which the alerting, orienting and executive attention networks, and their interactions, can be assessed in a single experiment, the Attention Network Test (ANT). Three groups of participants were tested, svMCI (N = 19), MCI free from brain vascular disease (nvMCI) (N = 15) and normal controls (NC) (N = 19). All participants performed a version of the ANT in which a tone was used as the alerting signal and the target and the distractors were framed to help target location. The svMCI group showed a lesser orienting effect and a higher congruency effect compared with nvMCI and NC groups, although this different congruency effect between groups became not significant taking the global reaction time effect out. In the nvMCI and NC groups the presence of a valid visual cue improved the executive network functioning but svMCI group did not show this interaction. Thus, svMCI group has the orienting network affected and this impairment and the global slowing may affect the correct functioning of the executive network.

**[PIII-75] Mixed faces for mixed emotions: What do we see in mixed expressions of emotions?****Fernández-Cahill, M.; Aguado, L.***Autonomous University of Madrid*

Participants evaluated a set of stimuli composed of images of pure and mixed emotions created from Ekman & Friesen's (1976) collection (Pictures of Facial Affect). In the first experiment the possibility that the same expression, pure or mixed, could be perceived as showing different emotions, depending on verbal context, was studied. For this purpose, each stimuli was preceded in different trials by the name of different emotions, acting as context or "prime" and each participant was asked to indicate to what extent did each face show that emotion. In a second experiment, the verbal context used consisted of descriptions of everyday situations that elicited pure or mixed emotions. Participants were asked to decide in a choice task which of four different expressions (pure and mixed) was more appropriate for each situation. Results indicated a remarkable expressive ambiguity for the mixed expressions, which was also observed but to a lesser extent for pure expressions. A more accurate identification of expressions, both pure and mixed, was obtained when the primes were congruent with these expressions. KEY WORDS: MIXED EMOTIONS, FACIAL EXPRESSION, EMOTIONAL EXPRESSION Ekman, P., & Friesen, W. V. (1976); Pictures of Facial Affect. Palo alto. CA: Consulting Psychologists Press.

**[PI-73] When language gets emotional: Irony and the embodiment of affect in discourse**<sup>1</sup>Filik, R.; <sup>2</sup>Hunter, CH. M.; <sup>2</sup>Leuthold, H.<sup>1</sup>University of Nottingham; <sup>2</sup>University of Glasgow

Although there is increasing evidence to suggest that language is grounded in perception and action, the relationship between language and emotion is less well understood. We investigate the grounding of language in emotion using a novel approach that examines the relationship between the comprehension of a written discourse and the performance of affect-related motor actions, specifically, hand movements towards and away from the body. Stimuli were presented word-by-word on a computer screen with the target word, which was always the final word of the sentence, changing to one of two colours after 500 ms. Participants had to indicate, by pushing or pulling a lever, which colour the target word had changed to. Results from Experiment 1 showed a significant affect-movement compatibility effect, specifically, faster pushing (avoidance) movements for negatively valenced target words and faster pulling (approach) movements for positive target words. This finding is particularly interesting given that participants were responding to a stimulus dimension unrelated to emotion (word colour). In Experiment 2, we investigated whether this effect could be modulated by the wider discourse context in which the sentence appeared. This was achieved by presenting sentences such as "You are so smart" in contexts supporting either a literal or ironic interpretation of the target word. Results showed that the affect-movement compatibility effect observed in Experiment 1 was effectively reversed for ironic materials in Experiment 2. A control study indicated that the target words used in both Experiments 1 and 2 did not produce an affect-movement compatibility effect when presented in isolation. Overall, results suggest that the emotional content of an utterance is rapidly computed within the widest possible interpretive domain, with effects being observed even when the task is not related to emotion.

**[PI-78] Measuring causal reasoning in clinicians during reading of clinical reports**

**Flores, A.; Cobos, P. L.; López, F. J.**

*University of Málaga*

Previous studies have shown that clinicians' causal theories about DSM-IV disorders determine the importance of diagnostic criteria when diagnosing such diseases. Specifically, those symptoms located at a higher position in a hierarchical causal network have a greater impact on diagnostic judgement than symptoms located at a lower position. The aim of our study is to extend these results by finding further evidence of this causal status effect on clinicians' reasoning processes involved in reading comprehension. The underlying rationale is that, if causal knowledge plays an important role in the diagnosis of DSM-IV disorders, clinicians should engage in efficient processes of causal reasoning during reading that should be evident through non-intrusive on-line measures. In our experiments, participants went through the reading of clinical reports informing about the symptoms present in hypothetical patients and about the diagnosis such patients were given by a hypothetical clinician. Causal reasoning was inferred from the effect of inconsistencies on reading times. Such inconsistencies were created by providing information about symptoms that conflicted with the DSM-IV disorder that a given patient was diagnosed with. Crucially, different degrees of conflict were created according to causal theories about DSM-IV disorders. Our results show that the more inconsistent the sentence the longer the reading time was for such sentence. Thus, clinicians engaged in causal reasoning during reading of clinical reports about patients with DSM-IV disorders.

**[PI-21] Implicit causality revisited: A cross-linguistic study of different domains of verbs in western and non-western languages**

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*<sup>1</sup>Middlesex University; <sup>2</sup>Novi Sad University; <sup>3</sup>Guilan University*

The implicit causality effect in verbs describing interpersonal scenarios refers to participants' biases concerning who brought the event about: towards the sentence-subject in action (e.g., help) and state-action (e.g., frighten) verbs, but to the sentence-object for state verbs (e.g., hates) (see Rudolph & Försterling, 1997, for a review). The present extends this research to the effect of semantic domain, language and culture on implicit causality. If previously reported findings hold, it would be expected that emotion verbs present the typical bias pattern described above, but the prediction is unclear for cognition or vision verbs since such domains were under-represented in previous studies. Although the implicit causality effect has been found in a number of Western languages in independent studies, the present experiment utilizes the same set of verbs to compare individual languages within the European, Western culture, and between Western vs. non-Western cultures namely, mainland China, Iran and Turkey. English, Finnish, Hungarian, Mandarin, Persian, Polish, Serbian and Turkish native speakers (N=250 university students, 50% female) were assessed on a task in which each verb item was presented within Subject-Verb-Object sentences. Participants were asked to complete a causal inference (S verb O... because.....) and responses were analysed in function of their attribution to the sentence-Subject or -Object. Results showed consistent implicit causality effects for the emotion domain in both Western and Non Western languages. Some differences emerged for cognition and visual domains, which will be tentatively explained on the basis of varying folk psychological beliefs about the origin of the experiences described by the verbs across cultures. Results have also implications for understanding the developmental trajectory of this linguistic bias in a six language data set collected with children. Reference Rudolph, U., & Försterling, F. (1997). The psychological causality implicit in verbs: A review. *Psychological Bulletin*, 121, 192-218.

**[PI-6] Better measurement with visual analogue scales: A web experiment****<sup>1</sup>Funke, F.; <sup>2</sup> Reips, U. D.***<sup>1</sup>University of Tübingen; <sup>2</sup>University of Deusto; <sup>3</sup>Basque Foundation of Science*

It is common practice to use ordinal rating scales to measure continuous variables. Depending on the number of response options and the distribution of true values this practice produces a considerable amount of formatting error. The authors hypothesize that measurement with visual analogue scales (VASs, continuous graphical rating scales) reduces formatting error, as there is a perfectly matching response option for every true value. In a Web experiment respondents (N = 240) were randomly assigned to a questionnaire where ratings were either made on 5-point scales, 7-point scales, 9-point scales, or VASs (created with the free Web service <http://vasgenerator.net>). For analysis the rating scale was used as an independent variable and the standard error of the median for each of the 58 items was used as a dependent variable. We found error to be significantly lower with VASs in comparison to every ordinal scale, even in comparison to 9-point scales,  $F(1, 115) = 10.15$ ,  $p = .002$ ,  $\eta^2 = .08$ . In comparison to ordinal scales, VASs produce considerably less formatting error. This leads to more statistical power and enables detecting small effect sizes that are not observable with ordinal rating scales. The authors suggest considering VASs to measure continuous variables.

**[PIII-13] Attentional and motor features of cueing effects****Gálvez, G.; Lupiáñez, J.***University of Granada*

This study investigates the motor manifestation of attentional mechanisms associated with facilitation, inhibition of return and foreperiod effect, using a cost-benefit paradigm (Posner and Cohen, 1984). We developed two experimental sequences for this purpose. We manipulated the motor demands in initial position with three different levels (Without previous response, Initial action of press key with the fingers and Initial action of press buttons with hands) in the first experimental sequence. We manipulated the different movements to performance (Reaching vs grasping) in the second experimental sequence (the initial position was press button with hands) Participants were required to make either unimanual reaching movements towards a bull's eye in the first experimental sequence, and make either unimanual reaching (towards a bull's eye) or grasping (towards a little cubicle) in the second experimental sequence. We divided the overall Reaction Time into different temporal parts: Premotor Reaction Time, Motor Reaction Time (i.e., between muscle activation and movement initiation) and Movement Time. This division provided data about temporal evolution of the studied effects. The main results showed that the size of cueing effects is modulated by movement to performance (reaching vs grasping). The motor demands of initial position modulated the presence of cueing effects in motor phases. The temporal expectations (the foreperiod effect) showed an inverted pattern in the motor phases of the movement. These results are discussed attended to the nature of these effects and the influence of the motor demand.

**[PI-33] Interpersonal verbs and body locomotion**

**Gómez, E.; Díaz, J. M.; Marrero, H.; de Vega, M.**  
*University of La Laguna*

In the past ten years a new debate has set up in cognitive psychology, embodiment vs., symbolism (de Vega, Glenberg & Graesser, 2008). From embodiment theorists cognition is for action and changes in action systems are predicted to affect language comprehension. One important finding that has been argued to support the claim that language is embodied is “action-sentence compatibility effect” (ACE) of Glenberg and Kaschak (2002). Here, we present a new version of ACE where participant made a response involving a leg movement either forward or backward. Our main concern was the understanding of interpersonal verbs, particularly the differentiation between approach (e.g. support) and avoidance (e.g. to ignore) actions, that can be considered to basic human tendencies. The results partially supported our main hypothesis: understanding a sentence with an approaching action (“Peter supported Mary) would facilitated a response with a toward movement (step forward), whereas understanding a sentence with an avoiding action (Peter ignored Mary) would facilitated a response with a backward movement (step backward).

**[PIII-5] Pkmζ role in the maintenance of an active avoidance memory in rats**

**Gamiz, F.; Manrique T.; Gallo, M.**  
*University of Granada*

Recent work has demonstrated the crucial role of the protein kinase Mzeta (PKMζ) activity in the maintenance of long-term potentiation (LTP) (Sacktor et al., 1993; Ling et al., 2002, 2006; Hernandez et al., 2003; Serrano et al., 2005; Sacktor, 2008;). Inhibition of PKMζ activity by intracerebral injection of zeta inhibitory peptide (ZIP) has shown a clear breakdown of different memories retention, including spatial, taste aversion, conditioned fear and inhibitory avoidance learned responses. In the present experiments we used adult male Wistar rats in order to investigate the effect of bilateral ZIP injections in the basolateral amygdala (BLA) on the retention of a non-spatial active avoidance learned response. ZIP microinjection (10nmol/μl) in the BLA applied 24 hours after training impaired retention of the avoidance learned response assessed 7 days later when compared with scrambled-ZIP injected control groups. However, a retraining session applied 24 hours later indicated no differences between the groups. These findings support a role of amygdala PKMζ in maintenance of active avoidance learned responses without this implying a permanent halt on learning ability. These results add to a bulk of data which point to a general critical role of PKMζ in the plastic changes involved in different types of memories independent of the neural circuit involved.

**[PII-56] Online and offline experiments on priming through a customizable free software application**

**Garaizar, P.; Vadillo, M. A.; Matute, H.**  
*University of Deusto*

Previous computer-assisted research on priming has been typically based on offline solutions leaving online experimentation aside. Considering the enormous potential of the Internet as a source of experimental subjects, we have focused on the development of an easily customizable online -and also offline- experimentation suite on priming. World Wide Web Consortium (W3C) standards compliant technologies (i.e. XHTML, CSS, JavaScript) and a widespread framework (jQuery) have been used, assuring cross-browser compatibility and code simplicity. Despite having been released under a free software license (GPL), its main features (localization/internationalization, instructions/cover story, timing of stimuli, colours of primes and targets, response keys, word lists, data collection) can be seamlessly customized without modifying application's source code.

**[PII-33] Cognitive factors involved in paper and electronic reading comprehension of sixth graders**

**García, V.; Salmerón, L.**  
*University of Valencia*

We analyzed the extent to which traditional cognitive factors involved in reading comprehension in paper texts are responsible for sixth graders performance in electronic texts. Proponents of the New Literacies approach (Coiro & Dobler, 2007) affirm that electronic reading demands a set of additional cognitive activities, such as deciding which hyperlinks to follow, which can't be accounted by traditional paper reading skills. We tested this framework for the particular case of hypermedia documents with a navigable overview of the contents. 66 sixth-graders read a text about 'Ancient Rome daily life' with a graphical overview of the sections, and answered 6 location and 6 integration questions about it. Half of the students read the text in paper format, whereas the other half read an electronic version which mimicked the original one, except for the fact that in this case students had to click on the hyperlinks available on the overview to access the document sections. Students were assessed on their decoding skills, reading abilities (measured with a traditional paper and pencil test), sustained attention and visuospatial reasoning skills. Regression analyses showed that 'traditional' reading abilities significantly explained a similar amount of variance for integration questions in both paper ( $R^2 = .14$ ) and electronic ( $R^2 = .16$ ) conditions. In addition, sustained attention proved to explain additional variance only for the paper version ( $R^2 = .09$ ). Our results do not concur with the strong assumptions of the New Literacies approach, but still suggest that the influence of relevant cognitive factors involved in text comprehension of sixth-graders, such as sustained attention, can be diminished in electronic text involving navigable overviews. As a preliminary explanation, we propose that navigable overviews could boost low attention skill readers' comprehension by providing them with a scaffold that forces them to focus constantly on the organization of the document.

**[PII-49] Previous knowledge about chronological organization of everyday activities avoids retrieval-induced forgetting in recall**

**García-Bajos, E.; Migueles, M.**  
*University of the Basque Country*

This study examines the role of organization and retrieval-induced forgetting in the recall of everyday activities. Previous knowledge guides the processing and retrieval of organized information. By the contrary, when materials are encoded as a list of non organized elements selective retrieval practice facilitates recall of practiced elements but it also triggers retrieval-induced forgetting of related contents in memory. Participants studied 24 common everyday activities obtained in a previous normative study. The activities were presented organized following chronological order or in a random way. Then, half of the participants of each group practiced retrieving twice five activities and the other half performed the retrieval practice task with capitals of the world. Facilitation of practiced activities was significant in both organized and random presentations. Retrieval-induced forgetting was found exclusively when the activities were studied in random order. Inhibition did not emerge when the participants studied the activities organized in chronological order. Recall was higher for organized than random presentation and although there were few errors they were typical daily activities, showing the role of prior knowledge in memory. These findings suggest that previous knowledge guides the processing of daily activities temporally organized and retrieval-induced forgetting appears when the activities are difficult to integrate into an organized schema.

**[PI-38] Decrease in conditioned flavour preference after post-training cs exposure is due to conditioned inhibition rather than to extinction: Evidence from retardation and summation tests**

**García-Burgos, D.; González, F.**  
*University of Granada*

Previous studies on conditioned flavour preference (CFP) using a neutral flavour as CS simultaneously paired with sucrose as the US have revealed that, after post- training CS exposure , 1) there is a dissociation in the persistence of the preference depending on the motivational state at the time of testing; the decrease in preference is only observed when rats are hungry either during training or during testing (Harris, Shand, Carroll, & Westbrook, *Journal of Experimental Psychology: Animal Behavior Processes*, 2004,30, 177-189); and 2) there is a detectable impact on the strength of the CS-US association using the US devaluation technique (Delamater, *Journal of Experimental Psychology: Animal Behavior Processes*, 2007,33, 160-171). Although the decrease has been attributed to extinction, the above motioned results are somewhat at odds with what is known about this learning process. Thus, the authors suggest that another kind of learning is responsible for the observed decrease in preference when hungry rats are repeatedly exposed to the CS after training: conditioned inhibition. To provide support for this hypothesis, evidence from retardation and summation tests was evaluated using a CFP paradigm in which thirsty rats received simultaneous CS-US pairings, using sucrose as the US, before being repeatedly exposed to the CS whereas hungry using two-bottle tests (CS vs. water). After these two phases, retardation (Exp.1) and summation (Exp.2) tests were given. The result showed that reacquisition of the conditioned preference was retarded in the retardation test as well as the conditioned preference of an independent excitator attenuated in the summation test. Together these results provide evidence against an interpretation of the decrease in preference observed in terms of extinction and suggest that during post-training CS-exposure inhibitory CS-US learning occurs. Research funding: grants #SEJ2006-13851 (MEC), #PSI2009-10627 (MICINN, Spain), and #HUM-02763 (Junta de Andalucía).

**[PIII-12] Development of attentional networks in prelingually deaf children****García-Giménez, N.; Daza, M. T.***University of Almería*

From a cognitive neuroscience view, attention has been thought of as a set of neural networks that perform very specific computations. Posner & Petersen (1990) proposed a model in which attention is conceptualized as consisting of the three anatomically defined brain networks, namely the alerting, orienting, and executive control networks. Previous studies have indicated changes in attentional networks over children between 6 and 10 years (Rueda et al., 2004). We studied the development of attentional networks in prelingually deaf children with five age groups ranging from 6 to 10 and different communication mode (oral vs. visual -LSE-). Results obtained from ANT revealed differences between the age groups, but this differences were not similar than those observed with non deaf children in previous studies. Our results suggest that development of attentional networks in deaf children could be influenced by the communication mode.

**[PIII-42] Differences between experts and novices in estimations of cue predictive power in crime****<sup>1</sup>, <sup>2</sup>García-Retamero, R.; <sup>3</sup> Dhami, M. K.***<sup>1</sup>University of Granada; <sup>2</sup>Max Planck Institute for Human Development; <sup>3</sup>University of Cambridge*

In this study, we compared experts' and novices' estimates of the power of several cues to predict residential burglary. Participants were experienced police officers and burglars, and graduates with no experience in this domain. They all estimated the weight of each cue in predicting the likelihood of a property being burgled. In addition, they ranked the cues according to how useful they would be in predicting the likelihood of burglary. Results showed that the two expert groups differed substantially in their cue weights and rankings, and the police officers were actually more similar to novices in this regard. Beyond this, the two expert groups were more consistent in their responses than novices, that is, they showed less variability in their estimates when using different response method and were more consistent with other participants from their own group. Our results extend the literature on expert-novice differences, and have implications for criminal justice policy and decision making.

**[PII-76] Detecting fakers of the autobiographical iat****Ghirardi, S. A. V.; Sartori, G.***University of Papua*

Autobiographical memories might be identified using a variant of the Implicit Association Test, or the autobiographical IAT (aIAT). The aIAT provides a measure of association between true sentences and sentences describing an autobiographical event. This tool might be used to evaluate whether specific autobiographical information is encoded within the respondent's mind/brain. This paper examines possible problems arising when the aIAT is used as a lie-detector technique. The results indicate that, when given previous instruction or training with an aIAT, examinees can alter their results and beat the "memory-detector". However, we have been able to detect successful fakers of aIAT on the basis of their specific response patterns. Our algorithm has the ability to spot the faker in a satisfactory manner. If, as demonstrated here, faking can be detected, then the real autobiographical event might also be identified when the examinee attempts to alter their results.

**[PIII-16] The us preexposure effect: Evidence from a conditioned flavour preference procedure**

<sup>1</sup>Gil, M.; <sup>2</sup>Symonds, M.; <sup>2</sup>Hall, G.; <sup>1</sup>de Brugada, I.

<sup>1</sup>University of Granada; <sup>2</sup>University of York

In a series of experiments, animals received exposure to a given sucrose solution. In a subsequent phase, the subjects were given a flavour preference procedure to test the ability of the sucrose to act as an unconditioned stimulus (US), with a neutral flavour as a conditioned stimulus (CS). In our initial experiments, some of the rats were given both the preexposure and the test phases in a highly familiar context (homecage), whereas the other animals received both phases in a novel and distinctive context. In both cases a decrement was observed in subsequent conditioning, that is, they showed less preference for the flavour used as a conditioned stimulus (CS), showing a US preexposure effect. In our final experiment, therefore, the aim was to analyse the role of associative and non associative processes in generating these preexposure effects by changing the context between the various phases of preexposure, conditioning, and test. In this case, animals displayed less neophobia in a UR test after preexposure, but still showed a US preexposure effect in a subsequent CR test. Investigación financiada por los proyectos PSI2009-07513 (MEC) y #HUM-02763 (Junta de Andalucía).

**[PIII-49] The effects of memory load in visual search are modulated by the similarity between the materials involved**

<sup>1</sup>Gil-Gómez de Liaño, B.; <sup>1</sup>Botella, J.; <sup>2</sup>Pascual-Ezama, D.

<sup>1</sup>Autonomous University of Madrid; <sup>2</sup>Complutense University of Madrid

The effect of memory load in visual search has shown a high heterogeneity of results: while some researchers have found an impairment of performance under high memory load conditions (eg. Lavie & De Fockert, 2006), others have found no effect of memory load (eg. Logan, 1978), and even others have found an improvement of performance under high memory load conditions (Smilek, Enns, Eastwood, & Merikle, 2006). In the present research we propose that the relationship between the material retained in working memory (WM) in a secondary memory load task and the target and distractors involved in the visual search task might be a key factor for explaining the discrepancies in the results. We tested our hypothesis manipulating that relationship in four experiments. The results show that the relationships between the material in WM and the target and distractors in the attentional task may be a crucial factor in modulating the effect of memory load in visual search. If the items retained in WM are similar to those presented as targets in the attentional task, visual search performance improves under high memory load conditions. On the contrary, if the items retained in WM are similar to those employed as distractors in the visual search task, there is no modulation of memory load in visual search. Finally, we discuss the theoretical implications in the context of the endogenous and exogenous attentional processes involved in visual search.

**[PIII-1] Perception of the self and others in healthy adult ageing****Girardi, A.; Della Sala, S.; MacPherson, S. E.***University of Edinburgh*

Neuroimaging studies have shown that the ventromedial prefrontal cortex (VMPC) is activated more when performing tasks requiring reflection on the self than on others (Craig et al., 1999; Johnson et al., 2002; Macrae et al., 2004; Ruby et al., 2004; Moran et al., 2006). Although little is known about the effects of healthy adult ageing on reflective processing on the self, a recent study by Ruby et al. (2008) using a personality awareness test suggests that performance does not decrease with age. This is in line with the dorsolateral prefrontal (DLPF) theory of ageing, where older adults are characterised by a decline in performing tasks tapping the DLPF cortex, while functions related to the VMPC are relatively preserved (MacPherson et al., 2002). The aim of the current study was to further assess the ability to reflect on the self and others in healthy adult ageing. A group of healthy younger and older adults were asked to assess their own and a relative/friend's personality as well as predicting their own and a relative/friend's behaviour in certain scenarios. The responses provided by participants were compared with the responses to the same items provided by relatives/friends in order to examine self awareness, actual and perceived change over time, the participant's awareness of the relative/friend's personality and behaviour and the relative/friend's actual change. Preliminary results suggest that older participants are significantly slower when assessing personality at the present time whereas they do not differ from younger adults when answering about the past, regardless of whether it refers to the self or another person. In contrast, older adults are significantly slower when assessing both present and past behaviour using the behavioural task. These findings suggest that there are age differences in the ability to judge personality and behaviour related to the self.

**[PIII-30] Psychometric properties of a screening reading tests for children and adults****Goikoetxea, E.; Ferrero, M.***University of Deusto*

Research on teaching reading has improved in quality so that made it possible to offer recommendations for educational practice based more on scientific evidence. Meta-analysis studies such as the National Reading Panel (2000) and other similar reports, bear witness. However, some areas still need to be investigated, some of them very critical to reading development and academic progress of a child. One such area is how to improve word reading in poor readers and dyslexics. What tasks to use, what stimulus to choose or how length of intervention is sufficient to produce permanent changes are some unanswered questions. Various reasons explain the limited research on treatments for reading words from the cost of data collection child to child, to the cost of lost school hours for children and teachers. The creation of screening tests to facilitate the screening of samples of readers, would greatly assist in this endeavor. The aim of this study is to develop a screening test of word reading for children and adults, in Spanish and Euskera. The test helps to know the level of lexical processing in a wide range of ages, in a very short time. Leo 1 min has two versions, each with four parallel forms. The simple version just manipulates the lexical frequency of words, the complex version manipulate other variables such as frequency syllabic orthographic neighbors. The administration of Leo 1 min to 90 children and 60 adults college shows that the scores reach appropriate reliability indices and correlate with reading aloud words and pseudowords of standardized tests.

**[PI-54] On the money – monetary and numerical judgments of currency**

**Goldman, R.; Ganor-Stern, D.; Tzelgov, J.**

*Ben-Gurion University of the Negev*

Numerical and monetary judgments of currency were examined using two tasks, a monetary value task (which coin has a higher monetary value), and a numerical value task (which coin has a higher numerical value). In Experiment 1 participants were presented with pictures of coins of the Israeli currency, the shekel, which is composed of 100 agorot. Higher discriminability between shekels compared to agorot due to a more frequent use and importance in every life was reflected in faster monetary comparisons of shekels pairs compared to agorot pairs. Automatic processing of numerical value was demonstrated for monetary judgments. When presented with pairs composed of a shekel coin and an agorot coin, responses were faster to pairs that were monetarily-numerically congruent (e.g., 10 shekels vs. 5 agorot) compared to incongruent (e.g., 5 shekels vs. 10 agorot). Numerical value judgments were unaffected by such congruency. There was evidence for the automatic activation of physical size mainly in the numerical task. A similar picture was obtained in Experiment 2 where instead of pictures of coins we used verbal descriptions of currency, demonstrating the generality of our results.

**[PI-46] The effect of relearning on directed forgetting**

**Gómez-Ariza, C. J.; Iglesias-Parro, S.**

*University of Jaén*

Inhibitory control of memory is thought to be an adaptive mechanism. Deactivating competing irrelevant memories can facilitate the access to relevant traces as well as enhance subsequent learning of new information. However, the adaptability of inhibition could go beyond its role to reduce interference. Rather than a permanent loss, inhibition seems to involve a transient inaccessibility. Moreover, from the new theory of disuse (R. A. Bjork & Bjork, 1992) one could expect inhibited traces become easily accessible, should they again be needed. Counter-intuitively, from the assumptions of this theory it might be predicted that inhibited memories become more recallable after relearning than non-inhibited traces. The aim of our study was to test the “benefit of being forgotten” hypothesis by using a variant of a task widely used to study intentional forgetting and wherein participants are explicitly instructed to forget part of the studied material: the selective directed forgetting effect (SDF). Hence, we expected that providing a relearning episode after an instruction to forget part of a list should make the to-be-forgotten information more recallable relative to the rest of the list. Our results clearly support this. Whereas SDF was observed in the forget group without relearning, the forget group with relearning showed the opposite effect: the part of the list that had putatively been the target of inhibitory control was the most recallable. Although with reduced accessibility in response to cues, this suggests that inhibited memories remain in a stand-by-like mode that allows them to be ready when needed.

**[PIII-6] Learned induced aversions to temporal and spatial context: A comparison****Gómez-Chacón, B.; Gamiz, F.; Martínez-Escudero, L.; Gallo, M.***University of Granada*

Previous work in our lab has demonstrated that the time of day may act as the external context modulating latent inhibition and retrieval of taste aversions. The aim of the present series of experiments is to assess the possibility of inducing aversions to the temporal context itself, similar to those external context aversions previously reported. Male adult Wistar rats were subjected to a behavioral procedure including three training sessions in which i.p. injections of lithium chloride (LiCl 0,15M; 1% b.w.) or sodium chloride (NaCl 0,15M; 1% b.w.) were applied either before being the animals confined to a distinctive spatial context or at a specific time of day. In both cases, the animals were acclimated to two different contexts being one of them safe and the other aversive. The presence of context aversions was assessed by drinking suppression at the specific context. The results indicated similar effects of the temporal and external contexts, thus supporting that the time of day cues may have not only a modulatory role on learning but also may act as a discrete cue itself. This research was supported by the grants PSI2008-03933 (MICINN. Spain) and HUM 02763 (Junta de Andalucía. Spain).

**[PII-39] A new measure of reading comprehension for primary school: The darc Its relation with prolec-r, working memory and intelligence****<sup>1</sup>Gómez-Veiga, I.; <sup>1</sup>Elosúa, M. R.; <sup>2</sup>López Escribano, C.; <sup>1</sup>Orjales, I.; <sup>2</sup>Pérez, E.; <sup>1</sup>Gil, L.; <sup>1</sup>García-Madruga, J. A.***<sup>1</sup>UNED; <sup>2</sup>Complutense University of Madrid*

The Diagnostic Assessment of Reading Comprehension (DARC) is a new measure of reading comprehension designed to assess four central processes: text memory, making inferences based on information provided in the text, accessing relevant background knowledge, and making inferences that require integrating background knowledge with the text (August, Francis, Hsu & Snow, 2006; Francis, Snow, August, Carlson, Miller & Iglesias, 2006; Hannon & Daneman, 2001). The main difference between this task and other measures of reading comprehension is the DARC's simplicity, since it was designed to be simple in vocabulary load and syntactic structure, and easy administration. In this work, the Spanish version of the DARC is presented, the relation of the DARC with other measures of reading and comprehension, such as the PROLEC-R, is assessed; and the relations of both tests with working memory (PAL) and intelligence (K-BIT) measures are compared in a third-grade students group. The results show that the DARC is correlated with the other measures of reading and comprehension, working memory and intelligence.

**[PI-37] Contextual biconditional discrimination of conditioned flavour preference in rats**

**<sup>1</sup>González, F.; <sup>2</sup>Hall, G.**

*<sup>1</sup>University of Granada; <sup>2</sup>Universidad de York*

In a biconditional-discrimination experiment on conditioned flavour preference, thirsty rats received two daily training sessions during which they were exposed to one of two flavours (X or Y) in two distinctive physical contexts (A and B). The flavours were reinforced with sucrose in one of the contexts but not in the alternative one (i.e. A: X+, B: Y+, A: Y-, B: X-). Next, animals were also food deprived for three days before they were given a two-bottle test with both flavours (X vs. Y) in each of the contexts. In spite of the fact that no single flavour or context signalled the presence of absence of reinforcement, animals showed greater consumption of the flavour that was presented in the context in which it had previously been reinforced. The same pattern was found when animals were later tested just thirsty. These results show that contexts can differentially modulate consumption of the flavours on test. Thus, our results suggest that, using a nutrient palatable flavour as US, context may exert conditional control on conditioned flavour preferences in rats. They contrast with the results from studies of human evaluative flavour-flavour learning (e.g., Baeyens et al 1996; 1998, using an aversive reinforcer and flavours or colours as modulators), which failed to obtain evidence of conditional control. Baeyens et al. (1996). No Evidence for Modulation of Evaluative Flavor–Flavor Associations in Humans. *Learning & Motivation*, 27,200-241. Baeyens et al. (1998). Neither Extended Sequential nor Simultaneous Feature Positive Training Result in Modulation of Evaluative Flavor–Flavor Conditioning in Humans. *Appetite*, 31, 185-204. This research was supported by grants #SEJ2006-13851 (MEC, Spain), #PSI2009-10627 (MICINN, Spain), and from the UK Biotechnology and Biological Sciences Research Council.

**[PI-41] A study of interference between outcomes based in a cued-response priming task**

**González Martín, E.; Cobos Cano, P. L.**

*University of Málaga*

In human contingency learning, interference between outcomes consists in a decrease in the expression of a learnt relationship (A-1) due to later pairings between this same cue, A, and a different outcome, 2. This phenomenon has been explained by associative retrieval processes in LTM. However, almost all previous studies have used causal tasks in which the dependent variable is a judgement about the cue-outcome relationships programmed. For this, it is difficult to reject the participation of inference processes based on causal reasoning. To improve this situation, we have developed a cued-response priming task which allows to measure in a more direct way associative retrieval processes. During the task, participants were shown a cue, C1 followed by a different cue, C2 and had to make a specific response to this last cue. The associative retrieval of C2 from C1 was measured by the priming of the C2 response due to the previous presentation of C1. In the first experiment, we confirmed the effectiveness of priming procedures to register LTM retrieval processes. In the second and third experiments, we could replicate the interference and renewal phenomena. In this last experiment, interference disappears when (1) the interfered A-1 relationship was learnt in a context (Context X); (2) the interfering A-2 relationship was learnt in a different context (Context Y); and (3) the A-1 priming test was made in the first context. The results confirmed the associative nature of interference processes.

**[PI-26] The recognition of generated and provided words: An electrophysiological study****González Nosti, M.; Cuetos, F.***University of Oviedo*

Many studies have found that people learn and remember self-generated information better than information externally provided. This phenomenon, called generation effect, has been proven as an effective technique to improve memory in healthy and clinical population with a wide variety of materials such as words, texts, drawings and numbers. The three hypotheses proposed to explain the generation effect (semantic hypothesis, effort hypothesis and transfer-appropriate processing hypothesis) share the opinion that generated and provided words are processed differently during learning. Therefore, the recovery of those words might also imply a different processing. The goal of this study was to explore those differences by measuring the electrophysiological activity associated to the recognition of generated and provided words during a memory task. Twenty two healthy native Spanish students from the University of Oviedo took part in a reading and completion of phrases task. Their event related potentials were recorded while they performed a recognition task in which the learned words (half high frequency and half low frequency) were presented along with the same number of non-learned words. The results show significant differences between generated and provided words around 600-750 ms. when the electrodes were analyzed on the whole. In the anterior electrodes this variable was significant in the first stages (150-450 ms.), while the posterior ones show significance in later stages (600-750 ms.). There were significant differences between high and low frequency words, however no interaction between this variable and the modality of presentation was found. The results of this study entail important theoretical implications, as they show that different processes are involved in the recovery of generated and provided words.

**[PI-30] Potenciales cerebrales asociados al procesamiento léxico en niños con trastorno por déficit de atención con hiperactividad****González-Pérez, P. A.; Domínguez, A.; Beltrán, D.; Hernández, S.***University of La Laguna*

The goal of this research was to study some lexical processes in children diagnosed as ADHD (DSM-IV) as they performed a lexical decision task. Event related-potentials were registered in two groups of ADHD: good and bad text comprehenders. The variables measured were lexicality (words/pseudowords), lexical frequency (high/low) imageability (high/low) and orthographic neighborhood density (high/low). Lexicality and frequency produced sustained differences from 400 ms to the end of the window (1000ms.). The semantic variable generated a very similar pattern than the previous one but starting later. The neighborhood density, on the contrary, produced differences at a very early peak (100 ms.) and at the N400 component but, however, these differences were more important in the group of ADHD without reading comprehension problems. The results are analyzed in terms of the lexical access and the competition processes concerned to carry out the task.

**[PII-51] Effect of activation and valence of IAPS images on incidental recognition using discrimination and bias measures (a' y b''d)**

<sup>1</sup>Gordillo, F.; <sup>1</sup>Arana, J. M.; <sup>1</sup>Meilán, J. J. G.; <sup>2</sup>Salvador, J. ; <sup>2</sup>Mestas, L.; <sup>1</sup>Carro, J.

*<sup>1</sup>University of Salamanca; <sup>2</sup>National Autonomous University of Mexico*

We studied the effect of emotion generated by IAPS images (International Affective Picture System) on incidental recognition of the images using discrimination and bias measures (A' and B''D). Images with emotional content are remembered better than neutral images but previous studies are conflicting as to how valence and arousal affect recognition memory: are images with pleasant or unpleasant emotional content discriminated better? And images with high or low activation? How does valence and arousal influence attitude, confidence and subject response time when the subject must decide if they recognize image or not? 39 students between 18 and 33 years participated in the experiment. We used 80 IAPS images with two levels of arousal (high and low) and two valences (pleasant and unpleasant). The subjects had to press "0" as quickly as possible when a cross appeared on the screen (distraction task reaction time). If the cross was not black, the subject had to memorize a series of stimuli (pictures and words) that appear immediately after the "cross" (distracting task of memorization) for 5 seconds. A series of IAPS pictures were presented according to their level of arousal and valence (incidental memory task). There was better discrimination, more conservative attitude, more confidence and a shorter response time, for unpleasant pictures and low activation than with the pleasant images and high activation. The results can be explained from an evolutionary viewpoint since unpleasant stimuli are more relevant to survival and therefore better discrimination.

**[PII-81] Costs of thinking about verbal probabilities: Is processing directionality easier than processing probabilistic meaning?**

**Gourdon, A.; Beck, S. R.**

*University of Birmingham*

Uncertain outcomes can be described by raw probabilities (e.g., "There is 40% chance"), and also by verbal probabilities (e.g., "There is a chance", "It is not absolutely certain"). Beyond their probabilistic meaning verbal probabilities also have a directionality (Teigen & Brun, 1995), i.e. can be positive or negative. In this study we made the first investigation into the potential differences in processing directionality and probabilistic meaning. Twenty participants chose between two outcomes described by verbal probabilities. In one third of the trials the probabilistic meaning was controlled and the directionality was varied. In another third the directionality was controlled and the probabilistic meaning was varied. In the last third both dimensions were different, reinforcing each other (congruent trials; e.g., a positive one carrying a high probabilistic meaning) or contradicting each other (incongruent trials; e.g. a negative one carrying a high probabilistic meaning). Accuracy, directionality of the actual answer and response time were recorded. When both dimensions differed, accuracy and response time indicated that participants found it easier to choose between congruent than between incongruent verbal probabilities. When one dimension or the other was held constant and the other varied, we found evidence that participants were influenced by both probabilistic meaning and directionality. Participants found easier to make decisions between positive verbal probabilities and between ones of high probabilistic meaning than between negative verbal probabilities and between ones of low probabilistic meaning. Finally when the probabilistic meaning was held constant, participants tended to choose the outcome with the positive verbal probability more often than chance. We discuss the possibility of a positivity bias influencing the process of verbal probabilities.

**[PII-59] Individual differences in numerical skills and probabilistic reasoning****Gracia, M.; Tubau, E.; Colomé, A.; Núñez-Peña, M. I.***University of Barcelona*

Probabilistic reasoning is strongly affected by the statistical format of the data. Specifically, a common observation is that probabilistic reasoning is enhanced when the data is represented as ratios of natural frequencies instead of normalized probabilities. However, it has been suggested (Peters et al, 2006; Tubau, 2008) that such enhancing effect of frequencies depends on numerical skill in using numbers to represent probabilities, being especially relevant for low numeracy participants. This study aimed at testing this hypothesis, using more basic numeracy tests. Participants were required to solve two standard arithmetic tests (Addition test and Addition and subtraction correction from the FReNCH Kit; Ekstrom, French, Harman and Dermen, 1976), a counter-intuitive arithmetic problem and two probabilistic problems (the later presented either in frequency or in probability format). Results showed positive correlations between participant's performance in the arithmetic problem, in the addition and subtraction test and participant's performance in the probabilistic problems but only when presented in the probability format, suggesting that successful probabilistic reasoning requires good arithmetic skills. Furthermore, whereas the frequency effect was reliable in the case of low numeracy participants, it was not reliable for the high numeracy ones. Therefore, as predicted, the statistical format effect seems to interact with the level of numeracy. Implications for probability and statistical education will be discussed.

**[PIII-8] Heightened conflict during cue-encoding increases backward inhibition in set-switching****Grange, J. A.; Houghton, G.***Bangor University*

Backward Inhibition is a performance cost caused by returning to a task after one (vs. more than one) intervening trial, and may reflect the inhibition of task-set components during task switching. Although typically thought to target response-related processes of task performance, we present converging evidence that backward inhibition can target cue-based preparatory stages of a task if cue-encoding is sufficiently difficult. In Experiment 1, we increased the conflict of cue-encoding by reversing learned cue-target pairings at the halfway point of the experiment. This reversal doubled the size of backward inhibition. Critically, response processes were identical in each half of the experiment, and so the observed increase in backward inhibition can only be attributed to increased conflict during cue-encoding. Experiment 2 controlled for effects of order of conditions or simple change of cue meaning, and demonstrated that the effect found in Experiment 1 depends on re-pairing members of the same cue and target set. The results are attributed to heightened conflict (and hence greater inhibition) during cue-encoding when a previously learned cue-target mapping is remapped. The findings support the view that backward inhibition is a flexible cognitive control mechanism that targets those aspects of the trial structure that generate the greatest inter-trial conflict, and is not tied uniquely to response processes.

**[PI-49] Dissociations between retrieval and metacognitive monitoring in recall: The mixed blessing of high inter-target association**

**Guzel, M. A.; Higham, P.A.**  
*University of Southampton*

Based on the encoding specificity principle (Tulving & Thomson, 1973), providing cues at test, encoded specifically with the targets at study, was expected to produce better recall than providing no cues or any other extra-list cues. In this set of experiments, the possible effects of inter-target association (ITA) on memory performance and metacognitive monitoring were investigated both in cued and free recall. Experiment 1 had two study-test cycles, with the study lists varying in terms of the strength of ITA (high versus low, manipulated by varying the number of exemplars from the same category within the list). Cue-target association was negligible in both lists. In the liberal scoring group, participants were informed that targets were counted correct regardless of which cues they were paired with, whereas for strict scoring group, targets had to be matched with their study cues. Results showed that liberal scoring participants behaved like strict scoring participants in terms of memory performance; however, monitoring performance for low ITA targets were found higher than high ITA targets in cued recall. In free recall, although monitoring for low and high ITA recall did not differ significantly, memory performance for high ITA recall was found higher than low ITA recall. In Experiment 2, ITA was again manipulated by varying the number of categories in the lists (i.e. twenty four-six-two). The results showed free recall participants had higher memory performance for list involving two categories than cued recall participants. In free recall, a more sound dissociation between memory performance and metacognitive monitoring was found. For the lowest memory performance (twenty four-category-list target recall), there found the highest monitoring performance. The results were discussed in terms of contemporary versions of generate-recognize models.

**[PIII-55] The effect of decoding task demands on comprehension and working memory**

**Haenen J.; Riddell, P.; Williams, T.**  
*University of Reading*

Previous research has shown that degrading text increases response times in word processing and invokes letter-by-letter reading strategies (for example, Cohen et al., 2008). This study explores the claim from the Simple View of Reading (Hoover & Gough, 1990) that decoding processes are dissociable from comprehension processes, with particular focus on the effects of decoding demands on working memory. A sample of 41 undergraduate students participated in experiments designed to manipulate decoding task difficulty. Manipulation was achieved by individually rotating letters within words by a random but limited factor – this has previously been shown to increase word recognition times. Tasks included a reading span working memory task, a reading comprehension task, and word recognition tasks. Results from word reading tasks confirmed previous findings of non-linear increase in reaction times with greater rotation of letters within words. Additional measures showed a linear increase in reaction time for recognising rotated individual letters. Despite the increased processing requirements of reading rotated words, there was, unexpectedly, little evidence of a direct effect of rotation on reading span scores. However, further analysis revealed that word recognition reaction times were a significant predictor of recall in the reading span test ( $R^2=0.18$ ,  $p=0.004$ ), suggesting that participants who struggled the most to read rotated words had greater difficulty in working memory tasks. Interpretations of these results are discussed with respect to modality of processing components in working memory tasks. Cohen, L., S. Dehaene, et al. (2008). "Reading normal and degraded words: Contribution of the dorsal and ventral visual pathways." *NeuroImage* 40(1): 353-366. Hoover, W. A. and P. B. Gough (1990). "The simple view of reading." *Reading and Writing* 2(2): 127-160.

**[PIII-9] The effect of parietal lesions in response to salient singletons****<sup>1</sup>Hernández, M.; <sup>2</sup>Costa, A.; <sup>3</sup>Humphreys, G. W.***<sup>1</sup>University of Barcelona; <sup>2</sup>University Pompeu Fabra; <sup>3</sup>University of Birmingham*

Attention may be captured by salient singletons even when they are irrelevant to the task at hand. Data from previous studies suggest a difference in the roles of frontal and parietal cortices in responding to salient singletons (e.g., Fockert et al., 2004; Hodsoll et al., 2009). The aim of this study is to contribute to shed light into the neural substrates of singleton capture. To do so, we compare 10 healthy controls, 8 brain-damaged patients with frontal lesions (Frontal patients) and 7 brain-damaged patients with parietal lesions (Parietal patients) in a visual search task including a salient singleton in the search array. Participants were presented with six lines arranged in a circle. All the lines but one had the same straight vertical orientation (fillers). The task was to determine the direction of the only tilted line (the target). Importantly, all six lines appeared inside geometrical shapes one of which could be unique in both color and shape relative to the other (singleton). There were three types of trials: (a) the singleton was not present in the search display (neutral); the singleton was present and contained the target line (valid), the singleton was present and contained a filler (invalid). Typically, relative to neutral trials, a singleton facilitates target responses on valid (singleton benefit) while interferes on invalid trials (singleton cost). Both Frontal patients and Controls showed singleton benefit but not singleton cost. These observations were in line with previous results of ours with 40 healthy individuals; that is, both Frontal patients and Controls behaved normally in this task. Interestingly, Parietals patients not only showed singleton benefit but also large singleton cost. The data are consistent with previous work indicating that (at least part of) the parietal cortex directs attention to salient stimuli regardless it disrupts the ongoing task.

**[PII-20] The relevance of the verb's motor associations in action naming by parkinson's disease patients****<sup>1</sup>Herrera-Gómez, E.; <sup>2</sup>Rodríguez-Ferreiro, J.; <sup>1</sup>Cuetos, F.***<sup>1</sup>University of Oviedo; <sup>2</sup>University of Barcelona*

Previous studies of the preservation of the semantic knowledge of Parkinson's disease (PD) patients have pointed out the existence of a relative verb impairment as revealed by an action naming specific deficit. This fact has been argued to result from the dependence of verb semantics on neural structures involved in motor control, that are affected in PD. The aim of this study was to explore the relevance of specific motor content of verb semantics in the relative action deficit present in PD patients. 49 patients diagnosed as non-demented parkinson's disease took part in an action naming experiment. A subjective rating study was conducted with an independent sample of 14 young adults in order to establish the prominence of motor associations of different verbs. Participants were tested individually and presented with two groups of 25 matched sets of verbs with high and low motor associations respectively. There were no significant differences between lexical frequency, age of acquisition, imageability and letter and syllable length values of the verbs, or the name agreement and visual complexity values of their corresponding pictures. Significantly lower scores were obtained in response to verbs with high motor associations, revealing that the verb-specific impairment present in PD is directly related to the motor content of the referred actions. This deficit may be due to degradation of neural networks associated with planning and executions of movements.

**[PI-7] Background sound impairs interruption recovery in dynamic task situations**

<sup>1, 2</sup>Hodgetts, H. M.; <sup>1</sup>Vachon, F.; <sup>1</sup>Champagne, J.; <sup>2</sup>Jones, D. M.; <sup>1</sup>Tremblay, S. (presenting author)  
<sup>1</sup>Laval University; <sup>2</sup>Cardiff University

Interruptions impair performance even on simple, static, laboratory-based tasks (e.g., Hodgetts & Jones, 2006), but little research has looked at their impact in more complex and dynamic situations. The current experiment used a radar operator task requiring the classification of aircraft as hostile, non-hostile or uncertain based on a number of criteria, judging the immediacy of the threat posed by hostile contacts and taking appropriate action as necessary. Participants were unexpectedly interrupted by another task which masked the radar screen as the scenario continually evolved. Task efficiency was impaired by interruption: Time between the selection of two contacts (decision-cycle time) was longer during the 20 s following interruption compared to the 20 s before. Notably, this cost of interruption was significantly greater in the presence of auditory distraction. Moreover, by 40 s after interruption, the decision-cycle time had returned to baseline when there was no background sound, but this was still elevated in the distraction condition. Resumption time – time to make the next action following interruption – was also significantly increased in the presence of distraction. Eye movement data showed that average fixation durations were quicker during the 20 s following interruption than the 20 s before, perhaps reflecting participants' attempts to rapidly re-encode and update their situation model of aircraft positions and status. Although the negative effects of background sound are well documented in specific laboratory tasks that require serial order (e.g., Jones, 1999), our novel results suggest that those processes involved in interruption resumption are also susceptible to the irrelevant sound effect; a finding that is not accounted for by current theories of interruption.

**[PI-65] “That’s not a real body”: Identifying stimulus qualities that modulate synaesthetic experiences of touch**

Holle, H.; Ward, J.  
University of Sussex

Mirror touch synaesthesia is a condition where observing touch to another's body induces a subjective tactile sensation on the synaesthetes body. The present study explores which characteristics of the inducing stimulus modulate the synaesthetic touch experience. Seven mirror-touch synaesthetes (MTS), which have been identified previously using an objective behavioral paradigm developed in our lab, watched videos depicting a touch event while indicating i) whether the video induced a tactile sensation, ii) on which side of their body they felt this sensation and iii) the intensity of the experienced sensation. Results indicate that MTS experience stronger tactile sensations when observing touch to real bodies as compared to when observing touch to dummy body parts or pictures and paintings of bodies. Observing touch to amputated dummy body parts elicited only a weak synaesthetic sensation. MTS were found to be relatively insensitive to the spatial arrangement in the stimuli, e.g., videos showing touch to a face in a profile view were as effective in eliciting synaesthetic touch as frontal views were. These results suggest that mirror-touch synaesthesia is not entirely bottom-up driven, but top-down modulations, such as knowledge about real and dummy body parts, also modulate the intensity of the experience.

**[PI-22] Cued language switching in sentence reading: Control inhibition and the asymmetric switching cost**

**Ibáñez, A.; Bajo, M. T.**  
*University of Granada*

Language switching in comprehension and production has been largely investigated. A common finding is that there is a reading time cost when switching from one language to another. This language switching cost is typically asymmetric in production tasks (Meuter and Allport, 1999). This asymmetry has been suggested to be the result of a top-down inhibition process directed to the language not in use. However, alternative explanations have been suggested (Finkbeiner, Janssen, Almeida & Caramazza, 2006). In order to study whether top-down processes play a role in the language switching asymmetry effect, we introduced a language cue immediately before sentence reading for later repetition. We had the assumption that language cuing would strengthen top-down vs. bottom-up processes involved in language switching; then, if the asymmetric cost is an index of inhibitory control, it would also be increased in this condition. We presented a colored cue (red or blue) indicating the language of the sentence in half of the trials. When cues were black they did not indicate the language of the sentence, and then, sentence reading would be more bottom-up guided. Therefore, the asymmetry effect is expected to be minimized in this condition. Our results showed that the language switching asymmetry appeared in the pre-cued condition but it was not significant for the black cued trials. Additionally, cognate effects were reliable only when reading was not cued, indicating that the language not in use was co-activated in this condition. These results provide support to the idea that the effect is dependent of cognitive control and language inhibition.

**[PII-13] Two coupled dynamic fields can explain how rts in ior depends of stimulation's spatio-temporal structure**

**Ibáñez-Gijón, J.; Travieso, D.; Jacobs, D. M.**  
*Autonomous University of Madrid*

The increasing evidence that perception and action play a mayor role in IOR indicates a need of explanations based on sensorimotor interactions. Here, we propose a basic neural mechanism for this sensorimotor interaction using a dynamic field model that performs motor decisions. Following previous modeling attempts of saccadic movements we use competitive inhibition interaction. Neurophysiological studies with monkeys show that this type of neural processing occurs during the performance of IOR tasks, and these studies point to the superior colliculus as the material locus of the mechanisms. Based on the concept of saliency maps, the perceptual input to the motor decision field preserves the environmental spatial relationships. Volitional predisposition is coded as an excitatory input coded in the same spatial metrics as the perceptual input. Two coupled decision fields are necessary: a fast excitatory field and a slow inhibitory field. We conducted an experiment to test the continuous dependence of the RTs on spatio-temporal properties. The experiment combined temporal variation in the onset of cue and target with spatial variation. The experiment shows that IOR is reduced as a function of cue-target distance. We used this data and Posner's data to fit model parameters with a genetic algorithm. Many parameter sets can reproduce the averaged RTs. We were also interested in the mechanisms that produce the strongly left skewed RT distributions in both inter and intra subject data. Based on the LATER model by Carpenter, we introduced Gaussian noise to the decision field representing neural variability. A much smaller fraction of the parameter sets were able to generate the observed RT distributions. In sum, this model provides a relatively simple explanation of both averages and distributions of RT in IOR, and it can be widely used in mental chronometry tasks.

**[PIII-63] The effect of perceived narrowness onto depth perception**

**Indino, M.**

*University of Zurich*

Gibson (1966, 1979) postulated that perceptual space construction is based on invariant visual information inherent in the structure of the visual scene. This, according to his direct perception view, is true both for three-dimensional natural environments and two-dimensional pictures. Sedgwick (1973, 1970) demonstrated that the horizon serves as referential base for the perceived relation between objects (cf. Rogers, 1996). The present study analyzed these relations from a developmental perspective employing Functional Measurement (Anderson, 1996): We investigated whether irrelevant – though very salient – visual information, such as the narrowness of a room, influences depth perception in children and adults. Participants had to mentally move objects in rooms of different narrowness. Afterwards they had to judge the perceived size of the object at the new position, taking into consideration the object's physical size and its distance to the horizon. The results reveal that the referential function of the horizon depends on the narrowness of a room in children as well as in adults.

**[PI-31] Knowledge of function and manipulation on everyday tools: An rtms study**

<sup>1</sup>Ishibashi, R.; <sup>2</sup>Pobric, G.; <sup>2</sup>Lambon, M. A.

<sup>1</sup>*Kyoto University*; <sup>2</sup>*University of Manchester*

One of the important and advanced cognitive abilities of human beings is the competency to use tools. Two cortical regions have been proposed to store different kinds of knowledge about tools ? function knowledge in the anterior temporal lobes (ATL) and manipulation information in the left inferior parietal lobule (IPL). We used repetitive transcranial magnetic stimulation (rTMS) and two semantic decision tasks to confirm the role of these regions in healthy participants. Two challenging tasks were designed to tap participants' memory of either function or manipulation. Stimulation of ATL slowed down the responses for the "function" judgments, whilst stimulation of IPL yielded slowed "manipulation" judgments. These results suggest that the two types of information about familiar objects are dissociable.

**[PII-42] Taxonomic categorization effects in insight problem solving**

**MacGregor, J. N.; Cunningham, J. B.; Hunter, G.**

<sup>1</sup>*University of Victoria*; <sup>2</sup>*University of Lethbridge*

Recent research has provided evidence of the involvement of ad hoc categorization processes in insight problem solving. The present research examines whether taxonomic category factors are also involved in insight problem solving. The paper reports an experiment which examined whether verbal insight problem solving is affected by the categorization effects of abstraction and typicality. The stimuli were eight verbal insight problems. In one condition the problems were presented in standard format. In the second condition, four of the problems were reworded so that elements of the problem were at a more abstract level of categorization, and four were reworded so that elements were less typical category exemplars, than in the standard condition. The experiment was conducted in a group setting with 75 native English speakers as participants, 37 randomly assigned to the standard-wording condition and 38 to the revised-wording condition. Overall, mean solution rates were significantly higher in the standard-wording condition, at 4.19 solved (52%), than in the revised-wording condition, at 3.11 (39%). Subsequent analyses showed that varying level of abstraction and degree of typicality had an equally detrimental effect on solution rates. The results support and extend the evidence that insight problem solving is affected by categorization processes common to cognition more generally.

**[PIII-72] The face specific proportion congruent effect: Social stimuli as contextual cues****Jiménez-Moya, G.; Lupiáñez, J. .; Rodríguez-Bailón, R.***University of Granada*

Social categorization is a cognitive process that consists in perceiving different individuals as members of the same group, because they share some traits. On the contrary, individualization occurs when an individual is perceived as a single exemplar, paying attention to the traits that differentiate this person from the rest of people. These two processes could be understood as two ends of a continuum. The main goal of the current study was to build a measure of the individuation/categorization process using an attentional task. We used an interference task in which a first name and surname were presented for participants to discriminate whether the first name was Spanish or foreign, while ignoring the surname, which could also be Spanish or foreign. This led to either congruent or incongruent conditions. Names and surnames were presented in the context of human faces, so that we created an association between each specific face and a proportion of congruency, leading to mostly congruent or incongruent faces. Thus, for example, male faces were associated with a high proportion of incongruent trials (or congruent, counterbalanced across participants), whereas female faces were associated with a low proportion of incongruent trials. Importantly, one face in each group was associated to the congruency of the other group. Results showed participants developed a different pattern of attentional control for every single face, i.e., the interference effect was different for individual faces, regardless of group's congruency, which suggests that faces were perceived in an individual fashion. These results support the existence of a face specific proportion congruent effect. They thus reveal the importance of social cues (i.e., individual human faces), which associated to different congruency proportions, could be used as a kind of context that guide attentional processes.

**[PI-77] Warm women and cold men: Gender accessibility and environmental temperature****Jiménez-Moya, G.; Willis, G. B.; Santiago, J.; Rodríguez-Bailón, R.***University of Granada*

Traditional gender stereotypes establish that women are warm and men are cold in their social relationships. Building on the notion that physical experiences affect the accessibility of mental representations, in this study we propose that the experience of physical temperature (hot vs. cold) will modulate the accessibility of "men" and "women" concepts. Participants' task was to write twelve first names. A group was exposed to a moderately cold temperature (17<sup>o</sup>-19<sup>o</sup>) and another group to a moderately hot temperature (21<sup>o</sup>-23<sup>o</sup>). Results showed that the cold group wrote more male than females names. In contrast, the hot group wrote more female than male names. This effect was clear on the first names listed and progressively vanished toward later names. Our results support the assumption that the accessibility of social concepts (such as gender) is influenced by the sensorimotor system. This pattern of results suggests that abstract concepts are not amodal representations, but are somehow connected to physical experiences in ways that are revealed by conventional linguistic metaphors.

**[PII-8] Integration of auditory and visual verbal cues in cognitive control**

**Kirkham, A.; Mari-Beffa, P.**

*Bangor University*

In the present work we investigate the use of verbal cues (visual and auditory) in cognitive control. Response times (RTs) to on-screen stimuli were recorded from participants in a series of both pure and mixed characteristic blocks; thus enabling both pure RTs and repeat/switch RTs to be measured. Prior to the response being made, the participants were presented with visual verbal cues indicating the characteristics required to respond to, however an identical auditory verbal cue was also presented through headphones concurrently. Participants were required to complete the study in three conditions. All conditions included visual and auditory cues but with the following extra actions by the participant: Silent - no verbal utterances were made; Articulatory suppression - verbal utterances of a suppressive form ("blah-blah") were made continuously throughout the trials; Foot-Tapping - no verbal utterances were made, but participants were required to perform a rhythmic foot-tap, to enable analysis of further dual-task interference. It was found that using visual and auditory cues in conjunction with the Silent condition resulted in the fastest RTs of the three conditions, with the Articulatory Suppression condition resulting in the slowest RTs. In this respect it is similar to the results of previous studies and indicates the integration of auditory circuits with the basal ganglia, and hence the evocation of actions. However, it must be noted that the RT improvements shown are not as drastic as when the participant performs articulation themselves, thus indicating a stronger integrative role in this form. The use of foot-tapping resulted in a slowing of RTs, indicating dual-task interference, but which did not hinder the participants to the same extent as that of Articulatory Suppression; hence further supporting the role of auditory circuits within basal ganglia connectivity.

**[PIII-65] Why do we look on the tangent point when steering a bend?**

**Kountouriotis, G. .; Merat, N.; Wilkie, R. .**

*University of Leeds*

Two main theories exist for accounting how people steer around a bend: the Tangent Point (TP) Theory (Land & Lee) and the Active Gaze (AG) Model (Wilkie & Wann). A recent study of real-world driving around bends reporting 75% of fixations occurring on/around the TP – an optical feature lying at the apex of the inside road edge. In contrast, when using tightly controlled experimental methods in the laboratory, gaze fixations are observed to fall at points on the road through which the driver wishes to pass – evidence which supports the AG Model. One explanation for TP fixation (that is consistent with the AG Model) is that drivers are trying to cut the corner (a behaviour which is often observed in real and simulated driving) and are therefore merely looking where they want to steer - the TP is fixated because it lies near to the participants' future trajectory. To test this explanation we ran an experiment where participants either maintained their lateral position on the road or were asked to take the racing-line and cut through the bend (randomly cued on a trial by trial basis). Our results demonstrate that participants fixate points on their future trajectory in both cases, but in the case of cutting the corner the future trajectory itself falls very near the TP and thus elicits TP fixations. These results are not predicted by the TP theory, but the AG Model can account for them.

**[PIII-46] Representation strength and salience of the unique features of similar stimuli in human perceptual learning**

**Lavis, Y.; Hall, G.**  
*University of York*

It has been shown in animals and humans that exposure to similar stimuli enhances discrimination between them – particularly when the stimuli are exposed on an intermixed schedule. One promising explanation for the facilitatory effect of intermixed exposure is that the unique elements of the stimuli have greater salience following intermixed than following blocked pre-exposure. However, the mechanisms responsible for this salience difference are under intense debate. The current study employed a human perceptual learning procedure to investigate the hypothesis that the salience of the unique elements is dependent on the strength with which those elements are represented. Participants were exposed to complex checkerboards (e.g. AX and BX) that consisted of small unique features (A and B) superimposed on a larger common background (X). When presented with unfilled outlines of the unique elements in Experiment 1, participants selected the correct colour more often for the unique elements of intermixed stimuli than for those of blocked stimuli, suggesting that the intermixed unique elements were better represented. In Experiment 2, exposure to all stimuli was intermixed, but intermixed exposure was supplemented in one condition with additional exposures to the unique elements in isolation. Same-different judgements were more accurate in the condition with the additional exposures, suggesting that discrimination between similar stimuli is better when their unique elements are more strongly represented. The results are discussed with respect to two mechanisms for salience modulation: one proposed by McLaren and Mackintosh (2000) and the other proposed by Mitchell, Nash and Hall (2008).

**[PII-1] No category effect in alzheimers disease**

**Laws, K. R.; Moreno-Martínez, F. J.; Adlington, R. A.; Gale, T. M.; Irvine, K.**  
*University of Hertfordshire*

Consensus acknowledges that Alzheimer's disease (AD) impairs semantic knowledge. Doubts remain, however, about whether this deficit is category-specific. Most studies have reported an impairment for naming living things (e.g. animals or plants), a minority have found an impairment for nonliving things (e.g. tools or vehicles), and some have found no category-specific effect. We examined this issue in three studies. Study 1 investigated picture naming in 32 AD patients and 34 elderly controls. We found the previously reported impairment for naming living things in AD patients and that this persisted even when intrinsic variables were covaried; however, covarying control performance eliminated the significant category effect. Hence, the category effect in Alzheimer's disease is no larger than is expected in the healthy individual. Study 2 examined picture naming, naming to definition, and word–picture matching in 38 patients with Alzheimer's disease (AD) and 30 elderly controls. Each task was matched across category on all “nuisance” variables. We found significant AD disadvantages for living things on all three tasks. However, using control performance as a difficulty index covariate eliminated the category effect on all three tasks. Indeed, we found that control performance accounted for 64% (picture naming), 49% (naming to description), and 42% (word–picture matching) of variance in AD performance. This suggests that, although category effects in AD patients do not reflect intrinsic variables, the size and direction of the category effect are not different. Finally, we investigated picture naming in 28 AD patients and 24 controls. Hierarchical regression analyses revealed that nuisance variables combined, control naming difficulty, and category uniquely accounted for 39%, 36%, and 3% of patient naming variance respectively. Together, these findings indicate that the category performance of AD patients does not qualitatively differ from elderly healthy individuals — it is an exaggerated normal profile.

**[PIII-52] Interference, inhibition and memory-based decisions in young and older adults**

**Lechuga, M. T.; Iglesias-Parro, S.; Gómez-Ariza, C. J.; Pelegrina, S.**

*University of Jaén*

It has been suggested that inhibitory processes may also affect decision making. Iglesias-Parro & Gómez-Ariza (2006) found a clear relationship between retrieval-induced forgetting (RIF), usually interpreted in terms of inhibition, and bias in a choice task. In this study, we explore the effect of retrieval practice on recall and choice tasks in young and older adults (over 65). Whereas a variety of research results suggest a decline with aging in executive control, recent studies on decision making reveal that older adults develop compensatory strategies to optimize decision making. In this experiment we manipulated the type of practice (retrieval vs. reading) participants performed on some of the character-attribute pairs previously learned. Then, all groups were to make a memory-based decision task and perform an item-specific recall test about the material previously learned. The results show a similar forgetting pattern for young and older participants. However, clear age differences emerged in the choice task, so suggesting that different mechanisms underlie memory-based decisions in both groups. These findings are discussed in terms of age differences in interference control.

**[PI-53] An R package for measuring and testing steepness in dominance hierarchies**

**<sup>1</sup> Leiva, D.; <sup>2</sup> de Vries, H.**

*<sup>1</sup>University of Barcelona; <sup>2</sup>Utrecht University*

Apart from linearity, steepness is another feature that can be of interest for ethologists when analyzing hierarchy of social dominance structures. A steepness index and a randomization procedure yielding its statistical significance have recently been proposed (de Vries, Stevens, & Vervaecke, 2006). Following these authors, steepness is defined as the average magnitude of absolute differences between adjacently ranked individuals, being the rank order obtained by means of individuals' overall success in dominance interactions. In de Vries et al. paper (2006) a significance test for the steepness measure was also presented. Specifically, this statistical procedure allows social researchers to decide whether the empirical value of the steepness index significantly differs from the expected value under the null hypothesis of random win chances for all dyads. Although ethologists are able to measure and test steepness of dominance hierarchies by means of the statistical procedure proposed by de Vries et al. (2006), no statistical software existed for that purpose. In this work we describe statistical software, written in R, for measuring and statistically testing the steepness of a dominance hierarchy based on a matrix of numbers of dyadic wins and losses. Additionally, Graphical User Interfaces (GUIs) are developed in order to ease the use of several functions included in the steepness package by those applied social researchers who prefer this kind of interface instead of a Command Line Interface (CLI) as R. An illustrative example taken from ethological research is presented to demonstrate the steepness package. References: de Vries, H., Stevens, J. M. G., & Vervaecke, H. (2006). Measuring and testing the steepness of dominance hierarchies. *Animal Behaviour*, 71, 585–592.

**[PII-70] Evoked potentials related to emotional consistency associated to discourse**

León, I.; Díaz, J. M.; de Vega, M.; Hernández, J. A.

*University of La Laguna*

In this study, participants read stories describing emotional episodes with either a positive or negative valence (Experiment 1). Following each story, participants were exposed to short sentences referring to the protagonist, and the ERP for each sentence's last word was recorded. Some sentences described the protagonist's emotion, either consistent or inconsistent with the story, others were neutral, and others involved a semantically anomalous word. Inconsistent emotions were found to elicit larger N100/P200 and N400 than consistent emotions. However, when participants were exposed to the same critical sentences in a control experiment (Experiment 2), in which the stories had been removed, emotional consistency effects disappeared in all ERP components, demonstrating that these effects were discourse-level phenomena. By contrast, the ordinary N400 effect for locally anomalous words in the sentence was obtained both with and without story context. In conclusion, reading stories describing events with emotional significance determines strong and very early anticipations of an emotional word.

**[PII-37] Time course of activation for backward and forward inferences during reading: An fmri investigation**<sup>1</sup>, <sup>2</sup>León, J. A.; <sup>1</sup>, <sup>2</sup>Escudero, I.; <sup>2</sup>Pratt, C.; <sup>2</sup>Just, M. A.<sup>1</sup>*Autonomous University of Madrid*; <sup>2</sup>*Carnegie Mellon University*

The aim of this study was to determine the neural underpinnings of forward (predictive) and backward (bridging) causal inferences. We used event-related fMRI to determine the localization and time course of activation while participants read short, 3-sentence passages. 16 participants read 40 experimental texts in one of four causal inference conditions: Explicit, Forward Highly Predictive, Forward Moderately Predictive, and Backward inferences. Activation was analyzed in two time windows: (1) at the end of the second sentence (the earliest point that readers may make inferences) and (2) at the end of the third sentence (a backward resolution promoting integration with inferential material). Results suggest that backward inferences are drawn during the inference window, resulting in greater activation in bilateral inferior frontal, bilateral superior medial frontal, and right posterior superior temporal regions. Forward inferences, however, were either not drawn at all or not drawn consistently during the inference window. Activation during the integration window differed reliably as a function of inference condition. Activation in the backward inference condition was greater over bilateral inferior frontal, superior medial frontal, anterior middle temporal and posterior superior/middle temporal regions. Activation in the forward inference condition was greater in left middle frontal and bilateral posterior inferior temporal regions, extending into fusiform gyri, hippocampal, and parahippocampal regions. Time course analysis also revealed evidence that backward inferences were drawn during the inference window, whereas forward inferences were either not drawn at all, or not drawn consistently.

**[PII-4] Interference in dual-task performance: Evidence for a response initiation bottleneck**

**Leuthold, H.**

*University of Glasgow*

Recent studies have indicated that performance in dual-tasks suffers from execution-related interference. However, the mechanisms underlying such interference are not fully understood, and two hypotheses have been proposed in terms of a late motor bottleneck versus a central, capacity-limited response monitoring process. Three behavioural experiments, using the psychological refractory period (PRP) paradigm, were performed to test these hypotheses. Task1 was always a tone detection task that demanded moving a slider from its start position over a short or long distance either towards or away from the body. Movement direction was precued 1200 msec before S1 onset, effectively making Task1 a simple RT task. The visual S2 was presented with SOA 50, 150, 350 or 800 ms. In Experiment 1, Task1 demanded either spatially compatible or incompatible responses. Crucially, the finding of an overadditive distance effect but an underadditive effect of compatibility with SOA on RT2 supported the late motor bottleneck hypothesis. Experiment 2 examined whether participants strategically delayed response execution in Task2. To this end, Task2 demanded responses of different complexity, resulting in the so-called response complexity effect. If participants strategically delay response execution in Task2, one would expect that the complexity effect decreases with decreasing SOA, because movement planning can proceed during the delay period. However, manipulation of response complexity produced an additive effect with SOA, thereby ruling out the strategy account. Finally, using a response priming task as Task2, Experiment 3 examined whether the late motor bottleneck resides in motor planning versus motor initiation processes. Critically, the response priming effect in RT2 increased with SOA, supporting the view that response initiation constitutes the late motor bottleneck process. Together Experiments 1-3 provide novel evidence for the existence of a response initiation bottleneck.

**[PIII-21] The influence of highlighting and word length on eye movements during reading**

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<sup>1</sup>*University of Southampton*; <sup>2</sup>*Wesleyan University*; <sup>3</sup>*University of Massachusetts*

An interesting issue in eye movements during reading is how non-foveal information affects saccadic targeting and fixation durations. Highlighting is often used by people to emphasise information in text. To date, its influence on reading has not been examined. We investigated the influence of highlighting on reading long and short words in sentence context. A target word that was either four or eight letters long was highlighted. There were four highlighting conditions: the whole target word highlighted, the first half highlighted, second half highlighted or no highlighting. Significant effects of highlighting and word length were found for saccadic targeting on the target word. Most notably, the eyes landed nearer to the beginning of the word when the first half of the word was highlighted. Significant effects of highlighting and word length were also found on reading times on the target word. For first pass measures, there were longer reading times in the partial highlight conditions than the non-highlight conditions, but there was little difference between the whole word highlight and no highlight conditions. In contrast, regressions to the target word increased under all highlighting conditions. The data indicate that saccades to non-foveated words are not influenced uniformly by highlighting (otherwise similar effects would have been observed for all highlighting conditions). Instead, early parts of words are particularly salient targets for saccades (White & Liversedge, 2004). In contrast, whole word and partial highlighting does uniformly influence regressive saccadic targeting. Also, partial word highlighting, which results in non-uniformity in a word's visual appearance, appears to be more disruptive to lexical access than whole word highlighting. Together the results indicate robust effects of low-level visual factors on oculomotor decisions of where and when to move the eyes during reading.

**[PI-62] Amplitude and speed of wielding modulate length perception through dynamic touch****Lobo, L.; Travieso, D.***Autonomous University of Madrid*

This study analyzes the role of movement in the extraction of the informational invariants that allow the haptic estimation of the length of objects that are held at a fixed place, and that are only allowed to be wielded. It has been demonstrated that under these circumstances haptic perception exploits the properties of rotational inertia of objects perceived proprioceptively. However, there are still several informational candidates to which the haptic system can be attuned. These candidates range from the mass of the object, to its static moment and its moment of inertia, which are already defined in respect to the point where the object is handled. In addition, though it seems clear that the last are relational properties that require specific forms of activity to be generated; only a few studies have tried to relate informational variables with specific patterns of exploration; in our case, different amplitudes and speeds of the wielding movement. In this respect, it has been found that static moment is preferred when the object is hold without movement, whereas wielding seems to be connected to the use of inertial properties as the principal moments of inertia. In this study, the specific role of movement is tested, first, demonstrating the need of wielding to extract rotational inertia properties and, second, through the manipulation of the wielding movement so that specific patterns lead to differences in the information used to estimate length through dynamic touch. In our study, two different amplitudes of the vertical rotation movement and two speeds are used so that the estimation rely more on rotational properties.

**[PIII-37] Functional neuroanatomy of rule learning in language: Role of prosodic cues****<sup>2</sup>, <sup>3</sup> Lopez-Barroso, D.; <sup>1</sup>, <sup>2</sup>, <sup>3</sup> Rodriguez-Fornells, A.; <sup>6</sup> Càmarà, E.; <sup>1</sup>, <sup>2</sup>, <sup>3</sup>, <sup>4</sup>, <sup>5</sup> de Diego-Balaguer, R.**<sup>1</sup>*Catalan Institution of Research and Advanced Studies; <sup>2</sup>IDIBELL; <sup>3</sup>University of Barcelona; <sup>4</sup>INSERM; <sup>5</sup>Normal Highschool of Paris; <sup>6</sup>University College London*

Prosodic information has been proposed to have a critical role in the extraction of rules in language. In recent work we have proposed that its importance resides in the engagement of attentional resources [De Diego-Balaguer et al. 2007]. To explore this hypothesis and its underlying neuroanatomical network we designed a fMRI experiment in which participants had to learn different artificial languages. Languages followed rules which established that the initial syllable of words predicted the last one irrespective of the middle syllable (AXC: puliku, pusaku, pubeku) or were unstructured random sequences. In half of the languages subtle pauses (25 ms) were introduced between words or between trisyllabic random sequences. Irrespective of structure, continuous versus pre-segmented materials led to increased activation in the left anterior ventrolateral prefrontal cortex (aVLPFC). This activation showed a progressive decrease along the learning session for the continuous streams but not for the pre-segmented ones. Regardless of the presence of pauses, increased activation appeared in the languages compared with random conditions in the left inferio-lateral parietal cortex (iLPC). The evolution of this response increased with exposition in the language conditions. Finally, learners of the rule in continuous languages showed a bilateral activation in the medial parietal cortex (mPC) compared to non-learners. These latter results support the involvement of endogenous attention in the extraction of rules irrespective of pause information as the mPC is part of the dorsal parietal system implicated in top-down attentional processes. On the other hand, the recruitment of the iLPC for language conditions points to the importance of verbal short-term memory and attention. Reference List De Diego-Balaguer R, Toro JM, Rodriguez-Fornells A, Bachoud-Levi AC. Different neurophysiological mechanisms underlying word and rule extraction from speech. PLoS ONE 2007; 2: e1175.

**[PIII-29] Allophonic perception in developmental dyslexia, a review**

**<sup>1</sup> López-Zamora, M.; <sup>1</sup> Luque Vilaseca, J. L.; <sup>2</sup> Serniclaes, W.**

*<sup>1</sup>University of Málaga; <sup>2</sup>René Descartes University*

Recent studies in the field of reading difficulties suggest that allophonic perception plays a fundamental role. These investigations, conducted mainly in French and English, found that children with developmental dyslexia show allophonic perception when discriminate worse between different phonemes and they do better when discriminating between variants of the same phoneme. This allophonic theory, which differs from the classical theory of categorical perception, can provide a different perspective to how we study the auditory processing , speech production and reading processes in students with and without reading difficulties (Serniclaes et al ., 2004; Bogliotti et al., 2008). In this work, using a sample of 203 spanish children of 7 and 9 years with and without reading problems, makes a study of how these two theories of perception relate and explain the phenomenon of dyslexia. Children were evaluated with a full battery of tests reading, phonological and intelligence, passed 8 tests of auditory processing in which they manipulated different acoustic properties of continuous sound, with the aim to study how the effect of affecting allophony to the different experimental groups.

**[PIII-28] Emotional pre-eminence on discrimination between human vocalizations versus > non human sounds**

**Lorca Marín, J. A.; Alameda-Bailén, J. R.**

*University of Huelva*

Currently are mounting several number of evidences for the dissociation in processing human vocalizations and sounds in front other environmental sounds (Aeschlimann et al, 2008). This work is investigate this aspect, controlling the emotional and affective in non-human linguistic communication, rarely investigated. Based on the model of Bradley and Lang (1999), Belin et al (2004), Fecteau et al. (2005) and Belin (2006) and assuming the two-dimensional model circunplexo arousal-activation and its distribution in a "boomerang-shaped". It selected four groups of human emotional sounds taken from the "Montreal Affective Voices "(MAV) (Belin, Fillion-Bilodeau, Gosselin, 2008), and four Human Sounds groups not collected in "The International Affective Digitized Sounds "(2nd Edition; IADS-2) (Bradley and Lang, 2007). We performed a 2x2x2 design: 1) Sounds emotional two values on non-human human, 2) Level of Valencia, positive versus negative, 3) and Level Activation, Low versus High. Depend Variable was taken as reaction time and misdiagnosis of sounds. In the analysis by item no differences in errors. As reaction times to be seen as human sounds have a time less reactive than non-human and positive valence lower than the refusal. There was no difference in the level of activation. The interaction between factors was also significant. This suggests that human emotional sounds are processed more rapidly than other types of emotional stimuli in the environment (such as model planned Aeschlimann et al, 2008 and Belin, 2006), and unlike which implies, those with positive information load faster than negative. The value of activation gave no information burden on our experiment.

**[PII-46] Source monitoring: Characteristics of memories also help to determine the confidence in the source decisions****<sup>1</sup>Luna Ortega, K.; <sup>2</sup>Martín Luengo, B.***<sup>1</sup>University of Minho; <sup>2</sup>University of the Basque Country*

The ability to determine correctly the source of a memory is very important in the everyday life. According to the Source Monitoring Framework (SMF), the source of a given memory is determined by an inferential process which takes into account several characteristics of the memory, as for instance the amount of perceptual or contextual information. The hypothesis here was that those characteristics can also influence the subjective confidence about the outcome of the inference. Specifically, we posed that when there are no characteristics to retrieve, for instance because the information was not previously presented, the evaluation of the confidence that the inference was correct could be more difficult. Participants read two narratives about the same bank robbery: the testimony of a teller and of a customer. After several filler tasks, participants completed a source monitoring memory test with 52 statements, 13 mentioned by the teller, 13 by the customer, 13 appeared in both testimonies and 13 in none. Participants had to indicate the source of each statement and to rate the confidence that the selected answer was correct. For information presented previously (sources teller, customer, and both) confidence was higher for correct than incorrect answers, but for new information (source none) it was not. Similarly, when participants answered “teller”, “customer” or “both”, meaning that they recovered at least some memory characteristics, confidence was higher in correct than incorrect answers. When the answer was “none”, meaning that they did not recover any memory characteristic, the difference was not significant. This result shows that when participants retrieve cues diagnostics of the source of the information, those cues also help to determine the confidence with which decision is made. Accordingly, when there is nothing to retrieve, the metamemory judgements are impaired.

**[PII-14] Measuring exogenous spatial attention during and after an acute bout of aerobic exercise**  
**Luque, A.; Morales, E.; Gálvez, G.; Sanabria, D.***University of Granada*

The aim of this study was to investigate the influence of aerobic physical activity on the deployment of exogenous spatial attention. Moderate exercise has been consistently associated with physical (e.g., reduction of cardiovascular disease) and mental (e.g., reduction of depression and anxiety disorders) well-being. On that basis, there is now growing interest on the influence of physical activity on selective aspects of brain function. In a recent review, Hillman and colleagues (Nature Neuroscience, 2008) highlighted the positive effect of aerobic fitness training on cognitive function, reporting both behavioural and neurophysiological evidence. Most of the recent work in this field has investigated the relationship between physical activity and control mechanisms, while stimulus-driven cognitive processes have received less attention. Moreover, a cursory look to the literature in this field shows apparently contradictory results regarding the influence of physical activity on cognitive function. One crucial aspect on this issue appears to be related to the temporal relationship between the bout of physical activity and the execution of the cognitive task. While some studies have measured cognitive function during physical activity other studies have tested cognitive functioning after a bout of physical activity. In our study, we attempted to address the issues raised above studying whether an acute bout of aerobic exercise, performed prior to or at the same time as the cognitive task, would influence exogenous spatial attention. Exogenous spatial attention was measured by means of a typical Posner's cuing paradigm. Participants' RTs and ACC were obtained in three different situations: 1) At rest; 2) during an acute bout of aerobic physical activity; 3) immediately after (once heart rate was back to rest levels) an acute bout of aerobic physical activity. The results are discussed in the context of the recent evidence of the significant influence of aerobic physical activity on brain function.

**[PI-19] Generating phonological structure: Evidence from English phrase production**

<sup>1</sup>Malpass, D.; <sup>1</sup>Wheeldon, L.; <sup>2</sup>Lahiri, A.

<sup>1</sup>University of Birmingham; <sup>2</sup>University of Oxford

The sound structure of words can undergo dramatic changes when they are produced in different utterance contexts. For example, the sentence “do you like her” could be articulated as a single prosodic unit with one main stress, e.g., “je-lie-ker”. The rules for parsing a sentence into prosodic units in English are still a matter of debate. We report two speech production experiments designed to investigate this issue. The experiments replicate and extend the Dutch findings of Wheeldon and Lahiri (1997, 2002) who demonstrated that in a delayed sentence production task, latencies were a function of the number of phonological words in a sentence. In contrast, in an on-line production task, latencies for the same stimuli were a function of the length of the initial phonological word of the sentence. We tested delayed and on-line production of the sentence types given in (1) below. The phonological word structure given by the bracketing is predicted by an algorithm that takes into account only prosodic information (rather than lexical or syntactic information) and attaches unstressed function words to the preceding phonological word. (1) Clitic sentences [plant the][seeds] Non-clitic sentences [plant] [three][seeds] Pronoun sentences [plant][them] Control sentences [plant][seeds] Our findings replicate the Dutch findings of Wheeldon and Lahiri (1997, 2002). In the delayed production task, latencies to the non-clitic sentences were longest whereas in the on-line production task, latencies to the clitic sentences were longest. The data support a prosodic based algorithm for phonological word formation. Speech measurement data also indicate that during normal language production, phrasing produces phonological words which are not isomorphic to syntactic words. These findings suggest that the phonological word is the preferred unit of output during speech production (Levelt, 1989, 1992), as speakers construct such a unit even at the cost of initiation speed.

**[PI-52] Percentage of nonoverlapping corrected data**

**Manolov, R.; Solanas, A.**

*University of Barcelona*

Recent revisions of scientific literature have shown that the percentage of nonoverlapping data (PND) is the most frequently used procedure to quantify treatment effectiveness in single-case designs, especially when carrying out meta-analyses. The attractiveness of the PND is probably related to its computational easiness and its straightforward interpretation. Nevertheless, the drawbacks of the procedure are also widely acknowledged – specifically, its distortion by trend and autocorrelation in data. The present study proposes a modification (referred to as PNCD) in one of the PND in order to deal with these weaknesses. The data correction procedure focuses on removing the baseline trend from data prior to estimating the change produced in the behavior due to intervention. Concurring with PND’s strengths, the calculus and interpretation of the proposed procedure is straightforward and it can be easily complemented by visual inspection of the graphed data. A simulation study is carried out in order to compare the original and the modified procedures in several experimental conditions. The results suggest that the new proposal is unaffected by trend and autocorrelation and can be used in case of unstable baselines and sequentially related measurements. An R code was developed in order to enhance the applicability of the PNCD.

**[PI-13] Comparing visual effect size indices for single-case designs****Manolov, R.; Solanas, A.; Leiva, D.***University of Barcelona*

Effect size indices are indispensable for carrying out meta-analyses and can also be seen as an alternative for making decisions about the effectiveness of a treatment in an individual applied study. The desirable features of the procedures for quantifying the magnitude of intervention effects include educational/clinical meaningfulness, calculus easiness, insensitivity to autocorrelation, low false alarm and low miss rates. Three effect size indices related to visual analysis are compared according to the aforementioned criteria: the widely used percentage of nonoverlapping data (PND) and two recently developed procedures (the percentage of data points exceeding the median, PEM, and the percentage of all nonoverlapping data, PAND) designed to overcome some of its limitations. The comparison is made by means of data sets with known parameters: degree of serial dependence, presence or absence of general trend, changes in level and/or in slope. The PND showed the highest discrimination between data sets with and without intervention effects. However, when autocorrelation or trend are present in data, the functioning of that procedure is less than optimal, being outperformed by the PEM for serially dependent data and by PAND in case of trends. Further improvements are needed in these indices in order to achieve more precise estimations of the magnitude of intervention effects.

**[PIII-22] Semantic interference in object and face naming****Marful, A.; Paolieri, D.; Bajo, M. T.***University of Granada*

There is a current controversy about the question of whether face naming and object naming are equally vulnerable to interference processes. The experiments reported in the poster address this issue. Experiment 1 compared naming of categorically related famous (e.g., actors, politicians) to naming of categorically related objects (e.g., tools, musical instruments) when the exemplars were presented on semantic homogeneous lists (exemplars from the same semantic category appeared consecutively) or semantic heterogeneous lists (category exemplars were mixed). Results revealed a significant slowing in both face naming and object naming when the stimuli were presented in homogeneous lists compared to heterogeneous lists. Experiment 2 showed that this interference effect is naming dependent. Thus, semantic interference of homogeneous lists disappeared when face and object naming alternated with the reading of their correspondent names in Experiment 2. Taking together these data provide evidence that both face and object naming are vulnerable to semantic interference.

**[PIII-2] Semantic and affective priming in healthy seniors and alzheimer's disease**

<sup>1</sup>Marín-Gutiérrez, A.; <sup>2</sup>Avilés, A.; <sup>2</sup>Carreiras, M.

<sup>1</sup>University of Salamanca; <sup>2</sup>Basque Center on Cognition, Brain and Language

One of the most salient features in Alzheimer Disease (AD) is the deterioration of memory. However, the nature of this deficit is still unknown. Recently, researchers have become interested on exploring the relationships between emotional system and semantic memory. In the present study, the main goal was to assess the integrity of activation processes of semantic and emotional information. Therefore, we conducted a study in which 20 AD patients and 20 controls, equated in age and education, performed a lexical decision task. 120 Spanish words (60 positive and 60 negative) were selected as targets. For each target (i.e., illness), we created an emotionally-congruent word (i.e., abandonment), an incongruent word (i.e., bliss), a neutral semantically-related word (i.e., symptom) and an unrelated neutral word (i.e., document) to serve as primes. Before running ANOVAS, raw data were transformed into their natural logarithms, which permits controlling the slowing effect observed in demented populations as well as a more controlled comparison between the demented and control groups. Results showed a significant semantic priming effect with positive words in AD patients as well as in controls, but only the latter showed a semantic priming effect with negative targets. We also found a significant inhibitory effect for incongruent positive information in AD patients as well as a robust facilitatory effect (hyperpriming) for both positive and negative congruent information. These findings are discussed in terms of the “hyperpriming phenomena” that is usually observed in patients suffering this kind of dementia.

**[PIII-73] Tactile conceptual metaphors: Another source of embodiment for abstract domains**

<sup>1</sup>Márquez, J.; <sup>2</sup>Valenzuela, J.; <sup>1</sup>Santiago, J.

<sup>1</sup>University of Granada; <sup>2</sup>University of Murcia

Embodiment theories emphasize the role of perceptual and motor representations for high level cognition. In the present work, we provide a first exploration of the metaphorical connection existing between the sensorimotor domain of tactile texture and abstract concepts. Specifically, we focus on the mappings between the tactile perceptions of “rough” and “smooth” and the personality concepts of “difficult, violent, bad mannered” in one hand, and “easy, conciliatory” in the other hand. Participants were shown a set of pictures and were told that those were candidates to be part of a trial jury. Their task was to accept or reject each candidate by moving a joystick. In one condition, the person being judged was depicted in a cover story as a bad person (who had harmed a relative of the participant). In another condition, the person being judged was the participant himself/herself. In one group, the joystick was covered with sand paper, whereas in another group it had a very smooth hairy cloth cover. Results showed that a soft touch led to a greater acceptance rate when the jury members were to judge oneself and a lower rate when they were to judge the bad person. A rough touch produced the opposite pattern of acceptance. These results show that it is not just the acceptance response which is associated to tactile sensations, but touch affects the social impression produced by the photographed person.

**[PII-44] Semantic distraction in free recall: Modality differences reduce source-monitoring errors**<sup>1</sup>Marsh, J. E.; <sup>2</sup>Hodgetts, H. M.; <sup>3</sup>Beaman, C. P.; <sup>1</sup>Jones, D. M.<sup>1</sup>Cardiff University; <sup>2</sup>University of Laval; <sup>3</sup>Reading University

The effect of distraction from to-be-ignored words on free recall of semantically-related to-be-remembered lists depends on whether the ignored and remembered words are presented in the same sense modality. This effect of semantic distraction was demonstrated in a study in which items of each type were interleaved during presentation. Four combinations of recalled and ignored material were used: auditory-auditory, visual-visual, auditory-visual and visual-auditory. The effect of semantic distraction on the number of items correctly recalled was comparable across all the various combinations of modality. However, intrusions from the to-be-ignored sequences were higher in those instances in which the modality was shared, namely auditory-auditory and visual-visual. This pattern of results suggests that interference occurs generally at a level beyond sensory analysis but that modality may be instrumental in excluding candidate responses from production by augmenting source-monitoring efficiency.

**[PIII-14] Phasic and tonic alertness: The effects on the exogenous orienting of attention**<sup>1</sup>Martella, D.; <sup>1</sup>Casagrande, M.; <sup>1</sup>Marotta, A.; <sup>2</sup>Fuentes, L. J.<sup>1</sup>University of Roma; <sup>2</sup>University of Murcia

Orienting and alerting are separate attentional systems: the first operates with spatial precision within a selected visual area, while the other is connected with intensity aspects, i.e., phasic and tonic alertness. Previous studies carried out to assess the relationship (independence/interaction) between these two components of alerting and the orienting networks, have led to contrasting results. Moreover, no study has assessed the effects of simultaneous manipulation of both phasic and tonic alertness on exogenous orienting. In this study we manipulated orienting by means of peripheral non-predictive cues, tonic alertness by means of sleep deprivation, phasic alertness by introducing a warning tone, and we varied the cue-target interval (200, 800, and 1100 ms SOA). The task was carried out in two sessions: a diurnal and a nighttime session. The results showed a non significant interaction between phasic alertness (warning) and the cueing effects. On the contrary, a significant reduction in the validity effect was observed in the low tonic alertness condition. Further analysis performed separately on the two sessions showed facilitation and inhibition of return (IOR) effects in the diurnal session, while in the night-time session only the facilitation effect was significant. These results suggest a selective effect of tonic alertness on IOR, but not on facilitation effects.

**[PII-10] The effect of the cueback on inhibition of return**

**Martín-Arévalo, E.; Lupiáñez, J.**  
*University of Granada*

Inhibition of Return (IOR) is an effect that consists of slower reaction times responding to stimuli appearing at locations where attention has been involuntarily captured previously as compared to new locations. The time course of IOR is different depending on the task, appearing earlier (i.e., at shorter cue-target SOAs) in detection tasks compared to discrimination tasks. Despite IOR is a well known effect in the literature, the exact mechanisms underlying the effect and its task dependency have not yet been determined. In the present work we assume that peripheral cues, apart from orienting attention, might also lead to the activation of an object or event representation that can be used to process the target (i.e., cue target integration processes). This activation will benefit analytic target discrimination processes (spatial selection benefit) but hinder target onset detection (detection cost). The cueing effect that is finally measured in RTs will be the result of the neat contribution to performance of each of these effects. Nevertheless, they will have different weights depending on the task (e.g., spatial discrimination benefits will have almost no contribution in detection tasks). A stimuli presented between the peripheral cue capturing attention and the target (cueback) was used in order to break the integration processes and isolate the detection cost. Results showed that IOR increased with the cueback in the discrimination task, but was reduced in the detection task, so that after a cueback a similar IOR effect was observed for both tasks. We conclude that the role of the cueback is to stop integration processes, thus leaving out detection cost as the single effect of cueing (i.e. IOR), the effect being then independent of task.

**[PII-45] The salience of repetitive structures tested in rats**

**Martínez, D.; Toro, J. M.**  
*Pompeu Fabra University*

Research has shown that, like humans, animals possess the ability to perform abstract operations like rule-based generalizations. However, it is still debated if such capacity implies either a general-purpose, or specialized, highly constrained mechanism. Previous research on humans has provided evidence in favour of the existence of a specialized mechanism constrained by certain perceptual saliences, like repetitions. In the present study, we asked if such constraints are also present in nonhuman animals, specifically, in rats (*Rattus norvegicus*). In our experiments, ten piano tones were combined to form 20 triplets that followed either a repetition (AAB or ABA) or an ordinal pattern (Middle-High-Low; MHL). During the task, rats had to swim through a “T” water maze in order to find a hidden platform while the triplets from a given pattern were being played. For half of the rats, AAB/ABA patterns signaled the platform was on the right side of the pool, while the MHL pattern signaled it was on the left side. The opposite configuration was used for the other half of the rats. In the first experiment, we explored rats’ performance in the discrimination of AAB vs MHL triplets, whilst in the second experiment we did it for ABA vs MHL triplets. A test session with new triplets, not presented during learning, was run in order to elucidate if rats generalized the rule to new exemplars. Our results show that, like humans, rats readily discriminate structures containing both adjacent and non-adjacent repetitions without the need of extensive discrimination training. Further research should explore if rats also present similar constraints as those present in humans in the generalization of abstract structures. In general, the present results suggest common abilities in the extraction of structures across different species.

**[PII-18] Improvement of visuospatial disturbances in children with precedents of great prematurity by differential outcomes**

**Martínez, L.; Sánchez-Joya, M.; Estévez, A. F.; Róldan-Tapia, L.**  
*University of Almería*

The rates of children's survival born with great prematurity have increased considerably in the last two decades. At the same time, physical and neurodevelopment disturbances have also increased in these children. In the present study we assessed the cognitive profile in children with precedents of prematurity (less than 32 weeks of gestation and low or equal weight 1500 grams) with regard to a control group matched one to one. The results showed worse results in the prematurity children group, especially in visuoperceptive tasks, working memory, executive functions and mental age. In a second phase, we also aimed to test whether the differential outcomes procedure (DOP) would improve performance of a group of sixteen children born prematurely in a visuospatial discrimination task. The DOP usually involves using unique outcomes for specific cued choices in a conditional discrimination task. When this training procedure is applied, learning is faster and better than when either a common reinforcer for all correct choices or different but uncorrelated reinforcers (the non differential outcomes condition) are used. The results indicated that children showed higher performance differential outcomes were arranged. This finding suggests that the DOP may be effective as a training tool to improve some of the deficits associated with preterm birth such as visuospatial discriminations.

**[PIII-70] Effects of power in control attributions**

**Martínez, R.; Rodríguez-Bailon, R. ; Moya, M.**  
*University of Granada*

The process of causal attribution can be considered as a useful tool for actors and for observers in the workplace because it could help to know the different expectations that people have about themselves and about other workers in the organizations. The goal of the current research is to analyze the impact of power in causal attribution processes. Specifically, , we analyze the attributions made by perceivers about people's success and failure who differ in the power that they have in a work setting. Results show that both the success and failure obtained by people with high power are explained by controllable, internal attributions, specifically, participants refer to the effort made by the powerful person. However, the explanation of the outcomes achieved by people with low power show a different pattern. Whereas the success is attributed to the subordinate's effort, the failure is attributed to his low abilities. Furthermore, in the same line, but from the other side, we developed a second study to analyze the attributions from the actor viewpoint focusing on those who hold powerful positions. Given that power can be defined as the control that an individual or group has over the outcomes than the others or himself/herself can get (Dépret and Fiske, 1996; Georgesen and Harris, 1998), our aim is to understand the importance of the controllability dimension on the attributions that powerful people make about their outcomes and their consequences on the persistence in future tasks. The results were analyzed in relation to previous findings and its implications in keeping the status quo.

**[PII-60] The effect of phonological similarity on updating in working memory**

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Updating in working memory involves substituting some information maintained in memory for new information. Previous results with a numerical updating task have shown that updating times were faster when the distance between the number to be replaced and that new one is smaller than when this distance is larger. Given that with close numbers it is more likely that the new number belongs to the same decade as the number previously stored, the previous effect may be due in part to the different amount of shared phonological features between the numbers. Our aim is to determine, with non-numerical material, whether the updating process is faster when the new information shares phonological features with the previously stored information. With this aim, we constructed lists of pseudowords (CVCV) in which the items involved in an updating trial could share or not a syllable. Results confirm that phonological similarity facilitates updating. Thus, the processes involved in updating occur faster when the information to be updated is similar to that stored in memory, probably owing to a representational effect of shared features.

**[PIII-31] The effects of bilingualism on attentional functioning: An investigation of conflict resolution and conflict adaptation**

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Beneficial effects of bilingualism on attentional functioning have been repeatedly reported. The bilingual advantage has been attributed to the engagement of executive attention in overcoming cross-linguistic interference. Bilinguals outperform monolinguals in tasks that involve components of executive control. The accounts of mechanisms underlying the enhanced executive functioning in bilinguals together with the experimental data collected so far are equivocal. The aim of our study was to investigate in detail the attentional efficiency of bilinguals with an emphasis on cognitive conflict processing. We examined the efficiency of attentional networks (executive, orienting and alerting) in bilinguals by the Lateralized Attention Network Task (LANT). The RT analysis revealed that bilinguals were characterized by the enhanced executive network, as reflected by the reduced cost of processing conflict. In addition, they exhibited more efficient alerting. The magnitude of the orienting benefit in the monolingual and bilingual group did not differ. The percentage of error analysis revealed that bilinguals were overall more accurate than monolinguals. The bilingual advantage was most pronounced on trials requiring processing of conflict (incongruent flanker trials). To further investigate the component of executive control in bilinguals, the pattern of conflict adaptation (so-called "Gratton effect", Gratton, Coles & Donchin, 1992) was analyzed in bilinguals and monolinguals. The possible influence of response-repetition priming on conflict adaptation effects was taken into account (Mayr, Awh & Laurey, 2003). Results are discussed in light of conflict-monitoring model.

**[PI-34] Bilingual advance in cued and uncued task-switching within language****<sup>1</sup>Mas, E.; <sup>1, 2, 3, 4</sup>de Diego-Balaguer, R.; <sup>5</sup>Ruz, M.***<sup>1</sup>University of Barcelona; <sup>2</sup>Catalan Institution of Research and Advanced Studies; <sup>3</sup>IDIBELL; <sup>4</sup>Normal Highschool of Paris; <sup>5</sup>University of Granada*

Several studies have shown that bilingualism enhances executive control reducing task-switching costs. The studies so far have either used linguistic tasks where participants are asked to switch between their languages or non-linguistic material participants alternate between different tasks. In the present experiment we explored whether the bilingual advance would show up when performing the task in one single language but alternating between different levels of language processing (semantic vs phonological) and whether this effect would vary as a function of the language dominance. Three groups participated in this experiment: Spanish monolinguals and two groups of Catalan-Spanish bilinguals, one with a dominant use of Catalan (L1Cat) and one group of balanced bilinguals (L1Cat/Sp). We used a paradigm in which participants were asked, on a trial-by-trial basis, to perform phonological or semantic judgments of upcoming Spanish target-words. In one type of block (Cued block), cues presented before the targets informed participants about the task to perform on the words. In the other block (Uncued block), task information was conveyed by the color of the target words. Results showed that all three groups were faster in non-switch than in switch trials, and were also faster in Cued than in Uncued blocks. However, groups differed in the size of switch effects. Although L1Cat and L1Cat/Sp groups were both bilinguals, only L1Cat had a switch effect smaller than Spanish monolinguals, while L1Cat/Sp did not differ from the other two groups. Thus, L1Cat switching within their non-dominant language appeared to enhance switch-related processes. On the other hand, preparatory cues reduced the size of the switch effect, but only for monolingual participants. All together, these results suggest that bilinguals are more efficient in switching between linguistic tasks than monolingual participants.

**[PI-39] The combined effect of interventions designed to improve children's logical reasoning performance****McKenzie, R.; Handley, S.***University of Plymouth*

The ability to reason outside of empirical knowledge forms the basis of disciplines including mathematics and science. Children often encounter difficulties, however, in divorcing reasoning from their own knowledge and beliefs. Where problem content conflicts with world knowledge, reasoning outcomes can be error prone. Specific interventions can improve logical performance. Strong instructions which stress the logical requirements of the task can lessen the tendency to give empirical responses to problems with false premises. Other contextual manipulations, such as embedding problems within a fantasy context can also improve logical performance. Accounts of interventions including fantasy contexts and instructions vary. One previous explanation suggests such interventions act by highlighting the need for a particular mode of reasoning. It is claimed that all instructional techniques, including the use of fantasy, serve to highlight the experimenter's intention, that reasoners should adopt an analytical approach to problem solving. This study shows that fantasy contexts and instructions do not work in the same way, and use of a mixture of presentation techniques can lead to poor logical reasoning performance. Children given instructional training, highlighting the logical nature of a reasoning task with empirically false content, showed the typical improvement in logical performance, compared to a control group. In a subsequent experiment, however, those children who received initial instructional training showed poor logical performance, compared to controls, on similar reasoning problems embedded within a fantasy context. These findings suggest that the effect of instructional training can persist for several months and can interfere with subsequent, alternative presentation techniques. This work is especially pertinent given current educational guidance proposing that the use of a range of presentational strategies should be used to facilitate children's problem solving abilities.

**[PIII-20] Emotional influence on driving behavior in risky situations**

**Megías-Robles, A.; Cándido-Ortíz, A.; Catena, A.; Maldonado, A.**

*University of Granada*

In this study we analyzed the influence of emotional stimuli on braking and eye behavior in risky situations using the HRT (Honda Riding Trainer) Simulator. The results showed that the stimuli with negative emotional valence speeded-up braking compared to neutral and positive ones. Moreover, both number and duration of fixations were larger for affect-laden images than for neutral ones. This indicates that more attention was deployed to the emotional than to the neutral images. However, the start time of the first fixation on the target was similar for the three emotional conditions. This pattern of results would indicate that emotion affects behavior in risky situations, by changing the criteria used for deciding whether to brake or not, rather than the subjects' ability to detect the risk itself.

**[PI-47] Inhibition processes in prospective memory**

**Meilán, J. J. G.; Arana, J. M.; Pérez Sáez, E.; Gordillo, F.**

*University of Salamanca*

Prospective Memory (PM) denotes memory for Goal-directed behaviour (future intentions) that must be executed at some later time or in response to a specific cue. We evaluated the importance of the Intention Superiority Effect (ISE: a special activation level of the intention contents) in a shopping task. Specifically, the process of forming an intention starts with the activation of semantic content in memory (Shopping list). This activation is currently most accessible in episodic/semantic memory and remains active over time and is protected against competing memory representations (Kuhl, 1987). We sought to analyse the changes in the activation level in the memory of products related to a shopping intention. The shopping was done in a simulated form, for which we used on-line shopping. The main conclusion obtained in this study was that maintaining certain intentions require goals must be shielded from interference, and distracting information should be inhibited. It seems that in situations in which such distracting (i.e. related products and no related products) stimuli are present, additional regulatory processes are required to shield intentions from oblivion.

**[PII-68] Cumulative effects of cognitive control in a stroop task: The importance of taking previous trials into account****Méndez, A.; Jiménez, L.***University of Santiago de Compostela*

The Stroop task requires subjects to respond according to the color of a word regardless of its meaning. Congruence effects (greater RT when the word refers to another color) are considered automatic because they occur even if the participants try to ignore the meaning of the word, but are modulated by aspects of the context: for example, the effect of congruence decreases after an incongruent trial. These sequential congruence effects have been attributed to increased cognitive control exerted after an incongruent trial, but also to repetition priming. Notebaert et al. (2006) have attempted to distinguish between both of these effects, identifying them as top-down and bottom-up effects, respectively. According to this suggestion, they found that the increase in cognitive control arises only with long stimulus-response intervals, whereas the repetition priming effect can be found even at very short intervals. In the present study we control for repetition priming effects, and we show the existence of cognitive control effects both with long intervals (750ms) and with interval 0. In accordance with the results of Notebaert et al., we found no evidence of sequential congruence effect when it was evaluated by considering only the consistency of the previous trial. However, when we took into account the congruence of previous trials, we found a cumulative effect of these previous trials on the current trial. The results suggest that the effect of cognitive control may act in a cumulative manner, as it might be inferred from its characterization in terms of cognitive inertia. Explicit measures of expectancies indicate that this effect is not attributable to a conscious expectancy.

**[PI-43] Human classical conditioning: The role of the valence and arousal of the unconditioned stimulus****Méndez, A.; Redondo, J.***University of Santiago de Compostela*

The present work shows preliminary results of a study in which an electrodermal classical conditioning procedure with humans participants was used. The goals of this study were, in one hand, to verify whether it was possible to obtain conditioning using an appetitive unconditioned stimulus (US) and, on the other hand, to compare this conditioning with that obtained with an aversive or unpleasant US. The images selected as stimuli were taken from IAPS (International Affective Picture System). Specifically, a picture with erotic content was used as pleasant US (USp) and another picture showing the burnt face of a child was used as unpleasant US (USu). As conditioned stimulus (CS) two images of faces with neutral expression were selected. One of the CS (CSp) always preceded the USp, and the other CS (CSu) always preceded the USu in the experimental group. In this group 15 CSu-USu and 15 CSp-USp trials. were presented in pseudorandom order, with the restriction that no more than two consecutive CS-US could be the same. The interval from the offset of the US until the next CS onset was variable, between 18 and 22 seconds (mean = 20 s). Stimuli duration was 5 s and the US was presented following the CS without delay between the two stimuli. In the control group 15 CSp, CSu, USp, and USu trials were presented in pseudorandom order (with the same restriction used in the experimental group). The inter-trial interval (time since the offset of a stimulus until the onset of the next one) was 10 s. Skin conductance response (SCR) elicited by both the CS and the US was scored. Results are discussed in relation to the theoretical framework that proposes an adaptive basis for human classical conditioning.

**[PII-3] Effects of aging and divided attention on intentional forgetting: Behavioural data and erp correlates**

**Menor de Gaspar, J.**  
*University of Oviedo*

One theoretical approach to cognitive aging stresses an age-related reduction in attentional resources. Craik(2002) are shown that this reduction could be simulated in young adults under dual-task conditions. The aim of this study was to analyse the involvement of attentional inhibition in intentional forgetting by directed forgetting procedure (item method). The aim was to test the hypothesis that forget instruction engage an attentional and cognitively demanding process that prevents the processing of the preceding item. Three groups of subjects participated in this experiment: older adults, young adults (single-task group), and young adults (dual-task group). EEG was recorded and ERPs were obtained during the study and test phases, but only data for study phase are shown. In the immediate free recall test restricted to remember items, older and young (dual-task) adults groups recalled less items and committed more intrusions of forget items than single-task group. Remember instruction evoked more positive waves than forget instruction in single-task group than dual-task and older groups on 100-400 msec period. However, in 500-900 msec period, forget instruction evoked more positive waves than remember instruction on the left central and posterior electrode sites in three groups of participants. In the final recognition test, the dual-task and older groups shown a smaller directed forgetting effect that the single-task group. Together, the results of this experiment suggest that forget instruction put into operation a process that requires the allocation of processing resources. When these resources are removes in dual-task condition or as a result of normal aging, subjects find it difficult to suppress processing of items to forget when these items can be integrated easily into the context of the list.

**[PI-5] The role of monitoring and control in discrimination of targets from similar non-targets**

**Miles S. M.; Macken, W. J.**  
*School of Psychology, Cardiff Universit*

The metacognitive monitoring and control processes involved in the ability to discriminate targets from non-targets that differ by a single critical feature were explored. One hundred and eighty participants learned 80 target nouns (regular singular and plural), and then were tested on 120 nouns: 40 target items (identical to those presented at study), 40 similar non-targets (changed in plurality between study and test), and 40 novel non-targets. The test required a speeded (250ms or 1000ms) yes–no judgement after each item. Participants were informed either before learning, or after learning but before recognition, that the test would contain non-target items similar to target items (i.e., that plurality changed between learning and test). Controls received no such instructions. Awareness information about target/non-target similarity reduced false recognition of similar non-targets only when presented before learning, and when the response interval was 1000ms. We further investigated whether this effect was a product of participants' orientation, with respect to the critical discriminating feature, or to them investing greater effort during study as a consequence to having been alerted to the relative difficulty of the test. This involved one group being oriented to the specific discriminating feature before study, and another merely instructed that the task was difficult, as some non-targets were highly similar to targets, and that they should invest considerable effort at study. Giving general instructions about task difficulty did not enhance discrimination between targets and similar non-targets. More efficient discrimination was achieved by orientating participants to the critical feature change, which enhanced the monitoring and control of their learning behaviours. Future experiments will investigate target/non-target when orientating to multiple discriminating features.

**[PIII-48] Effects of the cognitive interview on the recall and recognition of high and low typicality information**

**Miqueleiz-Ballesteros, J.; Migueles, M.**  
*University of the Basque Country*

The aim of this research was to analyze the effectivity of the cognitive interview on the recall and recognition of an event (a simulated bank robbery) taking into account the typicality of the actions involved. A significant improvement on the recall of low typicality actions was expected for the participants in the cognitive interview condition since its mnemonics are designed to aid the retrieval of episodic (thus, not script-based) information. Results for the recall showed that the cognitive interview elicited more true information for persons and events and the amount of errors and confabulations remained similar. Besides, high typicality information was better recalled than low typicality in both groups, while the cognitive interview scored higher for both low and high typicality. Several analysis of variances were calculated also for the recognition. Results indicated that low typicality actions were better recognized whereas the confidence on the answers was similar for both low and high typicality items. A' and B"D were also calculated. There was no difference for the A' indicator of accuracy neither for the typicality nor for the interview type or interaction. The B"D index's scores showed a more lenient response criterion for the high typicality items. Although the amount of time involved interviewing was significantly higher on the cognitive interview condition, its positive results make it a worthy technique, especially for the kind of information retrieved from the event under study and not script-based. Further research is needed regarding to how to improve this amount of information as well as the confidence of the participants regarding to it.

**[PIII-62] Dissociating attentional effects on the n170 event-related potential for faces, houses, and hands**

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Configural and holistic processing may have been played main role not only in face perception but also in body perception, which showed the same effect of inversion like faces. All objects processed holistically or non-holistically, depending on the nature of stimuli. Prior research reported that, faces and bodies processed holistically, whilst the other objects processed non-holistically, and recognition occur via local feature or part information. To test that for different types of stimuli under perceptual load, we manipulated attention sensu Lavie's perceptual load theory to short presentations of task irrelevant unfamiliar faces, hands, and houses. Participants responded to the target letters (X vs. N), under low load these letters were identical, but under high load the participants identified X or N among different letters. Our findings showed that, there was reduction of the face N170 and increased of the house N170, whilst no enhancement was observed for hands. We interpret that, for faces N170 was reduced by load because selective attention to letters reduces the holistic processing, whilst for hands we didn't find any enhancement, because the hands N170 didn't influence by selective attention because, the isolated body parts like as isolated face parts don't evoke the holistic processing. For houses N170 increased under high load condition, because house processing used non-holistic processing or other extreme types of holistic processing which less than faces and bodies Under High load condition this holistic processing increased because the human brain responded for a house as whole houses and not depending on the house parts, in this short time intervals, and also because there wasn't enough capacity to perceived these parts, whilst under low load condition, the non-holistic processing stand behind house processing.

**[PIII-41] Effects of degree of semantic similarity and stimulus duration in translation performance of highly competent Catalan-Spanish and Spanish-Catalan bilinguals**

**Moldovan, C.; Ferré, P.; Sánchez-Casas, R.; Demestre, J.**

*Universitat Rovira I Virgili*

Previous experiments examined the role of the degree of meaning similarity in the performance of highly proficient Spanish-Catalan bilinguals in a translation recognition task (Ferré, Sánchez-Casas, & Guasch, 2006; Guasch, Sánchez-Cassa, Ferré, & García-Albea, 2008). In this task, the critical pairs are the incorrect translation where the semantic relation between the two words of the pair could be very close (e.g., *ruc-caballo*, "horse"), less close (e.g., *ruc-oso*, bear) or unrelated (ej., *ruc-lejia*, "bleach"). An interference effect is expected if performance is sensitive to the semantic relation (i.e., longer responses in the related incorrect translation). The results of these experiments showed significant interference effects only when the words were very closely related (e.g., *ruc-caballo*). The present study was designed to explore why close relations (e.g., *ruc-oso*) did not produce an interference effect. One possible explanation relates to stimulus duration. That is, in previous experiments, participants were presented with the first word to be translated during 500 ms, and they had to decide if the second displayed word was the correct translation of the first one. It is possible that close semantic relations are initially activated but that activation decreases by the time the second word is presented. The experiments reported in this poster tested this hypothesis by reducing the presentation duration of the first word from 500 to 250 ms, using the same set of materials as those in the previous studies. Once again the results demonstrated that the bilingual performance was affected by the semantic manipulation, but significant interference effects were only obtained with very closely related pairs. A novel result was that the pattern of effects was not affected neither by dominance or translation direction. The results are discussed in relation to the conceptual feature model (De Groot, 1992; Van Hell and De Groot, 1998).

**[PII-11] Do circadian rhythms modulate post-error slowing?**

**Molina, E.; Amayra, C. ; Araújo, R.; de la Rosa, E.; González, L.; Lara, I.; Moreno T.; Arturo, A.;**

**Sanabria, D.; Correa, A.**

*University of Granada*

Biological rhythms are present in humans and can affect our behaviour. These rhythms allow us to classify people according to their chronotype, that is, evening-type or morning-type. It has been found that every chronotype shows best cognitive performance at his/her good-time of day, which is known as the synchrony effect. The aim of this study was to test synchrony effect can modulate the vigilance (measured through the response time) and the cognitive control (measured through the post-error slowing). Groups with evening and morning chronotype (as measured by a questionnaire) completed a temporal orienting go-nogo task at two different times, in the morning and in the evening. We replicated the typical synchrony effect for the response time, that is, people is quicker at their optimal time of day. Surprisingly, we found that the post-error slowing decreased at people's optimal time of day. This result contrasts with previous evidence suggesting that post-error slowing indexes cognitive control and should therefore increase at our optimal time of day. We can explain this result by considering that participants have more cognitive resources available at their optimal vs. non-optimal time of day to make the readjustments after error commission more efficiently/quickly.

**[PI-4] Discrimination studies with priming: An up-to-date review****Montes-Berges, B. ; Castillo-Mayén, M. R.***University of Jaén*

Discrimination studies have used different priming techniques. Using Bargh (2000) classification, priming techniques in social psychology could be sequential, conceptual or mindset priming. Moreover, sequential priming could be presented as supraliminal or subliminal, that means participants could see the stimulus consciously or only unconsciously. Regarding with the effect, the priming one has been evidenced on evaluations, answers reported or different behaviours that participant achieve just after the priming presentation, or even more than 1 hour later. The principal model which have tried to explain the priming effects in Social Psychology is the Neuronal Network Model. In this work, a review will be presented from the first studies on discrimination using priming techniques to the most recent ones.

**[PIII-39] Could inhibitory control mechanisms resolve the grammatical gender effect in bilinguals?****Morales, L.; Paolieri, D.; Bajo, M. T.***University of Granada*

In language production there is some evidence which demonstrates that some conceptual and formal properties of words interact in the bilinguals' language systems (Hermans, Bongaerts, De Bot, & Schreuder, 1998; Colomè, 2001). Inhibitory control processes have been recently considered to be involved in interference resolution in bilinguals, at least at the phonological level (Levy, McVeigh, Marful & Anderson, 2007). The aim of this study is to explore if the interference resolution is also carried out by an inhibitory mechanism at the grammatical level. Italian-L1 and Spanish-L2 bilinguals participated in two experiments each consisting of two main tasks. In both experiments participants started naming pictures in L2. We manipulated the gender congruency between the two languages (Gender Congruent condition, i.e., *sciarpa/bufanda* –scarf–, both feminine in Italian and Spanish, and Gender Incongruent condition, i.e., *tavolo/mesa* –table–, masculine and feminine, respectively) and the number of presentations of the pictures (1 and 5). Results showed a gender congruency effect with slower naming latencies in the incongruent condition. This means that gender information of the two languages is activated and interacts. We propose that an inhibitory mechanism is involved in resolving this gender interference. In the second phase we measured access to the L1 grammatical gender information of those words practiced in L2 during the previous task. Participants had to complete a gender decision task in L1 (Experiment 1) and a noun-phrase picture naming task in L1 (Experiment 2). Results showed slower decision times for those words practiced 5 times during the naming task in L2, and of more interest, the grammatical gender congruency effect was significant only for those words practiced 5 times. This pattern suggests that grammatical gender can cause interference in bilinguals, and that inhibitory processes may be responsible for resolving this interference at the gender level.

**[PII-48] Effect of prenatal choline supplementation on object recognition long-term memory in adult wistar rats**

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<sup>1</sup>University of Granada; <sup>2</sup>University Simón Bolívar

Choline is an essential nutrient required during early development, since its prenatal availability may induce long-lasting effects on memory types depending on the medial temporal lobe integrity. The relevance of prenatal choline availability on long-term object recognition memory was tested in the present experiment. Three groups of pregnant Wistar rats were fed from E12 to E18 with a choline-deficient (0 choline), standard (1,1 g/kg choline chloride) or choline supplemented (5 g/kg choline chloride) diets. The offspring was tested at the age of 3 months in a object recognition memory task applying retention tests 24 and 48 hours after acquisition. All the three groups (deficient, standard and supplemented) explored longer the novel object than the familiar one during the first retention test with no significant differences between them. However, in the second retention test, 48 h after acquisition the supplemented group exhibited improved memory compared both with the standard and deficient groups. Also, the deficient group showed memory impairment with shorter exploration time of the novel object compared with the standard group. In fact, while both supplemented and standard groups exhibited longer exploration times of the novel than the familiar object, the deficient group showed no differences, thus indicating no memory of the previously exposed object. In all, the results support a long-lasting beneficial effect of prenatal choline supplementation on long-term object recognition memory which is evident when the rats reach adulthood. Research funded by PSI2008-03933 (MICINN, España), PSI2009-07513 (MICINN, España) y HUM-02763 (Junta de Andalucía, España).

**[PI-28] Connectives comprehension and individual differences in reading**

Moreno, I.; Díaz, J. M.; Gámez, E.; León, I.; Morera, Y.; de Vega, M.

*University of La Laguna*

In order to know the role that connectives play in reading, the EEGs of three groups of subjects differing in two criteria (lexical ability and reading comprehension) were registered. The presence or absence of connectives in the experimental texts was associated with differences in the ERP: although the differences emerge around the 400 ms window, they seem to be more related to individual levels of reading proficiency than to (more simple or automatic) lexical processing. Key words: Reading, individual differences, ERP, semantic processing

**[PIII-3] Size matters: A study on naming and size knowledge in dementia of the alzheimer type**

Moreno-Martínez, F. J.; Goñi Imízcoz, M.

*National University of Distance Education (UNED)*

Category-specificity was longitudinally studied over a period of 12 months in seven Alzheimer disease patients, with two semantic tasks differing with respect to verbal processing demands: picture naming and a size ordering task. Items from each task were matched on all cognitive and psycholinguistic variables known to differ across domains (living-nonliving). Naming performance of patients was poorer than normal controls. Regarding category specific effects, while naming performance of patients was parallel to that of normal controls, patients' performance with the size ordering task revealed a different scaling of living things items while that of nonliving things mirrored performance of normal controls. This suggests that caution is needed when the picture naming task is exclusively used to document category specific effects.

**[PI-27] Longitudinal patterns of fluency impairment in dementia: The role of domain and "nuisance variables"****Moreno-Martínez, F. J.; Montoro, P. R.***National University of Distance Education (UNED)*

Background: The potential differential impact of Alzheimer's disease (AD) across semantic categories/domains (i.e. living/nonliving) has been extensively debated in the past 30 years. An important methodological consideration in this area is the issue of whether category effects are genuine or a by-product of intrinsic properties of items, i.e. nuisance variables (NVs). Aims: To investigate whether NVs versus semantic domain of words generated in a semantic fluency task better predict semantic impairment. Methods & Procedures: We examined semantic fluency performance of demographically matched AD patients and controls. AD patients were longitudinally examined over a two-year period. Norms of all NVs known to differ across domains were obtained for each word generated; influence of domain was also studied. Outcomes & Results: AD patients generated fewer words than controls, however, both groups showed fairly similar performance: words more familiar, with earlier acquisition, and representing concepts with higher manipulability were generated. Domain exerted similar influence on semantic fluency performance in controls and patients at initial evaluation, but it did not influence performance as the disease advanced. In contrast, the role of familiarity increased with disease progression. Conclusions: The role of NVs - especially familiarity- appears to be, comparatively, a more relevant predictor of longitudinal deterioration than semantic domain. Knowing which variables within a semantic fluency task longitudinally predict cognitive decline is a useful clinical tool and could possibly be a cognitive marker to improve accuracy of neuropsychological evaluation of patients with probable AD.

**[PIII-27] A set of high quality colour images with Spanish norms for seven relevant psycholinguistic variables****Moreno-Martínez, F. J.; Montoro, P. R.; Laws, K. R.***National University of Distance Education (UNED)*

In the present work, a new set of 140 high quality colour images belonging to 14 subcategories - is presented. One hundred and six Spanish speakers named the items and also provided data from several psycholinguistic variables: Age of acquisition, familiarity, manipulability, name agreement, typicality and visual complexity. Furthermore, an index of lexical frequency is also presented. Apart from the high number of variables evaluated, this set of stimuli present an important advantage with respect to other similar image corpi: naming performance of healthy people is fairly distant from the top limit of the scale, which satisfactorily allows to deal with ceiling effects problems, frequently observed when comparing healthy performance with that of neurological patients. In sum, this set of ecologically-valid stimuli provides a useful tool for research on visual object processing.

**[PI-14] Inferences with diagrammatic premises to study the differences between children and adults**

**<sup>1</sup>Moreno-Ríos, S.; <sup>1</sup>Rodríguez-Gualda, I.; <sup>2</sup>Rojas, C.; <sup>3</sup>García-Madruga, J.**

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Children make more deductive errors than adults. This has been attributed to a limitation in their working memory, lack of knowledge or a lack of the linguistic command required by classic inference tasks. It has been questioned whether very young children have an operative deductive capacity. From a theoretical analysis of the systems involved in reasoning, it has been proposed that some inferences are made automatically. It is possible that adults and children make these inferences in a similar way. In the present study, complex factors were controlled in order to test children and adults in a very elementary operation of inference. They performed the same task, which was not linguistically difficult and required no complex prior knowledge. Diagrammatic premises gave information about the possible location of three geometrical figures. Participants had to consider partial information about the location of one figure (premise) to determine whether the final location of the figures was possible (conclusion). In the identification condition, the conclusion required the identification of the characteristic shown in the premise but about only one figure. In the inference condition it was necessary to consider the rest of the figures together with the figure mentioned in the premise. The use of the inferential condition and the identification (non-inferential) condition allowed us to evaluate the specific sensitivity of the inferential process to development. The results support the hypothesis of the division of systems: children and adults were able to make identifications as well as inferences. However, developmental differences were shown when an inference was required.

**[PII-36] Bias in perspective taking during reading: Adjusting the knowledge of characters**

**Moreno-Ríos, S.; Rodríguez-Gualda, I.; Rodríguez-Mechén, M. A.**

*University of Granada*

Readers have to track the knowledge of every character in a story. Sometimes errors occur and readers attribute their own privileged knowledge to a character. Keysar (1994) studied this phenomenon in a communicative context. The task included stories in which one character writes a message to another. Participants seemed to attribute the knowledge owned only by the writer character to the reader of the message. Two possible explanations have been put forward for this error: the first due to inaccurate anchoring and adjustment processes and the second to a pragmatic effect in the communication. In this study the two explanations are tested introducing additional characters in the story. They had the privileged information but did not participate in the relevant communicative act.

**[PII-44] Framing effects in decision making and causal judgments****Müller, S. M.; Garcia-Retamero, R.; Okan, Y.; Perales, J. C.; Maldonado, A.***University of Granada*

In an experiment, we examined the relative impact of previous knowledge, empirical evidence, and environmental information on decision making processes and causal attributions. Participants made 120 decisions framed either as medical (heart disease) or economic (stock market) prognostic tasks. Before each decision, participants could actively search for information about the outcome criterion ("occurrence of a disease" or "decreasing value of a company's shares") on the basis of four selectable cues. Two cues were linked causally to the outcome (causal cues); the remaining two cues had a preventative relation to the outcome (preventative cues). We also manipulated validities between cues. Finally, we asked participants to judge the degree each cue was causally related to the outcome (i.e., a causal judgment). Results revealed a clear additive effect of previous causal knowledge and cue validity in decision making processes, both in the medical and in the economic environment. In contrast, causal judgments differed substantially depending on the environment: while participants persisted on their causal beliefs in the medical environment, they did not show any preference in the economic environment. These findings underline the need of models based upon two interactive mechanisms to explain the flexibility and complexity of causal learning and decision making in humans and the role of the environment in causal judgments.

**[PI-74] Differential brain activity during the negative initial aesthetic impression formation****Munar, E.; Nadal, M.; Rosselló, J.; Flexas, A.; Cela, C. J.***Grupo de Evolución y Cognición Humana, asociado al Instituto de Física Interdisciplinar y Sistemas Complejos (UIB-CSIC)*

Neuroaesthetics constitutes a relative new discipline that crosses experimental psychology with neuroscience. Knowledge in neuroaesthetics has considerably increased as a result of neuroimaging studies. Neuroimaging studies have revealed activity in a broad network of brain regions while participants enjoyed the beauty of stimuli. Nevertheless, little attention is usually paid to what goes on with regards to the non-beautiful stimulus processing. The objective of this poster is to show the results of brain activity registered by Magnetoencephalography (MEG) when participants judged the stimuli as not beautiful. In an aesthetic appreciation task, participants were asked to respond whether they found each image beautiful or not beautiful, emphasizing the importance of expressing their own impressions. Activity in right lateral orbitofrontal (RLOFC) cortex was greater while participants rated visual stimuli as not beautiful than when they rated them as beautiful. This activity mainly took place between 300 and 400 milliseconds after stimulus onset. We suggest that this activity is associated with a negative initial aesthetic impression formation driven by the negative affective value of stimuli rated as ugly. Other neuroimaging studies have revealed activity in the orbitofrontal cortex (OFC) while participants enjoyed the beauty of images. From these previous results and ours, we hypothesize a differential processing for beautiful and non-beautiful stimuli in the OFC.

**[PII-23] Sign language effects on memory skills: A study with sign language interpreters and bilinguals**

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*<sup>1</sup>University of La Laguna; <sup>2</sup>University of Málaga*

It is a common finding that the short term memory of interpreters of oral languages (e.g., Spanish-English) is higher than that of non-interpreters. Additionally, there is some evidence showing that Deaf people short-term visual memory might be higher than that of hearing people in virtue of their use of (visuospatial) Sign Languages. Finally, recent studies suggest that bilinguals might have higher executive functions skills than monolinguals (e.g., Bjalistok, 2005). In the present research we explore the short-term memory skills of a group of 13 Spanish Sign Language Interpreters (they interpret from sign language to oral and viceversa and were highly proficient in both languages), a group of 10 unbalanced bilinguals (Spanish oral language was its first language but they also were competent in Spanish Sign Language) and a group of 13 Spanish participants without knowledge of Spanish Sign Language. Participants' memory skills were evaluated with classic neuropsychological tests (WAIS-III; Weschler, 1997): Digit test to evaluate short-term verbal memory, Spatial Localization (Corsi) test to evaluate visuospatial short-term memory, and the Number and Letter test to explore the working memory. Interpreters showed better scores in working memory than bilinguals and monolinguals. Interpreters also outperformed monolinguals in the visuospatial domain. No differences were observed between bilinguals and monolinguals in any task. However, data showed significant linear increases in visuospatial as well as in working memory scores from monolinguals to interpreters, but not in the short term verbal memory task. Results suggest that, as it occurs in interpreters of oral languages, (sign language) interpreting increases working memory. Additionally is defended that experience with sign languages could lead to an increased visuospatial memory.

**[PIII-32] The time course of masked transposition priming for letters and pseudoletters****<sup>1</sup>Muñoz, S.; <sup>2</sup>Perea, M.; <sup>3</sup>García-Orza, J.; <sup>1</sup>Barber, H.***<sup>1</sup>University of La Laguna; <sup>2</sup>University of Valencia; <sup>3</sup>University of Málaga*

To identify a written word, it is necessary to encode letter position. In this context, the transposed-letter priming effect has become a key phenomenon to reveal how the brain encodes letter position. Behavioural research has shown that the fast acting mechanism responsible for “object” position coding works with familiar “object” identities (e.g. letters) but not with unfamiliar object identities (e.g. pseudoletters). In the present study, we used event-related potentials (ERPs) to explore the time course of transposition priming of familiar and unfamiliar object strings (i.e., letters vs. pseudoletters). We employed a masked priming same-different matching task. Target stimuli were preceded by a masked prime (SOA=50 ms) that could be: a) the same string (identity), b) the same string except for the transposition of the two internal letters/pseudoletters (transposition), or c) the same string except for the replacement of the two internal letters/pseudoletters (replacement). This manipulation was performed with letter and pseudo-letter strings in separate experimental blocks. The ERP data revealed that, for letter strings, the N1 component was larger in the left than in the right hemisphere, whereas this asymmetry was absent in strings of pseudoletters. Furthermore, at around 100 ms after target onset ERP waves corresponding to letters and pseudo-letters differed, becoming more positive for pseudo-letters than for letters at frontal sites and the opposite at occipital sites. The comparison between “same” and “different” trials resulted in an N2 mismatch effect; “different” trials produced more negative amplitudes than “same” trials between 200 and 400 ms. Even more, for “same” trials of letter strings, type of prime modulated this effect: identity and transposition conditions resulted in less negative amplitudes than the replacement condition. These results support the view that an abstract letter representation is necessary for the fast acting mechanism responsible for masked transposition priming.

**[PIII-68] Mechanisms of adaptation to asynchrony between multisensory signals****Navarra, J.; Velasco, I.; Spence, C.***<sup>1</sup>Sant Joan de Déu Foundation; <sup>2</sup>University of Madrid; <sup>3</sup>University of Oxford*

The brain adapts to asynchronous audiovisual signals by reducing the subjective temporal lag between them. However, it is currently unclear which sensory signal (visual or auditory) shifts toward the other. According to the idea that the auditory system codes temporal information more precisely than the visual system, one should expect to find some temporal shift of vision toward audition (as in the temporal ventriloquism effect) as a result of adaptation to asynchronous audiovisual signals. Given that visual information gives a more exact estimate of the time of occurrence of distal events than auditory information (due to the fact that the time of arrival of visual information regarding an external event is always closer to the time at which this event occurred), the opposite result could also be expected. Here, we demonstrate that participants’ speeded reaction times (RTs) to auditory (but, critically, not visual) stimuli are altered following adaptation to asynchronous audiovisual stimuli. After receiving “baseline” exposure to synchrony, participants were exposed either to auditory-lagging asynchrony (VA group) or to auditory-leading asynchrony (AV group). The results revealed that RTs to sounds became progressively faster (in the VA group) or slower (in the AV group) as participants’ exposure to asynchrony increased, thus providing empirical evidence that speeded responses to sounds are influenced by exposure to audiovisual asynchrony. Further testing, using different sensory combinations, suggests that, while the auditory temporal shift is relatively specific for the adapted sound, the temporal window within which multisensory integration takes place widens for sensory combinations that include other non-adapted sounds.

**[PI-51] An investigation of two types of familiarity**

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Implicit learning experiments typically involve a study phase where participants are shown stimuli that were produced according to a structural rule set (for instance, all stimuli are common nouns). Participants can usually identify never-before-seen structurally compliant stimuli at above-chance levels while not being able to verbalise the rule set. Such knowledge can operate through feelings of familiarity (Scott & Dienes, 2008). Familiarity is also implicated in recognition decisions, where participants only have to distinguish previously seen stimuli from those they have not seen (Jacoby, 1999). These experiments demonstrate that familiarity in structural decisions is not sensitive to an increase in the number of study presentations whereas familiarity in recognition decisions is sensitive to such manipulations. The results are extended by introducing a distraction manipulation and by removing participant-indicated recollect responses from the analysis.

**[PII-66] Differential outcomes: Improving delayed face recognition in adults with mental handicaps**

<sup>1</sup>Valdeavero, N.; <sup>1</sup>Estévez, A. F.; <sup>2</sup>Plaza, V.; <sup>3</sup>López-Crespo, G.; <sup>1</sup>Esteban, L.;  
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Three recent studies have demonstrated that the differential outcomes procedure (DOP) improve delayed face recognition in young adults (Plaza, López-Crespo, Fuentes, & Estévez, submitted), in aged people (López-Crespo, Plaza, Fuentes, & Estévez, 2009) and in adults with alcohol related amnesia (Hochhalter, Sweeney, Bakke, Holub, & Overmier, 2000). Although these data are very promising, further research is needed to assess the potential of the differential outcomes methodology as aid to memory. The main aim of the present study was to test whether this procedure improves the execution of a recognition memory task in a group of eight adults with mental handicaps. Participants showed a significantly better delayed face recognition when each face to be remembered was paired with its own outcome (the differential outcomes condition). This finding strongly suggests that the DOP can be a technique to facilitate memory-based performance in humans, especially in those people with memory impairments.

**[PII-73] Order effects in moral judgment: Implications for psychological theories of moral reasoning**

**Okan, Y.; Wiegmann, A.; Nagel, J.**  
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Explaining moral judgments has become a popular topic in recent cognitive sciences. In the present work, we focus on a factor that attracted surprisingly little attention so far, namely the temporal order in which moral scenarios are presented. We conducted an experiment to examine the influence of this factor in a series of dilemmas where a trolley can potentially harm three people, and an action is proposed that will avoid this outcome but will harm a fourth person instead. Previous research shows that judgments regarding the interventions suggested in the different scenarios vary as a function of structural parameters of the situation, such as the existence of physical contact with the potential victim, or whether the harm caused to her constitutes a means or a side-effect in saving the others. Our results showed that judgments regarding the actions varied substantially as a function of the order in which the dilemmas were evaluated, overriding in some cases the effect of variations of such situational parameters. In particular, actions judged positively when evaluated independently were instead judged negatively when evaluated as part of a sequence, and this was only the case when dilemmas where an action that was evaluated negatively preceded in this sequence. We discuss the implications of these findings for current psychological theories of moral reasoning and we highlight practical implications for the design of materials to evaluate people's moral intuitions.

**[PI-50] Production of false memories in the DRM paradigm using lists with two critical items: Position in the list vs. associative strength**

**Oliveira, H.; Albuquerque, P. B.; Machado, A. B.**  
*University of Minho*

The production of false memories has been studied by presenting words followed by recall and recognition tests (DRM paradigm). In this paradigm each list of words is associated with a critical item, which is not part of the list. A false memory occurs when the participant recalls or recognizes the critical item as a list member (Roediger & McDermott, 1995). In our experiments, participants were exposed to lists of words associated with two critical items (e.g., the first six words were associated with "slow", and the other six with "sweet"). Having found in previous studies the supremacy of the first half of converging associates lists on the levels of false recall of critical item, we tried to understand the relative weight of the variable position in the list (1st half vs. 2nd half) manipulating the associative strength of words in the second half of the list with the critical item. We constructed 8 lists, remaining constant the associative strength of words presented in positions 1 to 6 and varying the associative strength of words presented in positions 7 to 12. Results showed that increasing the associative strength of words in the second half of the lists leads to a significant increase in the recall of the critical item associated with it, but does not produce a significant decrease in the recall of the critical item associated with the words presented on the first half of the lists.

**[PII-35] New algorithms for evaluation summaries comparing lsa and human graders into two different academic levels**

**Olmos-Albacete, R.; León, J. A.; de Jorge Botana, G.; Escudero, I.**  
<sup>1</sup>*Autonomous University of Madrid;* <sup>2</sup>*Antonio de Nebrija University*

In this study we analyzed the reliability between human graders and LSA's assessment of summaries from readers that pertained from academic levels. A total of 786 participants from Primary, Secondary and University took part in this study. They read two texts (narrative and expository texts) and they summarized both with a maximum of fifty words. Summaries were assessed by four human's graders in a 0-10 scale. We have used LSA to simulate the human graders assessments examining: (1), the LSA's reliability assessments; (2), whether LSA can distinguish among the quality summarization in the different academic levels; and (3), whether LSA can find any differences in the quality between the narrative and expository summaries. The results support the idea that LSA arise as a reliable computational tool simulating human assessments in summaries made by student from academic levels.

**[PII-40] Testing online research methods in associative learning research: A comparison of learning curves in the laboratory and on the internet**

**Ortega-Castro, N.; Vadillo, M. A.; Orgaz, C.; Matute, H.**  
*University of Deusto*

The evidence found in recent years suggests that Internet-based research methods can be used successfully in a variety of experimental areas, among which are probabilistic reasoning and associative learning. Previous research in this area shows that well-known phenomena, such as competition between cues or the illusion of control, can be easily replicated online, with no significant differences between the results obtained by this method and those obtained with traditional samples in the laboratory. The present experimental series seeks to explore differences between the two experimental conditions making emphasis on the learning curve of cue-outcome associations. We conducted two experiments using different experimental preparations, where participants were exposed to a learning task in which the contingency between the cue and the outcome in the first half of the trial sequence was reversed in the second half of the sequence. The results of these experiments show that the behavioral pattern elicited by this contingency reversal was significantly reduced on the Internet, which seems to suggest that these participants did not pay enough attention to the experimental task, at least compared with participants from the traditional laboratory condition. However, the size of the difference between online and laboratory participants was highly dependent on the specific procedure and cover story used in the experiment.

**[PI-18] Telling the brain what to do: Interactions between speech and cognitive control in Parkinson disease patients**

**Mari-Beffa, P.; Kirkham, A.; Wright, S.; Williams, F.; Houghton, G.**  
*Bangor University*

Parkinson Disease (PD) Patients find it difficult to initiate new actions, whether motor or cognitive ones. The disfunction of some of the frontostriatal loops connecting the Basal Ganglia with the prefrontal cortex seem to be responsible for these deficits, yet the nature of these "cognitive loops" is still unknown. In the present research we asked whether Broca's areas is part of this frontostriatal circuit involved in the control of goal directed behaviour. We used a task switching paradigm in which 12 PD patients and 9 Control were asked to report the colour or the shape of a centrally presented figure. In one condition (Read Aloud), participants had to read aloud the instructional cue indicating the task to perform next. In a second condition (Articulatory Suppression), participants were instructed to repeat a meaningless syllable ("blah, blah") for the duration of the trial. The results demonstrated an improvement of switching performance for the reading condition compared to the articulatory suppression one only for patients affected on the right hemisphere. Those with damage on the left hemisphere showed the opposite pattern, where the switching pattern after reading the cue aloud was worse than following articulatory suppression. The results support the idea of a link between Broca's area and the Basal Ganglia that could be used for verbally-mediated cognitive control.

**[PII-75] Control and conciousness: A erps study about the effect of a mask in a cognitive conflict task**

**Panadero Sanchís, M. A.; Tudela, P.**  
*University of Granada*

In order to study the existence of non concious cognitive control, we used a variant of the classic Stroop task, in which a word (GRAY, RED, and BLUE) is presented followed by a color bar (GRAY, RED and BLUE).The word was always masked using two kinds of masks (@@@@, and #####, each one associated with a diffetent proportion of Incongruent Trials. The results showed a significative difference in the Reaction Time in both Congruent and Incongruent Tirials but only in the low proportion of Congruents Trials Condition. In a follow step we adapted this task to study ERPs. We expect the appearance of components of activation in anterior locations than traditionally had been associated with activation in ACC.

**[PI-63] Is the difference threshold a function of the physical or of the perceived stimulus?**

**<sup>1</sup>Pedraja, M. J.; <sup>2</sup>Montoro, P. R.**

*<sup>1</sup>University of Murcia; <sup>2</sup>National University of Distance Education*

According to Weber's law, the difference threshold (DT) is a function of the stimulus intensity. An important question is whether the values of intensity represent the physical intensity or the perceived intensity of the stimulus. Ono (1967) measured the DT for visual judgments of lines lengths, making use of stimuli with different sizes displayed at several viewing distances. His results showed that DT values could be properly predicted by both the physical size and the visual angle of the stimulus. A review by Ross (1997), centered in the relation between distal or proximal stimulus and discriminability, concluded that there is not enough evidence to reach a conclusion and further research is required. In addition, recent studies examining whether a preattentive processing of the apparent size of stimuli could occur (e.g., Busch & Müller, 2004), have made use of visual illusions in order to dissociate the physical from the perceived size of the stimuli. The present study focus on the role of physical and perceived size of stimuli as predictors of the DT in vision. Our approach consists in combining the classical psychophysical methods with the display of size illusions, in order to dissociate the physical size from the perceptual size of the stimuli. Busch, A. & Müller, H.J. (2004). The Ebbinghaus illusion modulates visual search for size-defined targets: Evidence for preattentive processing of apparent object size. *Perception & Psychophysics*, 66, 475-495. Ono, H. (1967). Difference threshold for stimulus length under simultaneous and nonsimultaneous viewing conditions. *Perception & Psychophysics*, 2, 201-207. Ross, H. (1997). On the possible relations between discriminability and apparent magnitude. *British Journal of Mathematical and Statistical Psychology*, 50, 187-203.

**[PIII-57] The origin of the distance effect in numerical updating tasks**

**Pelegrina, S.; Lendínez, C.; Lechuga, M. T.**

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In numerical updating tasks a number maintained in memory has to be substituted by other number. In these tasks, numerical operations are often used as a criterion to update the information (e.g. Garavan, 1998, Oberauer, 2002, 2003). Depending on the numerical operation, the two numbers involved in an updating trial may be more or less distant. We present three experiments to investigate the role of the numerical comparisons and numerical distance on updating. In the first experiment numerical comparisons are used to determine when a number has to be updated. Results show that close numbers (i.e., 25) to the number maintained in memory (i.e. 24) are updated faster than more distant numbers (i.e. 29). This result cannot be accounted for the distance effect observed in studies on numerical comparisons in which comparisons with close numbers are performed slower than comparisons with distant numbers (e.g. Dehaene et al., 1990). The second experiment replicates the distance effect with a task in which no numerical operations are used as criterion to update the information. This result confirms that the distance in updating tasks is not due to the numerical operation. An alternative explanation is that shared features (i.e., codes) between the numbers involved in updating have an impact on performance: the greater number of shared features (as in close numbers) the faster the updating is. The third experiment is aimed to determine in what extent shared features between the numbers influence the updating process. Results indicate that updating is faster when the two numbers (that one maintained in memory and that one to be memorized) share more features. The nature of the features which might play a role in this effect is discussed.

**[PI-58] Modification of the visual response evoked by geometric images in healthy subjects obtained during two laboratory stressors: The cold pressor test and an arithmetical mental task****<sup>1</sup>Pellicer, O.; <sup>1</sup>Pérez-Arroyo, M.; Salvador, A.***<sup>1</sup>Miguel Hernández University; <sup>2</sup>University of Valencia*

The Evoked Potentials (EP) is a neurophysiological test which consists of the receipt and identification of bioelectric signals generated in the nervous central system, after specific stimulation of receptive areas (Jiménez, 2004). Previous investigations have showed the possibility of modifying some of the components of the EPs such as cognitive stimuli. The aim of this work is to study the response either cortical activation or deactivation, by means of the measurement of the extent of the P100 in human subjects studied under two laboratory stressors: the cold pressor test and a specific arithmetical mental task. The sample was composed by 93 subjects, 41 males and 52 women with a range of age of 18 to 39 years. Based on another type of potentials, the P50 results (Jonhson and Adler, 1993; White and Yee, 1997; Yee and White, 2001), and given that there are no studies with the P100, we hypothesize that both types of stressors would produce a decrease of the extent of the P100, of major or minor magnitude, depending on the task. Our results showed that both stressors provoked a significant decrease of the extent of the P100. There is a major decrement during the arithmetical task. In case of the cold pressor test, the base of the extenuation of the response is within the level of the produced stress, which desynchronized the visual cortex. On the other side, the arithmetical task produced a decrement in the extent of the P100, both to stress and due to sensory competitiveness, evoked by visualization of numerical numbers during mental calculation

**[PII-5] Priming choice behaviour by action observation****<sup>1, 2</sup>Pereda, A.; <sup>2, 3</sup>Soto-Faraco, S.***<sup>1</sup>Parc Científic de Barcelona, Barcelona; <sup>2</sup>Dept de Tecnologies de la Informació i les Comunicacions, Universitat Pompeu Fabra, Barcelona; <sup>3</sup>Institució Catalana de Recerca i Estudis Avançats (ICREA)*

We addressed whether priming by action observation can result in a choice preference for action execution, an idea that pervades the literature on visuomotor priming but that, so far, has not been empirically tested. First, we demonstrated that goal-directed grasping actions are initiated earlier after observation of a compatible grasping action, even when this action directed to a different, yet action-compatible, target object. Importantly, we also introduced a free-choice condition, rather than the typical forced-choice, and found a significant compatibility effect on response selection probability, in addition to the usual speed-up in action latencies. This compatibility effect was also present in a condition where the prime was not the observed action itself, but a different stimulus that had been previously associated to it. The present findings provide a direct empirical demonstration that motor facilitation by action observation not only results in an improved performance, but also in a preference towards executing congruent actions in a free choice context. Furthermore, this priming effect can occur indirectly, as a consequence of association.

**[PI-32] Relationship between order of acquisition and vocabulary size**

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The lexicon is governed by the order at which words are learnt so that words that are learned early are accessed and retrieved faster than words acquired later in life. This is called the age/order of acquisition (AoA/OoA) effect. It has been observed and well established across a wide range of tasks and population samples (Juhász, 2005). Recently, Izura et al. (submitted) have shown an analog effect of OoA on word recognition and production tasks by manipulating the order of new (foreign) words. The main aim of the present work is to assess whether or not a intrinsic related variable to OoA, the vocabulary size, makes and influence on OoA effect. We created a training programme where a group of native speakers of Spanish learnt two sets of Welsh words; first 14-words (early set) and three days later other 14-words (late set). Vocabulary size was manipulated between participants, such a way that another group of participants learnt the same words plus 16 filler words. Cumulative frequency, frequency trajectory and number of training sessions were matched for each word at the end of training. Word length, first phoneme, neighbourhood density (in Spanish) and objective AoA of the translation into Spanish, among others, were matched among sets. All words were object names. OoA effects were tested by using lexical decision and picture naming and at different moments: 24 hours, 6, 13, and 41 days after the last training session. A main OoA effect was found in both tasks but the magnitude of the effect varied across the different testing times. Vocabulary size did not make a significant influence on that effect. These results are discussed in relation to some previous results and theories that suggest an influence of vocabulary size on OoA effect.

**[PIII-15] Chinquisit: A program to preprocess the inquisit result in priming problems**

Pérez-Cordón, L. G.; Castillo-Mayén, M. R.; Montes-Berges, B.

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Priming techniques have been used in Social Psychology to study the attitude towards objects or social categories. In a typical process of priming, a stimulus word, the prime, is presented to the participant for a short interval of time (sometimes subliminally). Then, another word is presented, the target, and the participant is required to provide with some response (for instance, to name it, to make a lexical decision or an evaluation task). In these experiments, it is measured participants' responses latency and if they are or not correct. If the prime and the target are congruent, significantly faster and more correct responses are expected than if they are not (e. g., a social category as prime, and a stereotype traditionally assigned to it, such as women-sensitive). These experiments are usually accomplished by using a computer program. One of the programs available in the web to achieve priming experiments is the Inquisit (<http://www.millisecond.com/>). However, it presents an important drawback: to our knowledge, results gathered by Inquisit cannot be analyzed easily (e. g., mean and standard deviation of different types of essays). In this contribution, we present a software solution that preprocesses the information generated by the Inquisit in order to present the summary of the results in a format that can be easily imported to the statistic package SPSS. This program compute automatically the data related to the latency of the responses and their correctness, removing the outliers if it is necessary. That way, this program makes easier the priming experiments using Inquisit, so that psychological research can profit from it. Moreover, because it is distributed using the GNU General Public License (GPL) and it runs on computers with Microsoft Windows operating systems, it can be modified and used in most of the computers. Keywords: priming, inquisit, preprocess.

**[PIII-76] Recognition, phenomenological judgments, and electrophysiological measures for emotional images**

**Pérez-Mata, N.; Albert, J.; López-Martín, S.; Carretié, L.**  
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Our goal was to investigate effects of emotional valence and arousal of images on behavioral measures (recognition and remember/know judgments) and electrophysiological measures (Event-Related Potentials, ERPs) correlated with recognition memory. Twenty-four participants saw 120 images (30 arousing-negative, 30 arousing-positive, 30 neutral, and 30 relaxing). On the study phase, participants assessed the valence and the arousal of each image. On the retrieval phase, participants saw 240 images (120 old and 120 new), and they made old/new and remember/know decisions. Spatial and temporal principal component analyses were employed to define and quantify the main components of the electrophysiological recognition response. Negative images were the best discriminated ( $d'$ ), but emotional content of stimuli did not affect participants' response biases ( $c$ ). On the other hand, the Positive images were correctly recognized faster, but rejected slower, than remaining pictures. Since an adaptive interpretation, for an organism is important to correctly discriminate Negative stimuli in order to avoid them, while rapidly recognize Positive stimuli is beneficial for him/her in order to approach to them. Moreover, we found more remember judgments associated with arousing stimuli (Negative and Positive) than non-arousing ones (Relaxing and Neutral). This result indicates that arousing images are benefited by specific episodic information at retrieval. Finally, electrophysiological analysis showed a Late Positive Complex activation (LPC) that revealed the typical old/new effect. The LPC is mostly related to retrieval based on recollection than on familiarity (Allan et al., 1998; Düzel et al., 1997; Paller & Kutas, 1992; Rugg et al., 1998). Moreover, this activation was modulated by the emotional content of pictures because it was enhanced for Negative and Positive images. Furthermore, source location analyses revealed that the origin of the LPC was located at parietal areas (precuneus), and the precuneus activation seems to be related to successful retrieval (Cannava & Trimble, 2006).

**[PI-15] The development of social attention control from 1 to 4 months**

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Previous studies of social attention suggest a paradox: although mature gaze following does not emerge until late in the first year, several component abilities that appear similar to gaze-following have been observed much earlier. In order to investigate the mechanisms that may explain this delay, we investigated control of social attention in two studies, the first with 1-month-olds, the second a longitudinal study of infants from 2 to 4 months. In both studies an adult turned toward one of two targets within the infant's immediate visual field. We tested: (a) whether infants were able to follow the direction of the adult's head turn, an ability referred to as proximal attention following; and (b) whether following a head turn was accompanied by further gaze shifts between experimenter and target, an ability called checking back. In the first study, 1-month-olds did not demonstrate proximal attention following at the group level. In addition, those infants who turned toward the same target remained fixed on it and did not check back. In Study 2, at the group level infants followed the adult's head turn at 3 and 4 months but not at 2 months. Those infants who turned toward the same target at 3 and 4 months also shifted gaze back and forth between experimenter and target. By 3 months infants are able to capitalise on the social environment to disengage and distribute attention more flexibly. The results support the claim that the control of social attention begins in early infancy and are consistent with the hypothesis that following the attention of other people is dependent on the development of disengagement skills.

**[PII-27] The role of the experimental list in ambiguous relative clauses attachment: Two completion studies**

**Piñeiro, A.; Ledo, A.; Fraga, I.; Acuña, C.**  
*University of Santiago de Compostela*

We present the results of two completion studies with sentences of the form “Los policías investigaban la esquina del sexo que...” (“The police investigated the corner of the sex that...”). The task consisted in participants completing the sentences plausibly with the first idea that came to their minds. Previous completion studies with this kind of sentences (Fraga, Piñeiro, Acuña, & Redondo, 2007; Fraga, Piñeiro, Redondo, & Acuña, 2008) have shown that, in the absence of emotionally-laden nominal antecedents, the relative clause (RC) was preferably attached to the first of a series of two NPs (NP1). By contrast, when emotion nouns are used, that trend may change. Moreover, in certain conditions the subjects’ preferences also seem to change as a function of the type and number of sentences included in the experimental list. This led us to conduct two studies. In the first one, the questionnaire contained 40 Neutral-Neutral sentences (both nouns being emotionally neutral) and 40 fillers. In the second one, the questionnaire had 40 Neutral-Neutral sentences and 40 Neutral-Pleasant ones (where the second noun was highly pleasant and arousing), as well as 32 fillers. Results confirm a preference to complete the sentences with an RC linked to NP1 in the Neutral-Neutral condition and to NP2 in the Neutral-Pleasant condition. Additionally, the percentage of NP1 attachments in the Neutral-Neutral condition was modulated by the experimental list: it was significantly higher when these sentences were presented alone than when they were accompanied by other sentences with emotional NPs. Therefore, future research should keep this in mind when experimental conditions are being considered.

**[PII-28] Effects of word length but not frequency in visual word recognition are differentially influenced by visual noise dynamics**

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The Lexical Decision Task (LDT) is considered a 'gold standard' for investigating visual word recognition. However, the presence of nonwords may induce sublexical processing, so to circumvent this various versions of the progressive demasking task (PDT) have become popular alternatives. We have developed a new PDT, which utilises different forms of dynamic visual noise masks. We compared the LDT with two different mask time courses, 'appear' and 'twinkle', in generating effects of word frequency (indicative of lexical processing) and length (reflecting sublexical processing). A between-subjects design was employed with three groups of skilled readers (N=24 per group). Each task used the same set of 80 words, orthogonally manipulated across frequency and length, plus a set of matched nonwords for the LDT. With both masks, the target word was displayed with dynamic noise – a fresh sample of noise was used for each refresh frame (60Hz). The stimulus was displayed until the participant responded. With the 'appear' mask the noise amplitude gradually decreased over successive frames so that the word progressively emerged. In contrast, the 'twinkle' mask kept the same noise amplitude across frames so only partial word information was revealed at any one time. Results showed a differential effect of noise mask type for word length but not for word frequency on word recognition times. Significant effects of frequency were found with both forms of noise mask and the LDT. In contrast, significant length effects were found only with the 'twinkle' mask and LDT, as shorter words were recognised faster than longer words, but not with the 'appear' mask. The length effect indicates that the 'twinkle' mask and LDT tap sublexical processing whereas the 'appear' mask elicits only lexical processing. This suggests the 'appear' mask engenders a purer measure of lexical processing than either the 'twinkle' mask or LDT.

**[PI-20] Can domain-general associative mechanisms support language learning? Evidence from statistical learning****<sup>1, 2</sup>Pizzioli, F.; <sup>1</sup>Karmiloff-Smith, A.***<sup>1</sup>University of London; <sup>2</sup>Catholic University of Louvain*

Non-adjacent dependencies characterize language structure (Chomsky, 1957) and appear to be learnable via simple associative mechanisms that compute distributional cues (e.g. Saffran, 2002; Gomez, 2002). The present study investigated the neurocognitive correlates of learning afforded by distributional properties of non-adjacent dependencies across different modalities to test the hypothesis of domain-generality. Three conditions were used: Artificial grammar (AG) in (1) verbal and (2) visual modalities; Sentences, (3) syntactic processing. In the AG verbal condition, triplets of bi-syllabic pseudo-words were selected. In the visual modality, exactly the same rules were reproduced using simple shapes. 3 "A" elements, 3 "C" elements, and 8 "X" elements were created. During learning phase a sequence of triplets were presented for 8 minutes. During the test phase, participants had to tell whether a given sequence respected or not the underlying rules; half of the triplets did not follow the rule (A-X-X). In the real language condition, the same participants listened to sentences some of which presented a local syntactic violation, which reproduced the A-X-X violation in the AG (e.g. She gave some \*many coins to the beggar). Overall, a similar pattern of brain activations emerged in different modalities. Participants present a negativity in both visual and verbal modality for the AG and local syntactic violation within sentence. Besides on frontal sites, a P3b was observed in the three conditions. However, a slow positivity was observed for sentences and visual AG only, while it failed to show for the AG in verbal modality. These findings suggest that the same neurocognitive mechanisms are implicated in the learning of non-adjacent dependencies both in the visual and verbal AG and real language processing, supporting the hypothesis of domain-general learning mechanism involved in language learning.

**[PII-26] An investigation of acronym properties: Norms, recognition, naming and association times for 175 acronyms****Playfoot, D.; Izura, C.***Swansea University*

Acronyms represent a significant and idiosyncratic part of our everyday vocabulary. A distinctive characteristic of acronyms is that their configuration does not obey orthographic and/or phonological rules. They are often formed by a sequence of illegal letter strings that can become highly familiar to the language user (e.g., ABC, BBC, CNN, FBI, FM, HIV, KFC, PM, TV, USB, etc). Due to this peculiarity, acronyms have been utilized in the study of influential models of reading aloud and in the investigation of the word superiority effect (Gibson, Bishop, Schiff & Smith, 1964; Lazlo & Federmeier, 2007). However, although acronyms appear to be an effective means of investigating word recognition and reading processes there is no normative data available allowing researchers an appropriate control of their experimental stimuli. Here we present a study of the following properties of 175 acronyms: age of acquisition, rated frequency, number of orthographic neighbours, letter length, phoneme length, number of syllables, imageability, inception date and pronounceability. Acronyms were presented to three separate groups of participants from whom naming, word association and lexical decision times were collected. The relationship between each of the variables is examined and their influence in recognition, naming and association times discussed.

**[PII-6] Task switching paradigm: The simplicity of the stimuli does not alter reversal of typical effect**

**Plaza-Ayllón, V.; Noguera, C.; Álvarez, D.; Carmona, E.**  
*University of Almería*

The task switch paradigm allows us to obtain measures of the cost of change. Usually decrease in accuracy and increase in reaction time. However, in previous experiments with a random task switching (ABBABAA...) we obtain a reversal of typical effect. In this experiment, we tried to ascertain whether this reversal is caused by the complexity of the stimuli, pictures of faces. We use simpler stimuli, and expected find the classic pattern of findings. However, the results show, again, lower reaction time in trials of change. This shows that the complexity of the stimuli is not a relevant variable in this experimental procedure. Perhaps the complexity or type of task are the cause of the reversal, this will be analyzed in future studies.

**[PI-35] Infants learn rules more easily over vowels than over consonants**

**Pons, F.; Toro, J. M.**  
*University of Barcelona*

One of the basic abilities involved in language learning is to use abstract structures. For example, an English learner should learn the default word order in her language is SVO, as in “She eats cookies”. Marcus and colleagues (1999) demonstrated that young infants generalize simple rules to new exemplars they have not heard before. Recent work however has suggested the ability to learn such rules in adults is constrained by properties of the linguistic system. More specifically, it has been demonstrated that adults compute certain statistics over consonants, while generalize structures over vowels (Toro et al. 2008). The source of such differences is nevertheless unknown. In the present study we addressed this issue by exploring the generalization of simple structures over vowels and consonants in 11-month-old infants. The infants were acoustically presented with CVCVCV nonsense words in which either the vowels (Experiment 1; e.g. tapane, moloku, dimila) or the consonants (Experiment 2; e.g. tateno, momika, didule) followed a simple AAB rule (the first two elements were the same, while the third one was different). After two minutes of total familiarization time, infants were presented with two lists of new items. One list contained items that followed the same rule as during familiarization (same), and the other contained items that did not follow such rule (switch). When the rule was implemented over the vowels, infants looked longer when presented with the switch list than to the same list. When the rule was implemented over the consonants, the infants looked the same at both lists. This suggests that 11-month-olds generalized the simple AAB rule over the vowels but not over the consonants. This result is parallel to that observed with adults and suggests that several years of experience are not necessary for processing asymmetries between consonants and vowels to arise.

**[PII-57] The influence of number processing on selective attention: An eye-tracker study****<sup>1</sup>Rahona, J. J.; <sup>2</sup>Ruiz Fernández, S.; <sup>1</sup>Hervás, G. ; <sup>1</sup>Vázquez, C.***<sup>1</sup>Complutense University of Madrid; <sup>2</sup>Eberhard Karls University*

Since Dehane, Bossini, & Giraux (1993) reported the spatial-numerical association of response codes (SNARC) effect, numerous studies documented an influence of number magnitude in manual (e.g., Fias, 2001), verbal (e.g., Brysbaert, 1995) and oculomotor (e.g., Fischer, Warlop, Hill, & Fias, 2004) responses. However, most of these studies involved forced-choice tasks and employed materials that could threaten the ecological validity of SNARC-effect. The present study explores whether the SNARC-effect persists when experimental conditions are closer to day-life conditions. To overcome these limitations, we designed a less restrictive task and employed materials more usual for participants. Specifically, participants were presented a number ranging from 1 to 9. Immediately after each presentation, pictures of emotional and non-emotional human faces were simultaneously presented at both sides of the screen. Participants were asked to look freely on the screen after the presentation of the number. Chi square and ANOVA analyses were used. The results replicated the SNARC-effect showing that, independently of the emotional valence of the presented faces, participants' first gaze was preferentially directed to the right (or to the left) when large numbers (or small numbers) anteceded the faces ( $p < .01$ ).

**[PIII-60] The mental time line is central and amodal****Raya, L.; Ouellet, M.; Santiago, J.***University of Granada*

What is the nature of the "mental time line"? Available evidence is congruent with both a central, amodal, time line as well as with a visual or motoric time line. Embodiment theories would support the latter, as the experiential basis of this representation are visual experiences and bodily movements. Prior studies are not diagnostic because they used visual stimuli and manual (lateralized) responses. In this paper, we describe studies designed to test for the central, amodal nature of the time line, by resourcing to auditory stimuli and vocal responses. In Experiment 1, words referring to past or future were auditorily presented at either left or right locations. Participants judged their temporal reference by pressing left or right keys. Temporal meaning interacted with response location, but not with stimulus location, supporting an embodiment account. However, in Experiment 2, we increased the saliency of the auditory spatial frame of reference by asking the participants to perform the task blindfolded. Under these conditions, temporal reference interacted also with stimulus location. In Experiment 3 we disposed of lateralized responses. Video clips of aging faces were centrally presented, followed by trials presenting frames of the clip. Participants reported verbally whether the face was closer to the beginning or the end of the clip. Simultaneously, a sound was presented moving from left to right, from right to left, or no sound. Using Signal Detection Theory, we were able to show that the directionality of the auditory stimuli both affected the discriminability of the temporal poles and the response bias. Given that audition cannot possibly embody the passing of time, the pattern of results is most consistent with an internal representation of time which is spatial, abstract, central and amodal, and can be accessed from different modalities.

**[PII-16] Episodic memory in infants aged 12 months: An eye tracking study**

**Ressel, V.; Sebastián-Gallés, N.**

*Pompeu Fabra University*

**Background and Aims:** This project aims at developing tasks to investigate episodic memory in infants. There is a controversy in the timing when this type of memory evolves, giving a time point between two and four years (Perner and Ruffman 1995; Wheeler et al., 1997), aside further indications of earlier memory traces (Káldy and Leslie, 2003). This study aims to clarify this question by investigating younger infants aged 12 months. **Methods:** We adapted a recognition task by Cansino et al. (2002), used to investigate episodic memory in adults, in which location and identity of an object has to be encoded and retrieved. A video was presented in which pictures of four puppets performed a trajectory from the middle upper part to the left bottom or to the right bottom part of a screen (two puppets moving all the trials to the same side). After eight encoding trials, the trajectory was occluded in 24 retrieval trials to assess if infants remember the identity and location of the puppets. Puppet sequence was randomized. A Tobii X120 eye tracking system was used to record eye fixation length for anticipatory gaze during the occlusion. 25 healthy infants (10 girls, aged 11;13-12;27 months) performed the task. **Results:** Fixation length for preference was measured for each puppet, showing no significant difference between stimuli. Evidence for a correct performance by looking longer to the expected side was present, suggesting encoding and retrieval of identity and location. **Discussion:** This study shows a new task to test episodic memory in infants aged 12 months. Although, a high variability between participants was found, some evidence for episodic memory at this age group was present.

**[PI-17] Differential responses of children with down's syndrome to the preschool children scale for skill and learning potential**

**Robles Bello, M. A.**

*University of Jaén*

The skills and learning potencial scale for preschool children (EHPAP by Calero, Robles, Márquez & de la Osa, 2009) is the main measure to assess learning potential in children. Grounded in the Vygotsky's and Feuerstein's models of cognitive development, a variety of research has shown evidence of good psychometric properties for the Spanish version (Robles 2007) as well as the English version (Application of Cognitive Functions Scale, 2003 or ACFS of C.S., Lidz y R.H. Jepsen; Haywood and Lidz, 2007). Our study applied the EHPAP to 50 preschool children with down's syndrome of two different socioeconomic backgrounds aged between 3-5 years old. The main goal was to know putative differences in cognitive functions between them as well as to answer the following question: what do these children need to do to succeed in typical academic challenges in school? The results show significant gains in both groups, specifically in the short-term visual memory and perspective taking scales.

**[PII-19] Effects of a training program of sphincter control in children with down's syndrome**

**Robles Bello, M. A.**

*University of Jaén*

The aim of the study was to explore the effect of a behavioural program for training sphincter control proposed by Robles y Basso (2008). An observational methodology was applied for three years to 50 children with Down's syndrome in an early childcare centre. The participants were 3 to 5 years of age. Significant clinical improvement was observed after 6 months of training in all children. In addition, this effect maintained for the 80% of the participants after one year. The results show positive effects of the training program at different levels of behaviour.

**[PIII-19] The role played by time on the mental representation of traffic sign information while emulating driving**

Roca, J.; Castro, C.; Bueno, M.; Moreno-Ríos, S.  
*University of Granada*

This study analyses the influence of processing time on the mental representation of traffic sign information in a response-generation task. The mental representations of obligatory and prohibitory traffic sign information have previously been studied by means of both an evaluation task and a response-generation task. Convergent evidence from these two tasks highlights some differences in the mental representations elicited by obligatory versus prohibitory information. Obligatory signs (i.e. it is obligatory to turn right) generate mental representations of allowed manoeuvres, whereas prohibitory signs (i.e. it is forbidden to turn left) generate initial mental representations of not-allowed manoeuvres. Recently, some research has been conducted to analyse the mental representations of a goal presented to the driver previously (i.e. you have to/ don't have to turn right) and the integration of these representations with the obligatory and prohibitory information. Results showed that the mental representations of initial goals and traffic signs are integrated in different ways with positive (you have to) and negative goals (you don't have to). With negative goals, an incongruence in the mental representations of initial objectives and road signs increases the reaction time. The present work examines further the integration process of the goal and the traffic sign representations, the results suggesting that the differences between positive and negative goals are dependent on the time available to process the goal information. If 1000 ms is given, reaction time is shorter and interactions arise; but if the time to process the goal information is reduced to 300 ms, reaction time is longer and the interaction pattern changes. The results in this condition of reduced processing time are more consistent with the immediate representations derived from the traffic signs.

**[PI-23] Emotion words have a processing advantage over neutral words in both first and second language**

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The relation between emotion and cognition can be approached from two different perspectives. For the automatic vigilance model of emotion (Pratto & John, 1991), attention is focused on negative stimuli, which freezes activity slowing down the processing of negative stimuli. For the model of motivated attention and affective states (Lang et al, 1990), attention focuses on motivationally significant stimuli, predicting facilitated processing of positive and negative stimuli. Do positive and negative valence exerts similar or different effects on word processing? Kousta, Vinson and Vigliocco (2009) controlled for valence, arousal and a total of 10 lexical and sub-lexical variables, meaning a novel contribution compared with previous work. Positive and negative stimuli had a facilitator role on word processing, providing support for the motivated affection and affective states model. We aimed to investigate the effect of emotion on the processing of valenced words in the second language (L2). Previous findings (e.g.: Dewaele, 2004) showed that verbal stimuli in L2 are less emotional than in their first language (L1). We predicted that bilinguals would not show the general facilitator effect reported by Kousta et al (2009). We tested three groups of bilinguals through Kousta's lexical decision. The first group, composed by 35 early Dutch- English proficient bilinguals showed a facilitator effect on valenced words contrary to our predictions. The second group (29 late Spanish- English bilinguals) also showed the effect. Finally, we wondered whether the L1 background would matter in order to observe facilitated processing of valenced stimuli. The third group was formed by 41 participants from 25 different L1s, whom also showed the facilitator effect on valenced words. These results suggest that bilinguals form emotional associations for words in their L2 just like in their L1. These results are compatible with the motivational model of affective states in both L1 and L2.

**[PII-12] Cognitive control in frontal damaged patients**

**Rodríguez-Bailón, M.; Lupiáñez, J.; Ruiz, R.; Funes, M. J.**

*University of Granada*

Neuroimaging studies have shown that the prefrontal cortex is involved in cognitive control. However, patient studies with lesions including the prefrontal cortex are not conclusive; meanwhile some of them have found a deficit in solving a conflict task, others have obtained that these patients can perform similar to controls. This controversy across lesion studies might be due to the use of very different conflict tasks and stimuli across studies. In addition, it might indicate that the prefrontal cortex is not equally involved in solving different conflicting situations. To test that we have designed a single task where we factorially combined three types of spatial conflict (Simon, spatial Stroop and visual search among distracters). Performance from a group of prefrontal patients showed a significantly larger Simon effect than the control group, meanwhile no differences were found across groups in Spatial Stroop and Visual search. These results strongly suggest that the prefrontal cortex might be involved in solving conflict that arises at the level of the response but not when the conflicting dimensions compete at perceptual stages of processing.

**[PII-2] Working memory updating in normal ageing**

**<sup>1</sup>Rodríguez-Fernández, R.; <sup>2</sup>Martín-Aragoneses, M. T.**

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Several neuropsychological and psychophysiological studies have indicated a large working memory age-related decline (Craik & Grady, 2002; Fisk & Sharp, 2004). Working memory deficits associated to aging are primarily related to central executive system (Andrés & Van der Linden, 2000; Brave & West, 2008; Rodríguez-Fernández, 2009). Nowadays, the need for fractionate executive processes is widely accepted. The central executive could be broken up into four components (Bunge, Klingberg, Jacobsen & Gabrieli, 2000; Collette & Van der Linden, 2002): i) updating function, ii) inhibition, iii) shifting process, and iv) dual-task coordination. The aim of our study was to analyse alterations associated to normal aging in the executive component of working memory. A total of 82 elderly volunteers (29 males, 53 females; age range: 55-75 years old) were divided into two age groups: younger or older than 65 years old (54% and 46%, respectively), and were assessed using a wide range of tasks involving executive functioning. All participants had normal or corrected vision and hearing, and were pretested on Spanish version of Mini Mental State Examination (MMSE) in order to rule out any evidence of cognitive decline or dementia. We also evaluated possible depression signs by means of Yesavage Geriatric Depression Scale. Statistically significant differences were found between groups in mainly updating tasks (i.e., a running memory task and a version of the Daneman and Carpenter's reading span test, 1980). These results are discussed in relation to the role of executive control processes in the updating function of working memory, and more specifically to inhibitory mechanism to resist interference from previously relevant information. Key words: Ageing, working memory, central executive, updating, interference

**[PII-22] Electrophysiological correlates of complement complexity in abstract verb processing****<sup>1</sup>Rodríguez-Ferreiro, J.; <sup>2</sup>González-Nosti, M.; <sup>2</sup>Cuetos, F.***<sup>1</sup>University of Barcelona; <sup>2</sup>University of Oviedo*

Transitive concrete verbs usually map onto a thematic matrix that includes simple direct objects (i.e. “the boy jumped the fence”). Conversely, some transitive abstract verbs tend to map onto more intricate sentential complements (i.e. “the girl remembered that the fence...”). The greater dependence of the meaning of abstract verbs in a complex interaction of propositional features has been proposed to account for differences in patterns of neural activity corresponding to access to the meaning of motion and abstract verbs. In order to explore the relevance of sentential contexts in the representation of the verb meaning, electrophysiological activity associated to the processing of concrete and abstract verbs was compared. Fifty transitive motion verbs (i.e. “saltar”) and fifty transitive cognition verbs that usually take sentential complements (i.e. “recordar”), matched in frequency, orthographic neighbourhood and letter length, were selected to be used in the experiment. Event related potentials were recorded from twenty three healthy native Spanish young adults while they performed a lexical decision task in which the target verbs were presented along with one hundred pseudoverbs. Abstract verbs in our experiment were associated to a reduced negative shift peaking around 370ms after stimulus presentation that was more evident in the left anterior electrodes. The modulation of a left anterior negative component by the manipulation of verb’s complement complexity in our experiment may hold up the idea that semantic processing of abstract verbs relies on the retrieval of a complex set of sentential contexts.

**[PI-56] Automatic processing of magnitude in 1-digit arabic numbers in third-grade children****Rodríguez-Santos, J. M.; García-Orza, J.; Iza, M.; Calleja, M.***University of Málaga*

Recent data have shown that the automatic access to magnitude representation could depend on number size. For instance, Mussolin & Noël (2007) found in second grade children that only one digit and small two digit numbers led to an automatic activation of their corresponding magnitude representation. The aim of the present study was to examine whether the automatic activation of numerical magnitude even in one-digit numbers depends on the size of the numbers. Numbers ranging from 1 to 9 were presented in different size in a Stroop paradigm. Thirty-seven third-grade children had to decide which of the two Arabic numbers presented was physically bigger. Physical and numerical magnitude could be congruent or incongruent. The numerical size (1-5, 5-9) and the numerical distance (1, 3-4), between the numbers was controlled. A delay between the appearance of the numbers and the difference in physical size was calculated for each participant –considering the difference in processing speed between a physical comparison task on similar digits and a magnitude comparison task with digits presented in the same size (see Mussolin & Noël, 2007 for a similar procedure). Results showed an interaction between congruency, size and distance. The analyses over the incongruent condition showed interaction effects between size and distance pointing out a lack of size effects on the bigger numbers (5-9) and slower response times between distant numbers when numbers equal or lower than 5 were considered. Our data suggest: 1) According to Schwarz & Ischebeck’s (2003) model, there is a positive relationship between the numerical distance and the interference effect. 2) The automatic access to Arabic numbers magnitude representation even in 1-digit numbers is related to the size of the numbers, showing the (reverse) distance effect only with those numbers lower than 6.

**[PIII-25] The role of variability in word recognition: Bilinguals vs. Monolinguals**

**Roessler, A.; Sebastián-Gallés, N.**

*Pompeu Fabra University*

The auditory speech signal is highly variable and mechanisms to extract meaningful information are complex and not yet fully explained by speech perception models. Indexical information (speaker's accent, emotional state) presents a source of information as well as variability. Recent literature has shown that fine-grained details of the auditory signal are retained in memory. In bilingual societies as in Barcelona, people are constantly exposed to two languages and importantly to slight (foreign-accented) mispronunciations. Furthermore, in bilingual contexts, speaker information correlates with language of communication. Therefore, comparing monolinguals with bilinguals might help to gather valuable insights into the role of variability in speech perception by investigating possible strategy-differences between mono-and bilinguals. A first study was conducted using an auditory lexical decision task. Subjects were presented with a list of words and non-words of which half were repeated by either the same speaker or a second speaker. On repeated trials subjects' reaction times should be faster (repetition priming), but a speaker change between presentations could block (attenuate) this effect. A significant repetition priming effect was detected for monolinguals and bilinguals, but no difference was found between speaker conditions or groups. As voice effects are generally small and depend on the task, a second study was conducted using the same materials, but a (explicit) recognition memory task. Again reaction time analysis revealed repetition priming but no speaker effects. However, on the error rate analysis monolinguals showed significantly higher error rates on the second presentation regardless of condition, while bilinguals only displayed higher error rates on different speaker conditions. Conclusions are still tentative, but the speaker effect seems not as reliable as previously proposed. However, the different results on error rates suggest differences in processing between the two populations. Further studies are underway to explore possibly small effects of bilingualism on indexical processing.

**[PII-63] The effects of priming with positive and negative affect words on ratings of facial attractiveness**

**Rogers, R.; Johnston, R. A.**

*University of Kent at Canterbury*

Experimental research has found that information known about a person can alter how others perceive their facial attractiveness and other facial characteristics. For instance describing a person's personality positively has been found to enhance their rated facial attractiveness, whereas describing their personality in negative terms has been found to diminish it. Research showing this effect typically presents participants with a short vignette, which manipulates the valence of certain personality dimensions, before asking them to rate the face of the person to which the vignette refers. The aim of the present research was to determine whether priming participants with positive and negative words, would have a similar effect, in order to better understand the mechanisms behind this effect. Attractive, average and unattractive faces were primed with positive, negative and neutral words that were unrelated to personality traits. There was a main effect of priming on attractiveness ratings, alongside the expected main effect of attractiveness. Faces primed with negative words were rated less attractive than faces primed with either neutral or positive words. However, faces primed with positive words were not rated any more attractive than those primed with neutral words. The result of priming was the same when taking ratings of facial kindness. Possible explanations for these results are discussed.

**[PIII-35] Inhibitory processes reduce interlingual intrusions in bilingualism****Román, P. E.; Bajo, M. T.**<sup>1</sup>University Jaume I; <sup>2</sup>University of Granada

It is widely proved that bilinguals activate simultaneously their two languages while speaking one language (e.g. Colomé, 2001; Martín, Macizo and Bajo, in press; Van Hell and DeGroot, 1998). While several mechanisms have been proposed as candidates to control production of the appropriate lexicon (e.g. Poulisse y Vongaert, 1994), the inhibitory account (Green, 1998) is gaining support (Costa y Santesteban, 1994; Kroll, Bobb, Misra and Guo, 2008; Levy, Marful, McVeigh y Anderson, 2007; Martín et al., in press). From this perspective, non-desired lexical entries would be suppressed in order to facilitate production of the desired trace, depending on the level of competition between language representations. In our study we tested the nature of such mechanism and its relation to intrusion. Native Spanish speakers named pictures once or five times in their L1 or L2 languages (English). After every trial they were asked to rate intrusion from the non-desired language. In a final phase, a phonological cued-recall test in L1 was presented. Results indicated that repeated naming in L2 reduced the accessibility of the corresponding L1 words. Moreover, we observed that reduction of intrusion reported through repetitions was related to L1 words forgetting. This finding suggest not only that inhibition can contribute to the successful production of a language while competing to other language, but also that it is so by decreasing the level of intrusiveness of competitors.

**[PI-72] Psychological analysis of the emotional impact of the European tobacco warning labels campaign**<sup>1</sup>Rosselló, F.; <sup>1</sup>Sánchez-Nácher, N.; <sup>1</sup>Muñoz, M. A.; <sup>2</sup>Viedma-del-Jesus, M. I.; <sup>1</sup>SanJuan R.; <sup>2</sup>Vila, J.;  
<sup>1</sup>Montoya, P.<sup>1</sup>University of Balearic Islands; <sup>2</sup>University of Granada

Research on human emotion showed that pictures of graphic scenes evoke body reactions and drive the activity of specialized brain networks. Here we use some of the psychophysiological tools successfully employed in those studies to investigate the impact of visual iconic information conveyed by the European Commission for use on tobacco product packages (European Commission Decision of 5 September 2003) Spanish students (age 14-34 years)(n=200) evaluated the campaign's pictures into the dimensions of hedonic valence and emotional arousal by the use of a normative psychometric scale. Pictures selected from IAPS (International Affective Pictures System), were presented combined with the ones from the campaign. Participants were not instructed about the sources and distinctions between the two sets of pictures. The average classification of the campaign's pictures on hedonic valence ranged from neutral to few unpleasant. None of the pictures were evaluated as highly arousing.. The results showed that visually unpleasant warnings may have a successful impact on consumers, especially on starters and those willing to quit smoking, if the warnings was highly unpleasant and arousing. Following previous reports, those evoke the strongest avoidance reactions. Negative affective predispositions should always be taken into consideration when planning for prevention campaigns.

**[PIII-77] Phobic picture system (pps): An useful tool for the experimental study of phobic processes**

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<sup>1</sup>University of Granada; <sup>2</sup>University of Islas Baleares

A first approach for the Phobic Picture System (PPS) is reported. The PPS is being developed to provide a set of standardized color photographs that includes contents across a wide range of phobic categories. The construction of the PPS is based on Peter J. Lang's dimensional model of emotions. The goal is to develop a set of normative phobic stimuli that is accessible to researchers in the study of emotional and phobic processes. In this first approach, participants were 91 university students who assessed the pictures using the three scales of the Self-Assessment Manikin: affective valence, arousal, and dominance. 280 pictures were rated in 4 Pictures Sets of 70 pictures each. The pictures includes a broad sample of different phobic contents (deep water, acrophobia, claustrophobia, fear of fly, blood and injection, snakes, rats, spiders, insects, birds, cats and dogs) and pictures select to IAPS of different affective contents (pleasant, unpleasant and neutral). At the end of the experiment, participants completed a scale in order to assess their level of fear in 27 phobic categories. The results show a distribution of the pictures within the bidimensional plot defined by valence and arousal. On the other hand, negative correlations were found between the Phobic Scale and Valence Scale, and positive correlations respect to Arousal Scale. All correlations were statistical significant ( $X < 0.05$ ). The results are discussed in relation to the International Affective Picture System (IAPS).

**[PIII-7] Dual-task processing when task-difficulty and task-order varies: Optimized central processing order?**

**Ruiz Fernández, S.; Leonhard, T.; Rolke, B.; Ulrich, R.**  
*Eberhard Karls University*

The Psychological Refractory Paradigm (PRP) requires participants to perform two successively but temporally overlapping choice reaction time tasks. Therefore, two stimuli (S1 and S2) are presented in rapid succession and require separate responses. The typical finding is that reaction time to S2 (RT2) diminished as the interval between S1 and S2 (stimulus onset asynchrony, SOA) increases. This PRP effect is attributed to a single central processing bottleneck involving response selection (Pashler, 1994). The optimization account of Miller, Ulrich and Rolke (2009) suggest a strategic bottleneck in order to minimize the total reaction time. The present experiment examines whether the task-order of two different difficult tasks underlies such an optimization. Therefore, in one part of the experiment, two different time-consuming tasks - a mental rotation task and a simple tone discrimination task - were combined. In another part of the experiment two similar time-consuming tasks - a letter discrimination task and a tone discrimination task - were combined. In order to minimize preparation, in both parts, the order of the two tasks and the time interval between the tasks (SOA) varied randomly from trial to trial. Based on the optimization account it was expected that in the condition with different time-consuming tasks participants would – at short, but not at long SOAs – tend to process the easier task first even when it is secondly presented (i.e., reversed processing order). In contrast, it was expected that in the condition with similar time-consuming tasks participants would – at short and long SOAs - tend to process the tasks in a first-come, first-served basis (De Jong, 1995). As expected, this result pattern was found ( $p < .01$ ), thus, supporting the notion of a strategic bottleneck.

**[PI-59] Backward effects from task 2 motor response on task 1 performance: Interference at central level or response coupling at motor level?**

**Ruiz Fernández, S.; Ulrich, R.**  
*Eberhard Karls University*

The standard bottleneck model of dual-task performance assumes that Task 2 response (R2) manipulation should not influence Task 1 performance. In contrast to this assumption, a recent study of Miller (2006) reported such a backward crosstalk effect. Specifically, results showed that a complex R2 increased Task 1 reaction time (RT1) providing first evidence that R2 motor demands may also affect RT1. However, since the execution of such complex movements may require central response monitoring, it is still unclear whether these effects emerged from interference at the motor or at the central level. The present study aimed to isolate more directly potential backward effects at the motor level. Therefore, in three experiments R2 movement distance was manipulated using a guided ballistic movement (see Ulrich, Ruiz Fernández, Jentszsch, Rolke, Schröter, & Leuthold, 2006). Specifically, Task 1 required a single keypress with the left index or middle finger based on tone pitch, and Task 2 required a short or long ballistic movement along a guided track with the right hand depending on letter identity. Contrary to the predictions of the standard bottleneck model, results showed that R2 movement distance affected RT1 as well as Task 1 response duration. It is argued that the backward effect observed in this study is due to response coupling at motor level rather than from interferences at central levels.

**[PIII-54] Directed updating and the sign of the recency effect**

**Ruiz, M.; Elosúa, M. R.**  
*National University of Distance Education*

In a running memory span task, the participants are presented with a list of items (e.g. letters, numbers or words) of unanticipated length. In a version of the procedure they report a predefined set (e.g. four) of the last portion of the list (closed-span procedure). According to Morris and Jones (1990), the recalled items must be updated in memory as the presentation of the list progresses. However, Ruiz, Elosúa and Lechuga (2005; also Elosúa and Ruiz, 2008) reported that most of the time, in the ordinary updating task, participants implement a passive processing strategy, with no updating. As the previous SEPEX meeting, Ruiz and Elosúa (2008) reported on results obtained with a new procedure in which a critical ISI (CISI= 1 sec) pointed out the target letters to be memorized: the pre-CISI letter, the post-CISI letter and the very last one of the list. The number of letters pre-CISI (1 to 4) were unanticipated, as much as the number of letters between the post-CISI target and the ending item (0 to 2). With such a small target set (as small as three items), an immediate recognition test was expected to yield high performance levels. In fact, participants failed on the recognition on the last serial position. This negative recency effect contrasted with the more conventional positive recency effect obtained with the closed-span procedure. We propose that there is a detrimental effect of the actively processed precedent target items on the last one (proactive interference), which is absent when either (a) the precedent items are passively processed (conventional updating task), or (b) the last item is actively processed. Here we report on results obtained under conditions in which the last item is anticipated and actively processed. In these conditions the negative recency effect is absent. Key words: updating, working memory, interference, negative recency

**[PI-16] Goal-directed imitation: State or trait?**

**Sakkalou, E.; Ellis, K.; Fowler, N.; Hilbrink, E.; Gattis, M.**  
*Cardiff University*

Debates about the mechanisms underlying imitation have for the most part focused on comparison of group means across experimental conditions. Such comparisons allow inferences about whether imitation was goal-directed in one condition versus another, but do not allow inferences about whether goal-directed imitation varies consistently between individuals. We compared infant performance on two experimental measures of goal-directed imitation. In the first experiment, 13-month-olds watched an adult experimenter move a toy across a table and towards a final location using a hopping action, and then were given an opportunity to play. Goal-directed imitation was operationalised as putting the toy in the same location as the experimenter. In the second experiment, the same infants were tested in a very different imitation paradigm at 14 months. In the second study infants watched an adult experimenter perform a two-step action on a novel toy, followed by a novel and entertaining outcome. During modeling, one action was marked intentionally with a purposeful tone of voice and one action was marked accidentally with a surprised tone of voice. In this study goal-directed imitation was operationalised not as reproducing the final action, but instead as reproducing the action that had been accompanied by a purposeful tone of voice. In Experiment 1, 13-month-olds placed the toy in the same location as the experimenter on 30% of the trials. In Experiment 2, 14-month-olds reproduced the intentional action on 69% of the trials. To investigate whether goal-directed is a trait, we examined the relation between individual performance on the two tasks, comparing reproduction of the final location in Experiment 1 with reproduction of the intended action in Experiment 2. Performance on the two tasks was positively correlated ( $r = .35, p < .05$ ), consistent with the claim that goal-directed imitation is a trait with interindividual variability.

**[PI-57] Functional independence between written and oral calculation**

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*University of Huelva*

**INTRODUCTION** There are several the patterns of execution and/or impediment of written and oral calculation described in the literature. This dissociation between written and oral calculation is observed with different arithmetical operations: addition, subtraction and multiplication. **OBJECTIVE:** To determine the different processes involved in the resolution of arithmetical operations on written and oral modality (addition, subtraction and multiplication). **INSTRUMENT:** Battery of Evaluation Processing Number and Calculation (Salguero & Alameda, 2007) composed by six blocks in which different skills are evaluated. Calculation block includes following task: verification, number reasoning, addition, subtraction and multiplication written and oral. **PATIENTS:** MC (31 years old, female) presents afasia. BET (42 years old, female) presents disfunction executive. MNL (47 years old, male) presents disfunction executive. **RESULTS:** MC and BET present altered written calculation: addition, subtraction and multiplication (MC:  $p=0,00$ ;  $p=0,00$ ;  $p=0,00$ , respectively. BET:  $p=0,00$ ;  $p=0,00$ ;  $p=0,00$ ) but they keep preserved the skills involved in the oral calculation: addition, subtraction and multiplication (MC:  $p=0,30$ ;  $p=0,45$ ;  $p=1$ , respectively. BET:  $p=0,28$ ;  $p=1$ ;  $p=0,26$ ). On the other hand, patient MNL intact conserve written addition and multiplication ( $p=0,55$ ;  $p=0,86$ , respectively) but he presents altered oral modality ( $p=0,03$ ;  $p=0,05$ ). **DISCUSSION & CONCLUSION.** In the literature there have been described similar cases. For example, patient HAR (McNeil & Warrington, 1994) conserves oral calculation but presents alterations on written additions and multiplications. Also, Cohen & Dehaene (1995; Dehaene & Cohen, 1995) have observed in alexic patients the correct achievement of addition in oral modality and altered in written form. These results can and must be explained in view of the most important theoretical models on calculation, that is, McCloskey, Caramazza and Basili (1985) model and anatomic functional model of Dehaene and Cohen (1995, 1997).

**[PII-30] Semantic vs. Superficial processing of hyperlinks in a wikipedia reading task**<sup>1</sup>Salmerón, L.; <sup>1</sup>Cerdán, R.; <sup>2</sup>Naumann, J.; <sup>1</sup>García, V.; <sup>1</sup>García-Carrión, P.; <sup>1</sup>Tavares, G.<sup>1</sup>University of Valencia; <sup>2</sup>German Institute for International Educational Research

We explored the strategies that students use to select hyperlinks during task oriented reading in a Wikipedia document. Current models such as the SNIF-ACT (Fu & Pirolli, 2007) consider that students assess the semantic relationship between their goal and the existing hyperlinks in the document. An alternative model, the Matching strategy, proposes that readers may select a hyperlink provided that it includes a word match which is also literally present in the question, independently of the semantic relationship between them. In our experiment 32 undergraduates read a Wikipedia document about the French Revolution and answered 8 location and 8 integration questions (e.g. “Why does the King defeat the new revolutionary laws emerged in the National Assembly, after the Storming of the Bastille?”). Half of the questions included a positive word match with both the relevant and an irrelevant hyperlink (e.g. relevant: “New revolutionary laws”; irrelevant: “Storming of the Bastille”), and half included a paraphrase of the relevant hyperlink while maintaining a positive match with the irrelevant link (e.g. relevant: “Novel legal order”; irrelevant: “Storming of the Bastille”). Results for hyperlink access showed an interaction between hyperlink type (relevant vs. irrelevant) and type of relevant hyperlink overlap (positive matching vs. paraphrase). Students accessed the relevant hyperlinks more often than the irrelevant ones, which show that they could clearly discriminate the relevance of hyperlinks. Nevertheless, participants selected the irrelevant link more often in the paraphrased relevant hyperlink condition. Therefore, when the relevant information in the question did not correspond to the exact wording of the relevant hyperlink, students tended to pick up the hyperlink that corresponded to a positive word match, even though it was irrelevant to their goal. This finding suggests that students often process hyperlinks superficially (by means of a matching strategy), which contradicts current semantic models of hyperlink selection.

**[PII-24] “...baby hypothermic following intubation”: Communicating temporal information in nursing summaries and its application in natural language generation**<sup>1</sup> Sambaraju, R.; <sup>2</sup> Gatt, A.; <sup>1</sup> Logie, R.<sup>1</sup>University of Edinburgh; <sup>2</sup>University of Malta

Natural Language Generation (NLG) involves the automatic production of textual summaries from non-linguistic data. Such summaries often need to communicate complex information about events, including their temporal location, as well as temporal and/or causal relations between them. In this paper, we are concerned with how humans communicate such temporal information. Our focus is on end-of-shift summaries in a neonatal intensive care unit and our goal is to automatically generate such summaries from patient data. We first present an analysis of a corpus of 32 end-of-shift nursing summaries, focusing on the representation of temporal information. Our results can be summarised as follows: (a) Temporal information about certain events is presented in the form of a temporal relation with another event in ways to inform causal associations between them. (b) Temporal information about certain events is provided through their proximity to the shift start and end times, in ways to inform consequent clinical actions. (c) Changes in the levels of parameters, such as Heart Rate, are temporally located within the duration of another event, e.g. intubation, to inform a causal association amongst them. Secondly, we describe a computational approach to temporal planning based on the corpus results observed. Given an event *e*, the model makes use of the following to determine temporal structure and the best way to express temporal relations through tenses and adverbials: (a) the salience of a previously mentioned event *e'* to which *e* can be related and which provides *e* with a reference time; (b) the use of an explicit timestamp in the absence of such an *e'*; (c) knowledge-based inferences to explicitly relate events to each other, when such relations are required to support further inferences.

**[PIII-78] Attentional capture and multisensory integration**

**Sanabria, D.; Tortosa, M.; Sarmiento, B. R.**

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The traditional view in the multisensory research field states that the integration of inputs from different sensory modalities into a coherent percept occurs prior to attentional selection. For instance, Bertelson and colleagues (2000, 2001) showed that spatial audiovisual ventriloquism did not depend on the deployment of either endogenous or exogenous spatial attention (see also Driver, 1996). Recent evidence from behavioural and cognitive neuroscience research has challenged this view, although there is still controversy regarding the precise role of attention in multisensory processing. Here, we present the results of a series of experiments that investigated the potential role of attentional capture on multisensory integration. In a typical Posner's exogenous cuing paradigm, participants had to look for the red (or green) target among two symbols that were presented one at either side of the screen, and to discriminate whether such character was an "=" or "x". Prior to the presentation of the target and distractor, a peripheral non-predictive cue was presented. The SOA between cue and target was manipulated on a trial by trial basis. A congruent (presented at the target location) or incongruent (presented at the distractor location) white noise burst accompanied the onset of target and distractor. A no sound condition was also used as baseline. The results suggest that multisensory integration depends on attentional capture, and that this effect is modulated by the SOA.

**[PII-53] Retrieval induced forgetting on facial features**

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Face recognition is a difficult task since it requires discriminating and choosing the correct features amongst a multitude of highly similar ones. Several face recognition models have provided different account for cognitive mechanisms to deal with this competition. Recall and recognition under strong competition condition is pervasive in human memory and some (e.g. Anderson, Bjork, & Bjork, 1994) have suggested that inhibitory control may be used to overcome interference between stimuli that compete for retrieval. This has been tested with the Retrieval-Practice paradigm and its main effect, the Retrieval-Induced Forgetting (RIF), which has been proved to occur with both semantic and visuo-spatial materials. Our aim is to explore if the same inhibitory mechanisms that solve competition between perceptual stimuli is also observed in face processing. In order to investigate this, we adapted the procedure used by Ciranni and Simamura (1999) with perceptual stimuli to facial features. The idea was to create competition between particular facial feature, namely the colour of the eyes, in faces categorized according to the colour and shape of their hair. Results showed that RIF is indeed found with facial stimuli, providing evidence that face processing might not differ substantially from other object's processing, since faces are also vulnerable to inhibitory processes. These data support the view that inhibition as central mechanism for executive control. Moreover, results are consistent with the predictions of serial models of face recognition.

**[PII-67] Cross-modal prediction in audiovisual speech perception**<sup>1</sup>Sánchez, C.; <sup>2</sup>Alsius, A.; <sup>3</sup>Enns, J. T.; <sup>1, 4</sup>Soto-Faraco, S.<sup>1</sup>*Pompeu Fabra University*; <sup>2</sup>*University of Barcelona*; <sup>3</sup>*University of British Columbia*; <sup>4</sup>*Catalan Institution of Research and Advanced Studies*

Information about past events can be used to make predictions about what is coming next. Human perception capitalizes on this type of predictive coding to speed up information processing in a variety of domains, including visual and auditory speech processing. The present study addressed whether predictive coding can occur across sensory modalities and, if it depends on language background (i.e., native vs. unknown language). In particular, we hypothesized that input in one sensory modality (i.e. the video of a speaker's articulatory movements) might contribute to predictions about upcoming events in a different sensory modality (i.e. an auditory speech stream). To test this we used an audio-visual matching task, in which observers made speeded judgments about spoken sentence fragments as either audiovisually matching or mismatching. Prior context to the combined audio-visual fragments could be speech in one of the modalities only (i.e., lead-in was audio or video alone) or else a non-informative stimulus. We tested for predictive effects in both auditory-to-visual and visual-to-auditory directions. The results supported the existence of both within (in the visual and in the auditory modality) and cross-modal prediction, though some asymmetries were observed. Only when prediction was based on prior visual information did it benefit performance of the audiovisual matching task; prior auditory information did not give the same benefit. Furthermore, we also found that previous knowledge of the language is required in order to take advantage from visual prediction.

**[PII-80] The role of sound symbolism in the perception of attractiveness: Crosslinguistics studies**<sup>1</sup>Santiago, L.; <sup>1</sup>Zaefferer, D.; <sup>2</sup>Santiago, J.<sup>1</sup>*Ludwig Maximilians University*; <sup>2</sup>*University of Granada*

Amy Perfors (2004) study "What's in a Name?" aroused a great deal of interest by showing that the stressed vowel of an English given name affected the perceived attractiveness of its bearer. Male pictures presented with names with a stressed front vowel (e.g., Steve) were consistently perceived as more attractive than those combined with names with a stressed back vowel (e.g., John). In contrast, female faces with names with a stressed back vowel (e.g., Julie) were perceived as more attractive than with names with a stressed front vowel (e.g., Liz). However, in her study the gender of the participants was not registered, name frequency was not controlled for, and the names were not randomly assigned to faces for each participant. Her results contrast with the Saussurean principle of arbitrariness of the linguistic code and reveal the psychological reality of (universal or specific) sound symbolism. In order to assess whether sound symbolism is universal (cf. Hinton et al., 1994), we examined these effects in a Romance Language, namely in Spanish. We used a modified design, following that used by Hartung, Klenovsak, Santiago, Strobl y Zaefferer (2009) with German, which allowed us to control for name frequency and denotation, and we also registered the participants' gender. No effects were found of the subject's gender. The observed results converge totally with Perfors' results acquired with English names and native speakers of this language, showing that her findings are also robust in Spanish, a language with important phonological differences with English. In contrast, both English and Spanish differ from the pattern observed by Hartung et al (2009) in German. Possible explanations for these contrasting results are discussed.

**[PII-69] Gaze-driven attention dynamics with different facial expressions: An n2pc study**

<sup>1</sup>Sassi, F.; <sup>2</sup>Galfano, G.; <sup>2</sup>Sarlo, M.; <sup>2</sup>Munaffò, M.; <sup>2</sup>Umiltà, C. A.; <sup>1</sup>Fuentes, L. J.

<sup>1</sup>University of Murcia; <sup>2</sup>University of Padua

Previous research investigating the possible effects of facial expression on gaze-driven orienting of attention has produced mixed results. The present study examined this issue in further detail by recording electric brain activity from the scalp of participants engaged in a spatial cueing paradigm with non-informative gaze cues embedded in fearful, disgusted, or neutral faces. Unlike previous studies, event-related brain potentials were recorded time-locked to both cue and target stimulus. In addition to classic early components (P1 and N1), N2pc was also computed time-locked to target onset. Behavioral data showed that gaze-driven orienting was not influenced by facial expression. Electrophysiological data overall showed that the effects of emotion and the effects of attention were reflected in different ERP components. Of particular relevance, an inverse N2PC effect was observed as a function of cue-target spatial congruence. This pattern is interpreted as evidence that N2PC can be used as a marker of reorienting of attention in spatially incongruent trials due to gaze-driven orienting.

**[PIII-17] A training study on false belief understanding through labeling objects**

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*University of Girona*

The present work aims to examine the relation between language and theory of mind. Specifically, we are interested in the causal role of object labeling in improving children's false belief understanding. The method was adapted from Lohmann & Tomasello (2003). Participants were 72 children. Their age ranged from 3 years and 5 months to 3 years and 11 months. They were selected following two pre-test criteria: a) their linguistic development needed to be normal according to their age group; b) they couldn't have acquired yet a false belief understanding, measured through a representational change task. After the pre-test, each child was randomly assigned to one of two training conditions, and a control condition. In the trainings, children were shown 12 deceptive and non-deceptive objects in 3 different sessions. After the training sessions; a post-test consisting in three false belief tasks was administered to the children. Results will be presented according to the three conditions: - Object denomination. In this case, the deceptive aspect of the objects was highlighted. The experimenter gave names for the reality (e.g., a candle) and the appearance (e.g., tomato) of the objects. - Labeling attributes. In this condition the deceptive aspect of the objects was not highlighted. The experimenter gave two adjectives for different attributes of each object. - Control condition. In this condition no objects were presented between the pretest and the post-test. The main findings show that giving alternative names, but not labeling attributes, for deceptive objects, helps children to improve their false belief understanding. Data also show that the denomination of the double perspective of one object was the only effective condition which fostered the generalization of the training to other false belief tasks.

**[PII-25] The European Portuguese adaptation of the affective norms for English words (anew)****<sup>1</sup> Soares, A. P.; <sup>1</sup> Comesaña, M.; <sup>2</sup> Simões, A.; <sup>1</sup> Fonte, L.; <sup>1</sup> Frade, C. S.***<sup>1</sup>University of Minho; <sup>2</sup>Porto Polytechnic Institute*

This work presents the European Portuguese (EP) adaptation of the Affective Norms for English Words (ANEW; Bradley & Lang, 1999). The EP version of the ANEW provides affective norms of valence, arousal, and dominance for 1034 words translated from English to EP by two independent judges with deep knowledge of the two languages. The differences between the translated versions were evaluated and a satisfactory compliance was achieved by consensus. The EP norms of the ANEW were based on a large sample of college students native speakers of EP enrolled in different degrees of several Portuguese universities. Participants rated approximately 60 words in the three affective dimensions (3x60) using the 9-point scale of the Self-Assessment Manikin (SAM) in a paper-and-pencil or a web self-paced procedure in which participants read each word and then assesses their emotional ratings. As in the Spanish adaptation (Redondo, Fraga, Padrón, & Comesaña, 2007) three psycholinguistic subjective indices (familiarity, concreteness and imageability) and five psycholinguistic objective indices, collected from national lexical databases (length, syllabic structure, grammatical class, frequency and number of orthographic neighbors) were included in the EP adaptation. The EP version of the ANEW is therefore a valid and useful tool that will allow researchers not only to control and manipulate the affective proprieties of stimuli, but also to develop cross-linguistic studies.

**[PIII-4] Proactive and retroactive processing in tentacle lowering conditioning in the common snail (*helix aspersa*): Blocking and sensory preconditioning****Solar, P.; Acebes, F.; Carnero, S.; Loy, I.***University of Oviedo*

Pavlovian conditioning can be used as a procedure to study complex cognitive processes useful to construct information processing models (Wheeler y Miller 2008). Nevertheless when these processes are studied in invertebrates they are usually used in physiological (cellular) learning correlates research (Krasne and Glanzman 1995). In this communication, some data will be present from our laboratory with a tentacle lowering conditioning procedure in the common snail (*Helix aspersa*). These experiments demonstrated, among other associative processes, that snails show both proactive processing of the information (latent inhibition or blocking) and retroactive processing (sensory preconditioning or second order conditioning). Theoretical implications of these results are discussed.

**[PI-8] Tms shows different roles for sma and pre-sma regions of medial frontal cortex in preparation for a task-switch**

**Stevens, T.; Monsell, S.**  
*University of Exeter*

Activation of medial frontal cortex has frequently been reported in association with task switching and response conflict. We used transcranial magnetic stimulation (TMS) to explore the role of medial frontal cortex in task-set preparation. In a task-cuing paradigm in which participants are cued by an auditory word to classify either the shape or the colour of a stimulus, increasing the cue-stimulus interval (CSI) from 150 to 800 ms allows time for task-set preparation. This usually reduces both the RT cost of a task-switch and the effect on RT of response conflict observed for stimuli which require incongruent responses in the two tasks. We applied TMS (3 pulses at 20 Hz) over pre-supplementary motor cortex (preSMA) or supplementary motor cortex (SMA) from 250 ms before the stimulus onset -- i.e. late in the preparation interval with an 800 ms CSI, but before the cue with a 150 ms CSI. Stimulating SMA during the long CSI substantially attenuated the reduction in switch costs usually seen with preparation, while stimulating pre-SMA eliminated the reduction in response conflict. This confirms that medial PFC is involved in task-set preparation, but also suggests a dissociation between the roles of SMA and pre-SMA.

**[PII-55] Response time variability in choice response time tasks and tapping tasks correlates positively**

**Stoetm, G.; Gray, K.**  
*Leeds University*

In psychological studies, researchers often focus on mean response times. But response time variability might, in principle, also reflect aspects of a participant's performance level - for example, higher variability might reflect lack of concentration. To further test this hypothesis, we compared response time variability of participants in two very different tasks. Participants (n=126) performed a two-choice response time task and a tapping task in which they tapped in synchrony with a flashing LED. We found a significant correlation between the variability in response times in both tasks. We discuss the various reasons why this correlation might occur.

**[PI-68] Auditory self-relevance and the perception of gaze****Stoyanova, R.; Ewbank, M.; Calder, A. J.***MRC Cognition and Brain Sciences Unit*

The direction of another's eye gaze provides a cue to where they are currently attending as well as to their future intentions and actions (Baron-Cohen, 1995). If that gaze is directed at the observer, it often indicates a deliberate attempt to communicate. However, in the natural environment, social cues such as gaze do not occur in isolation. We recently showed that gaze is more likely to be seen as direct in the context of an angry as compared to a fearful or neutral facial expression (Ewbank, Jennings & Calder, in press). This is consistent with the presence of a 'self-referential bias' when participants are faced with ambiguously directed gaze in the context of a threatening face. However, it remains unclear whether a self-referential signal in the auditory modality could exert an influence on the perception of gaze in the absence of a change in visual input. To address this question, we presented neutral faces displaying different degrees of gaze deviation whilst participants heard a name in the unattended auditory channel. Hearing one's own name and seeing direct gaze both capture and hold attention (Senju & Hasegawa, 2005; Moray, 1959). These two ostensive signals have also been shown to activate similar mentalizing regions (Kampe, Frith & Frith, 2003). Given the shared signal value of the two cues, we predicted that participants would evaluate a wider range of gaze deviations as looking directly at them when they simultaneously heard their own name. Our data supported this hypothesis showing, for the first time, that the communicative intent signalled via the auditory modality influences the visual perception of another's gaze.

**[PII-7] Can intention override the "automatic pilot"?****<sup>1</sup> Striemer, C. L.; <sup>2</sup> Yukovsky, J.; <sup>1</sup> Goodale, M. A.***<sup>1</sup>University of Western Ontario; <sup>2</sup>University of Birmingham*

Previous research has suggested that the visuomotor system possesses an "automatic pilot" that allows people to make rapid online movement corrections in response to sudden changes in target position. Importantly, the automatic pilot has been shown to operate in the absence of visual awareness, and even under circumstances in which people are explicitly asked not to correct their ongoing movement. In the current study, we investigated the extent to which the automatic pilot could be "disengaged" by explicitly instructing participants to ignore the target jump (i.e., "NO-GO"), by manipulating the order in which the two tasks were completed (i.e., either "GO" or NO-GO first), and by manipulating the proportion of trials in which the target jumped. The results indicated that participants made fewer corrections in response to the target jump when they were asked not to correct their movement (i.e. NO-GO), and when they completed the NO-GO task prior to the task in which they were asked to correct their movement when the target jumped (i.e., the GO task). However, increasing the proportion of jumping targets had only a minimal influence on performance. Critically, participants still made a significant number of unintended corrections (i.e., errors) in the NO-GO tasks, even under explicit instructions not to correct their movement when the target jumped. Overall these data suggest that, while the automatic pilot can be influenced to some degree by top-down strategies and previous experience, the pre-potent response to correct an ongoing movement cannot be completely disengaged.

**[PI-55] The intention of speech: Temporal erp evidence for an early dissociation between meaning and words**

<sup>1</sup>, <sup>2</sup>Strijkers, K.; <sup>3</sup>Holcomb, P.; <sup>2</sup>Costa, A.

<sup>1</sup>Pompeu Fabra University; <sup>2</sup>University of Barcelona; <sup>3</sup>Tufts University

Most models on object processing and naming posit that activation automatically cascades from semantic to lexico-semantic and, according to some, word form representations. Given this continuous transmission of information, top-down processing in function of the actual intention to utter words should at some point in time gate the flow of activation towards those representations relevant for response execution. However, very little is known about how and especially when the intention to speak or not to speak affects the bottom-up object processing. Based on recent findings showing early lexical ERP modulations (~ 175 – 200 ms) in overt naming tasks (Strijkers et al., 2009; Costa et al., 2009), we compared the time-course of processing during overt picture naming (experiment 1) with that of go/no-go semantic categorization (experiment 2), assuming that only naming requires fast lexical activation. In order to obtain a reliable measure of access to the object's name, lexical frequency was manipulated. During overt naming, low frequency ERPs diverged from high frequency ERPs very early on (~ 175 ms), replicating recent findings. Importantly, during semantic categorization of the same objects, low frequency and high frequency ERPs did not yield any early modulations. These results offer strong additional evidence that the brain rapidly accesses the lexical system after perceiving a picture; however and in contrast to most models, the fast lexical engagement only occurs when the intention to name is present. This is the first direct on-line demonstration for an early functional dissociation between meaning and words, with top-down task demands shaping bottom-up activation earlier as expected by most current theories.

**[PIII-18] ¿Ave o pájaro? The role of naming in inductive inference**

Tarlowski, A.

*University of País Vasco*

Inductive inference is one of the most fundamental reasoning processes. According to the models of induction the strength of inductive argument depends on the category membership of the premise and conclusion and their similarity. Both similarity relationships and category structure may be influenced by the patterns of label use. Although past research demonstrated that online presentation of labels plays a role in inductive inference no study has shown that naming practices affect stable category representations that enter into inductive judgments. In this study I provide evidence for a relationship between naming and inductive inference by examining Polish and Spanish speakers' inferences within the taxonomic class Aves. In Polish birds are named with one label, ptak, while Spanish uses two labels, ave and pájaro. Size is the feature that determines whether Spanish speakers label a bird as ave or pájaro. Participants were taught a novel biological property of a bird, small or large, and were asked to assess how likely it is that other animals, including small and large birds would have the property as well. The analysis of inferences within the class Aves indicates that, compared to Polish speakers, Spanish speakers' perception of inductive strength decreases more strongly as a function of bird size. This suggests that Spanish speakers perceive birds as a more diverse grouping than Polish speakers do, at least along the dimension of size. The role of labelling is the only plausible explanation of this result because Polish and Spanish speakers' cultural views on biological taxonomy and experience with bird species are comparable. The findings of this study contribute to the understanding of inductive inference and the relationship between language and thought.

**[PII-62] Predicting what other people will do: Spatial and temporal brain dynamics in response to expected and unexpected gaze shifts****<sup>1</sup>Tipples, J.; <sup>2</sup>Johnston, P.***<sup>1</sup>University of Hull; <sup>2</sup>Swinburne University*

The aim of the research was to uncover the key brain processes responsible for a key aspect of social cognition: predicting where people will look. Recent studies (e.g., Pelphrey, Singerman, Allison, & McCarthy, 2003) have shown that the posterior region of the STS (pSTS) is activated when participants view a person acting in an unexpected manner (looking away rather than toward a salient object). As a stronger test of the hypothesis that such activation is uniquely social in nature, patterns of brain activation occurring in response to expected and unexpected events in a social context (after observing person who will either look toward or away from an object) were compared with brain activation occurring in a non-social context (after observing a directional cue that will either point toward or away from an object). In separate studies, functional magnetic resonance imaging and event-related potential were used to measure brain activation. Pelphrey, K. A., Singerman, J. D., Allison, T., & McCarthy, G. (2003). Brain activation evoked by the perception of gaze shifts: The influence of context. *Neuropsychologia*, 41, 156-170.

**[PIII-38] Cognitive control and automatization in monolinguals, bilinguals and professional translators****Togato, G.; Macizo, P.; Bajo, M. T.***University of Granada*

Several studies comparing monolingual and bilingual groups show bilinguals' superior performance in tasks involving cognitive control (e.g., Bialystok et al., 2004). Moreover, recent studies comparing bilinguals and professional translators attempted to determine whether translator's abilities are a direct consequence of bilingualism or instead the result of a domain specific skill acquired through practice (e.g., Dilliger, 1994). On the basis of the above mentioned studies, our aim was threefold. Our first goal was to explore whether expert translators show enhanced automatization abilities with respect to control participants. The second goal was to investigate cognitive control in professional translators. The third aim was to specify whether the balance between automaticity and control is merely due to a second language use or to a more specific training in translation activity. Monolinguals, bilinguals and professional translators performed a memory search task (Schneider & Shiffrin, 1977). The memory set size was manipulated (i.e., 1, 2, 4 stimuli) along 3000 trials. In order to test the participants' flexibility and attentional control, on the 1500 trial a switch in the memory set and target stimuli was introduced. The analysis of the first 1500 trials indicated that professional translators did not show higher automatization levels compared neither to monolinguals nor to bilinguals. On the contrary, they maintained higher levels of cognitive control than monolinguals, as bilinguals did. Translators and bilinguals seemed to benefit from this initial attentional control maintenance when performing the second part of the task: switch cost associated to the 1500 reverse trial was reduced. As to our third hypothesis, we did not found differences between translators and bilinguals performance; our data suggest that the differences that would allow to differentiate between professional practice in translation and every day bilingual practice do not mirror in general attentional tasks based neither on automatization nor on cognitive control.

**[PII-9] Generalisation and training of proportion congruent effect and specificity of conflict adaptation**

**Torres Quesada, M. ; Funes, M. J.; Lupiáñez, J.**  
*University of Granada*

The purpose of this study is to assess whether two well known effects associated with cognitive control, conflict adaptation (Gratton effect) and proportion congruent effects reflect a single common or separate control systems. In addition, we wanted to see if these two forms of cognitive control are susceptible of training and able to generalize to other conflicting situations. To do so, on a training phase, we presented only one conflict type (e.g. Simon) where we manipulated the proportion of congruency (mostly congruent vs. mostly incongruent). However, on the pre-training and post-training phases, we displayed two different conflicts types (e.g. Simon and Spatial Stroop) with neutral overall incongruent-to-congruent ratio. The results point that the proportion congruent effect trained in one type of conflict is able to transfer from the training to the post-training phase and it does it independently of the conflict type. By contrary, the conflict adaptation effect did not generalize from one type of conflict to the other. This contrasting pattern of results strongly suggests the existence of two separate attentional control systems responsible of proportion congruent and conflict adaptation effects. Moreover, it seems that the control mechanism responsible of the proportion congruent effect is susceptible of being trained (at least under the kind of stimuli and conflicting situations used in the present study).

**[PIII-67] The effect of race and emotional facial expression in a trust game**

**Tortosa, M.; Ruz, M.; Lupiáñez, J.**  
*University of Granada*

Previous research suggests that both invariant and dynamic aspects of facial expressions affect decision-making processes in social encounters. Facial expressions contain information that can be used in inferring intentions and formulating beliefs about others. In two experiments we explored the extent to which the race of the partners and their emotional facial expressions influenced participants' decision-making in a Trust Game. On every trial participants were presented with a still facial image of their partners and had to choose whether to trust them and share the money, or not to trust them and keep the money for themselves. The participants' goal was to maximize their payoffs at the end of the game. These were adjusted so that a cooperative strategy between the two players yielded outcomes that made everyone better off. Race and emotional expression had no predictive value regarding the partners' reciprocation rate. The iterative nature of the game allowed us to explore the evolution of the cooperative behavior along extended social interactions. Race of the partners had no effect on participants' decisions: white participants cooperated equally with black and white partners. However, facial emotional expressions affected the participants' decision to trust their partners. Happy and neutral faces elicited higher cooperation rates than angry faces, and participants shared greater amounts of their money with smiling than with angry people. Importantly, emotional expressions influenced trust behavior after multiple interactions with the same partners. Our method provides a flexible means of exploring the effect of both invariant (e.g. race, gender) and dynamic (e.g. emotion, gaze direction) facial characteristics on trust decision-making. Future research using electrophysiological recordings will help us to study the neural substrates underlying these processes as well as the differences in processing those aspects.

**[PIII-23] Left and right coding of past and future in language: The mental timeline during sentence processing**

**Ulrich, R.; Ruiz Fernández, S.; Maienborn, C.**  
*Eberhard Karls University*

Abstract concepts, like time, have been assumed to be represented in terms of concrete dimensions such as space (e.g., Boroditsky, 2000). Recent support for a link between temporal and spatial cognition comes from response time studies reporting congruency effects between these dimensions (e.g., Santiago et al., 2007). These studies suggest that temporal referents are located on a mental timeline, which runs from left to right. From a linguistic point of view, this finding is somewhat surprising. While virtually all languages have explicit spatial means to refer to time (e.g., the day before Christmas), there appears to be no language that uses the concepts of left and right for the expression of time (e.g., the day to the left of Christmas; Radden, 2004). However, mental timeline studies suggest a spatial organization of time. In the present study we examined whether online-processing of sentence meaning activates a left-to-right representation of time. In Experiment 1 we examined whether participants can classify the temporal reference of a sentence faster when the stimulus-response assignment is congruent (i.e., left-hand keypress for sentences referring to the past and right-hand keypress for sentences referring to the future) with the assumed mental left-to-right representation of time than when the assignment is incongruent (i.e., reversed assignment). In Experiment 2 and 3 we examined whether the results of Experiment 1 are consistent with the notion that temporal information produces automatic response activation. Participants performed a judgment only about the content of a sentence (Does it make sense or not?) but not about the temporal information of the sentence. Results showed a time-space congruency effect during online processing of the sentence, thus demonstrating the effect not only for single words but also for complete sentences. However, data do not support the notion that this congruency effect is due to an automatic process.

**[PII-29] The neural correlates of counterfactuals: A fmri study with degrees of effort**

**<sup>1</sup>Urrutia, M.; <sup>1</sup>de Vega, M.; <sup>2</sup>Gennari, S.**  
*<sup>1</sup>University of La Laguna; <sup>2</sup>University of York*

Healthy right-handed participants read sentences describing actions in a factual or counterfactual format while their brain activation was recorded in an fMRI event-related design. The degree of effort in the sentences was manipulated by using verbs with objects differing in weight (e.g., raising the cup vs. raising the bride). Control sentences involved one of the objects with non-action verbs (e.g., admiring the bride). High-effort sentences activated premotor and parietal areas implicit in action execution to a larger extent than low-effort and control sentences. Counterfactuals, in addition, activated specific regions in the precentral gyrus, the medial prefrontal gyrus, and the anterior cingulate region, probably related to the complexity of their dual meaning processing. Finally, factials activated specific subcortical regions in the basal ganglia (putamen and caudate nucleus), especially for high-effort sentences. The results support an embodied approach to sentence meaning modulated by syntactic structure.

**[PII-15] The neural correlates of counterfactuals: A fmri study with contents of effort**

<sup>1</sup>Urrutia, M.; <sup>1</sup>de Vega, M.; <sup>2</sup>Gennari, S.  
<sup>1</sup>University of La Laguna; <sup>2</sup>University of York

Healthy right-handed participants read sentences describing actions in a factual or counterfactual format while their brain activation was recorded in an fMRI event-related design. The degree of effort in the sentences was manipulated by using verbs with objects differing in weight (e.g., raising the cup vs. raising the bride). Control sentences involved one of the objects with non-action verbs (e.g., admiring the bride). High-effort sentences activated premotor and parietal areas implicit in action execution to a larger extent than low-effort and control sentences. Counterfactuals, in addition, activated specific regions in the precentral gyrus, the medial prefrontal gyrus, and the anterior cingulate region, probably related to the complexity of their dual meaning processing. Finally, factuals activated specific subcortical regions in the basal ganglia (putamen and caudate nucleus), especially for high-effort sentences. The results support an embodied approach to sentence meaning modulated by syntactic structure.

**[PI-24] Switching between languages: Erp study**

<sup>1</sup>Van der Meij, M.; <sup>2</sup>Cuetos, F.; <sup>3</sup>, <sup>4</sup>Carreiras, M. ; <sup>1</sup> Barber, H. A.  
<sup>1</sup>University of La Laguna; <sup>2</sup>University of Oviedo; <sup>3</sup>Basque Center on Cognition Brain and Language;  
<sup>4</sup>IKERBASQUE Basque Foundation for Science

An important topic in bilingualism research is the interaction of different languages in the brain, and how easy it is to switch from one to another. In a previous ERP study we confront Spanish speakers (L1) with different levels of proficiency of English (L2) with switches from L2 to L1. The ERP results show the time-course of language switch costs in this direction: an initial detection of the switch driven by language-specific orthography (left-occipital N250), followed by costs at the level of the lexico-semantic system (N400) and updating or reanalysis process (LPC). The present study focuses on the same kind of switches but in the opposite direction: from L1 to L2. We presented native Spanish speakers with a high English proficiency 160 sentences of which 40 contained a switch in the middle of the sentence like in the previous experiment, and additionally, 80 sentences had a switch in the beginning. The ERP results showed an early negativity at posterior electrodes starting around 150 ms after the switched word onset. We propose this effect is related with the detection of the switch in language-specific orthography (left-occipital N250). With the same onset (150 ms) but at prefrontal electrodes, starts a long-lasting positivity (P300 family), which we interpret as showing updating or reanalyzing processing of this unexpected, and task-relevant event. The same pattern of effects was found as well for the switches in the beginning as in the middle of the sentence. The LO-N250 and the long lasting Positivity replicate the ERP effects found in the previous study with switches from L2 to L1. However, in contrast with the L2-L1 switches, when switching from L1 to L2, the N400 effect was not observed. This result is consistent with previous behavioral data that show greater cost when switching to L1 than to L2.

**[PI-3] The effect of task-set complexity on task-set reconfiguration****van 't Wout, F.; Lavric, A.; Monsell, S.***University of Exeter*

The effect of task-set complexity on task-set reconfiguration Félice van 't Wout, Aureliu Lavric and Stephen Monsell University of Exeter In task switching studies, reaction times and error rates are usually greater on switch than on repeat trials. This switch cost reduces with an opportunity for preparation, suggesting preparatory task-set reconfiguration. But the nature of this process and the representation of task-set that is activated remain unclear. In a task-cuing experiment, with a varied cue-stimulus interval, we manipulated the structure of the task set so that it was more or less complex, other things being equal. In the less complex 'rule' condition, participants were able to use simple categorical rules to guide performance. (For example, in a country classification task, four European countries mapped onto the left response, and four Asian countries onto the right response). This was not possible in the more complex 'arbitrary' condition, as the S-R mappings of eight stimuli (drawn from the same pool of country names) did not conform to any simple rule. Preparation was more effective in the less complex category-rule condition, and also less susceptible to interference from the currently irrelevant task set, as indicated by response congruence effects. Furthermore, with a long preparation interval, reaction times recovered from a switch more gradually over a following run of repeat trials in the condition with the arbitrary S-R mappings, suggesting that a task-set with a simpler description is more easily re-consolidated by performance of the task following a task change.

**[PI-40] The effect of stimulus pre-exposure schedule in human perceptual learning****Vázquez, G. A.; Arriola, N.; Alonso, G.***University of the Basque Country*

The effect of pre-exposure schedule (concurrent, intermixed, and blocked) to two similar visual stimuli (colored checkerboards) on the ability for human participants to discriminate between them in a "same/different" judgment task was investigated. A clear-cut pre-exposure schedule effect was found when participants were requested to make same-different judgments throughout the pre-exposure phase, and feedback was provided during the subsequent testing phase. Good performance was found after concurrent and intermixed pre-exposure that was notably superior to that after blocked pre-exposure and no pre-exposure. However, the pre-exposure schedule effect disappeared when no judgment was required during pre-exposure and feedback was not given during testing. These results are discussed in terms of associative and non associative accounts of perceptual learning.

**[PII-41] Training insight problem solving through focus on barriers and assumptions**

**Walinga, J.; Cunningham, J. B.; MacGregor, J. N.**

<sup>1</sup>Royal Roads University; <sup>2</sup>University of Victoria

According to Ohlsson's (1992) theory, insight problem solving involves unconscious processes of restructuring which, when they break an impasse, allow spreading memory activation to reach previously dormant knowledge elements required to solve a problem. However, Fleck & Weisberg (2004) found that restructuring frequently happened as a result of conscious analysis rather than unconscious processes, and in the absence of impasse, as defined by Ohlsson. We propose here that the recognition of a barrier to progress during insight problem solving may provide a focus for conscious analysis and bring about restructuring. We tested the proposal by examining the effects of different training routines on insight problems in two experiments. The first experiment compared three training routines, focusing either on assumptions, barriers, or goals, and a control condition. The results indicated that training focusing on barriers was more effective than training focused on goals. The second experiment combined training about barriers and about assumptions into a single routine. The results indicated that combined training led to significantly higher rates of insight problem solving than a control condition. The results support the proposition that recognizing and reinterpreting barriers in solving insight problems may be one form of conscious analysis that can result in restructuring. Fleck, J. I., & Weisberg, R. W. (2004). The use of verbal protocols as data: An analysis of insight in the candle problem. *Memory & Cognition*, 32, 990–1006. Ohlsson, S. (1992). Information processing explanations of insight and related phenomena. In M. Keane & K.J. Gilhooley (Eds.), *Advances in the psychology of thinking* (pp. 1-44). London: Harvester Wheatsheaf.

**[PII-17] Effects of global structure on verbatim narrative recall in adults and children**

**Weaver, A.; Briscoe, J.**

*University of Bristol*

Narrative recall draws upon language and memory processes to describe everyday events. Causal structure across locally-bound events facilitates event memory in early childhood (Bauer, 2007), although children do not utilize causal structure in narrative recall until above 6 years of age (Bishop & Donlan, 2005; Cain, 2003). For adults, working memory theories have explained global cohesion effects within narrative recall as due to temporary binding within the episodic buffer (Baddeley, 2000; Christoffels, 2006), or controlled attentional processes that combine disparate representations, alongside automatic linguistic processes (Cowan, 1999; Jefferies, Lambon Ralph, & Baddeley, 2004). Here, we examined sentence recall of adults, 5-6 year old and 8-9 year old children in the context of an attention-demanding concurrent visual choice reaction time task. Sentences were either presented within an intact story structure (coherent list condition) or were re-ordered prior to presentation (incoherent list condition). A coherent list advantage for all groups indicated that children as young as 5 years were able to use global story structure to facilitate recall. There was a stable effect size across all groups under single task conditions, but a marked increase in effect size occurred under dual task conditions between children and adults. Performance on narrative recall tasks correlated well to expressive language in children, and to semantic knowledge in adults. To conclude, global cohesion of narrative recall appeared to reflect a similar mechanism within adults and children, but the contribution of automatic linguistic processes varied with age. In addition, adults, but not children, recruited attentional (domain-general) processes to boost immediate recall for sentence lists without a coherent story structure.

**[PI-76] Antecedents and consequences of the perception of social power (and its legitimacy)****Willis, G. B.; Rodríguez-Bailón, R.***University of Granada*

A central question in power research concerns the understanding of the motivations that underlie the actions of powerful individuals. Power is ambivalent and has been associated both with the pursuit of selfish ends, as well as responsibilities and duties towards others. This presentation examines, for the first time, the concerns related to the Self that powerful and powerless individuals have when they pursue goals. Therefore, in Study 1 powerful, powerless and control participants were asked to list their goals related to responsibility/duties or hopes/aspirations. In this study power (vs. powerlessness and control) increased the accessibility of hopes and aspirations, whereas powerlessness increases the accessibility of duties and responsibilities. Because we were particularly interested in disentangle the effects of legitimate and illegitimate power, in Studies 2-3 we assigned participants to a power or powerlessness role using legitimate or illegitimate means. Then, in an allegedly separate task, we measured the accessibility of ideals (Study 2) and oughts (Study 3) through a goals generation task. Results showed that legitimacy moderates the effects of social power; that is, when participants held illegitimate power they generated more goals related with their responsibilities and obligations, whereas illegitimate powerless participants generated more ideals and aspirations. Finally, in a last study we examined the factors that lead to such legitimacy appraisals. The implications of these findings are discussed.

**[PII-43] Misperception of causality: Implications for quackery and pseudoscience****<sup>1</sup>Yarritu, I.; <sup>2</sup>Blanco, F.; <sup>1</sup>Matute, H.; <sup>1</sup>Vadillo, M. A.***<sup>1</sup>University of Deusto; <sup>2</sup>University of Leuven*

One problem of concern for sanitary authorities is the perception of effectiveness that some people have about ineffective and even harmful medical treatments. We suggest that this illusory perception of effectiveness can be explained as an illusion of control. The illusion of control takes place when a person acts with the intention of obtaining an outcome that is uncontrollable but occurs frequently, or when a person tries to get rid of a discomfort that often ceases spontaneously. In those cases, any action taken is considered effective in spite of not having any influence on the discomfort. Although in principle the illusion of control is defined as a distorted expectation about the effectiveness of one's behavior, there are reasons to believe that this illusion can appear even when the action is performed by an external agent. We propose this model to understand how some people develop irrational beliefs about quackery and pseudoscience in situations in which there is no personal involvement. In the present research we investigate two factors that should affect this illusory perception: the well-known effect of the probability of the outcome and the effect of the probability of the cue, which has scarcely been studied. The results suggest that although the personal involvement of the subject is not necessary to develop the illusion, a high proportion of the cue events is indeed needed, and this is so regardless of whether the cue is the subject's response or an external cue. This leads us to propose a way to reduce the illusion: since in natural uncontrollable situations it is not possible to control the frequency with which the outcome appears, a better possibility is to convince people to be exposed to situations where the cue is not so frequent, such as not taking medications whenever they feel discomfort.

**[PIII-64] Perceptual grouping modulates spatial flanker effects**

**Zeischka, P.; Deroost, N.; Coomans, D.; Soetens, E.**

*Vrije University Brussels*

Congruency effects are known to decrease when the irrelevant information on subsequent trials is repeated as compared to when it is alternated. This especially occurs when the response-stimulus interval between trials is very short (i.e. 50 ms), and is explained by the sustained-suppression hypothesis. According to this hypothesis, the irrelevant information is being suppressed during a given trial, and this suppression is supposed to linger on into the next trial. Consequently, repeated irrelevant information cannot or interferes less with the processing of the relevant information. This congruency modulation is also found in flanker tasks, but there it is limited to spatial/directional information, i.e. arrow stimuli. Moreover, the effect seems to depend on the type of arrows used. A possible explanation for these diverging results could be the influence of perceptual grouping. Some arrows allow for perceptual grouping of the target arrow and one flanker arrow, based on good continuation and closure. In the present study we systematically investigated the role of perceptual grouping on the congruency modulation effect. Experiment 1 reveals that the congruency modulation in the arrow flanker task disappears if grouping factors are decreased. Experiment 2 demonstrates that the congruency modulation can be obtained with nonspatial stimuli if grouping factors are provided. Experiment 3 added an additional grouping factor to both the arrows for which the congruency modulation is normally present or absent. This additional grouping factor triggered the congruency modulation for the arrows that normally do not induce a congruency modulation, while it did not affect the congruency modulation for the other arrows. These data demonstrate that perceptual grouping plays a crucial role in the congruency modulation in flanker tasks and that sustained-suppression might be limited to irrelevant dimensions, as opposed to irrelevant stimuli.

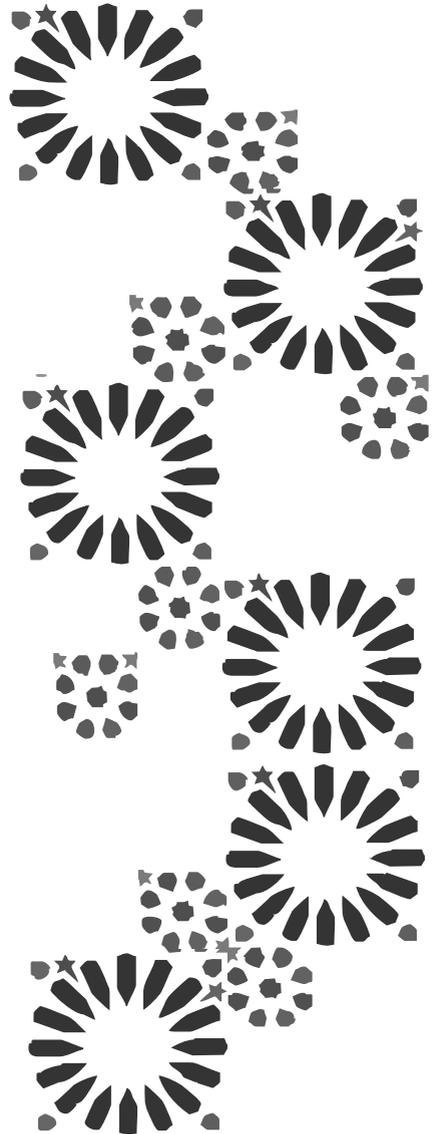
**[PI-10] Reduced target-distracter interference in congenital prosopagnosia**

**<sup>1</sup>Zubko, O.; <sup>1</sup>Wilkinson, D.; <sup>2, 3</sup>DeGutis, J.; <sup>2, 3</sup>Milberg, W.; <sup>4</sup>Nakayama, K.**

*<sup>1</sup>University of Kent; <sup>2</sup>New England Geriatric, Research, Education & Clinical Center, Veterans Affairs Boston Healthcare System; <sup>3</sup>Harvard Medical School; <sup>4</sup>Harvard University*

The aim of this study was to investigate the source of face recognition impairment in congenital prosopagnosia (CP). Recent studies indicate that CP involves an over-reliance on part-based visual processing which, it is proposed, is particularly susceptible to memory interference. To test this proposal, we administered a modified version of the delayed match to sample task in which participants were first presented with a sample, target face, followed by 1, 3 or 5 distracter faces that had to be judged as mostly male or mostly female, followed by a single face that was judged as same or different to the sample. We reasoned that if CPs code faces in a way that is prone to interference then their matching performance would decline as the number of distracter faces increased. Contrary to predictions, CPs were unhindered by the distracter task, while a separate group of age-matched controls became progressively worse as the number of distracter faces increased. One explanation is that the two groups differed in the level at which they encoded the distracter faces. Specifically, the controls might have encoded the faces at a deeper level that led them to individuate the identities of faces, while the CPs may have encoded the faces at a more superficial level that was sufficient to perform the gender task but not to determine identity. To test this account, we conducted a second experiment in which depth of encoding was limited by shortening the stimulus exposure duration of the distracter faces from 579ms to 200ms. All interference disappeared. We propose that CP may involve a reluctance/inability to undertake deeper levels of coding which can, somewhat paradoxically, reduce interference and make it easier to maintain the separability of underlying face representations.

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