PROCEEDINGS

OF THE
15TH MEETING

OF THE
EUROPEAN SOCIETY FOR COGNITIVE PSYCHOLOGY

29th AUGUST – 1st SEPTEMBER, 2007
MARSEILLE, FRANCE

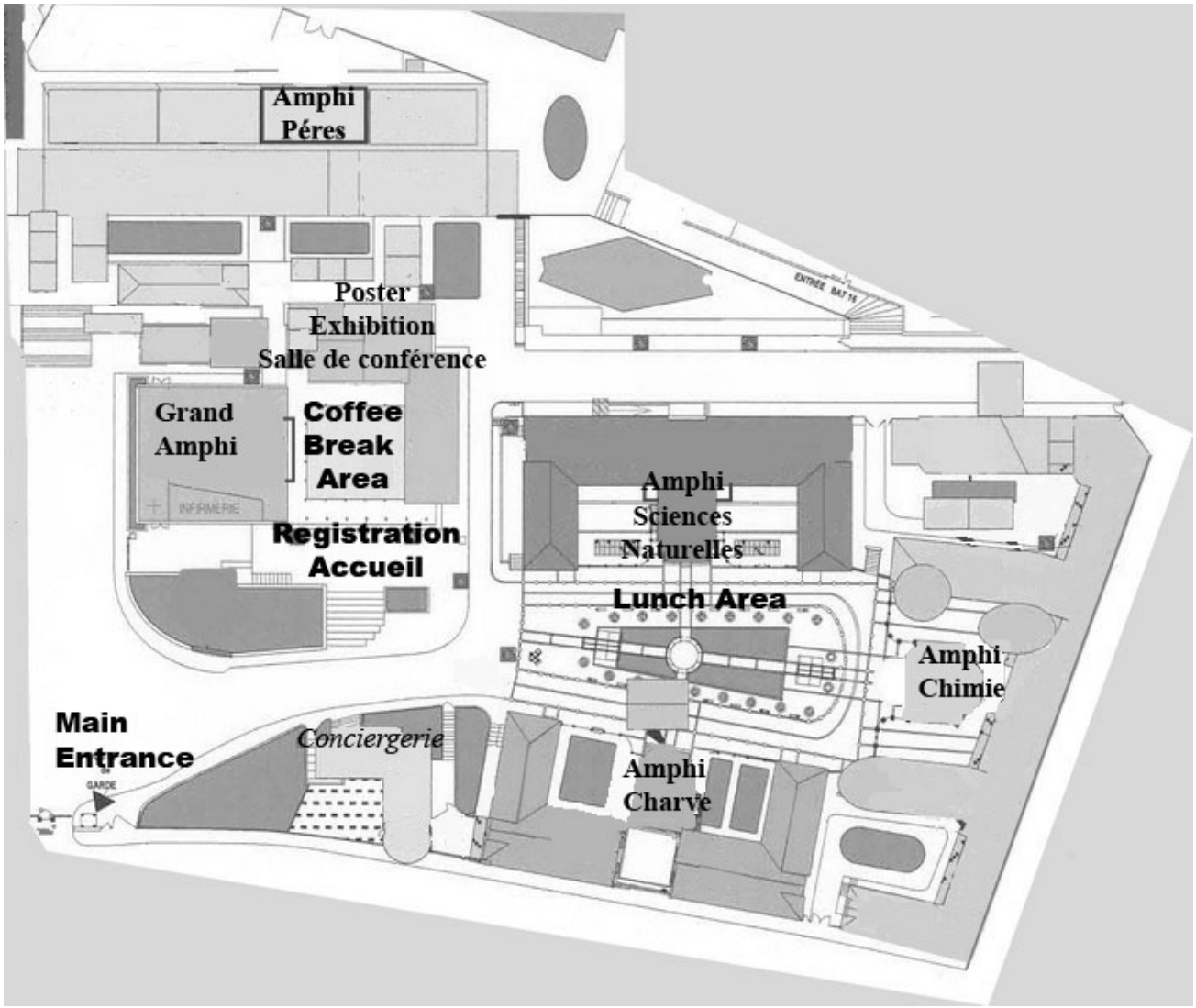
Conference committee:

Jonathan Grainger (chair)
François-Xavier Alario
Boris Burle
Stéphanie Desous
Stéphane Dufau
Niels Janssen

Conference proceedings edited by the scientific committee, consisting of

Jonathan Grainger
François-Xavier Alario
Boris Burle
Niels Janssen

Table of Contents


Amphi
Péres
Poster
Exhibition
Salle de conférence
Grand
Amphi
Coffee
Break
Area
Registration
Accueil
Amphi
Sciences
Naturelles
Lunch Area
Amphi
Chimie
Main
Entrance
Conciergerie
Amphi
Charve

WELCOME

We warmly welcome you to the 15th conference of the European Society for Cognitive Psychology in Marseille. The organizing committee is happy to welcome around 700 visitors to a meeting with over 600 contributions on a wide variety of current issues in cognitive psychology. We wish everyone an interesting conference and a pleasant stay in Marseille

THE ORGANIZING COMMITTEE

Jonathan Grainger (chair), CNRS-LPC
François-Xavier Alario, CNRS-LPC
Boris Burle, CNRS-LNC
Stéphanie Desous, CNRS-LPC
Stéphane Dufau, CNRS-LPC
Niels Janssen, LPC

LOCATION

The conference will be held on the St. Charles campus of the University of Provence.

SPECIAL EVENTS

We would like to draw your attention to the following events:

Day	Time	Event
Wednesday	5:00-6:00	Keynote Lecture (Mary Potter)
Wednesday	6:30-8:30	Opening Reception
Thursday	4:30-5:30	The Broadbent Lecture (Claus Bundesen)
Friday	4:30-5:30	The Bertelson Lecture (Eric-Jan Wagenmakers)
Saturday	4:00-5:00	Keynote Lecture (James L. McClelland)
Saturday	7:30 pm	Conference Dinner

ORAL PRESENTATIONS

All oral presentations are meant to last 15 minutes. Chairs and speakers are strongly urged to stick to the time schedule. In order to ensure rapid changeover between talks within a session, each chairperson has been asked to put all the talks of the session they are chairing on a single laptop computer. Please contact the chair of your session before the start of the conference and bring your talk on a memory stick or CD ready to be transferred to another computer.

POSTER SESSIONS

Poster sessions will be held on the thursday, friday, and saturday afternoons. Posters for presentation on a given day should be available for viewing throughout the whole day. Authors are requested to stand by their posters during the poster session.

SPONSORS

CNRS
Conseil Général des Bouches du Rhône
ESCoP
IFR Sciences du Cerveau et de la Cognition
Université de Provence
Ville de Marseille

SPECIAL THANKS

Organising an ESCoP meeting is no easy feat. Admittedly I had been warned about this, but thanks to André and Michel I eventually accepted. The number of participants has been rising steadily over the years and now appears to be stabilizing at around 600-700. This is a lot of people to handle, and I would like to thank everyone who was involved in the local organisation. However, there are two people in particular who deserve special mention – Stéphanie Desous and Stéphane Dufau. Without them none of this would have been possible, and I would probably already be on an early retirement plan (or extended sabbatical, however you want to call it). In the end, thanks to our two SDs, organising the 15th ESCoP conference almost became a pleasure (this is for future organisers). Special thanks also to Marilou Vandierendonck for her invaluable contribution to the organisation of this conference. Finally, it is indeed an honour for me, as a regular attendee at ESCoP conferences, to be the host for this one, and I can only hope that we will at least get somewhere close to the extremely high standards set by our predecessors.

Wishing you all an excellent conference and enjoyable stay in Marseille,

Jonathan Grainger,
Head of the Local Organizing Committee

CONFERENCE COMMITTEE

ESCoP HISTORY
The European Society for Cognitive Psychology was founded in 1985 by the so called « gang of five » consisting of Alan Baddeley (1st President), Paul Bertelson (2nd President), Janet Jackson (1st Secretary), Wolfgang Prinz (1st Treasurer), and John Michon.

The first conference took place in the Netherlands, in Nijmegen from 9–12 september 1985, and was by invitation only. "Psychological Research" published some of the papers of this Inaugural Meeting of ESCOP in a special issue (number 49) in 1987.
The second conference, the first officially open ESCoP meeting, was held in Madrid in 1987, and was organized by Maria Victoria Sebastian.

Following conferences and their organizers:

III - 1988 Cambridge (John Richardson)
IV - 1990 Como (Carlo Umilta & Giovanni Flores d'Arcais)
V - 1992 Paris (Michel Denis)
VI - 1993 Elsinore (Claus Bundesen)
VII - 1994 Lissabon (Amancio Da Costa Pinto)
VIII - 1995 Rome (Marta Olivetti Belardinelli)
IX - 1996 Würzburg (Joachim Hoffmann)
X - 1998 Jerusalem (Shlomo Bentin)
XI - 1999 Gent (André Vandierendonck)
XII - 2001 Edinburgh (Vicki Bruce & Robert Logie)
XIII - 2003 Granada (Teresa Bajo)
XIV - 2005 Leiden (Bernhard Hommel)

About the Society

ESCoP is a large Society with over 500 members, across a range of European countries and beyond. ESCoP's mission is "the furtherance of scientific enquiry within the field of Cognitive Psychology and related subjects, particularly with respect to collaboration and exchange of information between researchers in different European countries".

The Society encourages scientific research through the publication of the European Journal of Cognitive Psychology. Other forms of communication include less formal newsletters sent to all members, this website, and an electronic mailing list. The Society also promotes research through its regular conference meetings, has a highly successful program of summer schools, and provides funding for young researchers and activities. It has recently initiated research workshops to act as a catalyst for the establishment and networking of research groups in emerging areas of cognitive psychology.

The Society has a constitution and a committee who oversee the workings of the Society. From relatively humble beginnings, ESCoP has developed into a broad, successful and respected Society that promotes research in cognate subjects.

Society Committee:
Claus Bundesen (Copenhagen), President
Maria Teresa Bajo (Granada), Vice-president
Bernhard Hommel (Leiden), Treasurer
Diane Pecher (Rotterdam), Secretary
Geoffrey Underwood (Nottingham), Member
André Vandierendonck (Gent), Editor
Markus Knauff (Giessen), Member
Axel Cleeremans (Bruxelles), Member
Cristina Cacciari (Modena), Member
Iring Koch (Aachen), Member

ESCoP Membership

There are three types of membership within the Society: associated members (postgraduates or postdoctoral researchers who are developing their research career) full members and retired members.

Full membership is open to persons who are active and established researchers in some area of Cognitive Psychology. Such persons would normally have a Ph.D. or equivalent, and recent publications in refereed journals of psychology and cognate subjects. Exceptionally, at the discretion of the Committee, persons not fulfilling these criteria may be admitted to Full membership. Persons having Full membership shall be known as "Full members".

Associate membership is open to persons in the initial stages of their research careers and who are active researchers in some area of Cognitive Psychology. Such persons would normally be working on their Ph.D. (or equivalent). Associate membership would normally be limited to a maximum of five years. Any extension would be at the discretion of the Committee. Persons having Associate membership shall be known as "Associate members".

Retired membership Full members who retire can request a status of retired member. The committee defines the modalities under which this status is granted. Each year, the committee can elect a few full members for the status of honorary member. This status can be granted to full members who have been officers of the society and have contributed to the advancement of cognitive psychology in Europe. The duration of this status is limited in time. The committee defines the modalities (duration, how many each year, fees, …) under which honorary member status is granted.

CONDENSED SCHEDULE

		EVENTS	Grand Amphi
Wednesday Morning	10:00	Registration open 11.00-12.30 meeting: Women in Cognitive Science. Speaker: Virginia Valian.	
Wednesday Afternoon	14:00 16:00		Action planning
	16:45 17:00		Welcoming remarks
	17:00 18:00		Mary Potter (Massachusetts Institute of Technology) Keynote Lecture
	18:30	Opening Reception	
Thursday Morning	9:00 10:40		Numerical cognition
	11:00 13:00		Executive control
Thursday Afternoon	14:00 16:00		SYMPOSIUM: Motor timing and synchronization: behavioral and neurological evidences
	16:30 17:30		Claus Bundesen (University of Copenhagen) Broadbent Lecture
	17:30 19:30	POSTER SESSION I Salle de Conférence	
Friday Morning	9:00 10:40		SYMPOSIUM: Current Trends in Mathematical Cognition
	11:00 13:00		SYMPOSIUM: Task switching: Do we need a task-set?
Friday Afternoon	14:00 16:00		SYMPOSIUM: Limitations to concurrent processing
	16:30 17:30		Eric-Jan Wagenmakers (University of Amsterdam) Bertelson Lecture
	17:30 19:30	POSTER SESSION II Salle de Conférence	
Saturday Morning	9:00 10:40		SYMPOSIUM: The vulnerability of selective attention to disruption by sound: Varieties of auditory distraction 8:40-10:40
	11:00 13:00		Capacity limitations
Saturday Afternoon	14:00 16:00	POSTER SESSION III Salle de Conférence	
	16:00 17:00		James McClelland (Stanford University) Keynote Lecture
	17:00 17:30		Gretty Mirdal (University of Copenhagen) Funding of Cognitive Psychology in Europe: The European Research Council and the European Science Foundation
	17:30 18:30		Business Meeting
	19 :30	Conference Dinner Palais du Pharo	

		Amphi Péres	Amphi Charve (Physique)	Amphi Chimie	Amphi Sciences Naturelles
Wednesday Morning	10:00				
Wednesday Afternoon	14:00 16:00		SYMPOSIUM: Investigating the bilingual brain: evidence from behavioral, electrophysiological and imaging data	Memory I	SYMPOSIUM: Attentional limitations in the processing of sequential information
	16:30 17:00				
	17:00 18:00				
	18:30				
Thursday Morning	9:00 10:40	Spatial cognition	SYMPOSIUM: Orthographic Processing in Printed Word Perception III	Memory II 8:40-10:40	SYMPOSIUM: Neurocognitive correlates of Feature Integration
	11:00 13:00	SYMPOSIUM: Trends and perspectives on masked priming	Language comprehension	SYMPOSIUM: Cognitive Aging	SYMPOSIUM: Attention and saliency in the perception of real-world scenes
Thursday Afternoon	14:00 16:00	Learning	Language acquisition and dyslexia	SYMPOSIUM: Retrieval Processes in Episodic Memory	Attention I
	16:30 17:30				
	17:30 19:30				
Friday Morning	9:00 10:40	SYMPOSIUM: Implicit learning 8:40-10:40	Psycholinguistics	SYMPOSIUM: Perspectives on the role of inhibition in cognitive control 8:40-10:40	SYMPOSIUM: Linking attention and emotion: The establishment of human preference
	11:00 13:00	SYMPOSIUM: Manual and verbal action planning: Points of convergence	SYMPOSIUM: Modeling word recognition and reading aloud: beyond interactive activation	Higher mental processes	Attention II
Friday Afternoon	14:00 16:00	SYMPOSIUM: Cognitive mechanisms of language switching in bilingual speakers	Language production I	SYMPOSIUM: Intentionality and Causality Induced Temporal Binding	Perception and recognition
	16:30 17:30				
	17:30 19:30				
Saturday Morning	9:00 10:40	Bilingualism	Language production II	Emotion	Perception 8:40-10:40
	11:00 13:00	SYMPOSIUM: Working memory - European perspectives	Word and letter processing	SYMPOSIUM: Spatial Memory and Wayfinding: Cognitive and Neurocognitive Approaches	SYMPOSIUM: Temporal orienting
Saturday Afternoon	14:00 16:00				
	16:00 17:00				
	17:00 17:30				
	17:30 18:30				
	19:30				

WEDNESDAY AFTERNOON
14h – 16 h

Action planning, (1-6)
Grand Amphi

14:00-14:20	Adam, Moresi **(1)**
14:20-14:40	Nattkemper, Ziessler, Frensch **(2)**
14:40-15:00	Huestegge, Koch **(3)**
15:00-15:20	Ziessler, Nattkemper, Vogt **(4)**
15:20-15:40	D'ausilio, Brunetti, Delogu,Olivetti Belardinelli **(5)**
15:40-16:00	Christoffels, Van Den Wildenberg **(6)**

SYMPOSIUM: Investigating the bilingual brain: evidence from behavioral, electrophysiological and imaging data, (7-12)
Amphi Charve (Physique)

14:00-14:20	Kotz **(7)**
14:20-14:40	Indefrey **(8)**
14:40-15:00	Verhoef, Roelofs, Chwilla **(9)**
15:00-15:20	Rodriguez-Fornells, Mestres-Misse, Münte **(10)**
15:20-15:40	Frenck-Mestre, Foucart, Mclaughlin, Osterhout **(11)**
15:40-16:00	Costa, Strijkers **(12)**

Memory I, (13-18)
Amphi Chimie

14:00-14:20	Brennen, Dybdahl, Solberg **(13)**
14:20-14:40	Groome, Sterkaj **(14)**
14:40-15:00	Camp, Pecher, Schmidt **(15)**
15:00-15:20	Aslan, Bäuml **(16)**
15:20-15:40	Brandimonte, Ferrante, Bianco, Villani **(17)**
15:40-16:00	Marsh, Hughes, Jones **(18)**

SYMPOSIUM: Attentional limitations in the processing of sequential information, (19-24)
Amphi Sciences Naturelles

14:00-14:20	Dell'acqua, Pluchino, Jolicoeur **(19)**
14:20-14:40	Olivers, Meeter **(20)**
14:40-15:00	Ptito, Arnell, Jolicoeur, Macleod **(21)**
15:00-15:20	Wyble, Bowman, Nieuwenstein **(22)**
15:20-15:40	Tremblay, Vachon **(23)**
15:40-16:00	Colzato, Spape, Pannebakker, Hommel **(24)**

THURSDAY MORNING
9h – 13 h

Numerical cognition, (25-29)
Grand Amphi

9:00-9:20	Sedek, Brzezicka **(25)**
9:20-9:40	Lendinez, Pelegrina, Lechuga **(26)**
9:40-10:00	Herrera, Macizo, Semenza **(27)**
10:00-10:20	Thevenot, Barrouillet **(28)**
10:20-10:40	Cohen Kadosh, Cohen Kadosh, Kaas, Henik, Goebel **(29)**

Spatial cognition, (31-34)
Amphi Péres

9:00-9:20	Burigo, Sacchi, Coventry **(31)**
9:20-9:40	Olivetti, Delogu, Palmiero, Pasqualotto, Federici, Plaisant **(32)**
9:40-10:00	Price **(33)**
10:00-10:20	Burigo, Rothkopf **(34)**

SYMPOSIUM: Orthographic Processing in Printed Word Perception III, (35-39)
Amphi Charve (Physique)

9:00-9:20	Gomez, Ratcliff, Perea **(35)**
9:20-9:40	Van Heuven, Grainger **(36)**
9:40-10:00	Whitney, Cornelissen **(37)**
10:00-10:20	Davis, Lupker, Perea **(38)**
10:20-10:40	Norris, Kinoshita **(39)**

Memory II, (40-45)
Amphi Chimie

8:40-9:00	Barber, Rajaram, Marsh **(40)**
9:00-9:20	Boldini, Algarabel, Ibañez, Bajo (**41)**
9:20-9:40	Koriat, Pansky, Goldsmith **(42)**
9:40-10:00	Dewhurst, Bould **(43)**
10:00-10:20	Sweklej, Pochwatko, Balas, Godlewska **(44)**
10:20-10:40	Tunney, Fernie **(45)**

SYMPOSIUM: Neurocognitive correlates of Feature Integration, (46-50)
Amphi Sciences Naturelles

9:00-9:20	Colzato, Hommel **(46)**
9:20-9:40	Keizer, Colzato, Teeuwisse, Rombouts, Hommel **(47)**
9:40-10:00	Van Wouwe, Band, Ridderinkhof, Hommel **(48)**
10:00-10:20	Raffone, Wolters **(49)**
10:20-10:40	Fagioli, Ferlazzo, Hommel **(50)**

Executive control, (51-56)
Grand Amphi

11:00-11:20	Necka **(51)**
11:20-11:40	Soetens, Maetens, Zeishka **(52)**
11:40-12:00	Verbruggen, Logan **(53)**
12:00-12:20	Los **(54)**
12:20-12:40	Postal, Lallemand **(55)**
12:40-13:00	Pravettoni, Lucchiari, Vago **(56)**

SYMPOSIUM: Trends and perspectives on masked priming, (57-62)
Amphi Péres

11:00-11:20	Ansorge, Becker, Breitmeyer **(57)**
11:20-11:40	Dehaene, Delcul **(58)**
11:40-12:00	Schlaghecken **(59)**
12:00-12:20	Reynvoet, Vandenbussche, Van Den Noortgate **(60)**
12:20-12:40	Elsner, Kunde, Kiesel **(61)**
12:40-13:00	Kiesel, Pohl, Kunde, Berner, Hoffmann **(62)**

Language comprehension, (63-67)
Amphi Charve (Physique)

11:00-11:20	Molinaro, Vespignani, Canal, Cacciari **(63)**
11:20-11:40	Van Mulken, Ernestus **(64)**
11:40-12:00	Lee, Goldrick **(65)**
12:00-12:20	Bernardis, Salillas, Caramelli **(66)**
12:20-12:40	Pecher, Zanolie, Van Dantzig, Zwaan, Zeelenberg **(67)**

SYMPOSIUM: Cognitive Aging, (68-71)
Amphi Chimie

11:00-11:20	Ballesteros, Sebastian, Manso, Mayas, Muñoz **(68)**
11:20-11:40	Belleville, Jolicoeur, Gauthier **(69)**
11:40-12:00	Collette, Germain, Stawarczyk **(70)**
12:00-12:20	Chicherio, Li, Lindenberger **(71)**

SYMPOSIUM: Attention and saliency in the perception of real-world scenes, (72-77)
Amphi Sciences Naturelles

11:00-11:20	Mennie, Underwood **(72)**
11:20-11:40	Chauvin, Guyader, Herault, Marendaz **(73)**
11:40-12:00	Foulsham, Underwood **(74)**
12:00-12:20	Kingstone, Birmingham, Bischof **(75)**
12:20-12:40	Humphrey, Underwood **(76)**
12:40-13:00	Tatler, Vincent **(77)**

THURSDAY AFTERNOON

ORAL PRESENTATIONS
14h-16h

SYMPOSIUM: Motor timing and synchronization: behavioral and neurological evidences, (78-83)
Grand Amphi
- 14:00-14:20 Gepshtein, Seydell, Trommershaeuser **(78)**
- 14:20-14:40 Eerola, Luck, Toiviainen **(79)**
- 14:40-15:00 Ruspantini, Chistolini, Olivetti Belardinelli **(80)**
- 15:00-15:20 Wing, Doumas, Welchman **(81)**
- 15:20-15:40 D'ausilio **(82)**
- 15:40-16:00 Jirsa **(83)**

Learning, (84-89)
Amphi Péres
- 14:00-14:20 Schmidt-Hansen, Killcross, Honey **(84)**
- 14:20-14:40 Huizinga, Van Der Molen **(85)**
- 14:40-15:00 De Bruin, Rikers, Schmidt **(86)**
- 15:00-15:20 Vaquero, Jimenez, Gonzalez, Madrid, Lupianez **(87)**
- 15:20-15:40 Meo, Marucci **(88)**
- 15:40-16:00 Tillmann, Poulin-Charronnat **(89)**

Language acquisition and dyslexia, (90-95)
Amphi Charve (Physique)
- 14:00-14:20 Holmes **(90)**
- 14:20-14:40 Duncan, Grieve **(91)**
- 14:40-15:00 Pleh, Lukacs, Racsmany **(92)**
- 15:00-15:20 Delogu, Lampis, Olivetti **(93)**
- 15:20-15:40 Kempe, Schaeffler **(94)**
- 15:40-16:00 Lowenthal **(95)**

SYMPOSIUM: Retrieval Processes in Episodic Memory, (96-101)
Amphi Chimie
- 14:00-14:20 Bäuml, Aslan, Kuhbandner, Pastötter **(96)**
- 14:20-14:40 Sahakyan **(97)**
- 14:40-15:00 Racsmany, Conway, Albu, Zimmer, Kovacs, Krajcsi **(98)**
- 15:00-15:20 Bergström, Richardson-Klavehn **(99)**
- 15:20-15:40 Bajo, Gomez-Ariza, Fernandez **(100)**
- 15:40-16:00 Macleod **(101)**

Attention I, (102-107)
Amphi Sciences Naturelles
- 14:00-14:20 Akyurek, Riddell, Toffanin, Hommel **(102)**
- 14:20-14:40 Wyble, Bowman, Potter **(103)**
- 14:40-15:00 Belopolsky, Theeuwes **(104)**
- 15:00-15:20 Wühr **(105)**
- 15:20-15:40 Skarratt, Cole, Kingstone **(106)**
- 15:40-16:00 Vivas **(107)**

POSTER SESSION I (1001-1140)
17h30-19h30 - Salle de Conférence

APPLIED COGNITIVE PSYCHOLOGY I
- (1001) Gufoni, Dacremont
- (1002) Luna, Migueles
- (1003) Cunha, Albuquerque, Freire
- (1004) Guerin - Presselin, Versace, Champelovier
- (1005) Huertas, Zahonero, Pablos, Callejas, Navarro, Lupiañez
- (1006) Tabacaru
- (1007) Guzman Muñoz, Kuijper, Johnson

ATTENTION I
- (1008) Arend, Ward
- (1009) Caparos, Linnell
- (1010) Asanowicz
- (1011) Cappucci, Correa, Nobre, Funes, Lupiañez
- (1012) Arnal, Liger, Michael
- (1013) Petersen, Kyllingsbæk, Bundesen
- (1014) Cullen, Mari-Beffa
- (1015) Fagioli, Sdoia, Ferlazzo
- (1016) Antonucci, Girardi, Di Nocera
- (1017) Torralbo, Scalf, Beck, Kramer
- (1018) Botta, Santangelo, Raffone, Lupianez, Olivetti-Belardinelli
- (1019) Kalogeropoulou, Vivas, Woodruff

BILINGUALISM I
- (1020) Macizo, Bajo, Martin
- (1021) Brenders, Van Hell, Dijkstra
- (1022) Laxen, Lavaur
- (1023) Her, Koo, Nam
- (1024) Schoonbaert, Holcomb

COGNITIVE AGING I
- (1025) Megina, Gomez-Ariza
- (1026) Riby, Marriott, Bullock, Hancock, Smallwood, Mclaughlin
- (1027) Taconnat, Sacher, Froger, Souchay, Fay, Isingrini
- (1028) Tournier, Postal, Mathey
- (1029) Lapre, Postal, Mathey
- (1030) Bottiroli, Dunlosky, Guerini
- (1031) Moutier, Jabouley, Ergis

COGNITIVE DEVELOPMENT I
- (1032) Riby, Hancock
- (1033) Fagot, Dirk, Ghisletta, De Ribaupierre
- (1034) Verschoor, Coalter, Biro, Hommel
- (1035) Cartoni, De Martino, Mignani, Castelli
- (1036) Chevalier
- (1037) Neimer, Fernadez, Lecerf

EMOTION I
- (1038) Igoa, Chico, Martin, Bautista
- (1039) Syssau, Monnier
- (1040) Choi, Nam
- (1041) Nørby
- (1042) Grzegrzolka, Sweklej, Balas
- (1043) Ferreira, Esteves

EPISODIC MEMORY I
- (1044) Huenefeldt, Furia, Rossi-Arnaud
- (1045) Zeeuws, Deroost, Soetens
- (1046) Bergström, De Fockert, Richardson-Klavehn

(1047) Albu, Racsmany
(1048) Pastötter, Hanslmayr, Bäuml
(1049) Olivetti Belardinelli, Nardo, Veit, Birbaumer

IMPLICIT LEARNING I
(1050) Wierzchon, Gaillard, Asanowicz
(1051) Porsius, Poletiek
(1052) Scott, Dienes
(1053) Poplawska
(1054) Gheysen, Gevers, Fias

LANGUAGE COMPREHENSION I
(1055) Fraga, Piñeiro, Acuña, Redondo
(1056) Belacchi, Cubelli
(1057) Signoret, Tillmann, Grimault, Garcia, Perrin
(1058) Baroni, Freina, Borghi, Nicoletti
(1059) Kwon, Nam
(1060) Delle Luche, Van Gompel, Gayraud, Martinie

LONG-TERM MEMORY
(1061) Bonnotte, Casalis
(1062) Carneiro, Albuquerque, Fernandez
(1063) Hoffman, Tzelgov
(1064) Roye, Jacobsen, Schröger
(1065) Carneiro, Dias, Fernandez

MEMORY I
(1066) Iglesias-Parro, Ortega, Arias Orduña
(1067) Natali, Mastroberardino, Marucci
(1068) Zaballos, Alonso, Fernandez, Diez
(1069) Groome, Pipilis
(1070) Beato, Diez, Gozalo, Rodriguez
(1071) Oliveira, Albuquerque, Machado
(1072) Senese, Nigro, Cicogna, Cosenza, Sergi
(1073) Oczak
(1074) Marcatto, Ferrante, Pelizzon, Brandimonte
(1075) Bredart, Daury
(1075b) Graham, Riby

MOTOR CONTROL
(1076) Skalska
(1077) Massen, Herwig
(1078) Moresi, Adam, Rijcken, Van Gerven
(1079) Rieger
(1080) Berner, Hoffmann
(1081) Tessari, Gade, Rumiati
(1082) Walsh, Haggard
(1083) Paelecke, Kunde
(1084) Meynier, Davranche, Roger, Burle, Vidal, Hasbroucq

NUMERICAL COGNITION I
(1085) Notebaert, Reynvoet
(1086) Macizo, Herrera
(1087) Content, Nys, Content
(1088) Núñez-Peña,
(1089) Perrone, De Hevia, Girelli
(1090) Gertner, Henik, Cohen-Kadosh
(1091) Damas-Lopez, Garcia-Orza

PERCEPTION AND ACTION I
(1092) Dietrich, Rieger, Prinz
(1093) Somsen, Van Der Molen
(1094) Spape, Hommel
(1095) Cardinali, Frassinetti, Brozzoli, Roy, Urquizar, Farne'
(1096) Wykowska, Hommel, Schubö
(1097) Bidet-Ildei, Meary, Orliaguet

REASONING
(1098) Sevenants, Schroyens, Dieussaert, Schaeken, D'ydewalle
(1099) Gauffroy, Barrouillet, Lecas
(1100) Sacchi, Cioffi
(1101) Kubik, Nocka
(1102) Schmeltzer, Markovits
(1103) Gomez-Veiga, Garcia Madruga, Moreno Ríos
(1104) Egan, Byrne
(1105) Schaeken, Garcia Madruga

SPATIAL COGNITION I
(1106) Van Der Ham, Van Wezel, Oleksiak, Postma
(1107) De Goede, Postma
(1108) Cazzato, Cutini, Basso, Bisiacchi
(1109) Delpech, Huguet, Chanal, Caverni, Fantoni
(1110) Picucci, D'angelo, Di Leo, Filannino, Bosco

SPEECH PERCEPTION
(1111) Giroux, Rey
(1112) Dumay, Content, Radeau
(1113) Bagou, Content, Frauenfelder
(1114) Navarra, Spence, Soto-Faraco
(1115) Andics, Mcqueen, Van Turennout
(1116) Dufour, Frauenfelder
(1117) Vicente, Castro
(1118) Jacquier, Meunier
(1119) Perre, Midgley, Ziegler

VISUAL PERCEPTION I
(1120) Touzalin-Chretien, Ehrler, Dufour
(1121) Streff, Ferrier, Jimenez
(1122) Fonteneau, Davidoff
(1123) Sassi, Thierry
(1124) Wakisaka, Gunji, Ohta
(1125) Ben Abbes, Ripoll

WORD AND LETTER PROCESSING I
(1126) Pitchford, Wagstaffe
(1127) Mathey, Gobin
(1128) Ktori, Pitchford
(1129) Dusautoir, Casalis, Ducrot
(1130) Marinelli, Notarnicola, Angelelli
(1131) Hutzler, Braun, Münte, Rotte, Jacobs
(1132) Jung, Nam, Im
(1133) Acha, Perea
(1134) Marzouki, Midgley, Holcomb, Grainger

WORKING MEMORY I
(1135) Lecerf, Fernandez
(1136) Robert, Fagot, Lecerf, De Ribaupierre
(1137) Olszanowski, Balas
(1138) Donnadieu, Roulin, Fournet
(1139) Lucidi, Lefevre, Cestari, Rossi-Arnaud
(1140) Gimmig, Huguet, Caverni, Barrouillet, Lepine

FRIDAY MORNING
9h – 13h

SYMPOSIUM: Current Trends in Mathematical Cognition, (108-112)
Grand Amphi

9:00-9:20	Campbell, Metcalfe **(108)**
9:20-9:40	Imbo, Vandierendonck **(109)**
9:40-10:00	Camos **(110)**
10:00-10:20	Lemaire, Depestel, Hodzik, Lecacheur **(111)**
10:20-10:40	Luwel, Verschaffel, Onghena **(112)**

SYMPOSIUM: Implicit learning, (113-118)
Amphi Péres

8:40-9:00	Van Den Bos, Poletiek **(113)**
9:00-9:20	Monaghan, Merkx **(114)**
9:20-9:40	Dienes **(115)**
9:40-10:00	Deroost, Zeeuws, Soetens **(116)**
10:00-10:20	Destrebecqz, Vandenberghe, Chambaron, Fery, Cleeremans **(117)**
10:20-10:40	Poletiek, Caljouw, Van Dam **(118)**

Psycholinguistics, (119-123)
Amphi Charve (Physique)

9:00-9:20	Schweppe, Rummer, Fürstenberg **(119)**
9:20-9:40	Ernestus, Baayen **(120)**
9:40-10:00	Rummer, Schweppe, Fürstenberg **(121)**
10:00-10:20	Vitu, Lancelin, Marrier D'Unienville **(122)**
10:20-10:40	Bard, Hill, Nicol,Carletta **(123)**

SYMPOSIUM: Perspectives on the role of inhibition in cognitive control, (124-129)
Amphi Chimie

8:40-9:00	Hasbroucq, Davranche, Tandonnet, Meynier, Vidal, Burle **(124)**
9:00-9:20	Garavan, **(125)**
9:20-9:40	Forstmann, Van Den Wildenberg, Ridderinkhof **(126)**
9:40-10:00	Huguet, Sharma, Dumas, Booth, Brown **(127)**
10:00-10:20	Gevers, D'hooge, Notebaert, Verbruggen, Van Den Wildenberg **(128)**
10:20-10:40	Van Den Wildenberg, Burle,Hasbroucq, Vidal, Van Der Molen, Ridderinkhof **(129)**

SYMPOSIUM: Linking attention and emotion: The establishment of human preference, (130-134)
Amphi Sciences Naturelles

9:00-9:20	Shapiro, Raymond, Goolsby **(130)**
9:20-9:40	Raymond, Goolsby, Shapiro **(131)**
9:40-10:00	Eimer, Kiss **(132)**
10:00-10:20	Silvert, Nobre **(133)**
10:20-10:40	Taylor, Fragopanagos **(134)**

SYMPOSIUM: Task switching: Do we need a task-set?, (135-140)
Grand Amphi

11:00-11:20	Philipp, Jolicoeur, Falkenstein, Koch **(135)**
11:20-11:40	Meiran, Kessler, Cohen-Kdoshai, Elenbogen **(136)**
11:40-12:00	Steinhauser, Hübner **(137)**
12:00-12:20	Monsell, Mizon **(138)**
12:20-12:40	Logan, Schneider **(139)**
12:40-13:00	Liefooghe, Verbruggen, Vandierendonck **(140)**

SYMPOSIUM: Manual and verbal action planning: Points of convergence, (141-145)
Amphi Péres

11:00-11:20	Tubau **(141)**
11:20-11:40	Cleeremans, Sarrazin, Haggard **(142)**
11:40-12:00	Kray, Karbach, Eber **(143)**
12:00-12:20	Hartsuiker **(143b)**
12:20-12:40	Ganushchak, Schiller **(144)**
12:40-13:00	Hernandez, Costa, Sebastian-Galles **(145)**

SYMPOSIUM: Modeling word recognition and reading aloud: beyond interactive activation, (146-150)
Amphi Charve (Physique)

11:00-11:20	Jacobs **(146)**
11:20-11:40	Davis **(147)**
11:40-12:00	Dufau, Grainger, Ziegler, Touzet, Lete, Glotin **(148)**
12:00-12:20	Coltheart, Besner, Rastle **(149)**
12:20-12:40	Zorzi, Perry, Ziegler **(150)**

Higher mental processes, (151-156)
Amphi Chimie

11:00-11:20	Egan, Sarma, Mcgann, Breen, Doyle **(151)**
11:20-11:40	Thompson **(152)**
11:40-12:00	Stahl, Klauer, Erdfelder **(153)**
12:00-12:20	Vargas, Moreno-Rios, Castro, Underwood **(154)**
12:20-12:40	Besancon, Lubart **(155)**
12:40-13:00	Mcgann **(156)**

Attention II (157-162)
Amphi Sciences Naturelles

11:00-11:20	Band, 'T Hart, Jepma, Nieuwenhuis **(157)**
11:20-11:40	Triviño, Arnedo, Correa, Funes, Lupiañez **(158)**
11:40-12:00	Ferlazzo, Fagioli, Sdoia, Di Nocera **(159)**
12:00-12:20	Ruz, Nobre **(160)**
12:20-12:40	Couyoumdjian, Trincas, Carni, Di Pace **(161)**
12:40-13:00	Kiss, Jolicoeur, Eimer **(162)**

FRIDAY AFTERNOON

ORAL PRESENTATIONS
14h-16h

SYMPOSIUM: Limitations to concurrent processing, (163-168)
Grand Amphi
14:00-14:20 Brisson, Leblanc, Jolicoeur **(163)**
14:20-14:40 Cohen, Magen **(164)**
14:40-15:00 Pannebakker, Band, Ridderinkhof, Hommel **(165)**
15:00-15:20 Oberauer, Göthe, Kliegl **(166)**
15:20-15:40 Schubert, Stelzel, Strobach, Szameitat **(167)**
15:40-16:00 Koch **(168)**

SYMPOSIUM: Cognitive mechanisms of language switching in bilingual speakers, (169-174)
Amphi Péres
14:00-14:20 Dussias, Gerfen **(169)**
14:20-14:40 Kootstra, Van Hell, Dijkstra **(170)**
14:40-15:00 Gullberg, Indefrey, Muysken **(171)**
15:00-15:20 Elston-Güttler, Gunter **(172)**
15:20-15:40 Bajo, Ibañez, Macizo **(173)**
15:40-16:00 Kroll, Bobb, Misra, Guo **(174)**

Language production I, (175-180)
Amphi Charve (Physique)
14:00-14:20 Belke, Gieselmann **(175)**
14:20-14:40 Ayora, Alario **(176)**
14:40-15:00 Roelofs **(177)**
15:00-15:20 Hantsch, Mädebach, Jescheniak **(178)**
15:20-15:40 Katz, Hussey **(179)**
15:40-16:00 Vucetic, Plunkett, Westermann **(180)**

SYMPOSIUM: Intentionality and Causality Induced Temporal Binding, (181-186)
Amphi Chimie
14:00-14:20 Haggard **(181)**
14:20-14:40 Moore, Wegner, Haggard **(182)**
14:40-15:00 Eagleman **(183)**
15:00-15:20 Waszak, Herwig **(184)**
15:20-15:40 Humphreys, Buehner **(185)**
15:40-16:00 Buehner, Humphreys **(186)**

Perception and recognition, (187-192)
Amphi Sciences Naturelles
14:00-14:20 Lander, Davies **(187)**
14:20-14:40 Jüttner, Müller, Rentschler **(188)**
14:40-15:00 Kuhn, Kingstone **(189)**
15:00-15:20 Weston, Lewis, Wise **(190)**
15:20-15:40 Lewis, Hills **(191)**
15:40-16:00 Brunetti, Tirinelli, Olivetti-Belardinelli **(192)**

POSTER SESSION II (2001-2145) - 17h30-19h30 - Salle de Conférence

APPLIED COGNITIVE PSYCHOLOGY II
(2001) Nadarevic
(2002) Mcdowall, Bolter
(2003) Timmers, Brandmeyer, Desain
(2004) Huertas, Moratal, Portoles, Delgado, Zahonero, Lupiañez
(2005) Behzadi, Ekhtiari, Mokri, Oghabian
(2006) Albert, Hardouin, Pellen-Blin, Duflos-Frichot, Anderbuecken, Ripoll
(2007) Wilschut, Rinkenauer

ATTENTION II
(2008) Bausenhart, Rolke, Ulrich
(2009) Chica, Taylor, Lupiañez, Klein
(2010) Grimm, Schröger, Bendixen, Bäß, Roye, Deouell
(2011) Chiaramonte, Rousset
(2012) Chennu, Craston, Wyble, Bowman
(2013) Henderickx, Maetens, Soetens
(2014) Carni, Couyoumdjian
(2015) Fernandez, Philippe, Frechet, Michael
(2016) Tessari, Ottoboni, Bazzarin
(2017) Chajut, Schupak, Caspi, Algom
(2018) Michael, Meuter
(2019) Boenke, Ohl, Nikolaev, Lachmann, Van Leeuwen

BILINGUALISM II
(2020) Roman, Bajo
(2021) Hristova, Janyan
(2022) Strijkers, Costa, Santesteban, Hartsuiker, Escera
(2023) Ugen, Bode, Leybaert
(2024) Inurritegui, University Of Leuven
(2025) Gómez Veiga, Suárez Riveiro
(2026) Paolieri, Cubelli, Macizo, Bajo, Lotto, Job

COGNITIVE AGING II
(2027) Ludwig, Borella, De Ribaupierre
(2028) Guerdoux, Martin, Dressaire, Brouillet
(2029) Dorot, Mathey, Robert
(2030) Lestremau, Postal, Laliette
(2031) Bottiroli, Cavallini, Lecce, Palladino

DYSLEXIA I
(2032) Quemart, Casalis
(2033) Jucla, Chaix, Iannuzzi, Nespoulous, Demonet
(2034) Lassus-Sangosse, Valdois
(2035) Lallier, Donnadieu, Valdois
(2036) Prado, Valdois
(2037) Dubois, Prado, Valdois, Kyllingsbæk

EMOTION II
(2038) Khalfa, Peretz, Guye, Chauvel, Liegeois-Chauvel
(2039) Czernecka, Wierzchon, Asanowicz
(2040) Pecher, Lemercier, Cellier, Delgas
(2041) Van Dantzig, Boot, Pecher
(2042) Choi, Nam
(2043) Delcor, Brouillet, Brouillet

EPISODIC MEMORY II
(2044) Schütz, Bröder
(2045) Bould, Dewhurst
(2046) Lee, Huang
(2047) Coluccia, Bianco, Brandimonte
(2048) Holm, Mäntylä

EXECUTIVE CONTROL I
(2049) Belacchi, Carretti, Cornoldi
(2050) Crescentini, Del Missier, Shallice
(2051) Karbach, Kray
(2052) Wetzel, Widmann, Schröger
(2053) Grana, Gamboz, Biasutti, Semenza
(2054) Ellenbogen, Meiran
(2055) Nigbur, Stürmer
(2056) Er-El, Meiran

HIGHER MENTAL PROCESSES
(2057) Volf, Razumnikova, Tarasova, Onishenko
(2058) Razumnikova, Volf, Tarasova
(2059) Marucci, Inguscio, Valeri
(2060) Palmiero, Olivetti Belardinelli, Sestieri, Londei, D'ausilio, Di Matteo
(2061) Gonzalez, Esteves, Soares

IMPLICIT LEARNING II
(2062) Lukacs, Krajcsi, Nemeth, Kemeny
(2063) Kemeny, Lukacs
(2064) Faber, Sürer, Hinz, Bötzel, Danek
(2065) Schiffer
(2066) Guzman Muñoz, Johnson

LANGUAGE ACQUISITION
(2067) Bonnotte, Negro, Fayol, Lete
(2068) Zourou, Ecalle, Magnan, Sanchez
(2069) Janiot, Casalis
(2070) Verbrugge
(2071) Mermillod, Bonin, Roux, Ferrand, Meot
(2072) De Diego Balaguer, Andre, Rodriguez Fornells, Bachoud-Levi
(2073) Cochran

LANGUAGE COMPREHENSION II
(2074) Renau Op't'hoog, Tapiero
(2075) De Martino, Postiglione, Laudanna
(2076) Taffin, Brouillet
(2077) Scorolli, Borghi
(2078) Grataloup, Hoen, Meunier, Pellegrino, Veuillet, Collet
(2079) Ivady, Pleh
(2080) Di Domenico, Di Matteo, Perfetti, Francesca, Marco

LANGUAGE PRODUCTION I
(2081) Oliveira, Cunha, Albuquerque
(2082) Cook, Meyer
(2083) Oppermann, Jescheniak, Schriefers
(2084) Koo, Nam
(2085) Janssen, Schirm, Mahon, Caramazza
(2086) Janssens, Severens, Hartsuiker
(2087) Gerfen, Yudes, Bajo
(2088) Vucetic, Westermann, Plunkett
(2089) Peeva, Guenther, Anton, Nazarian, Alario

MEMORY II
(2090) Albuquerque, Gouveia, Freire
(2091) Chiara, Di Mauro, Mammarella, Cornoldi
(2092) Espinosa, Bajo, Tudela
(2093) Jin, Logie, Corley
(2094) Spataro, Mari, Rossi-Arnaud
(2095) Cerf-Ducastel, Murphy

NUMERICAL COGNITION II
(2096) Kallai, Tzelgov
(2097) De Brauwer, Fias
(2098) Macizo, Herrera, Ibañez
(2099) Herrera, Macizo, Cabrera
(2100) Naparstek, Henik
(2101) Krajcsi, Janacsek, Igacs

PERCEPTION AND ACTION II
(2102) Jepma, Wagenmakers, Nieuwenhuis
(2103) Nishimura, Ariga, Ono, Yokosawa
(2104) Girardi, Lindemann, Bekkering
(2105) Gillmeister, Badets, Heyes
(2106) Buczny, Sterczynski
(2107) Schuch, Bayliss, Tipper
(2108) Ohla, Gruber, Müller

PRIMING I
(2109) Van Den Bussche, Reynvoet, Van Den Noortgate
(2110) Fay, Isingrini, Taconnat, Pouthas
(2111) Bermeitinger, Frings, Wentura
(2112) Pimentel, Albuquerque
(2113) Juravle, Schubö
(2114) Reuter, Del Cul, Audoin, Malikova, Naccache, Ranjeva

SHORT-TERM MEMORY
(2115) Ferrari, Palladino
(2116) Corbin, Marquer
(2117) Monnier, Syssau
(2118) Alrik Sørensen
(2119) Fournet, Donnadieu

SPATIAL COGNITION II
(2120) Bednarek
(2121) Cattaneo, Vecchi, Monegato, Pece, Cornoldi
(2122) Núñez-Peña, Aznar-Casanova
(2123) Boot, Pecher
(2124) Picucci, Gyselinck, Lefevre, Nicolas, Piolino
(2125) Sepe, Trojano, Committeri, Grossi, Romani, Galati

TASK SWITCHING I
(2126) Gade, Koch
(2127) Smigasiewicz, Wierzchon
(2128) Van Loy, Liefooghe, Vandierendonck
(2129) Cooper, Mari-Beffa
(2130) Lukas, Philipp, Koch
(2131) Lallemand, Postal, Wawrzyniak, Charles
(2132) Wawrzyniak, Fabrigoule, Bouvard, Lallemand
(2133) Bonnin, Bouquet

WORD AND LETTER PROCESSING II
(2134) Lee
(2135) Casalis, Cole, Ducrot, Bouton, Marion
(2136) Paul, Andrews
(2137) Peressotti, Mulatti, Job
(2138) Crepaldi, Coltheart, Nickels
(2139) Yu, Kim, Chung, Nam
(2140) Seva, Monaghan, Arciuli

WORKING MEMORY II
(2141) Kessler, Meiran
(2142) Loncke, Desmet, Vandierendonck, Hartsuiker
(2143) Vergauwe, Barrouillet, Camos
(2144) Kalakoski, Therman, Lehtinen
(2145) Nemeth, Ivady, Mihaltz, Peckham, Krajcsi, Pleh

SATURDAY MORNING
9h-13h

SYMPOSIUM: The vulnerability of selective attention to disruption by sound: Varieties of auditory distraction, (193-198)

Grand Amphi

8:40-9:00	Lavie **(193)**
9:00-9:20	Sanmiguel, Escera **(194)**
9:20-9:40	Buchner, Bell, Rothermund, Wentura **(195)**
9:40-10:00	Hughes, Vachon, Jones **(196)**
10:00-10:20	Muller-Gass, Schröger **(197)**
10:20-10:40	Macken, Phelps, Jones **(198)**

Bilingualism, (199-203)

Amphi Péres

9:00-9:20	Feldman, Basnight-Brown **(199)**
9:20-9:40	Sanchez-Casas, Davis, Gracia-Albea, Guasch, Ferre **(200)**
9:40-10:00	Van Heuven, Conklin **(201)**
10:00-10:20	Van Assche, Duyck, Hartsuiker **(202)**
10:20-10:40	Ivanova, Costa **(203)**

Language production II, (204-208)

Amphi Charve (Physique)

9:00-9:20	Cholin, Bertz, Miozzo **(204)**
9:20-9:40	Mahon, Costa, Caramazza **(205)**
9:40-10:00	Malpass, Meyer **(206)**
10:00-10:20	Janssen, Alario, Caramazza **(207)**
10:20-10:40	La Heij, Boelens, Kuipers **(208)**

Emotion, (209-213)

Amphi Chimie

9:00-9:20	Tipples **(209)**
9:20-9:40	Underwood, Willison **(210)**
9:40-10:00	Uzer, Gülgöz **(211)**
10:00-10:20	Zeelenberg, Bocanagra **(212)**
10:20-10:40	Balas, Sweklej, Pochwatko, Godlewska **(213)**

Perception, (214-219)

Amphi Péres

8:40-9:00	Kyllingsbæk, Valla, Vanrie, Bundesen **(214)**
9:00-9:20	Boloix, Bastien **(215)**
9:20-9:40	Hübner **(216)**
9:40-10:00	Borghi, Valentina, Tessari, Nicoletti **(217)**
10:00-10:20	Basso, Ricciardi, Bonino, Sani, Guazzelli, Vecchi **(218)**
10:20-10:40	Busch, Fründ, Herrmann **(219)**

Capacity limitations, (220-225)

Grand Amphi

11:00-11:20	Habekost, Vogel, Rostrup, Bundesen, Waldemar **(220)**
11:20-11:40	Luria, Sessa, Gotler, Jolicoeur, Dell'acqua **(221)**
11:40-12:00	Chuderski, Orzechowski, Stettner **(222)**
12:00-12:20	Martens, Valchev **(223)**
12:20-12:40	Lavie, Forster **(224)**
12:40-13:00	Coltheart, Yen **(225)**

SYMPOSIUM: Working memory - European perspectives, (226-231)

Amphi Péres

11:00-11:20	Baddeley, Allen, Hitch **(226)**
11:20-11:40	Camos, Portrat, Bernardin,Vergauwe, Barrouillet **(227)**
11:40-12:00	Logie, Brockmole, Vandenbroucke **(228)**
12:00-12:20	Oberauer, Lange **(229)**
12:20-12:40	Towse, Hitch, Horton **(230)**
12:40-13:00	Vandierendonck, Szmalec **(231)**

Word and letter processing, (232-237)

Amphi Charve (Physique)

11:00-11:20	Carreiras, Gillon-Dowens, Vergara, Perea **(232)**
11:20-11:40	Schiller, Kinoshita **(233)**
11:40-12:00	Doignon-Camus, Zagar **(234)**
12:00-12:20	Lima, Castro **(235)**
12:20-12:40	New, Grainger, Boibieux **(236)**
12:40-13:00	Smolka, Gondan, Rösler **(237)**

SYMPOSIUM: Spatial Memory and Wayfinding: Cognitive and Neurocognitive Approaches, (238-243)

Amphi Chimie

11:00-11:20	Bullens, Nardini, Doeller, Braddick, Postma, Burgess **(238)**
11:20-11:40	Denis, Afonso **(239)**
11:40-12:00	Guariglia, Piccardi, Iaria **(240)**
12:00-12:20	Meilinger, Riecke, Bülthoff **(241)**
12:20-12:40	Fouquet, Igloi, Berthoz, Rondi-Reig **(242)**
12:40-13:00	Viard, Doeller, Bird,Burgess **(243)**

SYMPOSIUM: Temporal orienting, (244-249)

Amphi Sciences Naturelles

11:00-11:20	Wagener, Hoffmann **(244)**
11:20-11:40	Coull, Craig, Goulon,Nazarian, Vidal **(245)**
11:40-12:00	Rolke, Bausenhart, Ulrich **(246)**
12:00-12:20	Correa, Kane, Lupiañez, Nobre **(247)**
12:20-12:40	Lange, Heil **(248)**
12:40-13:00	Nobre, Rao, Correa **(249**

SATURDAY AFTERNOON
14h-16h

POSTER SESSION III (3001-3136) - Salle de Conférence

ATTENTION III
(3001) Rattat, Fortin, Schweickert
(3002) Chica, Christie
(3003) Dewhurst, Crundall
(3004) Zhao, Heinke, Humphreys
(3005) Yeari, Goldsmith
(3006) Frings, Bader
(3007) Zeischka, Maetens, Soetens
(3008) Stadler, N'Diaye, Ragot, Klimesch, Tallon-Baudry, Pouthas
(3009) Schubö, Dinkelbach, Akyurek
(3010) Fernandez, Garcia, Michael
(3011) Cosmelli, Lopez, Lopez-Calderon, Renault, Martinerie, Aboitiz
(3012) Ahmed, De Fockert, Chamorro-Premuzic
(3013) Ben Abbes, Ripoll

AUDITORY PERCEPTION
(3014) Widmann, Schröger
(3015) Petrova, Ziegler, Ferrand
(3016) Sperduti, Veit, Caria, Belardinelli, Birbaumer, Olivetti Belardinelli
(3017) Kirmse, Schröger, Jacobsen
(3018) Van Der Hoeven, Bronkhorst, Verhave
(3019) Marmel, Tillmann, Delbe
(3020) Boenke, Deliano, Ohl

BILINGUALISM III
(3021) Conklin, Dijkstra, Van Heuven
(3022) Popivanov, Janyan
(3023) Janyan, Popivanov, Andonova
(3024) Kim, Choi, Jung, Nam
(3025) Michel, Alario, Goslin, Castellano, Laganaro

COGNITIVE DEVELOPMENT II
(3026) Mouyi
(3027) Karemaker, Pitchford, O'Malley
(3028) Gronchi, Chiesi, Primi
(3029) Dekalo, Berger, Avishai
(3030) Hayashi

DECISION MAKING
(3031) Kossowska
(3032) Rey, Perruchet
(3033) Evans, Buehner
(3034) Thibaut, Arielle, Michel, Denis
(3035) Ekhtiari, Ekhtiari, Jannti, Behzadi, Mokri
(3036) Alpay, Stuermer

DYSLEXIA II
(3037) Mcdonald, Macken
(3038) Bellocchi, Bastien-Toniazzo
(3039) Martin, Cole, Leuwers, Sprenger-Charolles, Casalis, Frauenfelder
(3040) Lassus-Sangosse, Valdois
(3041) Sohn, Pyun, Jeong, Chang, Song, Nam

EPISODIC MEMORY III
(3042) Migueles, Garcia-Bajos
(3043) Garcia-Bajos, Migueles
(3044) Zillig
(3045) Iglesias-Parro, Ortega
(3046) Spitzer, Bäuml
(3047) Van Damme, D'ydewalle

EXECUTIVE CONTROL II
(3048) Smigasiewicz, Notebaert, Liefooghe, Necka
(3049) Martin, Guerdoux, Dressaire, Molinier, Brouillet
(3050) Wenke, Haggard
(3051) Roger, Vidal, Hasbroucq, Burle
(3052) Gamboz, Borella, Brandimonte
(3053) Mazzola-Pomietto, Jeanningros, Azorin, Grimault, Anton, Kaladjian

FACE RECOGNITION
(3054) Butcher, Lander
(3055) Costen, Brown, Akamatsu
(3056) Riby, Riby
(3057) Baird, Burton
(3058) Stern, Rossi-Arnaud, Fiori

LANGUAGE COMPREHENSION III
(3059) Galletti, Tapiero
(3060) Donnadieu, Berger
(3061) Bracco, Laudanna
(3062) Melinger, Weber
(3063) Braun, Hutzler, Münte, Michael, Jacobs
(3064) Hirata, Hirata
(3065) Kwon, Nam
(3066) Fonteneau

LANGUAGE PRODUCTION II
(3067) Delattre, Bonin
(3068) Carastro, Laudanna
(3069) Damian, Dumay
(3070) Gutierrez-Palma, Santiago De Torres
(3071) Aristei, Job, Kiefer

LEARNING
(3072) Swiezy
(3073) Vendrame, Cutica, Bucciarelli
(3074) Ross, Smolen, Stettner, Wasilewski
(3075) Girelli, Previtali, De Hevia
(3076) Gerbier, Koenig
(3077) Bounoua, Huguet, Cury

MEMORY III
(3078) Thorley, Dewhurst
(3079) White, Burton
(3080) Szpitalak, Wierzchon
(3081) Olszewska
(3082) Weinstein, Shanks
(3083) Marucci, Valeri, Inguscio, Mastroberardino
(3084) Labeye, Versace
(3085) Ortega, Gomez-Ariza, Bajo
(3086) D'angelo, Bosco, Brandimonte

NUMERICAL COGNITION III
(3087) Ganor-Stern, Kessler, Tzelgov
(3088) Herrera, Macizo
(3089) Macizo, Herrera, Perez-Rivas
(3090) Nys, Leybaert
(3091) Damas-Lopez

PERCEPTION AND ACTION III
(3092) Ishihara, Keller, Rossetti, Prinz
(3093) Nowicki, Keller, Prinz
(3094) Longo, Cardozo, Haggard
(3095) Setti, Borghi, Tessari
(3096) Glenberg, Scorolli, Borghi, Setti
(3097) Valdes-Conroy, Coventry, Guijarro-Fuentes, Castillo
(3098) Brozzoli, Pavani, Cardinali, Urquizar, Farne

PRIMING II
(3099) Marsh, Vachon, Hughes, Jones
(3100) Place
(3101) Pohl, Kiesel, Kunde, Berner, Hoffmann
(3102) Postiglione, Laudanna
(3103) Crepaldi, Arduino, Luzzatti
(3104) Faïta-Aïnseba, Mathey, Bouaffre
(3105) Mueller, Aviles, Duñabeitia, Carreiras

SPATIAL COGNITION III
(3106) Schneider, Boucheix
(3107) Vangkilde, Habekost, Bundesen
(3108) Putois, Koenig
(3109) Cazzato, Cutini, Basso, Bisiacchi

TASK SWITCHING II
(3110) Lepper, Massen, Prinz
(3111) Lindsen, De Jong
(3112) Demanet, Liefooghe, Vandierendonck, Verbruggen
(3113) Bonnin, Bouquet
(3114) Schuch, Koch
(3115) Konde, Barkaszi, Czigler
(3116) Sdoia, Pitzalis, Galati
(3117) Trincas, Couyoumdjian

VISUAL PERCEPTION II
(3118) Charras, Lupianez
(3119) Delord, Bordaberry
(3120) Wakisaka, Gunji, Hiroyuki
(3121) Spotarno, Meyer, Faure
(3122) Albert, Ripoll

WORD AND LETTER PROCESSING III
(3123) Tydgat, Grainger
(3124) Chetail, Mathey
(3125) Therouanne, Las Dit Peisson, Roth
(3126) Maïonchi-Pino, De Cara, Magnan, Ecalle
(3127) Hannagan, Dupoux, Christophe
(3128) Bouchiere, Foulin
(3129) Conrad, Grainger, Carreiras, Jacobs
(3130) Vergara, Duñabeitia, Laka, Carreiras

WORKING MEMORY III
(3131) Portrat, Camos, Barrouillet
(3132) Bialkova, Oberauer
(3133) Ferrari, Zocchi, Basso, Palladino
(3134) Mammarella, Fairfield, Dezulian, De Beni
(3135) Vandamme, Szmalec, Vandierendonck, Barrouillet
(3136) Schulze, Tillmann

Keynote speaker
Wednesday, 5:00 pm

Conceptual Short Term Memory in Language Comprehension and Visual Perception
Mary Potter
Massachusetts Institute of Technology

The Conceptual Short Term Memory (CSTM) hypothesis proposes that comprehension of any moderately complex, meaningful, and novel stimulus such as a pictured scene or a sentence requires rapid activation of a substantial body of conceptual information from long term memory (LTM). The best structural interpretation of the stimulus is extracted from this material, and irrelevant LTM material is rapidly deactivated (forgotten). This whole process can happen within 200 ms after the onset of a word or picture. I will describe and demonstrate experiments using rapid serial visual presentation (RSVP) and other methods that show that words in sentences or other context are readily perceived and interpreted in relation to context, producing systematic errors as well as enhanced accuracy. Similarly, pictures are quickly understood but cannot be remembered unless consolidated. CSTM plays a role, I suggest, in many familiar research paradigms.

The Broadbent Lecture
Thursday, 4:30 pm

The Nature of Visual Attention: Formulas Bridging Cognition and Neurophysiology
Claus Bundesen
University of Copenhagen

The neural theory of visual attention (NTVA) introduced by Bundesen, Habekost, and Kyllingsbæk (2005, *Psychol. Rev. 112*, 291) is presented. NTVA is a neural interpretation of Bundesen's (1990, *Psychol. Rev. 97*, 523) formal theory of visual attention (TVA). In NTVA, *filtering* (selection of *objects*) changes the number of cortical neurons in which an object is represented so that this number increases with the behavioral importance of the object (reallocation of processing resources by dynamic remapping of receptive fields). Another fundamental mechanism, *pigeonholing* (selection of *features*), scales the level of activation in individual neurons coding for a particular feature. The theory accounts both for a wide range of attentional effects in human performance (reaction times and error rates) and for a wide range of effects observed in firing rates of single cells in the primate visual system. NTVA provides a mathematical framework to unify the two fields of research—formulas bridging cognition and neurophysiology.

The Bertelson Lecture
Friday 4.30 pm

Current Developments in the Modeling of Response Times and Accuracy Using The Ratcliff Diffusion Model
Eric-Jan Wagenmakers
University of Amsterdam

The Ratcliff diffusion model for simple two--choice decisions (e.g., Ratcliff, 1978, Ratcliff & Smith, 2004) has two outstanding advantages. First, the model generally provides an excellent fit to the observed data (i.e., response accuracy and the shape of RT distributions, both for correct and error responses). Second, the parameters of the model can be mapped to latent psychological processes such as the quality of information processing, cautiousness, and response bias. In recent years, these advantages of the Ratcliff diffusion model have become increasingly clear. Current advances in methodology allow all researchers to fit the diffusion model to data easily; new theoretical developments shed light on the optimality and possible neural underpinnings of the model; and recent applications to aging, IQ, and lexical decision highlight the added value of a diffusion model perspective on simple decision making.

Keynote speaker
Saturday, 4:00 pm

An Integrated Approach to Lexical and Semantic Processes
James L. McClelland
Stanford University

Patients with semantic dementia generally show both lexical and semantic deficits. There is a striking parallel in these deficits, in that both involve regularization or typicalization. Such patients regularize spelling sound correspondences and past tenses, prefer typical to correct spellings for atypical words, draw extra legs on ground fowl like ducks and geese, and prefer typical to correct ears on elephants. Yet some patients with semantic dementia show a relative sparing of one kind of knowledge relative to others -- some patients are relatively good at lexical tasks while others are relatively good at semantic tasks. I will present joint work with Katia Dilkina and David Plaut on an integrated model in which damage tends to lead to parallel deficits but in which individual differences in the impact of the lesion on semantic and lexical tasks can arise due to variation in experience, architectural parameters, and lesion distribution.

Action planning
Grand Amphi
Wednesday afternoon 14h – 16 h

Chaired by Jos Adam, Maastricht University

14:00-14:20 **(1)**

Response Preparation with Static Versus Moving Hands - *Jos ADAM, Sofie MORESI*

This research tested the response inhibition account of the hand-advantage found in the finger precuing task. According to this account, the advantage of preparing two fingers on one hand (represented in one hemisphere) as opposed to preparing two fingers on two hands (represented in two hemispheres) is due, in part, to a response inhibition process that operates more efficiently within than between hemispheres. In this view, supplying extra activation to both hemispheres by moving the hands should decrease the within-hemisphere inhibition advantage. Twelve participants performed the finger precuing task with static and moving hands. As predicted by the response inhibition account, the hand-advantage, present with the hands at rest, decreased with the hands moving.

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14:20-14:40 **(2)**

Producing Digits by Key-Presses Generates the Snarc-Effect - *Dieter NATTKEMPER, Michael ZIESSLER, Peter A. FRENSCH*

The SNARC-effect is a spatial compatibility effect which is usually observed when numbers are processed. Relatively small numbers are preferentially responded to with the left hand and relatively large numbers with the right hand. Surprisingly, this effect is also observed when persons produce nominally task-irrelevant numbers by key-press responses to visual features (color or shape) of objects. Responding was faster when the mapping of response keys to the numbers they produced was SNARC-compatible (left key produces 2,3: right key 7,8) than when it was incompatible (left key produces 7,8: right 2,3). This observation shows that action planning is facilitated if there is an overlap between spatial features of the response and (non-physical) spatial features of the effect. This adds support to the notion that (1) effects of voluntary actions become anticipated during response production and (2) that anticipations of forthcoming effects have the power to bias the motor system.

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14:40-15:00 **(3)**

Response-Response Interference in Simultaneously Executed Oculomotor and Manual Movements - *Lynn HUESTEGGE, Iring KOCH*

Previous research on the coordination of eye and hand movements has mainly focussed on grasping movements, implying experimental paradigms where subjects have to respond with both effector systems to a common target. In the present study, we analyse on a more general level to what extent concurrently performed eye and hand movements interact. For this purpose, in Experiment 1 subjects had to respond to an auditory stimulus with either a button press (manual response), a saccade to a visual target (oculomotor response), or both. In Experiment 2 and 3, the difficulty of response selection in the manual task was increased: Subjects had to cross hands and respond to the auditory stimulus with either the spatially corresponding hand or button. The results indicate that both, manual and oculomotor responses, generally suffer from dual task conditions, and that oculomotor response times are severely prolonged with increasing difficulty of the simultaneous manual task.

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15:00-15:20 **(4)**

Distractor-Effect Interference Proves the Inclusion of Effect Codes in Action Preparation - *Michael ZIESSLER, Dieter NATTKEMPER, Stefan VOGT*

Motor actions are performed to achieve particular environmental effects, i.e. goals. Consequently, the desired effects should play a crucial role in the selection of actions (inverse models, ideomotor principle). In addition, the preparation of a selected action seems to include the anticipation of the effects achievable with this action (forward models). Evidence for effect anticipation is mainly based on experiments in which the effects were actually presented during response preparation. A problem with this paradigm is that influences of effect codes on the responses could be due to their explicit activation by external stimuli. In our new paradigm we presented distractors between stimuli and responses which were compatible or incompatible to learned response effects. Responses were faster in compatible trials, i.e. distractors interfered with the forthcoming effects. This strongly suggests that effect codes were activated during response preparation. Otherwise the distractors should be neutral and response times should be unaffected.

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15:20-15:40 **(5)**

Audio-Motor Interaction in Experts: How Action Effects Modulate Planning and Execution - *Alessandro D'AUSILIO, Riccardo BRUNETTI, Franco DELOGU, Marta OLIVETTI BELARDINELLI*

Tight auditory motor coupling is a prerequisite for an effective action control in some categories of experts. Years of practice as a musician, for instance, build up a map connecting sounds and related actions. Neuroimaging and neurophysiological methods have already shown how passive listening to rehearsed pieces induce a motor and premotor activity (Lahav et al., 2007; D'ausilio et al., 2006). Behavioral studies have also found how the concurrent presentation of an incongruent piano sound interfere with the planning of a piano key-press, leading to longer reaction times (Drost et al., 2005). In this study we further address the issue whether congruent notes lead to a facilitation or not respect to a baseline condition (no sound), and the time course of such interference/facilitation.

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15:40-16:00 **(6)**

Stop Talking! Comparing Stop-Signal Inhibition of Hand and Vocal Responses - *Ingrid K. CHRISTOFFELS, Wery P.M. VAN DEN WILDENBERG*

Whether gossiping or organizing a surprise, one immediately stops speaking when the topic of conversation arrives. Speech is a complex natural response with a nonarbitrary and rich stimulus-response mapping. To quantify the level of inhibitory control over speech production and its relation to hand response inhibition we administered three tasks in which responses had to stopped upon presentation of a stop signal: (1) a classic stop signal task with two pictures indicating left/right hand response, (2) vocal version: overt naming of (only) two pictures, (3) classic picture naming of 60 pictures. Word frequency was manipulated as a stimulus intrinsic variable. Stop-signal RT was slower for vocal than for manual choice responses and slowest in classic picture naming. Further, inhibition was slower for naming low than high frequency pictures, even when there were only two response alternatives. It appears that response inhibition interacts with task relevant processes in speech production.

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SYMP: Investigating the bilingual brain: evidence from behavioral, electrophysiological and imaging data
Amphi Charve (Physique)
Wednesday afternoon 14h – 16 h

Organized by Cheryl Frenck-Mestre, University of Provence

14:00-14:20 **(7)**

Electrophysiological Evidence on L2 Cognate Processing - *Sonja A. KOTZ*

Cognates share both word form and semantics across languages and thus may share various levels of representation (i.e. lexical, semantic). Here I will approach L2 cognate processing from three angles: (1) how does L2 proficiency affect cognate processing? (2)

in which way do task demands affect L2 cognate processing? (3) are there cognate transfer effects when L2 speakers process cognates in L1 and L2? Two L2 speaker groups (high/low proficient L1German-L2English) participated in two experiments (Exp1: concrete/abstract decision; Exp 2: lexical decision) with the order of visual word (cognate/non-cognate) presentation (German/English) counterbalanced across participants. Results reveal that task and order of language presentation affect how high and low proficient L2 speakers process cognates. A task that entails deep semantic processing results in both proficiency differences and a cognate transfer effect into L1 for low proficient L2 speakers. A similar result was not obtained in the lexical decision task.

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14:20-14:40 **(8)**

Neural Reorganization During Second Language Learning - *Peter INDEFREY*

A recent meta-analysis of hemodynamic studies on bilingual language processing (Indefrey, 2006) shows that second language (L2) sentence processing activates the same brain regions as L1 sentence processing. Given that most bilingual studies tested participants after years of L2 exposure, it is not known, when the recruitment of L1 language processing areas for L2 sentence processing starts. To study the time course of behavioral and neurophysiological changes during the acquisition of a new language, we conducted longitudinal fMRI and ERP experiments on different groups of L2 learners. Depending on the speed of learning, changes in hemodynamic brain responses related to sentence-level processing in a second language can be observed in the first weeks or months of L2 learning. Changes in electrophysiological responses may be observed even after a few hours of training on a small aspect of L2 morphosyntax.

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14:40-15:00 **(9)**

Electrophysiological Evidence for Endogenous Control of Language Switching in Overt Picture Naming - *Kim VERHOEF, Ardi ROELOFS, Dorothee CHWILLA*

Language switching in bilingual speakers requires cognitive control to select the appropriate language. Previous language-switch studies used the color of pictures to indicate the required language thereby confounding endogenous and exogenous control. To investigate endogenous language control, we recorded event-related potentials (ERPs) while Dutch-English bilingual speakers overtly named pictures that were preceded by language cues. The cue-stimulus interval was 750 ms and the response language on consecutive trials could be the same (repeat trials) or different (switch trials). Naming latencies were longer on switch than on repeat trials, independent of the response language. Cue-locked ERPs showed an early posterior negativity for switch compared to repeat trials for L2 but not for L1, and a late anterior negativity for switch compared to repeat trials for both languages. The early switch-repeat effect might reflect disengaging from the non-target native language, while the late switch-repeat effect reflects engaging in the target language.

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15:00-15:20 **(10)**

Meaning Acquisition of Concrete and Abstract New-Words: Behavioral and Neurophysiological Evidences - *Antoni RODRIGUEZ-FORNELLS, Anna MESTRES-MISSE, Thomas F. MÜNTE*

Acquiring the meaning of a new-word in a foreign language can be achieved by extracting it from a linguistic context. The aim of the present investigation was to simulate word learning of new-words associated to concrete and abstract concepts in a variant of the human simulation paradigm that provided linguistic context information (Mestres-Missé et al., 2006). Young adult native speakers of Spanish were required to silently read two related sentences in order to derive the meaning of a novel word that appeared in the terminal position of each of these sentences. Using self-pace reading and functional magnetic resonance imaging we demonstrated that the acquisition of the meaning associated to concrete and abstract new-words was qualitatively different: (i) a different pattern of reading times was observed, and (ii) a different brain network sustained the acquisition of both type of concepts. The implications of the present results to the dual-code and context availability model of abstract and concrete word processing will be discussed.

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15:20-15:40 **(11)**

The Effect of Phonological Realization of Inflectional Morphology in French: ERP Evidence - *Cheryl FRENCK-MESTRE, Alice FOUCART, Judith MCLAUGHLIN, Lee OSTERHOUT*

Herein we examined the impact of the phonological realization of morpho-syntactic agreement in written French, as revealed by ERPs. The presence vs. absence of phonological cues to morphological variation was manipulated. Of interest was whether a graded ERP response to these different conditions could be found in native speakers (experiment 1), and whether non-native learners would benefit from the presence of phonological cues (experiment 2). Results for native French speakers revealed that compared to grammatically correct instances, phonologically realized inflectional errors produced a significant P600 response which was statistically larger than that produced by silent errors. For German L1 - French L2 learners, the phonological realization of morphemes influenced processing as well. Phonologically realized errors produced a robust P600 response whereas silent errors produced a trend for an N400 response. The results are discussed in reference to previous studies of L2 acquisition of morphosyntax.

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15:40-16:00 **(12)**

Electrophysilogical Correlates of Cognate and Word Frequency Effects in Bilingual Speech Production. An ERP Study. - *Albert COSTA, Kristof STRIJKERS*

Cognate words are known to enjoy a processing advantage in bilingual speech production. There are different views about how this effect comes about in the course of naming. The present study aims at testing whether cognate effects are a special case of word frequency effects. To do so, we conducted an ERP study in which Spanish-Catalan bilinguals are asked to perform a picture naming task. Behavioural results show a clear frequency effect and interaction between frequency and cognate status. In the ERPs high frequency items start to disperse around 150ms post target presentation from low frequency items and continue to disperse until the end of the epoch. Identical results are found when comparing the ERPs between cognates and non-cognates. The results of the present study suggest that cognate effects in bilingual speech production have the same origin of word frequency effects. The implications of these observations for models of speech production and bilingualism will be discussed.

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Memory I
Amphi Chimie
Wednesday afternoon 14h – 16 h

Chaired by Maria A. Brandimonte, Suor Orsola Benincasa University

14:00-14:20 **(13)**

Retrieval-Induced Forgetting in War-Induced Post Traumatic Stress Disorder - *Tim BRENNEN, Ragnhild DYBDAHL, Øivind SOLBERG*

The present study used a retrieval-induced forgetting (RIF) paradigm to investigate whether patients with Post Traumatic Stress Disorder (PTSD) have a particular deficit in unintentional forgetting. The participants were from Bosnia: some had chronic war-induced PTSD and some were controls without PTSD. Participants first studied exemplars of words from semantic categories, then practiced retrieval of a subset of words from half

of the categories, and then recalled words from the first phase. Nonpracticed words from practiced categories were less likely to be recalled than words from nonpracticed categories, a standard RIF effect, and the effect was statistically equivalent in the groups. This suggests that the automatic inhibition of concepts is unaffected in PTSD. Clinical self-report measures did not correlate significantly with the size of the RIF effect. The implications for nonemotional and emotional cognition in PTSD will be discussed.

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14:20-14:40 **(14)**

Retrieval-Induced Forgetting in Schizophrenia and Depression - *David GROOME, Fiorentina STERKAJ*

Goal: To investigate whether retrieval-induced forgetting (RIF) is normal in schizophrenic and depressed individuals. Method: The RIF procedure was carried out on 21 schizophrenics, 21 depressives, and 21 normal control subjects. All subjects also completed the Beck Depression Inventory (BDI). Results: Both the depressed group and the schizophrenic group were found to have a significant reduction in their RIF compared with the control group. RIF was also found to correlate with BDI scores across the groups. Conclusions: Depression and schizophrenia are associated with impaired RIF, though the impairment found in schizophrenics may reflect co-morbid depression. It is possible that depression may intefere with cognitive inhibitory processes such as RIF, or alternatively impaired RIF may cause a vulnerability to depression. Further research is needed to clarify the direction of causality, but these findings could offer new insights into the processes underlying depression and schizophrenia.

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14:40-15:00 **(15)**

Is Retrieval-Induced Forgetting Cue-Independent? - *Gino CAMP, Diane PECHER, Henk SCHMIDT*

Retrieval of particular memory items (FRUIT - orange) may lead to forgetting of related memory items (FRUIT – banana). This retrieval-induced forgetting (RIF) effect is often ascribed to inhibitory processes. Crucial evidence for inhibition as cause for RIF is the fact that the forgetting effect is found when extralist cues are used to test memory (YELLOW for banana). These cues are supposed to provide an independent test of memory and can rule out non-inhibitory accounts of RIF, such as interference. However, we argue that unstudied categories as extralist cues may not provide a truly independent test of memory. Therefore, we tested items with item-specific cues (monkey – b___) in our experiments. We did not find RIF for studied items (banana) nor for items that were not studied in the experiment (apple). However, we did find RIF for both types of items when we used studied categories as cues (FRUIT). The implications of these findings for theories of RIF are discussed.

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15:00-15:20 **(16)**

Context-Dependent Memory in Children - *Alp ASLAN, Karl-Heinz BÄUML*

We examined the effects of contextual changes on children's episodic memory. Kindergarteners, first and fourth graders, and young adults, studied two successively presented lists of items. Between the two lists, subjects were provided an imagination task supposed to create a change in mental context (context-change condition), or they conducted an unrelated distractor task (no-context-change condition). Replicating prior work, the imagination task caused both List-1 forgetting and List-2 enhancement in young adults. In children, the imagination task also caused List-1 forgetting, but it had no effect on recall of List-2 items. These results indicate that, unlike young adults, children are not able to benefit from a change in mental context. The dissociation between forgetting and enhancement suggests that the two effects are mediated by different mechanisms with different developmental trajectories.

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15:20-15:40 **(17)**

Remembering to Do Things for Others: When Incentives Hurt - *Maria A. BRANDIMONTE, Donatella FERRANTE, Carmela BIANCO, Maria Grazia VILLANI*

Memory for future actions, or prospective memory, often involves remembering to do things for others rather than for oneself. Yet, virtually nothing is known about pro-social memory for intentions. In two experiments, we explored the effects of different types of rewards on pro-social remembering. Across the two experiments, participants could receive 1 course credit, different amounts of money, publicity (i.e., an image reward), or a combination of them, for their pro-social prospective behavior. Results revealed that memory for an intention was better when the participant's action had a social relevance than under standard prospective memory conditions. They also showed that pro-social prospective memory performance was equally good under high or no incentive conditions. However, consistent with social and economic theories of altruism, when a small explicit incentive was introduced, it had the detrimental effect of crowding out intrinsic motivation, hence reducing pro-social remembering. The expectancy of an image reward (publicity) also produced crowding out. However, when the image reward was coupled with a small amount of money, crowding out effects vanished. These results help highlight the complex dynamics between cognitive, social, and motivational mechanisms underlying memory for intentions.

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15:40-16:00 **(18)**

Auditory-Semantic Distraction: a Process-Based View - *John. E. MARSH, Robert. W. HUGHES, Dylan. M. JONES*

The experiments we report here demonstrate auditory-semantic distraction in tests of memory for semantic category-exemplars. The findings show that the effects of irrelevant sound on category-exemplar recall are functionally distinct from those found in the context of serial short-term memory by showing sensitivity to: a) the lexical-semantic, rather than acoustic, properties of sound; b) between-sequence semantic similarity, and c) the output-dominance of the irrelevant items. The experiments also reveal evidence of a breakdown of a source-monitoring process under conditions of between-sequence semantic similarity. Results are discussed in terms of competitor inhibition and source-monitoring approaches and support a dynamic, process-oriented, rather than a structurally-based, account of forgetting.

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SYMP: Attentional limitations in the processing of sequential information

Amphi Sciences Naturelles

Wednesday afternoon 14h – 16 h

Organized by Pierre Jolicoeur, University of Montreal, and Roberto Dell'Acqua, University of Padova

14:00-14:20 **(19)**

Reassessing the Role of Control in the Modulation of the Attentional Blink Effect - *Roberto DELL'ACQUA, Patrik PLUCHINO, Pierre JOLICOEUR*

The most recent conceptualizations of the attentional blink (AB) phenomenon have enriched the stage set by models proposed in the past with elements illuminating the crucial influence of strategic factors in the modulation of the AB effect magnitude, and of the active control played by participants on the flow of rapidly presented serial visual information to ultimately determine whether an AB effect is observed. These recent proposals have sometimes been raised against one of the original proposals concerning the cause of the AB, namely, that of a structural limitation affecting the encoding of information in visual short-term memory. With the help of three experiments, the present contribution will seek to find a way to reconcile these latest proposals with findings that seem to reinforce the notion that some of the limitations of our visual system when processing rapid serial visual information cannot be strategically circumvented, or controlled.

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14:20-14:40 **(20)**

A Booster/Bouncer Theory of Temporal Attention - *Christian OLIVERS, Martijn MEETER*

What is the time course of visual attention? Attentional blink studies find that the second of two targets is often missed when presented within about 500 ms from the first target, resulting in theories about temporary capacity limitations or bottlenecks. Earlier studies, however, have reported quite the opposite finding: Attention is transiently enhanced, rather than reduced, for several hundreds of milliseconds after a relevant event. Here we present a theory that integrates these contradictory findings. There is no central role for capacity limitations or bottlenecks. It is assumed that relevant events trigger a ballistic subcortical attentional booster function, meant to enhance the target information. However, in the attentional blink task, the distractor after the target is being boosted instead, resulting in a strong inhibitory response in working memory, which closes the gate to consciousness (the "bouncer"). The theory explains many findings that are problematic for limited-capacity accounts.

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14:40-15:00 **(21)**

Equivalent Delay of the P3 for the Second Target Within and Across the Visual and Auditory Modalities in the Attentional Blink: Electrophysiological Evidence for An Amodal Central Bottleneck. - *Alexia PTITO, Karen ARNELL, Pierre JOLICOEUR, Jeff MACLEOD (read by Pierre JOLICOEUR)*

Subjects monitored two concurrent streams of stimuli, one visual and one auditory, for the presence of digits among letters. The digit targets could occur in either stream, at random, and a first target in one stream provided no information about the modality of presentation of the second target, ensuring monitoring of both information streams at all times. The design thus eliminated task switching, modality switching, and differential preparation as possible contributors to the results. Because there was no mask following the second target, we expected, and found, minimal attentional blink effects in report accuracy. However, the P3 response to the second target was delayed when the SOA between the first and second target was short, relative to long SOA. The delay was the same in all combinations of target modality. The results provide strong support for a central (amodal) bottleneck in the attentional blink paradigm.

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15:00-15:20 **(22)**

Competitive Regulation of Attention: a Mechanism Behind the Blink - *Brad WYBLE, Howard BOWMAN, Mark NIEUWENSTEIN*

The Attentional Blink (AB; Raymond , Shapiro, & Arnell 1992) is a well known example of the limited capacity of visual encoding. Recently, the associated phenomenon of sparing has been demonstrated to occur for four or more targets in a row (Nieuwenstein & Potter 2006; Olivers, Van Der Stigchel & Hulleman 2007; Kawahara, Kumada & Di Lollo 2006), effectively eliminating the blink for targets presented at lags 2 and 3. Our modeling work proposes that visual attention is regulated by competing influences from bottom up and top down processing. Targets in the visual field excite attention, while encoding of previously attended targets inhibits attention, perhaps to provide episodically distinct representations within working memory. Simulating these influences in a competitive neural network circuit reproduces a broad spectrum of recent blink data, including spreading of sparing, whole report, and cueing.

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15:20-15:40 **(23)**

Modality-Specific Perceptual and Amodal Attentional Sources of Interference in the Attentional Blink - *Sébastien TREMBLAY, François VACHON*

When listening to a rapid succession of stimuli, processing of the second (T2) of two successive targets among distractors is often impaired, a phenomenon known as the attentional blink (AB). We conducted a systematic examination of the auditory AB and the conditions under which it is obtained. A series of experiments revealed four key findings: i) T2 masking, even when delayed, is necessary for the AB to take place in audition; ii) auditory AB deficits are observed when T2 is masked by interruption but not by integration; iii) heterogeneous distractors tend to produce a greater blink than homogeneous distractors; iv) the locus of key information for target identification (stimulus onset vs. offset) modulates the impact of masking only for auditory sequences. These findings provide evidence that processing auditory and visual information is restricted by similar attentional limitations but these limits are constrained by properties specific to each sensory system.

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15:40-16:00 **(24)**

Working Memory and the Attentional Blink: Blink Size Is Predicted by Individual Differences in Working Memory Capacity - *Lorenza S. COLZATO, Michiel SPAPE, Merel M. PANNEBAKKER, Bernhard HOMMEL (read by Bernhard HOMMEL)*

The Attentional Blink (AB) is often attributed resource limitations but the nature of these resources is commonly underspecified. Recent observations rule out access to short-term memory or storage capacity as limiting factors, but operational bottlenecks are still an option. We considered (operational) working memory (WM) capacity as a possible candidate and investigated the relationship between individual WM capacity (as measured by OSPAN), intelligence (as measures by Raven's SPM), and the size of the AB. WM capacity was negatively correlated with the AB, whereas intelligence only improved general accuracy. These results support the idea that individual processing limitations (with regard to either attentional allocation policies or the speed of global cortical integration processes) are responsible for the blink.

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Numerical cognition
Grand Amphi
Thursday morning 9h – 10h40

Chaired by Roy Cohen Kadosh, University College London

9:00-9:20 **(25)**

The Effects of Subclinical Depression and Aging on Mental Arithmetic: Evidence From Time Accuracy Functions - *Grzegorz SEDEK, Aneta BRZEZICKA*

The working memory limitations in depression and old age were examined using a cognitive psychophysical paradigm for the neurological test known as PASAT (Paced Auditory Serial Addition Test). This paradigm examines individual and group cognitive performance applying time accuracy functions (TAF) to completing data. Those functions convert the wide range of presentation time into accuracy according to precisely defined negatively accelerating exponential functions. We carried out studies aimed at comparing nondepressed and subclinically depressed students, as well as young and older adults, on the performance of two versions of this tasks (standard and simpler PASAT). The findings showed that depressed students and older adults were impaired in differences on onset and rate of processing but not at the asymptote level (optimal level of performance). These findings suggest that both old age and depression influence the dynamic aspects of information processing, but this effect is greater in the older adults group.

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9:20-9:40 **(26)**

The Role of the Numerical Operations Involved in Updating Memory Tasks on Updating Costs - *Cristina LENDINEZ, Santiago PELEGRINA, Teresa LECHUGA*

We investigated the role that different operations involved in two numerical updating memory tasks may have on updating costs. Participants had to memorize two initial numbers and then to apply numerical operations to them in order to update the information in memory. The first experiment involved arithmetic operations.

Results showed that updating cost increased with operation difficulty. In other experiments, numerical comparisons determined if the number should be updated. Results showed that updating costs were greater for easy comparisons (distant numbers) than for difficult ones (close numbers). Taken together, results in these experiments suggest that, rather than operation difficulty itself, it is numerical distance between the numbers which has an impact on updating costs.

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9:40-10:00 **(27)**

Numbers and Space? Yes, But Having Room in Working Memory - *Amparo HERRERA, Pedro MACIZO, Carlo SEMENZA*

This work examined the role of working memory in basic numerical processing. In two experiments, participants performed a comparison task in single and dual-task conditions. In the dual conditions, the comparison task was accomplished while phonological or visuospatial information had to be maintained for a later recall test. The results showed that the requirement of maintaining visuospatial information produced the lack of spatial-numerical association of response codes (SNARC) effect. The absence of the effect was found even when participants correctly retrieved magnitude information, as indicated by a similar distance effect in all conditions. These results show the participation of the visuospatial component of working memory in the occurrence of the SNARC effect.

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10:00-10:20 **(28)**

Encoding Processes in Mental Arithmetic - *Catherine THEVENOT, Pierre BARROUILLET*

In line with Dehaene's triple-code model, we showed that each numerical processing requires a specific representational format for input. Adult were given two numbers presented successively on screen through a self-presentation procedure after being asked either to add, subtract or compare them. We considered the self-presentation time of the first number as reflecting the complexity of the encoding for a given planned processing. Self-presentation times were longer for additions and subtractions than for comparisons with two-digit numbers. In a second experiment, we showed that this effect was even more pronounced in participants with low arithmetic skills. These results suggest that variability in the very early stages of processing underpins individual differences in mental arithmetic.

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10:20-10:40 **(29)**

Abstract and Non-Abstract Representations of Numbers - *Roi COHEN KADOSH, Kathrin COHEN KADOSH, Amanda KAAS, Avishai HENIK, Rainer GOEBEL*

It is a commonly held view that numbers are represented in an abstract way. Here we show that by using a repetition suppression paradigm, which taps automatic numerical processing while reducing intentional strategies, it is possible to detect non-abstract numerical representations. The functional magnetic resonance imaging results revealed a left/right asymmetry in parietal lobe function. In contrast to an abstract representation in the left parietal lobe, the numerical representation in the right parietal lobe included non-abstract representations and showed a preference for magnitude in the notation of Arabic numbers. Our results challenge the commonly held belief that numbers are represented solely in an abstract way in the human brain. Moreover, they support the idea that the usage of automatic processing is needed in order to probe the core mental representation uncontaminated by intentional strategies.

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Spatial cognition
Amphi Péres
Thursday morning 9h – 10h20

Chaired by Marta Olivetti, University of Rome "La Sapienza"

9:00-9:20 **(31)**

Spatial Prepositions and Informativeness - *Michele BURIGO, Simona SACCHI, Kenny R. COVENTRY*

Describing the location of an object with respect to a second (reference) object is affected by a range of "extra-geometric" variables including "what" objects are and "how" they interact (e.g., Coventry & Garrod, 2004). The present study examined whether talking about the location of an object is also affected by how informative a spatial description can be, and specifically by whether "converseness" holds or not for a given spatial expression (i.e., whether "A on the left of B" correctly implies "B on the right of A" ; Levelt, 1996). An acceptability rating task investigated the use of spatial terms such as "on the left/right" as possible descriptions of scenes where the converseness principle was show to hold or not by manipulating the relative orientation of located and reference objects. The results show that converseness does matter for spatial language comprehension, suggesting that informativeness (Grice, 1975) is important for spatial description.

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9:20-9:40 **(32)**

Interactive Sonification of Geographical Maps: a Behavioural Study with Blind Subjects - *Marta OLIVETTI, Franco DELOGU, Massimiliano PALMIERO, Emanuele PASQUALOTTO, Stefano FEDERICI, Catherine PLAISANT*

Sonification is a promising solution for facilitating the access to geographical maps by blind people. This study aims at evaluating the representations of geographical maps acquired by means of a sonificated exploration. Three groups of subjects (10 early-blind, 10 congenitally-blind and 10 blindfolded sighted subjects) explored four sonificated maps of progressive difficulty by means of two interfaces (Keyboard-TouchTablet). For each one of the heard maps, subjects chose the correspondent tactile map among four alternatives (one target and three distractors). Then, subjects answered a questionnaire about the features of the acoustic geographical information. Main results indicate that all the groups of subjects achieved a good representation of the maps. Both keyboard and touch tablet are useful devices for navigating acoustical maps. Interestingly, we did not find any performance difference between the three groups. These results may imply that an early exposition to visual information is not a necessary condition for spatial mental mapping.

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9:40-10:00 **(33)**

Are Synaesthestic Spatial Forms Useful? - *Mark PRICE*

A minority of people experience certain types of sequential information, such as months, week days, or numbers, as involuntarily arranged in spatially extended patterns. These so-called spatial forms are often quite complex and idiosyncratic. A small but growing body of research is showing that the reported experience of these spatial forms is associated with behaviourally measurable differences in the cognitive representation of these sequences. It has been suggested that the forms can be considered as a variety of synaesthesia, and as an explicit exaggeration of the more common implicit overlap between spatial and sequential representation. However less attention has been paid to whether spatial forms are associated with any particular cognitive benefits or disadvantages, and to why only some people experience them. We address these issues by comparing people with and without spatial forms in a variety of experiments which test their ability to learn or manipulate sequence information, including conditions where we attempt to disrupt spatial forms using dual task interference paradigms that target visuo-spatial components of working memory.

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10:00-10:20 **(34)**

Are You Expecting a Change? Advantages in Focusing on the Details - *Michele BURIGO, Constantin A. ROTHKOPF*

Inductive and deductive mechanisms allow people to extract regularities from the world in order to improve the processing of everyday stimuli (Rips, 2001). These mechanisms are mediated by attention that contributes to improve dealing with unpredicted

events by redistributing attentional resources to a wider number of alternatives (Cherubini, Burigo & Bricolo, 2005). A series of experiments based on a Change Blindness paradigm (Rensink, 2002) explored whether people extract regularities to build up an expectation on the Type of Change (ToC) comparing, for example, sequences where a change in colour follows four changes in locations. The results indicate that people attend a specific ToC showing slower time detection on the last scene (change in location), i.e. one cannot expect a change but it should expect that precise change to be efficient. This suggests that the expectations are very specific and must be focused on the core detail in order to yield to an advantage

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SYMP: Orthographic Processing in Printed Word Perception III
Amphi Charve (Physique)
Thursday morning 9h – 10h40

Organized by Colin J. Davis, Royal Holloway, University of London

9:00-9:20 **(35)**

The Overlap Model of Letter Position Encoding - *Pablo GOMEZ, Roger RATCLIFF, Manuel PEREA*

Over the last few years, a lot of empirical and modeling work has focused on the process via which the positions of letters in a string are encoded. We present evidence for the Overlap Model. In this model, the basic assumption is that letters in the visual stimulus have distributions over positions so that the representation of one letter will extend into adjacent letter positions. To test the model, we conducted a series of perceptual identification experiments with words and nonwords. In addition, we present data from short term priming studies, and an extension of the model in to the RT data.

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9:20-9:40 **(36)**

Letter Position Coding in Visual Word Recognition: the Overlap Open-Bigram Model - *Walter VAN HEUVEN, Jonathan GRAINGER*

How is letter position information coded during visual word recognition? According to the open-bigram model a printed word stimulus activates abstract letter identities in a bank of horizontally aligned letter detectors (the alphabetic array). The identity and location information in this array is then used to activate ordered pairs of letters (open-bigrams), which in turn activate words that contain these bigrams. We propose a new version of this model called the overlap open-bigram model for which letter detectors in the alphabetic array have large overlapping receptive fields so that not only adjacent and non-adjacent letter combinations are activated but also transposed letters. We calculated match values between prime and target for various relative-position priming conditions tested in recently published studies for the overlap open-bigram model and other letter position coding schemes. The results show that the overlap open-bigram model provides the best fit with the observed priming effects.

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9:40-10:00 **(37)**

Serial Revealing Reveals Serial Processing - *Carol WHITNEY, Piers CORNELISSEN*

A key claim of the SERIOL model of orthographic processing is that letter order is encoded serially. There is a growing consensus that grapheme-to-phoneme conversion is carried out sequentially, implying serial activation of letter representations. However, the proposal that such seriality also drives direct lexical access remains highly controversial. To provide support for this latter claim, we carried out three lexical-decision experiments in which the target's letters were sequentially revealed in left-to-right versus right-to-left directions, at rates of 10 to 40 ms per letter. We observed a robust advantage for left-to- right conditions, which was present even when phonological effects were controlled (Experiment 2). We present a mathematical model that explains the pattern of results within and across experiments. These findings are difficult to explain under the assumption of parallel processing, providing strong evidence that direct lexical access normally involves a serial encoding of letter order.

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10:00-10:20 **(38)**

Are Vowels and Consonants Treated Differently in the Orthographic Input Code? - *Colin DAVIS, Steve LUPKER, Manuel PEREA*

There is now considerable evidence that transposed-letter nonword primes (e.g., jugde-JUDGE) are more effective than replacement-letter nonword primes (e.g., jupte-JUDGE). Recently, Perea and Lupker (2004) demonstrated that, in Spanish, this transposed-letter prime advantage exists for transpositions involving two consonants but not for those involving two vowels. This consonant-vowel difference causes problems even for models that can successfully explain transposed-letter effects (e.g., SOLAR, Davis, 1999). In Experiment 1, we demonstrated a parallel result in a language with different syllabic and phonological characteristics (English) in both a masked priming experiment and an unprimed lexical decision task in which the transposed letter strings (e.g., adacemy, acedamy) were used as the nonwords. Results in Experiment 2 suggest that at least part of the reason for the vowel-consonant difference is because of the higher letter frequencies of the vowels. Possible alternative interpretations of the vowel-consonant difference are discussed.

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10:20-10:40 **(39)**

Slow Slots with Slops: Evidence for 'Slot-Coding' of Letter Positions with Positional Noise - *Dennis NORRIS, Sachiko KINOSHITA*

Most current computational models of word recognition use the slot-coding scheme for representing letter positions within a word. This scheme assumes separate slots for each possible letter position within a word, and that letter identities are associated with a specific slot. Recently, this scheme has come under attack on the basis of findings such as the transposed-letter priming effect which suggest that coding of letter position within a word is not absolute. Alternatives to the slot-coding schemes include the SOLAR model which assumes relative position coding and various models which make use of open bigrams (coding based on ordered letter pairs). We report two experiments using the cross-case same-different word match task that are problematic for the constrained OB (open bigram), unconstrained OB, SERIOL and SOLAR models. The results are instead interpreted in terms of a noisy position-coding scheme, in which positional information becomes available more slowly than letter identity information. The Bayesian Reader (Norris, 2006) implementing this scheme is able to simulate these results.

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Memory II
Amphi Chimie
Thursday morning 8h40 – 10h40

Chaired by Asher Koriat, University of Haifa

8:40-9:00 **(40)**

Remembering, Knowing, and Just Knowing: Changes Over Time - *Sarah J. BARBER, Suparna RAJARAM, Elizabeth J. MARSH (read by Suparna RAJARAM)*

The Remember-Know procedure (Tulving, 1985) was introduced to capture the experiential distinction between episodic and semantic memories. However, extant research has typically made use of Know judgments to capture familiarity rather than semantic memory. Using three distinctions - Remembering, Knowing (familiarity) and Just Knowing (semantic knowledge), Conway, Gardiner, Perfect, Anderson, and Cohen (1997) found a shift from

Remembering to Just Knowing over time for material learned in psychology classes. We addressed this issue in a controlled, laboratory study where study narratives contained easy and hard facts. The effects of delay depended on the difficulty of the material; Remembering decreased (for both easy and hard facts) while Just Knowing increased (for easy facts). In contrast to Just Knowing (semantic memory judgments), Knowing (familiarity judgments) did not increase with delay. We conclude that Just Knowing (semantic memory) can be distinguished both from Remembering (episodic memory) and Knowing (familiarity).

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9:00-9:20 **(41)**

Perceptual and Conceptual Familiarity in Recognition Memory: An Event Related Potential Study. - *Angela BOLDINI, Salvador ALGARABEL, Antonio IBAÑEZ, Teresa BAJO*

Theoretical debate is still widely open on the role played by perceptual vs. semantic factors in modulating Familiarity during Recognition Memory. An Event Related Potentials study was carried out to investigate whether the electrophysiological correlates associated with perceptual and/or conceptual manipulation of Familiarity would differ and to what extent. Subjects were given a yes/no picture recognition task. Test-pictures were either the same presented at study, different pictures of studied objects, pictures of unstudied objects but belonging to the same categories seen at study, or pictures of completely new objects from unstudied categories. The effects of both perceptual and conceptual manipulations were significant at behavioural level. The electrophysiological correlates (300 - 550 ms time-window) of items in the two conditions differed in that their amplitudes went into opposite direction compared to baseline. These are findings for a potential dissociation between perceptual and conceptual bases of Familiarity process.

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9:20-9:40 **(42)**

An Output-Bound Perspective on False Memories: the Case of the Deese-Roediger-Mcdermott (DRM) Paradigm - *Asher KORIAT, Ainat PANSKY, Morris GOLDSMITH*

The Deese-Roediger-McDermott (DRM) paradigm has generated a wealth of provocative findings since its revival by Roediger and McDermott (1995), and provides the most impressive laboratory manifestation of false recall. The overall message delivered by this research emphasizes the fragility of memory and the ease with which false memories can be induced. In this article we contrast an input-bound perspective with an output-bound perspective for the assessment of memory accuracy, and show that even in the context of DRM research the output-bound accuracy of memory reports is quite impressive: Across 108 studies reviewed, an item freely recalled and reported by a DRM participant has about a .90 probability of being correct. We discuss the processes that contribute to the high dependability of memory reports. Despite the important theoretical and applied value of the vast amount of recent work on memory distortions and errors, more care is needed in articulating messages to the scientific community and to the public regarding the overall trustworthiness of memory reports.

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9:40-10:00 **(43)**

Identifying the Origin of False Memories: a Comparison of Associated and Categorised Lists - *Steve DEWHURST, Emma BOULD*

Four experiments investigated the roles of encoding and retrieval processes in the creation of the memory illusions produced by associated (DRM) and categorised lists. Smith et al (2002) argued that the DRM effect is caused by associations made at encoding whereas the category repetition effect is caused by associated made at retrieval. This claim was based largely on their findings that DRM but not categorised lists show priming effects. In contrast to Smith et al., we found priming effects with both types of list in two experiments. We also show that DRM and categorised lists are influenced by explicit instructions to make associations at study (Experiment 3) but not by test-induced priming (Experiment 4). These findings strongly suggest that memory illusions produced by both DRM and categorised lists are primarily the result of associations made at encoding.

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10:00-10:20 **(44)**

Decision Making Under Cognitive and Informational Load. - *Joanna SWEKLEJ, Grzegorz POCHWATKO, Robert BALAS, Malgorzata GODLEWSKA*

The main goal was to determine the impact of working memory load, time delay and information load on decision making. After viewing sequentially presented features of four different products participants were asked to choose the best one. The products were characterized by either 4 or 12 features. One out of four always had greatest number of positive characteristics. Participants were choosing immediately after products were presented or after 3 minutes delay filled with the secondary task (WM load condition) or simply thinking about the options. The results showed that WM load substantially decreased accuracy of choice comparing to immediate decision condition. Conscious deliberation in delayed decision condition did not help to make correct choices. Accuracy of choices was higher when more information was presented. The above results contrast Dijksterhuis et al. (2006) deliberation-without-attention hypothesis by indicating that „implicit thinking" is not effective when WM resources are limited.

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10:20-10:40 **(45)**

Cognitive Processes Involved in the Representation of Conceptual Knowledge: Toward a Unified Theory. - *Richard TUNNEY, Gordon FERNIE*

A fundamental aspect of human cognition is our ability to acquire novel concepts. Despite this, precisely how the mind represents concepts remains an unresolved question. According to exemplar based models we memorize each instance of a category and when asked to decide whether novel items are category members or not, the decision is based on a similarity comparison with each stored instance. By contrast, prototype models assume that categorization is based on the similarity of the target item to an abstraction of the central tendency or average of previously encountered instances. Previous research has been influenced by neuropsychological dissociations that suggest the process of categorization is independent of memory for exemplars (e.g. Squire & Knowlton, 1995). We report a series of experiments using the well-known prototype distortion task (Posner & Keele, 1968) that test the hypothesis that instead of reflecting independent processes, these dissociations reflect strategic shifts in the information participants use to make decisions. References Squire, L.R. & Knowlton, B.J. (1995). Learning about categories in the absence of memory. Proceedings of the National Academy of Science, 92, 12470-12474. Posner, M.I. & Keele, S.W. (1968). On the genesis of abstract ideas. Journal of Experimental Psychology, 77, 353-363.

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SYMP: Neurocognitive correlates of Feature Integration
Amphi Sciences Naturelles
Thursday morning 9h – 10h40

Organized by Lorenza S. Colzato, Leiden University

9:00-9:20 **(46)**

Ecstasy Use Impairs the Updating of Visuomotor Bindings - *Lorenza S. COLZATO, Bernhard HOMMEL*

Recreational users of ecstasy have shown impairments in cognitive functions as memory, attention and executive function. Surprisingly, none of the previous studies investigated visuomotor integration processes (e.g. the binding between visual and action feature). We asked whether and how recreational use of ecstasy (MDMA) impacts sensorimotor feature binding, which we assume to be related to the dopaminergic and serotonergic system. MDMA users and controls were matched per sex, age, alcohol consumption

and IQ. Both group were tested by using Hommel's (1998) event file task, which measures the updating of visual-visual and visuomotor binding. MDMA users performed significantly worse than control in updating visuomotor bindings but not visual-visual bindings. Hence, MDMA use impairs selectively the updating of sensorimotor binding between the task-relevant stimulus feature and the response.

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9:20-9:40 **(47)**

When Moving Faces Activate the House Area: An FMRI Study of Object File Retrieval - *André W. KEIZER, Lorenza S. COLZATO, Wouter TEEUWISSE, Serge A.R.B. ROMBOUTS, Bernhard HOMMEL (read by Bernhard HOMMEL)*

The visual cortex of the human brain contains specialized modules for processing different visual features of an object. Confronted with multiple objects, the system needs to attribute the correct features to each object (often referred to as 'the binding problem'). The brain is assumed to integrate the features of perceived objects into object files--pointers to the neural codes of these features, which outlive the event they represent in order to maintain stable percepts of objects over time. It has been hypothesized that if an object file is reactivated upon object reviewing, it will reactivate all the features they point to in a pattern-completion process. We investigated this using an event-related fMRI design. The results show compelling evidence for this mechanism: we demonstrate that encountering a moving visual object automatically reactivates the neural codes of the object that previously moved in the same direction. Reactivation correlated with performance costs, suggesting that the former indeed causes the latter.

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9:40-10:00 **(48)**

FMRI Shows Opposing Forces of Experience-Based and Context-Based Decision Making - *Nelleke C. VAN WOUWE, Guido P. H. BAND, K. Richard RIDDERINKHOF, Bernhard HOMMEL*

Working memory maintenance of the current task context is crucial in acting adaptively. With insufficient context representations, recent experiences increasingly bias current decisions. By means of a rapid event-related fMRI we aimed to distinguish the contribution of control processes and episodic memory traces in an adapted AX-continuous performance task, using words (cues) and faces (pictures). Behavioral results indicate that top down control and episodic memory traces both explain part of the variance in performance. If a specific context stimulus was followed by a face on previous occasions, subsequent presentation of that context stimulus reactivated the 'face' area in the brain, regardless of whether it was now followed by a face. Moreover, activation in medial frontal areas suggests that executive control was applied in trials when incompatible response tendencies (induced by expectations) had to be corrected. This study tentatively shows that top down and bottom up processing equally affect performance in decision making.

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10:00-10:20 **(49)**

Integration, Attention and Awareness: Insights From Buddhist Psychology and Meditation Studies - *Antonino RAFFONE, Gezinus WOLTERS*

Recently, many behavioural and neuroimaging experiments have shed light on functional and neural processes related to consciousness and attention. A remarkable property of consciousness is given by global access to widespread neural processes in the brain, related to different stimulus attributes and their integration. We present a model of conscious access and binding based on either selective attention or mindfulness. Mindfulness, a notion derived from Buddhist psychology and meditation practice, is characterised by a non-selective or open attention state, emphasising awareness of the present moment. Based on a neuroimaging study with meditating Buddhist monks, we integrate mindfulness-based conscious access with a form of higher-order or reflective awareness, enabling observation of own mental states. Reflective awareness may be associated to immediate metacognition. The model is related to the brain, specified in a neurocomputational architecture derived from the work of Dehaene and collaborators, and then simulated, leading to novel experimental ideas.

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10:20-10:40 **(50)**

Controlling Attention Through Action: Observing Actions Primes Action-Related Stimulus Dimensions - *Sabrina FAGIOLI, Fabio FERLAZZO, Bernhard HOMMEL*

We previously demonstrated that planning an action affects visual attention by improving the analysis of action-related stimulus dimensions: preparing for a reaching action enhances the processing of location information, whereas preparing for a grasping action enhances the processing of visual size information. Here we show that this "backward priming" of perceptual dimensions that are relevant for the planned action also applies when individuals are merely observing those actions, without any intention to imitate them. Subjects watched video-clips reproducing a grasping or a reaching action and, then, were presented with location- or size-defined stimulus events. As expected, size-defined events were detected faster after seeing a grasp and location-defined events were detected faster after seeing a reach. These results strongly support the claim that perceptual and motor features referring to perceived and planned events are coded in the same cognitive format and selected by the same attentional mechanism.

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Executive control
Grand Amphi
Thursday morning 11h – 13h

Chaired by Eric Soetens, Vrije Universiteit Brussel

11:00-11:20 **(51)**

Switching Between Three Tasks: Cognitive Strategies As Determinants of Switch Costs - *Edward NECKA*

Task switching has been usually investigated with two tasks, although the necessity to switch between three tasks possibly leads to specific sources of switch costs. Three tasks have been devised according to the levels of processing theory. Participants were shown with two letters and asked to decide whether they complied with one of three rules: (1) being identical in colour (sensory level), (2) identical in shape (structural level), or (3) identical as two consonants (semantic level). It was hypothesized that switch costs would be influenced by the level of processing required by the task to switch from, as well as the task to switch into. The results from three experiments suggest that, contrary to the hypotheses, switch costs do not depend on the tasks' characteristics. Rather, they seem to depend on the strategy that people use to decide which rule is to be checked first in the given trial.

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11:20-11:40 **(52)**

Memory-Link Priming Effects As An Explanation of the Simon Reversal Effect - *Eric SOETENS, Kathleen MAETENS, Peter ZEISHKA*

When subjects react with a left or a right response to the color of a stimulus appearing left or right from fixation, location-congruent reactions are faster than incongruent reactions. This Simon effect decreases or reverses when participants first practice with blocks of incompatible location-relevant trials or when incompatible and Simon trials are mixed. In two experiments, with a mixed and with a blocked design, we found that this effect is primarily caused by an increased Simon reversal effect after incongruent trials, with only small changes after congruent trials. The increased reversal is of a relative permanent nature in the blocked design, compared to only temporary effects in a mixed design. This difference is explained by the formation of a new, incompatible long-term

memory link only in the blocked condition. The interaction with preceding congruency is explained by priming of short- and long-term memory links by the preceding trial.

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11:40-12:00 **(53)**

Cognitive Control and Memory - *Frederick VERBRUGGEN, Gordon LOGAN*

Cognitive control theories attribute control to executive processes that adjust and control behavior online. Theories of automaticity attribute control of skilled behavior to memory retrieval (MR). We contrasted online adjustments (OA) with MR, elucidating their roles in controlling performance in the stop-signal paradigm. We found evidence of short-term OA after unsuccessful stopping. In addition, we found that MR can slow responses for 1-10 trials after successful inhibition, suggesting the automatic retrieval of task goals. Based on these findings, we concluded that cognitive control can rely on both MR and OA.

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12:00-12:20 **(54)**

Inferring Metal Processes Using Additive and Underadditive-Factor Logic - *Sander LOS*

By applying Sternberg's (1969) additive-factor method (AFM), temporally non-overlapping mental processes are inferred from additive as opposed to interactive effect relations between two independent variables. Recently, Los & Schut (2007) argued that the application of the AFM is not justified if one of the variables dynamically influences the preparatory state of a process. To deal with those variables, Los and Schut proposed an underadditive-factor method (UFM) that infers the architecture of mental processes from a trichotomy of effect relations (additive, overadditive and underadditive). In this talk I will present data that demonstrate the scope and limitations of both AFM and UFM. References Los, S. A., & Schut, M. L. J. (2007). The effective time course of preparation. Cognitive Psychology (in press). Sternberg, S. (1969). The discovery of processing stages: Extensions of Donders' method. Acta Psychologica, 30, 276-315.

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12:20-12:40 **(55)**

Task Switching in Aging: the Role of Response Repetition and Task Repetition - *Virginie POSTAL, Stéphanie LALLEMAND*

The task-switching paradigm is often used to investigate control processes in aging. Most of the studies have shown greater switch cost for older than for young adults when latency differences were compared for heterogeneous and homogeneous blocks (general switch costs) rather than when latency differences were compared for switch and non-switch trials within heterogeneous blocks (specific switch costs). The age-related differences in switching have been rather interpreted as a difficulty to maintain and coordinate task sets in working memory than as a difficulty of switching per se. The aim of the present experiments is to show that this difference of results' pattern can be observed in the specific switch cost condition by manipulating the task to realise and by studying the role of response repetition (Exp1) and task repetition (Exp2). The findings suggest that age-related impairments in task-switching components vary as a function of load in memory.

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12:40-13:00 **(56)**

Neurophysiological Correlates of Feedback Processing: An Eeg Study - *Gabriella PRAVETTONI, Claudio LUCCHIARI, Gianluca VAGO*

The pattern of neural correlates of loss or gain feedback have been the subject of a number of studies, but further research is needed to better understand this process. We conducted an EEG study using a modified version of the IOWA gambling task. We analysed both EEG power spectrum and ERP components evoked by presentation of a feedback response (money gain or loss) in fifteen participants. Our data showed that a negative ERP component is present about 250 ms after feedback but that other components are present too. Furthermore, the alpha and theta oscillatory activity seem to be correlated to the decision making process, in particular over anterior cortical regions. In conclusion, our data, in line with some prior findings (Taylor et al., 2007), showed that the evaluation of a feedback response is correlated to a complex pattern of cortical activation which may well be related to a reward-related functional network

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SYMP: Trends and perspectives on masked priming

Amphi Péres

Thursday morning 11h – 13h

Organized by Wilfried Kunde, Martin-Luther-University Halle-Wittenberg and Andrea Kiesel, Julius-Maximilians-University Wuerzburg

11:00-11:20 **(57)**

Revisiting the Metacontrast Dissociation: Comparing Sensitivity Across Different Measures - *Ulrich ANSORGE, Stefanie BECKER, Bruno G. BREITMEYER*

In the metacontrast dissociation procedure, presenting a masked shape prime prior to a visible shape target leads to reaction time effects of the prime in an indirect measure, although participants cannot consciously detect prime shapes in a direct measure (W. Klotz, & O. Neumann [1999]. Journal of Experimental Psychology: Human Perception and Performance, 25, 976-992). This has been taken as evidence for processing of unconscious input. The results of the present metacontrast dissociation study indicate that although participants are unable to consciously report the shape of the prime, they can consciously perceive motion between masked primes and visible targets in a direct measure (Experiment 1). This indicates that former tests did not provide an exhaustive measure for residual conscious perception of the prime in the metacontrast dissociation procedure. Further tests however revealed that residual motion perception cannot account for performance in the indirect measure (Experiment 2). Although the results thus leave the conception of processing of unconscious input intact, they may prompt a revision of the criteria for it.

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11:20-11:40 **(58)**

Brain dynamics underlying the non-linear threshold for access to consciousness - *Stanislas DEHAENE, Antoine DELCUL*

When a symbol is masked, which brain processes are prevented from occurring, and which continue to unfold without much change? Can we follow in time the successive stages of non-conscious stimulus processing, and precisely determine when a stimulus becomes accessible to conscious report? I shall present electro-encephalographic data from a masking paradigm which permit precise timing of the non-linear divergence that leads to conscious access. The results indicate that much occipital and temporal processing of visual words and digits can unfold in a subliminal manner, yet with a depth that varies with the target-mask interval. The neural mechanisms of the threshold for conscious access correspond to a relatively late (270 ms) sudden activation of distributed cortical areas including prefrontal cortex, which is followed by long-lasting top-down reverberation with posterior perceptual areas.

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11:40-12:00 **(59)**

High-Level and Low-Level Motor Control in a Hybrid Masked-Prime Simon Task - *Friederike SCHLAGHECKEN*

In response conflict paradigms, both response-relevant and response-irrelevant stimuli or stimulus features are presented. In Simon-like paradigms, stimulus identity is relevant, whereas location is irrelevant. In the Masked Prime task, the irrelevant stimulus is a briefly presented, backward-masked prime, and the relevant stimulus is a subsequently presented, clearly visible target. In both paradigms, the irrelevant information can trigger automatic response activation, which might conflict with the response required by the relevant target. It is assumed that in Simon-like

tasks, conflict resolution is a high-level process mediated by frontal cortical structures. In Masked Prime tasks, in contrast, conflict resolution is assumed to be a low-level process mediated by subcortical and posterior cortical structures. If these assumptions are correct, then in a hybrid task, interactions between automatic activation processes, but not between low-level and high-level conflict resolution processes, might be observed. Four experiments will be reported that explore these possibilities.

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12:00-12:20 **(60)**

Mechanisms of Subliminal Semantic Priming: a Meta-Analysis - *Bert REYNVOET, Eva VANDENBUSSCHE, Wim VAN DEN NOORTGATE*

Subliminal priming has recorded a research history filled with debate and controversy. Marcel (1983) was one of the first to report that unconsciously presented words primed semantic associates. His results were looked at with great skepticism, but as the years went by, and research methodology improved, it was repeatedly shown that subliminally presented stimuli can influence the processing of subsequent stimuli. As the existence of subliminal priming effects was now no longer questioned, the debate progressed beyond existence claims and focused on whether subliminal primes can activate their semantic meaning. Dehaene et al. (1998) suggested that subliminal primes are processed in a series of stages, including semantic categorization. Although often criticized and disputed, accumulating evidence is recently being provided in favour of such a semantic categorization hypothesis. However, the conditions under which subliminal semantic priming effects can or can not be observed remains an important object of discussion that has produced numerous inconsistent research results. Therefore, this meta-analysis was not primarily designed to provide proof of the mere existence of subliminal priming but rather to expose some of the mechanisms underlying subliminal semantic priming. By statistically combining the research results on subliminal semantic priming conducted throughout the years we hope to unravel some of the factors that mediate the emergence of subliminal priming effects (for example: prime duration, prime visibility, the task used in the experiment, the use of novel versus repeated primes, the use of number versus word primes, etc.).

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12:20-12:40 **(61)**

Redundancy Gain in Subliminal-Priming - *Katrin ELSNER, Wilfried KUNDE, Andrea KIESEL*

Responding to a visual target is typically faster when the target occurs simultaneously with other redundant targets rather than when it is presented alone, the so-called redundancy-gain effect. This phenomenon has been demonstrated several times with conscious stimuli. Here we report three experiments which explored whether redundant subliminal stimuli produce such gains as well, and whether they do so by simultaneously coactivating the motor response, or by increasing the probability of either stimulus reaching the motor system quickly (so called horse race). We found redundancy gains by subliminal primes in a detection task which required simple speeded reactions (Exp. 1) as well as in a number-categorization task (Exp. 2). Analyzes of the distributions of RTs in Experiment 3, in which two primes could either be assigned to the same or to opposite responses, suggest that results are better reconciled with a race model rather than a coactivation model. Consequently, we conclude that in each trial only the prime which is processed most rapidly gets access to the motor system.

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12:40-13:00 **(62)**

Playing Chess Unconsciously: Subliminal Priming of Conjunction Stimuli Is Restricted to Experts - *Andrea KIESEL, Carsten POHL, Wilfried KUNDE, Michael BERNER, Joachim HOFFMANN*

Experts in a field process task relevant information more efficiently than novices (Reingold, Charness, Pomplun, & Stampe, 2001, PsychSci). Here we investigated if chess experts are able to detect unconsciously whether a briefly presented chess situation entails a checking configuration. Thereby, check detection required integrating two features – identity and location – of the chess figures. In a subliminal priming experiment, chess experts but not novices revealed unconscious priming effects. Even if novices trained the task extensively (more than 3000 trials) no priming effects were observed for prime-stimuli that have been seen several hundred times as targets. We conclude that for novices, conscious awareness seems to be a prerequisite for more complex visual processing. However, contrary to current views (Engel & Singer, 2001, TICS) experts revealed priming effects for unconsciously presented conjunction stimuli. We conjecture that experts acquired templates, that is, visual memory episodes for chess configurations in which the respective features are already bound. These templates enable complex visual processing outside of conscious awareness.

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Language comprehension
Amphi Charve (Physique)
Thursday morning 11h – 12h40

Chaired by Cristina Cacciari, Modena e Reggio Emilia University

11:00-11:20 **(63)**

What ERPS Tell Us About the Mechanisms Underlying Idiom Comprehension - *Nicola MOLINARO, Francesco VESPIGNANI, Paolo CANAL, Cristina CACCIARI (read by Cristina CACCIARI)*

This study investigated the processing of idioms using an ERP paradigm. According to the Configuration Hypothesis (Cacciari & Tabossi, 1988), the activation of an idiomatic meaning takes place only after a sufficient portion of the idiom makes the reader recognize the idiomatic nature of the string. Predictable idioms (i.e., strings recognized as idioms before the last word) in their canonical forms were embedded in neutral contexts and were visually presented word by word to fifty participants. We had two control conditions: a. the constituent just after the idiom's recognition point was substituted, and b. the word that triggers the idiom's recognition was substituted. An N400 emerged when the canonical wording of idioms was altered. At the words following the recognition point, an earlier positive peak around 250 ms emerged for the idiomatic string suggesting that the processing system is engaged in confirming the previous recognition of the idiomatic configuration.

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11:20-11:40 **(64)**

Maintaining the Two Meanings of Idiomatic Expressions Facilitates Comprehension - *Margot VAN MULKEN, Mirjam ERNESTUS*

Some slogans invite readers to keep both the literal and the idiomatic meaning of an idiomatic expression activated. This paper reports three experiments investigating whether the literal meaning is deactivated also in these slogans, as in idiomatic expressions in general. Participants were presented with two sentences simultaneously: a slogan with an idiomatic expression (e.g., We'll show the way) followed by a sentence supporting either both meanings of the expression (Driving School Perfect coaches you with passion) or only the idiomatic meaning (Arts School Perfect coaches you with passion). Participants read the set of sentences faster if the second sentence supported both meanings. Moreover, they also performed subsequent lexical decision faster, especially if the target for lexical decision referred to any of the two meanings of the expression. Apparently, competition models of semantic activation cannot explain the processing of idiomatic expressions requiring the activation of both meanings.

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11:40-12:00 **(65)**

Emergent Subsyllabic Representations: Evidence From Korean and English - *Yongeun LEE, Matt GOLDRICK (read by Matt GOLDRICK)*

English speakers group together certain segments within syllables (e.g., 'bet'=b//et). Some theories attribute this to a language-wide syllable structure pattern (e.g., all syllables contain an onset and rime). Others assume it reflects co-occurrence patterns of particular segments (e.g., 'et' is higher in frequency than 'be'). We show both factors contribute to English and Korean speakers' representations of syllables. We examined onset-vowel-coda (OVC) syllables. When segment sequences (OV vs. VC) differed in their association strength, both English and Korean participants grouped together the more strongly associated segments. However, when OV and VC sequences had equal association strength, speakers' groupings reflected language-wide patterns. In English, VC sequences tend to be strongly associated and participants tended to group these segments together; in Korean, the opposite pattern held. A connectionist phonological processing architecture can account for these findings. Representation and processing reflects item-specific effects (e.g., segmental co-occurrence strength) as well as recurrent language-wide patterns.

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12:00-12:20 **(66)**

The Integration Between the Word and Gesture Meaning Systems: Evidence From RTS and ERPS - *Paolo BERNARDIS, Elena SALILLAS, Nicoletta CARAMELLI*

Aim of the present study was to assess the relationships between the gesture and language meaning systems with a priming paradigm at both the behavioral and the neurophysiological levels. Fifteen participants watched forty video-clips of different types of iconic gestures followed by words (nouns or verbs), which could be related or unrelated in meaning. Behavioral results showed an interference effect between the meaning of iconic gestures and that of unrelated words. ERPs analyses showed a greater P200 component for nouns than for verbs, which was modulated by the relation with the preceding gesture, and a clear N400 with greater negative values for verbs than for nouns. Although there was evidence for a deep integration between word and gesture in the P200 time window; the lack of interaction between the meaning relation and the grammatical class in the N400 time window suggests that the meaning systems of word and gesture differ.

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12:20-12:40 **(67)**

Activation and Retention of Modality-Specific Information During Language Comprehension. - *Diane PECHER, Kiki ZANOLIE, Saskia VAN DANTZIG, Rolf ZWAAN, René ZEELENBERG*

According to embodied cognition theories, language comprehenders simulate sensorimotor experiences to represent meaning. There is now evidence in the literature that subtle perceptual variations that are implied by sentences, but not explicitly described, can affect subsequent visual perception. Moreover, representations of meaning can be modality specific. Although these findings support the embodied view, strategic imagery may also play a role. To prevent such strategies, we investigated long term effects of sentence reading on object recognition. Language comprehenders first read a list of sentences about objects. Only after the complete list had been read was recognition memory tested with pictures. Recognition performance was better if the modality (Exp. 1) or the orientation or shape (Exp. 2) of the object matched that implied by the sentence. These results indicate that previously found match effects were not due to strategic imagery, and show that details of sensorimotor simulations are retained over longer periods.

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SYMP: Cognitive Aging
Amphi Chimie
Thursday morning 11h – 12h20

Organized by Laurence Taconnat, University of Tours and Patrick Lemaire, University of Provence

11:00-11:20 **(68)**

Visuospatial Working Memory in Vision and Touch: a Study with Young and Older Adults - *Soledad BALLESTEROS, Manuel SEBASTIAN, Antonio MANSO, Julia MAYAS, Francisco MUÑOZ*

We investigated unimodal and crossmodal spatial working memory in young and older participants using a dual task paradigm. Experiment 1 combined two different spatial primary tasks (Visual Matrices and Haptic Corsi Blocks) with two visual and haptic secondary tasks. The results showed that the visuospatial WM of older adults was lower than that of the young participants. Both, young and older adults showed larger visual than haptic spans. Experiment 2 combined two visual/ haptic identical primary tasks with three interference tasks (verbal, visual, haptic) and a control condition. Young and older participants had to inform of the spatial locations of two identical items while ignoring a third different one under the three interference conditions. Older adults were less accurate than young adults independently of modality. Moreover, performance was lower in touch than in vision at all secondary tasks conditions in both groups. Results are interpreted by the simultaneous/sequential nature of visual and haptic processing.

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11:20-11:40 **(69)**

Attentional Switching and Rapid Information Processing in Mild Cognitive Impairment - *Sylvie BELLEVILLE, Pierre JOLICOEUR, Serge GAUTHIER*

Older persons with mild cognitive impairment (MCI) are at high risk of developing Alzheimer's disease and may stand in a preclinical phase of the disease. For this reason, it has been proposed that the presence of memory deficits is the hallmark of MCI. In this talk, we will present data in support of attentional control deficits in MCI. Attentional control refers to the person's ability to deploy executive attention. Attentional control was measured using task switching paradigms that manipulated the nature of the switch set and the cue-to-target as well as target-to-cue intervals. An attentional blink paradigm that measured the ability to process temporal information rapidly was also used. These tasks indicated the presence of selective impairment of attentional control in MCI. MCI participants showed anomalies in switching capacities and rapid information processing of sequential targets. This indicates impairment of attentional control in the MCI phase along the MCI/AD continuum.

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11:40-12:00 **(70)**

Effect of Normal Aging on Perceptual and Motor Inhibitory Processes - *Fabienne COLLETTE, Sophie GERMAIN, David STAWARCZYK*

A theoretical distinction between perceptual and motor inhibitory processes was proposed by Dempster and Corkill (1999). In that context, the performance of elderly and young subjects (N=20) was compared on a series of tasks requiring motor or perceptual inhibition, with the hypothesis that perceptual, but not motor, inhibitory processes, could be impaired in normal aging. Perceptual and motor inhibitiory processes were assessed respectively with (a) the Stroop, negative priming, flanker and perceptual conflict tasks, (b) the go/no-go, stop-signal, antisaccade and motor conflicts tasks. A preserved performance in elderly ($p>0.05$) was observed for the go/no-go, stop-signal and negative priming tasks only. These results does not support the hypothesis of a selective impairment of perceptual inhibition in elderly, but rather support (to the exception of the antisaccade task) the hypothesis of a more important sensitivity to interference in elderly when several alternatives are available at the stage of response production.

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12:00-12:20 **(71)**

An Integrative Cross-Level Perspective to the Compensation Vs. Dedifferentiation Dilemma in the Aging Brain. - *Christian CHICHERIO, Shu-Chen LI, Ulman LINDENBERGER*

In recent years, functional neuroimaging techniques have become increasingly critical for the study of cognitive aging. The main finding showing more diffuse and less task-specific patterns of brain activation with advancing age has been interpreted in terms of performance-enhancing cerebral compensation and generally viewed as contradictory to the performance-deteriorating functional dedifferentiation supported by multivariate behavioural research. Furthermore, data linking brain to behaviour pose still other challenges for researchers. This presentation raises a number of methodological caveats and reviews the conceptual status of compensation and dedifferentiation. In particular, emerging evidence suggests that both hypotheses may be tightly linked. Moreover, large-scale studies that aim to integrate empirical evidence across domains of functioning, timescales, as well as behavioral and neuronal levels of analysis are illustrated. Adopting an integrative cross-level approach may shed new lights on the functional significance of cerebral reorganization during senescence and offer a promising framework to future cognitive aging research.

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SYMP: Attention and saliency in the perception of real-world scenes

Amphi Sciences Naturelles

Thursday morning 11h – 13h

Organized by Geoffrey Underwood, University of Nottingham

11:00-11:20 **(72)**

Picture Inspection Processes and Human Eye Movements - *Neil MENNIE, Geoffrey UNDERWOOD (read by Geoffrey UNDERWOOD)*

Currently, efficient retrieval of images from large picture databases is a problem in many different applications. The challenge is to devise methods of representing those images that facilitates retrieval, indexing, and avoids the problems of textual description. One potential solution is to examine the similarity of eye movements executed during image inspection and recall as an alternative method of indexing and as signatures for retrieval. Here, in our first study, we used a search task where we constrained objects to specific locations and asked subjects to search for a change from a previously viewed image. We compared three different, published models of comparing scanpaths between the first and second viewings. Results show scanpaths are more similar than chance and scanpath similarity changes over the course of a session. We discuss the merits of each model and outline future studies to address the functional role of eye movements in image retrieval.

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11:20-11:40 **(73)**

Flexible Uses of Saliency Map During Ocular Explorations of Real- World Scenes. - *Alan CHAUVIN, Nathalie GUYADER, Jeanny HERAULT, Christian MARENDAZ*

What guided attention as we inspect images of real-world scenes? The saliency map model model of Itti & Koch (2000) predicts that regions with particular properties attract attention and drive ocular explorations.

But, because previous works were mainly based on correlation analysis (but see Einhauser, 2002), no causal link could be established between image properties and ocular fixations. Therefore, we manipulated the saliency and "semantic congruency" of small regions within 72 natural scenes and measure eye movements. In contrast with control condition, data analysis showed that, first, when the saliency of one region was reduced the region was less attractive.

Secondly, when an incongruent object was inserted, the region was less attractive. In conclusion, on one hand; we establish a causal link between saliency and ocular fixations. On the other hand; keeping most of image properties constant, we show that ocular fixations are flexibly driven by the congruency of an object and its context.

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11:40-12:00 **(74)**

A Search Benefit for Saliency in Normal and Distorted Photographs - *Tom FOULSHAM, Geoffrey UNDERWOOD*

Visual saliency seems to have a small but significant effect on where people look when freely viewing natural images. However, it has been argued that search tasks are dominated by top-down guidance driven by knowledge of the target. In the experiments reported here, participants searched for image regions in colour photographs whilst having their eye movements recorded. Target regions that were highly salient (in terms of the Itti and Koch, 2000 model) were looked at earlier and resulted in quicker reaction times than lower saliency or non-salient control regions. In additional experiments, the scenes were distorted using a gaze-contingent display which removed high spatial-frequency, colour or contrast information from the periphery. A saliency benefit remained, suggesting that saliency does have effects in search and that these are robust with some manipulation of image statistics.

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12:00-12:20 **(75)**

The Science of Social Attention - *Alan KINGSTONE, Elina BIRMINGHAM, Walter F. BISCHOF*

We all have a strong intuition that eyes are special stimuli. Among other things, gaze seems to tell us where other people are attending. Importantly, our sense that gaze is special is reflected in investigations and theories of social attention. And yet there is, at best, very weak evidence for the fundamental assumption that eyes are selected preferentially over other stimuli. In my talk I present evidence that supports this assumption, but also that the preferential selection of eyes is intimately tied to the situation, e.g., the complexity of the scene and the goals of the observer. Implications for theories of social attention, as well as for methods of scientific investigation, will be discussed.

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12:20-12:40 **(76)**

Expertise and Saliency in Scene Recognition - *Katherine HUMPHREY, Geoffrey UNDERWOOD*

Is the sequence of eye movements people make when viewing a picture related to encoding the image into memory? The suggestion of a relationship is supported by studies that have found that scanpaths are more similar over multiple viewings of a stimulus than would be expected by chance. It has also been found that low-level visual saliency has a large influence on initial formation of these scanpaths, and has lead to formation of theories such as the Saliency Map Hypothesis. However, bottom-up processes such as these can be overridden by top-down cognitive knowledge in the form of domain expertise. Domain experts were asked to look at a set of naturalistic photographs in preparation for a memory test. Then they were given a second set of stimuli and were asked to identify the picture as old (from the previous set) or new (never seen before). Eye tracking analyses (including scanpath comparison using a string editing algorithm) revealed that saliency did influence where participants looked and in what sequence. However, this was significantly reduced when participants viewed pictured from their expert domain. This effect is shown to be robust over multiple viewings of the stimuli.

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12:40-13:00 **(77)**

Image Features, Behavioural Task and Systematic Tendencies in Scene Viewing - *Ben TATLER, Ben VINCENT*

When we observe human behaviour, what we record is a combination of at least three factors: (1) extrinsic influences (e.g., image features), (2) intrinsic influences (e.g., task) and (3) systematic tendencies of the behavioural system. Systematic tendencies can be thought of as regularities that are common

across all instances of and manipulations to the behaviour; thus providing a baseline for assessing the influence of extrinsic or intrinsic factors upon the behaviour. We show that non-systematic factors (image features and task) dominate oculomotor behaviour in exocentric co-ordinates, but in retinocentric co-ordinates oculomotor behaviour is dominated by systematic tendencies to move the eyes in particular ways. We consider potential underlying causes of the observed systematic tendencies.

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SYMP: Motor timing and synchronization: behavioral and neurological evidences
Grand Amphi
Thursday afternoon 14h – 16h

Organized by Marta Olivetti Belardinelli, University of Rome "La Sapienza" and Irene Ruspantini, Instituto Superiore di Sanità, Rome

14:00-14:20 **(78)**

Rapid Decisions Under Risk in Face of a Natural Variation of Visual-Motor Uncertainty - *Sergei GEPSHTEIN, Anna SEYDELL, Julia TROMMERSHAEUSER*

Biological movements are prone to error. Movement planning would benefit from taking movement variability into account, by applying appropriate corrections for the different shapes and sizes of error distributions of different movements. We studied how humans performed rapid hand movements towards visual configurations associated with explicit positive and negative payoffs. The distributions of movement errors had anisotropic (elliptic) shapes, elongated in the direction of movement. In agreement with predictions of a normative model of motor planning, observers adjusted their aiming strategy so as to maximize the overlap of the error distribution with the regions of positive payoff while minimizing the overlap with the regions of negative payoff. To do so, observers had to take into account the different shapes of error distributions associated with different movements. The results suggest that the nervous system can represent the multiple uncertainties that affect the consequences of our interaction with the environment.

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14:20-14:40 **(79)**

An Investigation of Pre-Schoolers' Corporeal Synchronization with An External Timekeeper - *Tuomas EEROLA, Geoff LUCK, Petri TOIVIAINEN (read by Geoff LUCK)*

We present new methods for studying pre-schoolers' rhythmic and synchronization abilities. 46 children (2 – 4 years old) were presented with a familiar excerpt of music, and their movements recorded with an optical motion capture system and video camera. To examine the synchronization process in more detail, abrupt tempo changes were introduced into the excerpt by time-stretching the audio file. The childrens' movements were analysed in terms of their periodicity by using windowed autocorrelation. In addition, the synchronization of these periodic movements to the beat structure of the music, the latter obtained from a beat-finding analysis of the audio signal, was examined. Various indices of synchronization accuracy were developed. The children were found to display one of three main movement types (hopping, circling, or swaying), and periodic movements were identified in all three types. These periodic movements were at times synchronized with the music, but there was limited evidence of tempo-adjustment.

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14:40-15:00 **(80)**

Spontaneous Rhythm and Serial Correlations in a Finger-Tapping Task - *Irene RUSPANTINI, Pietro CHISTOLINI, Marta OLIVETTI BELARDINELLI*

All actions take place in time. Under specific conditions, the requirement of a precise timing becomes a key feature of skilled motor coordination. Over several decades research has focused on the capacity to produce regularly timed intervals or to synchronize a motor response with a sensory event. However, our knowledge of the temporal mechanisms underlying such processes is still far from being elucidated. We analysed the timing features of repetitive movements in a finger-tapping task under different conditions: externally triggered by a metronome and self-paced (i.e. synchronization-continuation paradigm). 22 subjects were involved in the experiment. Each performed the task at three rates: 1) spontaneous rate(SR); 2) SR plus 20 %, and 3) SR minus 20% in a random order. Serial correlations were determined in the series of the intertap intervals(ITI) and tap intensity level (TIL). In the short term binary, ternary and quaternary patterns appeared in both the ITI series (periodisms) and the TIL series (rhythms). Rhythms were equiprobable at SR, at fast rates binary and quaternary patterns increased, at slow rates the quaternary pattern decreased. Periodism distribution was not significantly affected by the tapping rate; periodisms were mainly binary. Rarely, more complex patterns were detected. Eventually, power-law correlations were assessed by means of Detrended Fluctuation Analysis in the long term. Results suggest that sequential taps are not isolated events, they appear rather to be organized in structured patterns, both in the short and the long term. A functional model will be presented to account for these evidences.

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15:00-15:20 **(81)**

Synchronisation with Unreliable Metronomes - *Alan WING, Mihalis DOUMAS, Andrew WELCHMAN*

How is timing information from multiple sensory streams combined to maintain ensemble performance? One possibility is that responses are adjusted according to a weighted combination of available sound, vision, and touch cues. Giving more weight to less variable streams predicts that responses will be more closely synchronised with these streams. Moreover, synchronising with two concurrent streams would be less variable than with either stream alone. To test this Maximum Likelihood Estimate model, participants (N=8) tapped the right index finger in synchrony with an auditory or haptic (flexion-extension movements imposed on the left index) metronome, or the two cues in combination. Mean asynchrony was intermediate and variability was lowest in the combined condition as predicted by the model. However, when variability was added to the auditory metronome, the prediction of greater dependence on haptic information was only partly met, possibly because participants' prior experience suggested that auditory information is more reliable.

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15:20-15:40 **(82)**

Audio-Motor Coupling: the Case of Music and Speech - *Alessandro D'AUSILIO*

Recently the audio-motor synchronization has gained high visibility among researcher. In this context language and music offer two separate but similar fields to effectively study this function at work. In order to successfully form action-perception couples, both require the precise coordination of auditory and motor functions, in which timing plays of course, a major role. Here will be given a general overview of the field and an update on recent published and submitted researches. Results from a TMS study on musicians showing how passive listening engage a primary motor cortex activity will be presented as well as an fMRI study showing how the amount of reproducibility of speech sounds differentially recruit a parieto- frontal network of areas including premotor areas.

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15:40-16:00 **(83)**

Dynamic System Theory Suggests Two Timing Mechanisms in Human Movements - *Viktor JIRSA*

Dynamic system theory provides a language based on mathematical theorems to describe the evolution of time-dependent systems. In particular, geometric descriptions of phase flows are most appealing, because they provide an unambiguous classification of dynamic systems. Phase flows are defined as the

rate of change of the state variables of a system. For the case of single effector movements along one dimension, the state variables are commonly assumed to be the end effector's position and velocity. If the latter is true, then we can prove that basically two mechanisms can exist to execute a periodic movement. The two mechanisms are unambiguously distinguished by their phase flow topologies. It is most intriguing, that one of the proposed timing mechanisms requires an explicit time keeper unit (such as a pace maker), the other mechanism does not, which has implications for currently undergoing brain imaging studies. We have developed a set of measures quantifying the phase flow structures and applied these to experimental data (rhythmic movements) from human subjects and computationally generated data. All measures converge to the same result: For movement frequencies smaller than 1Hz, the movements are more discrete and require a time keeper. For higher movement frequencies, the movements become continuous and are self sustained, i.e. do not require a time keeper.

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Learning
Amphi Péres
Thursday afternoon 14h – 16h

Chaired by Francesco S. Marucci, University of Rome "La Sapienza"

14:00-14:20 **(84)**

The Relationship Between Schizotypy and Three Consequences of Stimulus Exposure: Latent Inhibition, Learned Irrelevance and Priming - *Mia SCHMIDT-HANSEN, Simon KILLCROSS, Rob HONEY*

Simple exposure to a stimulus has a number of marked effects on subsequent behaviour. It can retard the rate at which a stimulus is subsequently learnt about (e.g., in demonstrations of latent inhibition and learned irrelevance) and can facilitate later stimulus identification (e.g., in demonstrations of priming). Previous research suggests that latent inhibition, and the attentional process that is often presumed to underlie it, is disrupted in participants who have high schizotypy scores. However, in our studies while learned irrelevance and priming were disrupted in such participants, latent inhibition was not. These results show that, at least under some circumstances, latent inhibition is preserved in participants with high schizotypy scores; and imply that one must look to the disruption of processes other than those involved in latent inhibition to explain the relationship between high levels of schizotypy and both learned irrelevance and priming.

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14:20-14:40 **(85)**

Age-Related Change in the Ability to Switch Between Choice Tasks and to Shift Between Stopping and Going - *Mariette HUIZINGA, Maurits VAN DER MOLEN*

This study examined developmental differences in the ability to switch between tasks and to shift between stopping and going. Three age groups (7-year-olds, 11-year-olds, and young-adults) performed on a standard version and on a hybrid version of the task-switching paradigm, in which participants were cued to consider the color or shape of a target stimulus. Participants had to execute a choice response on some trials, but a disjunctive response on others. The paradigm allowed the assessment of the speed of switching between choice tasks, and of shifting from stopping to going. The results showed that the costs involved in switching between choice tasks decreased with advancing age until late childhood. This effect decreased when the interval between cue and target increased. In addition, the costs in shifting from stopping to going decreased with the children's age, but already reached mature levels by early childhood. The results indicate that switching between color and shape responses and shifting between stopping and going are time-consuming processes that mature at different rates.

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14:40-15:00 **(86)**

Differences in Deliberate Practice Explain Drop-Out and Male-Female Differences in Chess - *Anique DE BRUIN, Remy RIKERS, Henk SCHMIDT*

Studies on the development of expertise that compare experts to non-experts have identified a strong relation between accumulated hours of deliberate practice and performance. However, it is possible that only those who eventually become experts benefit from deliberate practice, and that others do not and therefore drop out. This would lead to an overestimation of the relation between practice and performance. To examine this, we studied young chess players, who were still in or had recently dropped out of a national training program. Using a linear mixed models analysis, we found that drop-outs had invested significantly less time in deliberate practice throughout their career, which also explained their lower chess ratings. This rejects the possibility that the relation between deliberate practice and performance only holds for those who eventually reach the top. Moreover, the performance difference between males and females could mainly be attributed to less deliberate practice by females.

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15:00-15:20 **(87)**

The Expression of Implicit Learning Depends on Context Changes Only If They Increase Control Demands. - *Joaquin M.M. VAQUERO, Luís JIMENEZ, Yeray GONZALEZ, Eduardo MADRID, Juan LUPIANEZ*

Jiménez et al. (2006) demonstrated that implicit but not explicit sequence learning was affected by superficial task changes. However, this qualitative difference can be explained either because implicit learning is context-dependent or because the new task caused participants to adopt a more stringent control strategy, that indirectly affected the expression of implicit learning. To examine these contrasting accounts, we compared learning under incidental and intentional conditions using either locations or symbols to define sequences. Following a training phase, participants were presented with a transfer block in which superficial changes were introduced that increased or decreased task difficulty. The expression of implicit learning was hindered especially by those transfer tasks that produced an increase in the control requirements. This suggests that not all contextual factors are equally important, but that the expression of implicit learning is specifically hindered by task changes that induce the adoption of a more stringent control set.

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15:20-15:40 **(88)**

Rule Based Instruction, Learning and Recognition: Verifying on Children the Anderson's Theory of Learning - *Maria MEO, Francesco S. MARUCCI (read by Francesco S. MARUCCI)*

Main goals of this study were: 1) to investigate learning and recognition of new stimuli in children; 2) to evaluate the plausibility of Anderson's theory of learning. In experiment 1, 4 people living an unreal planet are presented in 2 training sessions together with verbal descriptors in two condition: rule-based versus descriptive training text. Then was told to children that an invading army were going to this planet disguising themselves like this 4 people. Invaders were constructed modifying people in 4 ways: adding, subtracting, changing the shape or the colour in one/more particular. There were 3 level of complexity of modifications. Subjects were requested to recognize the original people. In experiment 2, training sessions were absent, but subjects had a rule-based or descriptive instruction text. Results: 1) for all subjects recognition has been hardest in subtraction condition; 2) children took advantage from rule based training, not from rule based instruction.

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15:40-16:00 **(89)**

Auditory Expectations for Newly Acquired Material: Combining Implicit Learning and Priming Paradigms - *Barbara TILLMANN, Bénédicte POULIN-CHARRONNAT*

Based on knowledge about structural regularities of the environment, perceivers develop expectations for future events, leading to facilitated processing of expected events. The priming paradigm is an indirect investigation method of perceptual expectations and has shown facilitation of structurally expected events for various materials. Our study investigated whether newly acquired knowledge allows for expectancy formation. In the first phase of the experiment, listeners were exposed to structured tone sequences that were based on a finite-state grammar, used in implicit learning research. In the second phase, listeners made speeded judgments on a perceptual feature of either a target tone in the sequences or a visual event presented in synchrony with the target tone. The target tone respected or violated the structure of the artificial grammar. First data show that response times were slower when a structural violation was presented. This suggests that listeners' acquisition of new tone structures influences event processing.

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Language acquisition and dyslexia
Amphi Charve (Physique)
Thursday afternoon 14h – 16h

Chaired by Vera Kempe, University of Stirling

14:00-14:20 **(90)**

Adult Spelling and Phonological Processing - *Virginia M. HOLMES*

Why do some skilled adults who can read difficult-to-spell words, such as plagiarism, have greater trouble than others spelling such words accurately? In three experiments, groups of good and poor adult spellers were matched on reading accuracy. The poor spellers took longer than the good spellers to read aloud long printed words. Do the spelling and reading problems reflect inferior phonological processing ability? Relative to the good spellers, the poor spellers produced no more phonologically implausible misspellings, and they were just as good at spelling nonwords. Their phonological memory was just as good, as was their speed and accuracy at naming pictures. However, compared with the good spellers, poor spellers were worse at classifying printed words and detecting letter misorderings in long words. These poor adult spellers do not have a phonological processing problem, but they are slower at orthographic processing, confirming the intimate relationship between reading and spelling processes.

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14:20-14:40 **(91)**

Line Bisection in Developmental Dyslexia "Evidence of a Left Visual" Mini-Neglect'? - *Lynne DUNCAN, Christopher GRIEVE*

Recent work has found that the normal pattern of leftward bias in line bisection is absent amongst developmental dyslexics suggesting a spatial attention deficit. In the present study, a computerised version of the Landmark task is used to compare dyslexic bisection judgements with those of controls under fast and slow presentation times. Preliminary results are consistent with bisection performance being sensitive to level of skill and strategy use in reading. Contrary to expectation the dyslexics show a significant leftward bias which tends to be more extreme in extent than that of chronological-age controls but less extreme than that of reading-age controls. Dyslexic performance is also characterised by a wide variation in response especially under fast presentation conditions. Individual profiles are explored in an attempt to relate leftward bias to dyslexia subtypes. The outcome is discussed in terms of current understanding of line bisection performance and theoretical accounts of developmental dyslexia.

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14:40-15:00 **(92)**

The Difficulty of Source and the Ease of Suffixes in Hungarian Spatial Language - *Csaba PLEH, Ágnes LUKACS, Mihály RACSMANY*

Modern psycholinguistic studies started to use experimental and child language observational data on the language of space to obtain evidence for the primacy issue: who leads, language or spatial cognition in the articulation of spatial language. Following the model of Landau and Jackendoff strong claims can be made about the universal distinctions languages make about space, and their relationship to the organization of spatial cognition in the brain. However, there are important differences in this regard between languages. Hungarian data will be used to illustrate how a universal cognitive tendency – the primacy of goals – can be shown to exist very early on in a language that requires distinctions along the path (e.g. in, into, 'from inside'). The difficulty of source was also present in learning artificial space markers, while at the same time, suffixes as opposed to postpositions were very easy to acquire. Studies on Williams syndrome subjects will also presented. This condition is characterized by severe limitations of spatial cognition, related to the underdevelopment of posterior parietal areas. Spatial language in these subjects was very limited compared to their general level of grammatical morphology. However, in detailed comparisons no differences were found in the qualitative pattern of errors in spatial language. The limitations of computational space limit spatial language in this group, but at the same time the types of computations performed by the limited system are identical. A sentence completion study indicates that in using spatial suffixes to code interpersonal meanings like to be angry at, both in normal subject and in impaired populations spatial use is easier and earlier. All of these data support a rather universal and cognition based view of the unfolding and organization of spatial language.

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15:00-15:20 **(93)**

From Melody to Prosody: Music Transfer Effect in Mandarin Chinese Lexical Tone Detection - *Franco DELOGU, Giulia LAMPIS, Marta OLIVETTI*

This study aims at verifying if the discrimination of lexical Mandarin tones varies in function of music melodic ability. Three different samples of Italian speakers (naïves students, students of Mandarin and children) were asked to perform a same-different task on two brief sentences in Mandarin. When the difference occurred, it could either be a different word (phonological condition), or a different tone of one of the words (tonal condition). The task requires to identify the kind of occurred variation. Furthermore, participants' melodic memory was tested by means of a specific sub test of the Wing's Test of Musical Intelligence. Main results show that all groups performed significantly better in identifying phonological variations rather than tonal ones. More interestingly, subjects that scored high at Wing's test showed better performance exclusively in tonal detection. Our results demonstrates a music-to-language transfer effect that selectively improves prosodic processing.

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15:20-15:40 **(94)**

Prosodic Disambiguation in Child-Directed Speech - *Vera KEMPE, Sonja SCHAEFFLER*

In four experiments, we examined prosodic disambiguation of syntactically ambiguous sentences like 'Touch the dog with the flower.' using a referential communication task. Half of the sentences were presented with an ambiguous context in which both the instrument and the modifier interpretation were plausible; for the other half the context allowed only one interpretation. Speakers were 48 mothers and 48 non-mothers addressing an adult and a 2-3 year old child. Half of the speakers addressed a real, the other half an imaginary child. Results showed that only non-mothers, but not mothers, used the pause durations after the first noun to differentiate between instrument and modifier interpretation. On the other hand, mothers raised their pitch more than non-mothers in the child-directed condition. These findings suggest that child-directed speech of mothers is primarily affective, rather than didactic, in nature, designed to capture the child's attention rather than to clarify message content.

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15:40-16:00 **(95)**

Recursion and Language Acquisition - the Role of Concrete Representations of a Formal System - *Francis LOWENTHAL*

We used Concrete Representations of a Formal System (CRFS) with patients who had lost the ability to communicate in a structured way. CRFSs were used in the context of problem solving activities which can be introduced non verbally and solved using a recursive approach. The positive results observed in subjects with localized cerebral lesions were not observed in patients with cerebral diffuse lesions. Structural progresses in language production were observed in normal subjects. We claimed, and Lefebvre proved, that manipulations of CRFSs enable the subject's brain to mobilize new neurones when they are engaged in a language production task. Hauser, Chomsky and Tecumseh Fitch recently claimed that human communication differs from animal communication because humans have the possibility to perform recursive computations. We thus suggest that manipulations of CRFS have the positive effects observed because they train the brain to use a recursive approach in problem solving tasks.

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SYMP: Retrieval Processes in Episodic Memory
Amphi Chimie
Thursday afternoon 14h – 16h

Organized by Karl-Heinz Bäuml, Regensburg University

14:00-14:20 **(96)**

Does Directed Forgetting Depend on Attention and Mood? - *Karl-Heinz BÄUML, Alp ASLAN, Christof KUHBANDNER, Bernhard PASTÖTTER*

In list-method directed forgetting, participants are cued to intentionally forget a previously studied list while remembering a subsequently presented second list. In response to the forget cue, typically List-1 recall declines (forgetting) and List-2 recall inclines (enhancement). By showing that List-2 encoding is a necessary condition for the directed-forgetting effect, prior work indicated that the underlying mechanisms operate during List-2 encoding. We conducted a series of experiments in which we examined how directed forgetting is affected through divided attention and negative moods experienced during List-2 encoding. Divided attention during List-2 encoding reduced recall of List-2 items, but it did not affect the forgetting and did not affect the enhancement. Negative moods experienced during List-2 encoding did also not affect the enhancement. However, negative moods eliminated the forgetting. Successful directed forgetting, therefore, does not depend on processing List-2 items with full attention. It presupposes, however, that List-2 items are processed in nonnegative moods.

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14:20-14:40 **(97)**

Can We Intentionally Forget Actions? - *Lili SAHAKYAN*

Research demonstrates that people are capable of intentionally forgetting previously acquired information when instructed to do so (known as the directed forgetting effect). Supporting evidence comes from studies utilizing both verbal materials and pictorial stimuli. Experiment 1 and 2 employed the list-method directed forgetting paradigm with action phrases as stimuli in order to investigate whether people can forget the actions they had performed. In Experiment 1 pure lists of subject-performed tasks (SPT) were used, and in Experiment 2 mixed lists containing both verbal tasks (VT) and SPT were used. Experiment 3 manipulated the environmental context between the study and the test to compare the degree of forgetting of VT and SPT. Overall, the results showed that both VTs and SPTs suffered to the same degree from the directed forgetting instruction and the physical context change manipulation. Implications for the theories of directed forgetting and action memory are discussed.

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14:40-15:00 **(98)**

ERP Components of the Think/No-Think (TNT) Task and Subsequent Recall - *Mihály RACSMANY, Martin A. CONWAY, Mónika ALBU, Márta ZIMMER, Gyula KOVACS, Attila KRAJCSI (read by Martin A. CONWAY)*

In a TNT experiment EEG was used to identify event-related brain potential (ERP) components characterizing thinking or not thinking about an items from a recently presented word list. ERP components were also examined in a subsequent phase of cued-recall in which preciously learned words were recalled to an associated cue. In the TNT phase not thinking about a recently presented word was characterized by bilateral frontal activity. In the cued-recall phase remembering words that had not been thought about in the earlier TNT phase was associated with predominantly left sided activity, especially in the left frontal lobe. This and other differences are considered in detail.

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15:00-15:20 **(99)**

Direct Suppression of Unwanted Memory Representations in the Think/No-Think Procedure? Behavioural and Brain-Activity Evidence. - *Zara BERGSTRÖM, Alan RICHARDSON-KLAVEHN (read by Alan RICHARDSON-KLAVEHN)*

Repeatedly trying to avoid thinking of an unwanted memory can eventually render the memory inaccessible to consciousness: The memory has become forgotten. However, people can use a variety of strategies to prevent the unwanted memory from coming to mind, and different strategies may have different subsequent consequences. Here, we present experimental evidence that instructing participants to use a strategy of substituting a different thought for the unwanted memory (thought substitution) produces a different pattern of brain activity compared with instructing participants to avoid thought substitution, and to simply block the unwanted memory (thought suppression), and that the two strategies have qualitatively different consequences in terms of later forgetting as assessed by behavioural measures. The results suggest that forgetting can be caused by direct suppression of unwanted memory representations, without the need to activate an alternative memory representation.

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15:20-15:40 **(100)**

Tracking Retrieval-Induced Forgetting: Inhibition and Transfer Appropriate Processing - *Teresa BAJO, Carlos GOMEZ-ARIZA, Angel FERNANDEZ*

It has been proposed that retrieval-induced forgetting (RIF) depends on conceptual processing in memory, since the effect is hard to find with perceptually-driven memory tests. However, there are no a priori reasons to think that inhibitory control acting during memory selection can only be triggered by conceptually-driven competition. In order to explore this issue, we adapted the standard retrieval practice paradigm to introduce either lexical or semantic categories both at study and at practice. In the reported experiments, we found that inducing perceptual/lexical competition during retrieval practice led to RIF when a variety of perceptually-driven final tests were used. Furthermore, the same kind of lexical competition during practice did not produce RIF effects when the final test consisted of a conceptual task. Taken together, these results can be taken as evidence that the presence and absence of Retrieval Induced Forgetting is to a great extent dependent on transfer appropriate processing.

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15:40-16:00 **(101)**

Inhibitory Control: a Sophisticated Form of Memory Updating? - *Malcolm MACLEOD*

Contemporary models of memory point to the possibility of active forms of forgetting such as retrieval inhibition. An inhibitory control account of memory, however, may not simply represent the means by which we can forget unwanted or redundant information but may also represent a means by which we can meet the myriad challenges imposed upon us by a complex social world. According

to such a view, the kind of forgetting demonstrated via the retrieval practice paradigm could be viewed as a byproduct of an otherwise adaptive process. This paper seeks to evaluate the evidence for this claim by considering the extent to which inhibitory control offers a sophisticated form of memory updating and, in doing so, permits a level of flexibility in the retrieval of information that would appear necessary for us to function in an adaptive manner.

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Attention I

Amphi Sciences Naturelles
Thursday afternoon 14h – 16h

Chaired by Elkan Akyurek, Ludwig-Maximilians-University Munich

14:00-14:20 **(102)**

Event-Related Potentials Provide Evidence for Adaptive Attentional Integration - *Elkan AKYUREK, Patricia RIDDELL, Paolo TOFFANIN, Bernhard HOMMEL*

We studied temporal integration of visual information for the case of Lag-1 sparing, which is the escape from the attentional blink deficit when successive target stimuli follow each other directly. Lag-1 sparing has been attributed to the joint integration of both targets in a single episodic representation. It is often assumed that integration is an early process and a result of external factors. Our study showed that this is incorrect. Event-related potentials (ERPs) revealed that participants were able to adjust temporal integration according to task expectations regarding presentation speed. When a fast presentation rate was expected, joint integration was less common and distinct modulations of the ERP were observed: Opening a new object representation for the second target was associated with N2- and P3-type ERP components. When participants expected a slow presentation, targets were more frequently integrated together, resulting in the absence of modulations specific to the second target.

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14:20-14:40 **(103)**

Contingent Transient Attention Benefits Digit Identification - *Brad WYBLE, Howard BOWMAN, Mary POTTER*

We hypothesize that spatial transient attention (Nakayama & Mackeben 1989) plays a role in target detection in the attentional blink. Resources deployed in response to T1 can spill over to benefit the T2 to produce lag-1 sparing. We test this hypothesis with experiments that present digit targets amidst symbol distractors in a spatial array. Results suggest that one target item (T1) presented very briefly can benefit the detection of a different target (T2), but only at the same location and only at short (107 ms) but not longer (213 ms) SOA's. This benefit is especially pronounced if the T1 is not reported, suggesting that attention is deployed prior to successful identification of the target. An additional experiment suggests that this cueing benefit results from attention and is not driven by categorical priming. We conclude that attention is deployed, contingently by categorically defined targets that are not otherwise salient.

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14:40-15:00 **(104)**

Inhibition of Eye Movements to Memorized Locations - *Artem V. BELOPOLSKY, Jan THEEUWES*

Recent research has shown a direct link between spatial working memory and activation of the eye movement system. It was argued that keeping a location in working memory may be nothing else than the preparation of an eye movement. The present study further examined this question. Participants were asked to maintain a location in memory and on half of the trials to make a saccade in response to a central cue. On half of the trials, the location of the saccade target coincided with a location kept in memory. We found that participants were slower in making a saccade to a location kept in spatial working memory relative to other locations. This inhibition was significantly greater than inhibition of return caused by the mere presentation of the cue. The results suggest strong involvement of oculomotor system in maintenance of spatial working memory.

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15:00-15:20 **(105)**

Evidence for An Inhibitory Mechanism of Object-Based Visual Attention. - *Peter WÜHR*

The present study investigates the ability to inhibit the processing of an irrelevant visual object, while processing a relevant one. Participants were presented with two overlapping shapes (e.g. circle and square) in different colors. The task was to name the color of the relevant object designated by shape. Congruent or incongruent color words appeared in the relevant object, in the irrelevant object, or in the background. Stroop effects indicated how strong the respective area of the display was processed. The results showed that words in the relevant object produced larger Stroop effects than words in the background, indicating amplification of relevant objects. In addition, words in the irrelevant object consistently produced smaller Stroop effects than words in the background, indicating inhibition of irrelevant objects. Control experiments replicated these findings with brief display durations (250 ms), and ruled out perceptual factors as a possible explanation. In summary, results support the notion of an inhibitory mechanism of object-based attention, which can be applied in addition to the amplification of relevant objects.

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15:20-15:40 **(106)**

Social Factors Influence Inhibition Of Return (IOR). - *Paul SKARRATT, Geoff COLE, Alan KINGSTONE*

Welsh et al. (2005) reported that when a person observes someone else making a reaching response to a particular location, the observer is slower to respond to that location rather than a different comparable location. This suggestion of an "inhibition of return" (IOR) effect occurring between individuals is highly novel, and as such warrants further study. The present study investigated whether social IOR occurs even when vision of a response is partially occluded. That is, when one knows that a response was made to a location without seeing its execution. Remarkably, social IOR was found irrespective of whether responses were visible or not. These results indicate that social IOR can be driven on the basis of a higher-order inference of another individual's behaviour. 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.

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15:40-16:00 **(107)**

Re-Examining the Contribution of Working Memory to IOR: the Effect of Visual Complexity and Array Size in a Dual Task Paradigm. - *Ana B. VIVAS*

Since inhibition of return (IOR) was first reported by Posner & Cohen (1984), there has been an on going debate about the nature of this phenomenon. More recently, it has been proposed that IOR is a complex phenomenon that may reflect the contribution of multiple processes such as those related with motor selection and attentional orienting (see Berluchi, 2006 for a review). In addition, Castel et al. (2003) have suggested that visuospatial working memory may be needed to maintain and updated the inhibited location (Castel, Pratt, & Craik). In two experiments using a double task paradigm we further examined what is the capacity of the memory system that mediates IOR, and whether a more active or passive memory storage is needed to keep track of the location. We found that IOR was eliminated when participants were asked to remember visual information presented between the cue and the target. However this effect was further modulated by the size and type (visual complexity) of the memory array. We discussed the results in terms of the adequacy of the dual task paradigm to assess the contribution of working memory to IOR.

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SYMP: Current Trends in Mathematical Cognition
Grand Amphi
Friday morning 9h – 10h40

Organized by Koen Luwel, University of Leuven

9:00-9:20 **(108)**

Arabic Digit Naming Speed: Task Context and Redundancy Gain - *Jamie I. D. CAMPBELL, Arron W. METCALFE*

There is evidence for both semantic and asemantic routes for naming Arabic digits, but neuropsychological dissociations suggest that number-fact retrieval (2 × 3 = ?) can inhibit the semantic route for digit naming. Here, we tested the hypothesis that such inhibition should slow digit naming, based on the principle that reduced access to multiple routes would counteract redundancy gain (the response time advantage expected from parallel retrieval pathways). Participants named two single digit numbers and then performed simple addition or magnitude comparison (Experiment 1), multiplication or magnitude comparison (Experiment 2), and multiplication or subtraction (Experiment 3) on the same or on a different pair of digits. Addition and multiplication were expected to inhibit the semantic route whereas comparison and subtraction should enable the semantic route. Digit naming time was approximately 15 ms slower when participants subsequently performed addition or multiplication relative to performing comparison or subtraction, regardless of whether or not the same digit pair was involved. A letter naming control condition in Experiment 3 demonstrated that the effect was specific to digit naming. Number fact retrieval apparently can inhibit Arabic digit naming processes.

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9:20-9:40 **(109)**

The Role of Working Memory in Simple and Complex Arithmetic Strategies - *Ineke IMBO, André VANDIERENDONCK*

When solving simple-arithmetic problems, people have been shown (a) to rely on their working memory and (b) to use several strategies such as retrieval, transformation and counting. The present study was designed to test which working-memory resources are needed across these different strategies. To this end, four experiments were conducted – one for each arithmetic operation. The selective interference paradigm was used to test the role of executive and phonological working-memory resources. The choice/no-choice method was used to test strategy selection and strategy efficiency independently. Results showed that the execution of both retrieval and nonretrieval strategies relied on executive working-memory resources. Phonological working-memory resources were only needed in nonretrieval strategies. Results on strategy selection showed no effects of any working-memory load. Importantly, both strategy execution and strategy selection were influenced by individual differences such as gender, math anxiety, calculator use, arithmetic skill, and mathematical experience.

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9:40-10:00 **(110)**

The Impact of the Working Memory Capacity on Counting Strategies - *Valérie CAMOS*

Among the diversity of the models of working memory, some models consider working memory capacity as a kind of mental energy involved in any activation and retrieval (Anderson, 1993; Anderson & Lebiere, 1998). Within this theoretical framework, individuals with high working memory spans are considered to have more mental energy than low span individuals. Thus, they outperformed low spans in any tasks that require the retrievals of information from long-term memory. For example, they solved faster simple additions the answer of which are directly retrieved from long term memory. Their larger amount of cognitive resources would also permit high span individuals to keep active more information. It could be then suggested that high span individuals use different strategies than low spans because the choice of strategies of the former relies on more information. It would be expected that high span individuals use more complex strategies, i.e. strategies involving information not directly linked to the goal of the task. This hypothesis was tested on adults' counting. Among the different counting strategies, some relies on knowledge that are not primarily linked with counting, e.g., the use of multiplication (Camos, 2003). We predicted that high span individuals would use such strategies more frequently than low span.

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10:00-10:20 **(111)**

Strategy Switching Costs in Arithmetic – *Patrick LEMAIRE, Isabel DEPESTEL, Suzanne HODZIK, Mireille LECACHEUR* Three experiments were run in which participants were asked to solve arithmetic problems. More specifically, participants had to solve computational estimation tasks in which they had to find approximate products of problems (e.g., 43x72=2800). Two specific strategies were tested, rounding-down (i.e., participants were required to round both operands down to the closest decades) and rounding-up (i.e., participants had to round both operands up to the closest decades). In pure conditions, participants were asked to use each rounding strategy to solve all problems. In mixed conditions, participants were asked to alternate between two strategies. General strategy switch costs (i.e., Mixed condition performance – Pure condition performance) and specific strategy switch costs (i.e., within mixed condition, performance on switch trials – performance on nonswitch trials) were influenced by a number of parameters, such as participants' age or the number of strategies to switch among, as well as time for participants to prepare to execute strategies and time to reconfigure strategy sets. These data do generalize findings from cognitive control and task switching to strategy selection. They also have a number of implications to further our understanding of strategy selection and cognitive control processes. We shall discuss these implications in this talk.

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10:20-10:40 **(112)**

Does Switching Between Cognitive Strategies Involve a Cost? - *Koen LUWEL, Lieven VERSCHAFFEL, Patrick ONGHENA*

Task switching experiments have already amply shown that a performance cost emerges when switching between two simple cognitive tasks. The present study investigated whether a similar cost would occur when switching between two strategies for determining numerosities of colored blocks in a 10 x 10 grid. Participants could either use an addition strategy (whereby the blocks are added) or a subtraction strategy (in which the number of empty squares in the grid is subtracted from the total number of squares). Experiment 1 investigated the occurrence of a switch cost in the 'middle' range of the numerosity continuum with a cueing-paradigm. Solution time data revealed a strategy switch cost that seemed to increase as a strategy became less adaptive to the given numerosities. Experiment 2 generalized these findings to free strategy choices in the lower and the upper end of the numerosity continuum. The implications of these findings for the strategy choice process will be discussed.

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SYMP: Implicit learning
Amphi Péres
Friday morning 8h40 – 10h40

Organized by Fenna Poletiek and Esther van den Bos, Leiden University

8:40-9:00 **(113)**

Implicit Artificial Grammar Learning: When the Structure Is Useful - *Esther VAN DEN BOS, Fenna H. POLETIEK*

Under what conditions does implicit learning occur? The present study proposes that the process occurs reliably whenever the structure is useful to one's task. To test this hypothesis, both the presence and the potential usefulness of the structure were varied

in an artificial grammar learning experiment. Participants were presented with non-word sentences and had to identify the ice-creams they referred to. In one condition, identification could be based on the meaning of the individual non-words. The structure was demonstrated to be useless to this task, as no more ice-creams were identified with grammatical than with random sentences. In the other condition, word meanings had to be combined. The structure was shown to be useful, as more ice-creams were identified with grammatical than with random sentences. A subsequent grammaticality judgment test indicated that implicit learning occurred when the structure was useful to the identification task, but not when it was useless.

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9:00-9:20 **(114)**

The Richness of the Stimulus in Language Acquisition - *Padraic MONAGHAN, Marjolein MERKX*

Human language is distinguished from other species' communicative systems by the range, complexity, and qualitative properties of the structures that it contains. But to what extent are these structures acquired from the environment surrounding the learner, or may they be purely innately specified? In a series of artificial language learning studies, we have investigated the potential richness of the language environment in providing information to the learner about language structure, in terms of learning both words and grammatical categories from continuous speech. We combined distributional, phonological, and prosodic sources of information in artificial languages and found that with more information present in the speech, learning words was more accurate. We suggest that poverty of the stimulus arguments only apply if one focuses on single modalities within the language environment. When cues across several sources are combined, the language seems to be sufficiently constrained to enable increasingly effective learning.

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9:20-9:40 **(115)**

Gambling on the Unconscious - *Zoltan DIENES*

Two experiments explore the use of two different subjective measures of unconscious knowledge: wagering and confidence reports. Are people better able to distinguish when they know from when they do not by verbal reports of their mental state (guess vs sure) or by wagering on their correctness (low vs high wager)? Both methods have been used to measure the conscious status of mental states on the assumption that a conscious state is a state one is aware of being in. Using the artificial grammar learning paradigm, experiment one showed that people could discriminate between states of knowledge with verbal confidence ratings but not with wagers. Experiment two showed that when people gave both confidence ratings and wagers on the same trial, wagering was now in line with verbal reports in discriminating different states of knowledge.

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9:40-10:00 **(116)**

The Influence of Pre-Attentive and Attentive Processes on Implicit Sequence Learning - *Natacha DEROOST, Inge ZEEUWS, Eric SOETENS*

We investigated the automatic nature of implicit sequence learning by determining the influence of pre-attentive and attentive processes in the Serial Reaction Time Task (Nissen & Bullemer, 1987). Participants were instructed to react to a sequenced target that was surrounded with randomly changing distractor items. The distractors were varied in such a way that either a pre-attentive feature search (e.g. all distractors were green circles) or an attentive conjunction search (e.g. distractors were a green circle, a red square and a green square) was required in order to detect the target (a red circle). Sequence learning in both conditions was assessed under equal conditions in a transfer phase in which the target was presented without distractors. The results showed that sequence learning was equally good under feature and conjunction search conditions. These findings are in line with the view that implicit sequence learning runs independently of attention.

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10:00-10:20 **(117)**

Timing and Aging in Sequence Learning - *Arnaud DESTREBECQZ, Muriel VANDENBERGHE, Stéphanie CHAMBARON, Patrick FERY, Axel CLEEREMANS*

One way to approach the problem of consciousness involves exploring the differences between conscious and unconscious cognition. Striking dissociations between subjective experience and behaviour have now been reported in various domains. Yet, the extent to which information processing can take place without consciousness remains controversial — in part because of the substantial methodological challenges associated with demonstrating unconscious cognition; in part because of conceptual differences in the manner in which such dissociations are interpreted. Our research is specifically targeted towards the study of dissociations between implicit and explicit learning. This question will be addressed through the sequence learning paradigm, which can be seen as involving a fundamental dimension of human cognition (sequence processing is indeed involved in many different skills, such as the execution of complex movements, language processing, the planification of action, or problem solving). In this talk, I will present different studies exploring the role of timing and aging on implicit and explicit sequence learning. Results emphasize the importance of temporal delay and temporal organization for the acquisition of explicit sequence knowledge.

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10:20-10:40 **(118)**

Effects of Item Prototypicality on Recognition and Classification in Two Stimulus Domains - *Fenna POLETIEK, Carien CALJOUW, Wessel VAN DAM*

Effects of item Prototypicality on Recognition and Classification in two Stimulus Domains. Poletiek, F., Caljouw, C, & Van Dam, W., Leiden University, the Netherlands Implicit memory has been shown among others in the DRM paradigm: participants erroneously recognize new words (lures) as old when the new words are semantically related to the words studied. Implicit learning has been demonstrated in the Artificial Grammar Learning tasks, which procedure is basically similar to the DRM task. However, the stimuli are letter sequences obeying a structure, and participants are required to categorize test items. One view is that (false) recognition and classification judgments are two separate processes (Knowlton & Squire, 1994). However, recent studies (e.g., Kinder, et al., 2003) propose that they are expressions of one, heuristic, process. In two experiments, using two stimulus domains (semantically related words and phonetically related non-words respectively), we explore the contribution of recollection and implicit learning processes, in a recognition and a categorization task. Our results point at one –gist extraction (Koutstaal, et al., 1999)- process underlying both recognition and classification.

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Psycholinguistics
Amphi Charve (Physique)
Friday morning 9h – 10h40

Chaired by Françoise Vitu, University of Provence

9:00-9:20 **(119)**

Beyond Sentence Boundaries. the Contribution of Grammatical Gender Information to Prose Recall - *Judith SCHWEPPE, Ralf RUMMER, Anne FÜRSTENBERG*

In the context of text recall it is often stated that surface representations are quickly forgotten (based on studies by Jarvella, 1971, JVLVB, and Sachs, 1967, Perception & Psychophysics). The general idea is that meaning information is retained beyond sentence boundaries, while lexical and syntactic information is available only for the most recent constituent. We conducted a text

recall experiment based on Jarvella's paradigm to demonstrate that in spite of this grammatical gender information contributes to recall of short texts. Although it is known that grammatical gender information is used in anaphor interpretation even if noun and pronoun do not belong to adjacent sentences, there is no direct evidence for a gender contribution to text memory so far. A recent study (Schweppe & Rummer, 2007, JML) demonstrated that grammatical gender information contributes to sentence recall. The present results indicate that the assumption of a recall contribution of gender information can be extended to prose recall.

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9:20-9:40 **(120)**

Lexical Competition for Acoustically Reduced and Unreduced Words - *Mirjam ERNESTUS, Harald BAAYEN*

Lexical frequency is known to affect the comprehension of acoustically unreduced words. This study investigated the roles of frequency and segment duration in the comprehension of reduced words, which are ubiquitous in conversational speech (e.g., "yesay" for "yesterday"). Two lexical decision experiments demonstrated that segment deletion harms comprehension, irrespective of lexical frequency. This suggests that higher-frequency words are prone to reduce (Zipf), not because a high frequency would protect the listener against unintelligibility, but because a high frequency facilitates lexical selection and articulation for the speaker. Surprisingly, longer, less reduced segments elicited longer response latencies. For segments following the Uniqueness Point, this inhibitory effect of longer durations was restricted to lower-frequency words. Lower-frequency words tend to have more higher-frequency competitors. These apparently become more highly activated with longer segment durations, leading to delayed word recognition. This suggests that slow careful speech has the paradoxical side effect of increased lexical competition.

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9:40-10:00 **(121)**

Doe Eye-Movements During Reading Interfere with Memory for Visuo-Spatial Information? - *Ralf RUMMER, Judith SCHWEPPE, Anne FÜRSTENBERG*

It is an important finding in multimedia research that learning benefits from different presentation modalities for pictures and texts (modality effect). Cognitive models of multimedia learning postulate two restrictions of the cognitive system responsible for this effect. (1) The split attention assumption attributes the modality effect to the fact that auditory texts and pictures can be focused at the same time whereas visual texts and pictures cannot. (2) According to the modality assumption, visual texts demand the same subsystem of working memory as pictures, while auditory texts provide an additional cognitive resource. We suggest replacing the latter by two more specific assumptions (which are in line with current working memory research): (a) The idea that there is a general advantage of auditory over visual texts (general modality effect), and (b) the idea that eye-movements during reading hamper visuo-spatial rehearsal. Two experiments test these assumptions. The results are in line with our hypotheses but do not support the multimedia modality assumption. Hence we propose three different mechanisms responsible for the multimedia modality effect: First, the restriction of the perceptual system; second, the mechanisms responsible for the general modality effect; and third, directed eye-movements during reading that hamper visuo-spatial retention.

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10:00-10:20 **(122)**

Eye Movements in Reading: the Role of Perceptual-Economy Processes. - *Françoise VITU, Denis LANCELIN, Valentine MARRIER D''UNIENVILLE*

As previously shown, a word is more easily recognized when the eyes initially fixate near the centre of the word than when they start out from one of the word's ends. Surprisingly, fixation durations are longest and not shortest towards the centre of words. The present experiments investigated the origin of this intriguing phenomenon referred to as the Inverted-Optimal Viewing Position (or I-OVP) effect. They showed that the effect is not language specific since it generalizes to meaningless strings of symbols. At the same time, the effect is not obligatory; its strength varies with the amount of information expected at the stimulus location. These findings suggest that the I-OVP effect results from perceptual-economy processes. Fixations are held longer when the eyes are estimated to be at locations in words/stimuli where greater amounts of information are anticipated. Implications for models of eye-movement control in reading will be discussed.

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10:20-10:40 **(123)**

Look Here: Effects of Communication and Role on Alignment of Gaze At Shared Dynamic Targets - *E. G. BARD, R. H. HILL, C. NICOL, J. CARLETTA*

To discover whether dialogue aligns cognitive representations (Pickering & Garrod, 2004), Richardson, Dale, and Kirkham (in press) used cross-recurrence analysis to show that interlocutors' gaze is better time-aligned during dialogue than during monologue. We ask whether dialogue, the joint task, or communication itself aligned visual attention. Thirty-two dyads were eye-tracked while constructing tangrams on yoked computer screens. Three communication modalities, -- spoken dialogue, interlocutor gaze (cross-projected eye track), interlocutor movement (cross-projected mouse track), -- were varied factorially. Dyads were assigned manager / helper roles, as is common in dialogue experiments, or no roles, as is customary in other joint action paradigms. Alignment of players' gaze at dynamic regions of interest always significantly exceeded randomized cell baselines, even without communication. Each modality significantly improved task efficiency over the no-modality condition. While any non-verbal modality improved gaze alignment over no-modality conditions, spoken dialogue actually reduced alignment when players had different roles. PICKERING, M., & GARROD, S. (2004). Towards a mechanistic psychology of dialogue. Behavioral and Brain Sciences, 27, 169-190. RICHARDSON, D. C., DALE, R., & KIRKHAM, N. (in press). The art of conversation is coordination: common ground and the coupling of eye movements during dialogue. Psychological Science.

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SYMP: Perspectives on the role of inhibition in cognitive control

Amphi Chimie

Friday morning 8h40 – 10h40

Organized by Wery P.M. van den Wildenberg, Birte U. Forstmann, Universiteit van Amsterdam, and Borís Burle, CNRS & Provence University

Chaired by K. Richard Ridderinkhof

8:40-9:00 **(124)**

The Dual Nature of Temporal Preparation: Neural Activation and Suppression Revealed by TMS of the Motor Cortex - *Thierry HASBROUCQ, Karen DAVRANCHE, Chrsitophe TANDONNET, Chloé MEYNIER, Franck VIDAL, Boris BURLE*

Single-pulse transcranial magnetic stimulations of the motor cortex were performed in order to decipher the neural mechanisms of time preparation. We varied the degree to which it was possible to prepare for the response signal in a choice reaction time task by employing either a short (500 ms) or a long (2500 ms) foreperiod in separate blocks of trials. Transcranial magnetic stimulations were delivered during these foreperiods in order to study modulations in both the size of the motor evoked potential and the duration of the silent period in tonically activated response agonists. Mean motor evoked potential area and silent period duration were assumed to reflect, respectively, the excitability of

the cortico-spinal pathway and the recruitment of inhibitory cortical interneurons. Shorter reaction times were observed with the shorter foreperiod, indicating that a better level of preparation was attained for the short foreperiod. Silent period duration decreased as time elapsed during the foreperiod and this decrement was more pronounced for the short foreperiod. This result suggests that time preparation is accompanied by a removal of intra-cortical inhibition, resulting in an activation. Mean motor evoked potential area decreased over the course of the short foreperiod, but not over the long foreperiod, revealing that time preparation involves the inhibition of the cortico-spinal pathway. We propose that cortico-spinal inhibition secures the development of cortical activation, preventing erroneous premature responding.

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9:00-9:20 **(125)**

The Neuroanatomy of Inhibitory Control - *Hugh GARAVAN*

This presentation will focus on the neuroanatomy of motor inhibitory control as revealed by fMRI and TMS studies. These studies, in combination with lesion analyses, identify the right inferior frontal gyrus as a central node in the brain network subserving this important aspect of cognitive control. A second focus will be the mediating influences of individual differences on this neuroanatomy. Specific emphasis will be placed on sex differences and modulation of inhibitory control across the menstrual cycle. Results will show that the functional neuroanatomy of inhibitory control varies between different demographic groups and also within individuals and is also senstitive to the content of the stimuli to which participants respond and inhibit.

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9:20-9:40 **(126)**

Acting on Impulse: Neural Mechanisms, Temporal Dynamics, and Individual Differences in Interference Control in the Simon Task - *Birte U FORSTMANN, Wery PM VAN DEN WILDENBERG, K. Richard RIDDERINKHOF*

Functional magnetic resonance imaging (fMRI) methods may help in understanding processes of response capture and response inhibition in conflict tasks, such as the Simon task. However, data-driven approaches thus far have not yielded consistent insights into these processes. In my talk I will present a theory-driven approach that capitalizes on individual differences in the processes of central interest. Based on the so-called activation-suppression model, specific behavioral parameters for each individual derived from reaction time (RT)-distribution analysis were computed. These parameters correspond closely to the processes of inappropriate location-driven response activation (capture) and of the subsequent inhibition of this response as detailed by the model. I will show data of an fMRI study with 24 participants in which activation in pre-supplementary motor area (pre-SMA) was found to correlate with the RT-distribution measure of response capture, whereas the right inferior frontal cortex (IFC) was found to correlate with the RT-distribution measure of response inhibition. These results, that are consistent against the backdrop of the larger literature on cognitive control, could have been derived neither from the standard data-driven fMRI approach, nor from inspecting overall mean RT only.

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9:40-10:00 **(127)**

Social Comparison Effects in the Stroop Task : Controlling the Uncontrollable in Presence of Other People. - *Pascal HUGUET, Dinkar SHARMA, Florence DUMAS, Rob BOOTH, Rupert BROWN*

Previous findings have shown the power of social presence and related social comparison processes (phylogenetically very old) over what has been thought to be invariant automatic processing in the Stroop task. Forced-comparison with a slightly faster coactor was associated with a smaller Stroop effect, a phenomenon that did not result from conscious control of lexical-semantic activation. Here, we offer evidence that 1) reduced Stroop effect can also be associated with the presence of a slower coactor, provided one's superiority in the Stroop task is relatively threatened, and 2) this reduction under self-threatening comparison circumstances cannot be restricted to the action of non-social factors. These findings, which offer new reasons to pay constant attention to the social environment of cognition, will be discussed in relation to distraction-conflict theory and the notion of « lateral inhibition ». It will be suggested that cognitive control may sometimes result from complex interactions between phylogenetically very old and younger mechanisms.

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10:00-10:20 **(128)**

Response Inhibition with Implicit Spatial Information - *Wim GEVERS, Elisah D'HOOGE, Wim NOTEBAERT, Frederick VERBRUGGEN, Wery VAN DEN WILDENBERG*

Previous studies investigated whether response inhibition in the stop signal task and interference control in conflict tasks rely on similar mechanisms. In spatial conflict tasks, spatial information can be relevant or irrelevant. In a SRC task this information is relevant whereas in a Simon task this information is irrelevant. Stopping responses were prolonged for incompatible trials in the Simon task but not in the SRC task. In both tasks, the spatial information is presented explicitly as a position on the screen. In the present study we investigated whether similar inhibitory mechanisms are operative if conflicting information is presented implicitly. To this end, we used the SNARC effect. This shows that relatively small (large) numbers are responded to faster with the left (right) hand. Here, we combined the stop task with the SNARC task to see how stopping behavior is influenced by the processing of relevant or irrelevant implicit spatial information.

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10:20-10:40 **(129)**

The Structure and Dynamics of Stopping Responses Revealed by Electrical and Magnetic Brain Stimulation - *Wery VAN DEN WILDENBERG, Borís BURLE, Thierry HASBROUCQ, Franck VIDAL, Maurits VAN DER MOLEN, K. Richard RIDDERINKHOF*

The ability to stop ongoing actions in a split-second is an important element of cognitive control and flexibility. In the 80's, research concerning response inhibition got a major boost from the introduction of the stop-signal paradigm. The so-called "stop task" has been used to isolate and manipulate cognitive stop processes in an experimental setting. In this talk, I will focus on key brain structures as well as process dynamics related to stopping a motor response, using two brain-stimulation techniques. Experiments with "deep-brain stimulation" in patients diagnosed with Parkinson's disease show the involvement of the basal ganglia in response inhibition. Transcranial magnetic stimulation (TMS) over the primary motor cortex, another brain-stimulation technique, revealed the time-course of the physiological inhibition process.

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SYMP: Linking attention and emotion: The establishment of human preference

Amphi Sciences Naturelles

Friday morning 9h – 10h40

Organized by Kimron Shapiro and Jane Raymond, University of Wales, Bangor

9:00-9:20 **(130)**

Linking Attention and Emotion: the Establishment of Human Preference - *Kimron SHAPIRO, Jane RAYMOND, Brian GOOLSBY*

There are two major brain systems that prioritise the processing of information needed to guide human action: a selective attention system that preferentially facilitates processing of task-relevant information and suppresses processing of task irrelevant information, and an emotion system that interprets information in terms of current and future goals. Because coordination between these systems is essential for normal human function, it is important to understand how they interrelate. We report the results

of a multidisciplinary (behavioural, electrophysiological, neuroimaging, and neural network modelling) investigation directed at probing how these systems interact to control behaviour. Our results suggest that an interacting network of brain structures links attention, emotion, and executive control areas result in the establishment of higher-order behavioural preference.

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9:20-9:40 **(131)**

Distractor Devaluation: Cognitive Inhibition Affects Emotional Response - *Jane RAYMOND, Brian GOOLSBY, Kimron SHAPIRO*

Emotional responses to arbitrary stimuli of no explicit value depend on the observer's attentional state when such stimuli were last encountered. Using a simple visual selection task, we asked participants to attend or ignore visual objects and then, a short time alter, evaluate them on social or emotional scales. Previously ignored items were evaluated more negatively than attended items, an effect we call distractor devaluation. Here we present evidence that similar distractor devaluation effects can be produced in a directed forgetting paradigm and in a stop-action (go / no-go) simple manual response task using face stimuli and 'trustworthiness' evaluations. Our results support the notion that cognitive inhibition modulates stored representations of visual objects and that these mnemonic processes have consequences for subsequent emotional response.

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9:40-10:00 **(132)**

Electrophysiological Evidence for a Direct Link Between Attentional Selection and Distractor Devaluation - *Martin EIMER, Monika KISS*

We investigated whether the attentional selection of targets among distractors affects subsequent emotional responses in a task where participants had to rate faces that had previously been presented as targets or distractors in a visual search task. Overall, distractors were rated as less trustworthy than targets. To examine the association between the efficiency of selective attention during visual search and subsequent emotional responses, the N2pc component was measured during visual search, and was then quantified as a function of subsequent evaluative judgments. Evaluation of distractor faces covaried with selective attention. On trials where distractors were judged negatively, the N2pc emerged earlier, demonstrating that attention was strongly biased towards target events, and distractors were effectively inhibited. When previous distractors were judged positively, the N2pc was delayed, indicating unfocused attention to the target and less distractor suppression. These findings demonstrate that variations in the efficiency of attentional selection across trials can predict subsequent affective evaluation.

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10:00-10:20 **(133)**

The Influence of Attentional Demands on the Processing of Emotional Facial Expressions - *Laetitia SILVERT, Anna Christina NOBRE (read by Anna Christina NOBRE)*

Recent studies have yielded inconclusive evidence about the degree to which processing of threat-related stimuli is automatic and unconstrained by the availability of attentional resources. We performed parallel experiments using hemodynamic (fMRI) and electrophysiological (ERP) measures of neural activity to investigate the influence of selective attention on the processing of peripheral emotional versus neutral faces under conditions with different degrees of perceptual demands. The results showed significant effects of selective attention upon emotional processing, which were further modulated by the perceptual demands of the tasks. Hemodynamic and electrophysiological measures provided qualitatively different and complementary information about the neural systems and dynamics involved.

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10:20-10:40 **(134)**

Modelling Distractor Devaluation and Its Neurophsyiolcogical Correlates - *John TAYLOR, Nickolaos FRAGOPANAGOS*

A series or recent studies have shown that selective attention can influence the emotional value of the selected/ignored items. Specifically, ignored items (distractors) were consistently rated less positive in emotional evaluations following attentional selection relative to the selected ones (targets). Furthermore, a known electrophysiological index of attentional selectivity (N2pc) was shown to correlate with the level of the observed 'distractor devaluation' (DD). A neural model was developed in order to account for these findings by means of a plausible mechanism linking attentional processes to emotional evaluations. This mechanism relies on the transformation of attentional inhibition of the distractor into a reduction of the value of that distractor. The model is successful in reproducing the existent behavioural results as well as the observed link between the magnitude of the attentional N2pc and the degree of DD. Moreover, the model proposes a series of theoretical predictions that call for further experimental investigation.

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SYMP: Task switching: Do we need a task-set?
Grand Amphi
Friday morning 11h – 13h

Organized by André Vandierendonck, Ghent University, and Iring Koch, RWTH Aachen

11:00-11:20 **(135)**

Dissociable Contributions of Response Selection and Response Execution in Task-Set Switching - *Andrea M. PHILIPP, Pierre JOLICOEUR, Michael FALKENSTEIN, Iring KOCH (read by Iring KOCH)*

In task switching, proactive task-set interference is assumed to play a crucial role for the occurrence of shift costs and n-2 repetition costs. The present study used a go/no-go signal delay (GSD) to explore the role of response selection and execution with respect to interference. The GSD was either 100 ms or 1500 ms. Participants were encouraged to use the GSD for response selection and preparation. Two experiments indicate that task-set interference can be resolved during response selection and response preparation in the current trial. However, the experiments also suggest that the proactive interference that gives rise to shift costs and n-2 repetition costs in the succeeding trial appears not to be related solely to response selection but also to response execution in the current trial. Thus, the present study demonstrates dissociable contributions of response selection and response execution to the emergence and resolution of task-set interference in task switching.

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11:20-11:40 **(136)**

Transient Working Memory Representations That Govern Intentional S-R Translation - *Nachshon MEIRAN, Yoav KESSLER, Oshrit COHEN-KDOSHAI, Ravid ELENBOGEN*

Three instruction related congruency effects are described in the literature, including flanker effects appearing immediately following the S-R instructions (First Trial Flanker Compatibility Effect, FTFCE, Cohen-Kdoshai & Meiran, 2007), backward compatibility (BC, Hommel, 1998) and the task-rule congruency effect in task switching (TRCE). A series of works shows that while the BC and FTFCE depend on limited capacity working memory, the TRCE reflects the operation of the relatively unlimited capacity activated long-term memory compartment of working memory (Cowan, 1988; Oberauer, 2001). The implications of these results will be discussed in reference to Woodworth's (1938) prepared reflex metaphor.

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11:40-12:00 **(137)**

Task Confusions in Task Switching: Implications for the Idea of a Task Set - *Marco STEINHAUSER, Ronald HÜBNER*

Residual switch costs in task switching are often assumed to reflect a proactive effect of a recently established task set. In this context, a task set represents a configuration of the cognitive system which is necessary for successful task performance. This configuration specifies not only, e.g., perceptual or motor processes but also the task goal. We discuss the validity of these assumptions by considering the effects of task confusions, which occur when a participant applies one task although another task is intended. We show that it is not the intended task but the erroneously applied task that is reflected in the subsequent switch effect. Using a connectionist model, we demonstrate that the classical concept of a task set is insufficient to explain this result. Our findings are more consistent with the idea that the residual switch costs are caused by a goal-independent strengthening of task rules.

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12:00-12:20 **(138)**

Task-Set Control with "Univalent" Stimuli and/or Responses - *Stephen MONSELL, Guy MIZON*

In most task-switching research, all or many of the stimuli afford more than one of the tasks in play. It is sometimes suggested (following Jersild 1927) that when only "univalent" stimuli are expected, there is no danger of selecting the response appropriate to the wrong task, so that the need for task-set modulation disappears (multiple task-sets can be kept simultaneously active, or a single task-set can encompass both tasks). Yet there are reports of non-trivial switch costs with univalent stimuli. We report a comparison of switch costs between conditions with and without bivalent stimuli. We consider two senses of stimulus "univalence": the currently irrelevant dimension (i) has a value not mapped to any response, or (ii) is absent. We also consider the role of response valence, i.e. whether the set of responses has to do double duty, so that the responses' meaning changes when the task changes.

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12:20-12:40 **(139)**

Get Ready, Get Set for Task Set - *Gordon LOGAN, Darryl SCHNEIDER*

The concept of task set is indispensable for understanding the nature of cognitive control. Task descriptions in natural language are too ambiguous; tasks can be described at many different levels (e.g., hoping to convince you, writing an abstract, typing words, pressing keys) and in many different ways at each level. The processing substrates of performance are too ambiguous as well. Processing states can vary continuously, so there are an infinite number of states that underlie any one task and the boundaries between one task and another are fuzzy. The concept of task set mediates between these two levels of description, providing a symbolic description of the task that maps onto the linguistic description and a mathematical or computational description of the task that maps onto the processing substrate.

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12:40-13:00 **(140)**

Measuring Task-Set Reconfiguration by Using Response-Repetition Effects. - *Baptist LIEFOOGHE, Frederick VERBRUGGEN, André VANDIERENDONCK (read by Frederick VERBRUGGEN)*

Many studies demonstrated that switch-costs are not uniquely originated by task-set reconfiguration and that other processes also have a significant contribution to the size of the switch-cost. Consequently, interpreting switch-costs as a marker of task-set reconfiguration is difficult and there is a need for further behavioral measures of task-set reconfiguration. In a series of experiments we explored the use of response-repetition effects in this context. Response repetitions entail a benefit for task-repetition trials and a cost for task-switch trials. At first, the response-repetition effect thus also seems to result from task-set reconfiguration and the present study investigated to which extent response-repetition effects are sensitive to the additional processes that are known to influence the switch-cost but that are not specific to task-set reconfiguration.

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SYMP: Manual and verbal action planning: Points of convergence

Amphi Péres

Friday morning 11h – 13h

Organized by Bernhard Hommel and Niels Schiller, Leiden University

11:00-11:20 **(141)**

Getting Ready on Time: the Role of Auditory Code in Sequential Action Control - *Elisabet TUBAU*

Motor skilled performance, such as that in music or sports, requires having acquired both the correct order of the actions and the precise timing at which each action should be performed. As will be commented, an optimal code for representing order and temporal information seems to be the auditory code. Specifically, in the context of motor sequence learning, it has been found that auditory action effects enhance performance while auditory noise (i.e. random tones presented at the onset of mandatory stimuli) interferes the timing of action execution. Furthermore, individual differences in sequential action acquisition correlate with differences in sensitivity to auditory patterns, as revealed with event-evoked potentials. Overall, these results suggest that sounds linked to actions enhance representing the rhythmic structure of the sequence and, accordingly, the timely execution of the corresponding actions.

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11:20-11:40 **(142)**

Time, Action, and Consciousness - *Axel CLEEREMANS, Jean-Christophe SARRAZIN, Patrick HAGGARD*

Time plays a central role in consciousness, at different levels of information processing. Here, we focus on awareness of simple motor acts, such as pointing movements. Subjects reached for a target, which was unpredictably shifted laterally on some trials. Participants (1) expressed their expectancy of a shift, (2) pointed at the target, adjusting their movement towards the shift if required and (3) reproduced the movement just made (a measure of motor awareness). We analysed the spatial disparity between the initial and the reproduced movements on those trials with a target shift. Negative values (undershoots), suggest "motor pessimism" in that motor awareness only reflects a sluggish, reconstructed awareness of the actual movement, while positive values (overshoots) suggest "motor optimism" in that the reproduced movement is influenced more by participants' intention to point to the shifted target than by their actual movement. Expectancy strongly influenced experience of action. Further, delays inserted between expectancy, action and reproduction had no effect on visuomotor adjustment but influenced action awareness by boosting undershoots, suggesting increased reliance on a time-limited memory for action. Awareness of action is thus influenced by prior thoughts and expectations, but only over a short time period — it is a dynamic and flexible mixture of what we intend to do and of what our motor system actually does.

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11:40-12:00 **(143)**

Verbal Self-Instructions: a Useful Tool for Reducing Age Differences in Task Switching? - *Jutta KRAY, Julia KARBACH, Jutta EBER*

The goal of this study was to examine the role of verbal self-instructions for age-related differences in task switching. Task-switching ability, measured as the difference between performance in single- and mixed-task blocks in which participants switch between two tasks (termed mixing costs), increases during childhood and decreases in old age. To measure the influence of language on task switching we compared conditions in which

participants (a) named the next task (task-relevant verbalization), or (b) verbalized words not related to the task at hand (task-irrelevant verbalization), with conditions in which participants (c) did not verbalize. Results indicated that mixing costs were substantially reduced under task-relevant and enhanced under task-irrelevant verbalization. Age-related differences in mixing costs were substantially reduced when participants named the next task. These findings suggest that verbal self-instructions are a useful tool for retrieving the next task goal and for reducing action-control deficits in younger children and older adults.

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12:00-12:20 **(143b)**

New visuo-spatial associations by training verbo-spatial mappings in the first language. *Wim NOTEBAERT, Wendy DE MOOR, Wim GEVERS, Rob HARTSUIKER (read by Rob HARTSUIKER)*

We investigated whether verbo-spatial and visuo-spatial information share a common representation. We demonstrate that when the associations from spatial words to spatial responses are altered, so that the word LEFT becomes associated with a right response and the word RIGHT with a left response, the associations from the spatial locations left and right to the spatial responses also change. This effect was only observed for first-language spatial words (Dutch) and not for second-language spatial words (French), and was not increased when these languages were combined. The findings argue for shared verbo-spatial and visuo-spatial representations (Zhang, Zhang, & Kornblum, 1999) and for relatively weak lexical-semantic connections for second-language words (Kroll & Stewart, 1994).

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12:20-12:40 **(144)**

Stress and Semantic Context Affect Brain Error-Monitoring Activity - *Lesya GANUSHCHAK, Niels SCHILLER*

In the field of action monitoring, a specific event-related brain potential (ERP), i.e. the Error-Related Negativity (ERN), is associated with error detection. The present study relates the ERN to verbal self-monitoring. We investigated how the ERN is affected by psychological stress in a semantic blocking paradigm. The semantic composition of blocks of pictures was manipulated; blocks were semantically related (dog, cat, horse) or semantically unrelated (cat, table, flute). The stress manipulation did not affect error rate; however, the stress condition yielded increased amplitudes of the ERN compared to the no-stress condition. Furthermore, participants showed semantic interference effects in reaction times and error rates. The ERN amplitude was also larger during semantically related than unrelated blocks. Semantic relatedness seems to lead to more conflict between possible responses. This result demonstrates that the ERN is sensitive to linguistic manipulations and suggests that the functioning of the verbal self-monitoring system during speaking is comparable to other performance monitoring, such as action monitoring.

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12:40-13:00 **(145)**

Bridging Language and Action Control: the Case of Bilingualism - *Mireia HERNANDEZ, Albert COSTA, Nuria SEBASTIAN-GALLES (read by Albert COSTA)*

Language production requires the involvement of decision making processes (decide which ideas to convey, which words to produce, etc,) in order to control behaviour. A theoretical important question is whether the control processes involved in speech production are shared with those processes involved in other cognitive capacities. To advance in such a question, we focus on the particular case of bilingual language production given that bilinguals need to exert a continuous control over their two languages to avoid mixing them. In particular, we ask the question of whether such a continous language control affects the development/efficiency of other attentional abilities involved also in action control (e.g., selective attention, shifting mind sets, conflict resolution). We will discuss recent data on Switching, Stroop, and flanker tasks (non-linguistic tasks) comparing the performance of monolinguals and bilinguals. Our research shows that the efficiency of several general attentional components involved in action control are affected by the bilingualism.

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SYMP: Modeling word recognition and reading aloud: beyond interactive activation

Amphi Charve (Physique)

Friday morning 11h – 12h40

Organized by Johannes Ziegler, CNRS & University od Provence

11:00-11:20 **(146)**

Cross-Fertilization Between Mind Mappers and Cognitive Modelers - 10 Years After: What's New in Word Nerd World? - *Arthur JACOBS*

With the rise of neuroscientific methods in psychology the need for computational and cognitive models that can predict other dependent variables than response times and error rates becomes obvious. On the other hand, any viable and accurate account of complex cognitive processes such as reading must take into account the temporal and anatomical constraints imposed by the fact that reading is a human brain function (Barber & Kutas, 2006). About a decade ago, when some authors speculated about how data on brain activity can constrain computational models of cognition and how such models can guide neuroimaging research, respectively, the conclusion was: “However, we know of no computational model that explicitly simulates rate of bloodflow, magnitudes of blood volume, or latencies and amplitudes of ERP components” (Jacobs & Carr, 1995). The present paper takes a critical look at how this situation has changed in 2007 with a focus on models of word recognition and reading.

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11:20-11:40 **(147)**

Advances in Competitive Network Models of Word Identification: Interactive Activation Goes Solar. - *Colin J. DAVIS*

Since its introduction quarter of a century ago, the interactive activation (IA) model has been possibly the most influential model of visual word identification. Although the original model focussed on explaining data from the Reicher-Wheeler task, subsequent work has shown that the model can give a good account of performance in the lexical decision task, in both its unprimed and primed versions. However, research has also identified a number of empirical results that necessitate changes to the original model, including modifications to its input coding scheme, to the way in which the model represents word frequency, and to its assumptions concerning inhibitory interactions. These assumptions are implemented in the SOLAR (Self-Organising Lexical Acquisition and Recognition) model of visual word identification, which belongs to the same family of competitive network models as IA. SOLAR also tackles a critical challenge for the IA model by seeking to explain the mechanisms underlying learning.

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11:40-12:00 **(148)**

Self-Organized Learning of Orthographic Representations - *Stéphane DUFAU, Jonathan GRAINGER, Johannes ZIEGLER, Claude TOUZET, Bernard LETE, Hervé GLOTIN (read by Jonathan GRAINGER)*

Unsupervised learning of orthographic representations was simulated using a self-organizing map. The network learned to map prelexical orthographic representations (open-bigrams) on to whole-word orthographic representations. The network was exposed to a realistic input drawn from primary school reading manuals and tested in 5 successive phases after exposure corresponding to the 5 grades or primary education. The resulting network successfully simulated error rates obtained in a developmental study of beginning readers. In order to simulate response times (RTs), the network structure and weights were

implemented in an interactive-activation model. The resulting model provided a good fit to the development data for both error rates and RTs.

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12:00-12:20 **(149)**

Falsifying the DRC Computational Model of Reading. - *Max COLTHEART, Derek BESNER, Kathleen RASTLE*

The Dual Route Cascaded (DRC) model of visual word recognition and reading aloud is a computational model which successfully simulates many more results from studies of reading than any other computational model(Coltheart et al., Psychological Review, 2001). Since the publication of this large paper on the DRC model, we have been engaged in an extensive program of research aimed at falsifying the model. Most of this work has been unsuccessful. But there have been occasional successes, and these will be reported in this talk. The results which falsify the DRC model will be described, and work on a revised model which might be able to accommodate all of these results will be discussed.

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12:20-12:40 **(150)**

The CDP+ Model of Reading Aloud - *Marco ZORZI, Conrad PERRY, Johannes ZIEGLER*

There are at least three different types of computational model that have been shown to account for various facets of both normal and impaired single word reading: 1) the connectionist Triangle model; 2) the Dual-Route Cascaded model; and 3) the Connectionist Dual Process model. We identify major strengths and weaknesses of these models. In the spirit of nested incremental modeling, we then present a new Connectionist Dual Process model, CDP+, which builds upon the strengths of two of the previous models while eliminating their weaknesses. Contrary to the Dual-Route Cascaded model, CDP+ is able to learn and produce graded consistency effects. Contrary to the Triangle and the Connectionist Dual Process model, CDP+ accounts for serial effects and has more accurate nonword reading performance. CDP+ also beats all previous models by an order of magnitude when predicting individual item-level variance on large databases. Thus, we show that building upon existing theories by combining the best features of previous models - a nested modeling strategy that is commonly used in other areas of science but often neglected in psychology – results in better and more powerful computational models.

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Higher mental processes
Amphi Chimie
Friday morning 11h – 13h

Chaired by Valerie Thompson, University of Saskatchewan, Canada

11:00-11:20 **(151)**

Counterfactual Thinking and Blame Assignment - *Suzanne EGAN, Kiran SARMA, Marek MCGANN, Michael BREEN, Eileen DOYLE*

We report the results of an experiment that investigated counterfactual thinking and blame assignment in a rape trial. We presented participants with a newspaper article that gave information about an actual rape trial. Participants were then asked about how much blame they would assign to the alleged perpetrator and victim and why, how avoidable the incident was and to generate counterfactual thoughts about how it could have been avoided. The results showed that people typically assigned more blame to the man for the incident but also assigned a smaller but substantial amount of blame to the woman. Participants thought the incident was avoidable but they tended to focus on undoing the woman's actions when generating counterfactual thoughts even though they had assigned more blame to the man. The results may have implications for how people think counterfactually and for how rape is reported in the media.

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11:20-11:40 **(152)**

On Being Confidently Wrong: Representational Complexity and Confidence in Deductive Reasoning - *Valerie THOMPSON,*

The available evidence suggests that confidence in deductive inferences is based on variables that are not linked to the execution of analytic processes. A strong test of this conclusion is afforded by mental models theory (Johnson-Laird & Byrne, 1991), which assumes that problem difficulty is determined by representational complexity. Reasoners solved syllogisms that varied in terms of the ease with which they could be represented. Whereas some easily represented syllogisms engendered confidence, others did not. We propose the data are better explained by Chater and Oaksford's (1999) probability heuristic model, which posits a limited role for analytic processes in deductive reasoning.

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11:40-12:00 **(153)**

Matching Bias in Wason's Selection Task Is Not Eliminated by Explicit Negations - *Christoph STAHL, Christoph KLAUER, Edgar ERDFELDER*

It is still debated whether analytic reasoning processes contribute to performance in Wason's selection task (WST). The matching bias effect in the negations paradigm and its elimination by explicit negations are central arguments against reasoning. In contrast, in a recent model of the WST, analytic processes assume a central role. The present research aims at clarifying the processes underlying matching bias. Two WST experiments were conducted in the negations paradigm to replicate the basic finding and to compare effects of implicit and explicit negations. Results revealed robust matching bias in implicit negations. In contrast to previous findings, matching bias was reduced but not eliminated in conditions using explicit negations. Model-based analyses suggest that matching bias is due to a switch toward a negative test strategy caused by negations. These findings suggest that WST performance cannot be fully explained by relevance and highlight the role of analytic reasoning in the WST.

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12:00-12:20 **(154)**

Deontic Reasoning, Mental Models Theory and Traffic Signs Information - *Cristina VARGAS, Sergio MORENO-RIOS, Candida CASTRO, Geoffrey UNDERWOOD (read by Candida CASTRO)*

Is it better to use obligation or/and prohibition signs at an intersection? In order to answer this question the conditions in which one or the other option can be backed have being analysed in our lab: The time available for making the decision, number of signs ("cluttering visual"), or complexity of the situation. We study the mental representations that lie behind traffic signs. To explain the results and provide practical suggestions and traffic applications we look to the Mental Models Theory (Johnson-Laird, 1983; 2001). According to the Mental Models theory, each piece of information is represented by specific examples of states of the world ("states of affairs") compatible with the information given by them. For example they could generate mental pictures of turns taken and combine these possibilities with new information given. Deontic reasoning maintains that mental models are based on the principle of making salient what is permissible in terms of obligations, but what is impermissible in the case of prohibitions (Bucciarelli and Johnson-Laird, 2005). The theory predicts that those situations represented initially will produce a fast response and fewer errors than those not represented initially. However, previous results from our laboratory suggest that the deontic mental model does not always make salient what is impermissible in the case of prohibitions. Three experiments were carried out to test predictions about deontic reasoning using different display times for diagrammatic traffic signs (obligatory and prohibitory signs). The results supported partly the principle of deontic mental models. Participants´ response times suggested that they represented what was permissible and not what was impermissible for prohibition when they had more time to understand the premise.

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12:20-12:40 **(155)**

Individual Differences in the Development of Creative Competencies in School Children - *Maud BESANCON, Todd LUBART*

Studies on the development of creativity have highlighted the impact of learning environments. In particular, pedagogical approaches are hypothesized to differ concerning their emphasis on individual initiative, and action-based learning. A semi-longitudinal study was conducted during two consecutive years with 210 children in elementary schools with traditional and alternative (Freinet and Montessori) pedagogical approaches. We used various measures of creativity which differed on type of task (divergent thinking versus integrative task) and domain of expression (verbal versus figural). Our results highlight differences in creative development due to two factors: type of school learning environment and type of creative task.

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12:40-13:00 **(156)**

Accounts of Motivation in Cognitive Psychology: An Assessment and Suggestions for Future Research - *Marek MCGANN*

Some recent trends in cognitive research place renewed emphasis on concepts such as "motivation", "volition" and "action". Though a number of different domains within Cognitive Psychology already address these issues, it is not always clear how some of the basic concepts should be considered. In the light of an enactive approach to cognitive research a survey and evaluation of different conceptions of motivation in contemporary Cognitive Psychology is undertaken. Topics such as regulatory systems (cybernetic negative feedback systems), task set, prospective memory and processes of mental control are examined. It is suggested that much cognitive research maintains a passive/reactive conception of motivation and action. Some suggestions are made regarding an alternative approach to understanding motivation and goal-directed activity are suggested, along with methodological implications.

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Attention II
Amphi Sciences Naturelles
Friday morning 11h – 13h

Chaired by Juan Lupianez, Universidad de Granada

11:00-11:20 **(157)**

ERP Approaches to the Accessory Stimulus Effect - *Guido P.H. BAND, Ellen 'T HART, Marieke JEPMA, Sander NIEUWENHUIS*

If during a choice reaction time (RT) task subjects are presented with an irrelevant loud stimulus, RT is typically shortened, and accuracy is reduced. This phenomenon has been dubbed the accessory stimulus effect or immediate arousal effect. The question what the processing locus of the RT gain is has been studied for decades, but only recently the chronometrical possibilities of brain potentials (ERP) in this regard have been recognized. In two choice RT tasks, silence, soft or loud accessory stimuli were presented, and the latency of ERP components was compared. This allowed us to compare the latencies and intensities of early perceptual processes, attentional onset, stimulus evaluation, response decision, and motor processes. The ERP latencies and amplitudes suggest that the effect of accessory stimuli are rather widespread, spanning from perceptual to motor facilitation. These results are interpreted in terms of Nieuwenhuis et al.'s (2005) model of modulatory projections of norepinephrine from the locus ceruleus to the cortex.

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11:20-11:40 **(158)**

Temporal Orienting After Frontal Damage - *Mónica TRIVIÑO, Marisa ARNEDO, Ángel CORREA, María Jesús FUNES, Juan LUPIAÑEZ (read by Juan LUPIAÑEZ)*

There might be different mechanisms by which we can anticipate the appearance of a critical event as to be ready to respond to it as soon as it appears. This study explores three of these basic abilities related to temporal anticipation (foreperiod effects, sequential effects and temporal orienting of attention) in patients with lesions localised in the frontal lobes, who presented frontal symptoms in neuropsychological testing. We found in the frontal group a dramatic impairment of temporal orienting and foreperiod effects whereas sequential effects (the impact of the previous foreperiod on the current foreperiod) remained significant and only mildly affected, as compared to a matched-control group. Results are interpreted by considering that temporal anticipation can be implemented by different mechanisms ranging from voluntary orienting attention in time to more automatic temporal inertia processes. Whereas the former would be severely damaged in frontal patients the latter would be spared in them.

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11:40-12:00 **(159)**

Road-Safety and Phone Conversations: the Role of Shifting Attention Across Near and Far Spaces - *Fabio FERLAZZO, Sabrina FAGIOLI, Stefano SDOIA, Francesco DI NOCERA*

Epidemiological surveys and empirical studies showed the detrimental effects of phone conversations upon driving. However, the mechanisms underlying these negative effects are still unclear. Indeed, conversing through hand-held phones requires a continuous shifting of the driver's attention between the personal space (conversation space), and the peripersonal and extrapersonal spaces (driving space). Here, we show that attention shifting between separate spatial compartments crucially affects the driving performance. In four experiments, we compared the performance on a visual detection task of drivers conversing with an in-car passenger and with hand-held, earphone-operated, loudspeaker-operated phones. Results showed that drivers were slower at responding to the visual stimuli when conversing through a hand-held or an earphone-operated cell phone than when conversing through a loudspeaker-operated cell phone or with a passenger. These results suggest that due to the brain coding the space into multiple representations, spatial factors critically affect the driving performance while conversing on a phone.

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12:00-12:20 **(160)**

Brain Mechanisms of Attentional Selection Within the Language Domain - *Maria RUZ, Anna C. NOBRE*

Research on attention has extensively explored the effects of selecting spatial locations or spatially-laden perceptual objects or their features. Much less is known about the dynamics of attentional deployment to abstract categories such as the different levels of linguistic representations. Our study explored the effects of cueing attention to the orthographic, phonological or semantic dimensions of visually presented words. Indices of brain activation were obtained, in different sessions and participants, by means of high-density EEG and fMRI. Our results show that cues focusing attention on different abstract linguistic attributes activate a set of regions partially overlapping with those in control of visuo-spatial attention. Such cues generate a preparatory state that is dissociable across tasks before the target is presented, and modulate different stages of word processing as indexed by the N200, N320 and N400 ERP components. Our conclusions stress the commonalities of selective attention within the spatial and Language domains.

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12:20-12:40 **(161)**

Executive Control and Expectancies in Endogenous Orienting of Attention - *Alessandro COUYOUMDJIAN, Roberta TRINCAS, Serena CARNI, Enrico DI PACE*

Until now studies on cognitive and neural mechanisms underlying spatial orienting of attention have been mainly concerned the features of attentional focus and its allocation (form, width, speed, etc.), the question of what can be attended (positions, objects, features, etc.), and the comparison between modalities of orienting

(automatic vs voluntary). Therefore, these studies have scarcely considered how and in what degree attention can be oriented consistently with individual's plans, independently to the individual's expectancies. The present three studies aims to investigate the role of executive control mechanisms and of anticipated knowledge on spatial shifting of attention, by means of spatial cuing paradigms in which expectancies on target location are disentangled from instructions to attend to a specific location. Results show that individuals are not be able to inhibit their expectancies when conflicting with spatial cues.

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12:40-13:00 **(162)**

Electrophysiological Evidence for Dimension-Specific Attentional Capture by Irrelevant Singletons - *Monika KISS, Pierre JOLICOEUR, Martin EIMER*

We investigated whether attentional capture by irrelevant singletons is modulated by dimension and location task relevance. The N2pc component was measured as an electrophysiological marker of the spatial allocation of attention in response to the search array. Singleton targets (red circle in colour blocks, green diamond in shape blocks) were presented among 11 distractors (green circles) in a circular array. Non-target trials contained an irrelevant singleton (blue circle or green square). In Experiment 1, targets could appear anywhere on the left or right side. Experiment 2 was similar to Experiment 1, except that targets appeared only in the top or bottom position of the circular array, therefore distractor locations were always irrelevant. In both experiments, the N2pc was attenuated for relevant-dimension distractor singletons relative to targets, and further attenuated for physically identical singletons when the other dimension was relevant. These results suggest that attentional capture is dimension-specific but not location-specific.

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SYMP: Limitations to concurrent processing
Grand Amphi
Friday afternoon 14h – 16h

Organized by Guido Band and Merel Pannebakker, Leiden University

14:00-14:20 **(163)**

Visual-Spatial Contingent Capture Is Involuntary But Not Automatic. - *Benoit BRISSON, Emilie LEBLANC, Pierre JOLICOEUR (read by Pierre JOLICOEUR)*

We used the event-related potential (ERP) method with human electrophysiology in combination with a dual-task paradigm to determine whether the involuntary capture of visual spatial attention in the contingent-capture phenomenon is modulated by concurrent central processing. At long SOA (low concurrent processing load), the N2pc, an ERP component that indexes the locus of visual spatial attention, was elicited by a visual stimulus that matched top-down control settings, but not by an equally-salient stimulus that did not match the top-down control settings, demonstrating contingent visual-spatial attentional capture. At short SOA (high concurrent load), the N2pc to the capture stimulus was attenuated. Although contingent capture of visual-spatial attention appears to be involuntary, capture depends on concurrent load. Either the initiation of a shift of visual spatial attention requires central attention, or perhaps top-down control settings cannot exert as strong an influence on spatial attention while the dual-task bottleneck is engaged.

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14:20-14:40 **(164)**

Hierarchical Control of Modular Architecture: Implications for Dual Task Performance - *Asher COHEN, Hagit MAGEN*

The influential Response Selection Bottleneck (RSB) model assumes that the existence of a single response selection mechanism is the principal cause for dual task costs. Many studies using the Psychological Refractory Period (PRP) paradigm appear to support this model. We propose an alternative model, termed Hierarchical Control of Modular Architecture (HCMA), which assumes that the architecture of the visual system is modular, and cross-talk WITHIN modules is a major cause for dual task costs. We present several PRP experiments that pit the predictions of the two models against each other. These experiments support the modularity model and contradict the RSB model. The HCMA model has several novel predictions concerning dual task performance and we present additional experiments that confirm these predictions. We propose that the modularity assumption, augmented by assumptions concerning the operation of attentional systems, may account for all the principal results in the PRP literature.

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14:40-15:00 **(165)**

Investigating Dual-Task Costs with Mental Rotation - *Merel PANNEBAKKER, Guido BAND, Richard RIDDERINKHOF,Bernhard HOMMEL*

Three dual-task experiments investigated how mental rotation affects concurrent processing. E1 showed that simultaneous mental rotation of two stimuli was sensitive to the synchrony of the rotation directions. Likewise, E2 showed that simultaneous processing of an upright S2 during mental rotation of S1 was modulated by the synchrony of task-irrelevant S2 motion. We conclude that not only the available capacity for demanding tasks, but also the compatibility between concurrent operations influences dual-tasking. Because dual-tasking is affected by task-irrelevant features, we maintain that dual-task costs were modulated by conflicting representations. Coordinating processes may defer S2 processing, even non-demanding processes. E3 investigated whether mental rotation defers attention in the second task using the brain potential N2pc. A latency effect of the N2pc would indicate that parallel attention is deferred by other factors, such as coordination. This would argue against earlier research that attention would not be deferred because its capacity is hardly limited.

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15:00-15:20 **(166)**

Age Differences in Dual-Task Performance After Practice - *Klaus OBERAUER, Katrin GÖTHE, Reinhold KLIEGL*

Much evidence points to the existence of a bottleneck for central cognitive processes, such as response selection and retrieval from memory. The bottleneck constrains operations to be executed one at a time. We have shown that with practice young adults can learn to perform two updating operations in working memory in parallel without interference (Oberauer & Kliegl, 2004, JEP:HPP). Can old adults achieve the same degree of dual-task efficiency? In the present study, we had 12 old adults practice the working-memory updating task for at least the same amount as the young adults in the previous study. We also tested 6 new young adults and combined them with the 6 participants of Oberauer & Kliegl (2004) to form a young comparison group. The task consisted of holding one digit and one spatial position in working memory and update them through sequences of 7 to 9 operations each. In the single-task condition, a sequence of updating operations on one element was followed by a sequence of operations on the other. In the dual-task condition, one numerical and one spatial updating operation were requested simultaneously. After 18 to 24 sessions of practice, the majority of the young participants achieved the criterion of parallel processing: Their latencies for pairs of operations in the dual-task condition were no longer than the longer of two individual updating steps in the single-task condition. None of the older adults came even close to this criterion, suggesting a qualitative difference in how young and old adults deal with dual-task situations.

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15:20-15:40 **(167)**

The Neural Implementation of Bottleneck-Interference Regulation in Dual Tasks - *Torsten SCHUBERT, Christine STELZEL, Tilo STROBACH, Andre SZAMEITAT*

Recent models suggest that bottleneck interference in dual tasks is not a passive mechanism and that active control processes regulate the order and the mutual interaction of processes competing for access to a bottleneck. We used fMRI and investigated the neural localisation of these processes in a dual task. Participants performed a PRP task where the order of the component tasks changed randomly from trial to trial. We predicted higher control demands in changing-order trials (trials where the order of the component tasks is reversed to the previous trial) than in same-order trials. Consistent with this prediction, we found increased RTs and error rates just as increased fMRI activation in the lateral prefrontal cortex in different- compared to same-order trials. These findings argue against a passive recruitment model of bottleneck regulation and suggest that the alternation of task-inhibition and task-initiation processes at a bottleneck is associated with increased neural computation.

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15:40-16:00 **(168)**

Visual Encoding and Action Priming in Dual Tasks - *Iring KOCH*

The present study investigated object-based action priming in dual-task performance. Naturalistic objects (i.e., a photo of a mug) with potentially action-relevant features, such as a handle, were presented in a perceptual orientation judgment task with non-speeded verbal report. This task was combined with a logically unrelated auditory-manual RT task. The results indicate an RT priming effect when the response side in the RT task was spatially compatible with the object orientation. In single-task conditions, in which the object could be ignored, overall performance was significantly improved but the action priming effect was still present. This priming effect also occurred with new objects, which were not previously associated with an overt response. These results are consistent with the idea that objects prime associated actions automatically once subjects are set to process the action-relevant object features.

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SYMP: Cognitive mechanisms of language switching in bilingual speakers

Amphi Péres

Friday afternoon 14h – 16h

Organized by Janet van Hell, Radboud University Nijmegen, and Chip Gerfen, Pennsylvania State University

14:00-14:20 **(169)**

Processing Costs While Reading Code-Mixed Sentences - *Paola DUSSIAS, Chip GERFEN*

Bilinguals sometimes codeswitch because the presence of a word or phrase in the other language better conveys their intentions. For bilinguals who are listening or reading, however, codeswitches can be unexpected and thus potentially more difficult to process than corresponding within-language sentences. In this talk, we present the results of an experiment that examines how the morphemic composition of codeswitched constituents affects their processing during reading. Specifically, we investigates the processing costs incurred when the switch involves a complementizers that fulfills a purely grammatical function (Spanish que/English that). Switching such complementizers are hypothesized to incur processing costs because they demand greater activation of the embedded language. We found that sentences in which the complementizer did not participate in the codeswitch were easier to comprehend (measured by reading times & eye-movement fixations) than sentences in which it did. Implications of our findings for Myers-Scotton & Jake (2001) 4-M model are discussed.

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14:20-14:40 **(170)**

Alignment in Codeswitching: the Role of Word Order and Interlocutor - *Gerrit J. KOOTSTRA, Janet G. VAN HELL, Ton DIJKSTRA*

This study focuses on the equivalence constraint on codeswitching, which holds that languages are switched at locations where the word order of the languages involved is the same. In the first experiment, Dutch-English bilinguals described pictures to each other in which they had to codeswitch. One of the participants was a confederate, whose utterances served as a prime for the naïve participant. Pictures were preceded by phrases that led to word orders that were either congruent or incongruent between Dutch and English. Two-third of the codeswitches agreed with the equivalence constraint, but participants also produced codeswitches the equivalence constraint could not explain. To examine the confederate's role in eliciting codeswitches, we conducted a second experiment using the same task, but without a confederate as interlocutor. The implications for the equivalence constraint and the viability of the confederate-scripting technique for examining the cognitive mechanisms of codeswitching will be discussed.

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14:40-15:00 **(171)**

The Processing of Code-Switched Noun Phrases: Evidence From Shadowing - *Marianne GULLBERG, Peter INDEFREY, Pieter MUYSKEN*

This study explores the relationship between postulated constraints on within-constituent code-switches and processing. We examine adjective-noun word order as a conflict domain in Papiamento-Dutch code-switching. Papiamento prefers postnominal and Dutch prenominal adjectives. Although switches within such noun phrases necessarily violate the surface grammar of both languages, they occur in spontaneous production. We investigate whether the language of the determiner and of the preceding finite verb affect the processing and acceptability of switched object-NPs. 21 Papiamento-Dutch bilinguals participated in a shadowing task and an acceptability judgement task to allow for comparison of on-line processing and off-line assessments. The results indicate that both determiner and finite verb affect processability and acceptability, but that their effect is modulated by language dominance both on- and off-line. Overall Papiamento structure with Dutch insertions is preferred over Dutch structure with Papiamento insertions. We discuss the implications of structural and dominance effects for theories of code-switching.

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15:00-15:20 **(172)**

Fine-Tuned: Phonology and Semantics Affect First- to Second-Language Zooming In - *Kerrie ELSTON-GÜTTLER, Thomas GUNTER*

To investigate how L1 (German) phonology and semantics affect L2 (English) processing, we manipulated language context before, and auditory input during, an English semantic priming experiment in which reaction times and event-related brain potentials were measured on targets following interlingual homograph primes (gift= German “poison”). In Experiment 1, in which participants viewed a pre-experiment English film (16 heard noise during the experiment, 16 heard German pseudowords), only participants who heard German pseudowords showed L1 influence indicated by N400 priming of L1-related targets in the first experimental half. In Experiment 2, 16 participants viewed a German film then heard noise, and showed comparable influence of the L1 in the first experimental half. In Experiment 3, in which 16 participants viewed the English film then heard real German words, lower proficiency participants showed L1 influence during the entire experiment. We discuss our findings in terms of context types that affect L1-to-L2 adjustment.

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15:20-15:40 **(173)**

Comprehension and L2 Activation: Code Switching Without Switching Cost? - *Teresa BAJO, Antonio IBAÑEZ, Pedro MACIZO*

Some translation tasks involve continuous between language switches. For example, in bilateral translation, the translator comprehends and translates sentences from two languages that alternate in ways that are not always predictable. How do they

cope with the cost of these continuous switches? In our experiments trained translators and untrained bilinguals read Spanish or English sentences word by word at their own pace. After reading the sentences, they had either to repeat them in the input language and answer a verification question (Experiment 1 and 2) or to only verify the question (Experiments 3 and 4). The cognate status of some critical words was also manipulated. Cognates effects were taken as indicating activation of the alternative language (AL), whereas the RTs to the first words of the sentences served to estimate switching costs. Results indicated that the presence of cognate effects was associated to lower switching costs relative to conditions without cognate effects. In turn, the activation of the AL was dependent on the experience of the participants, the language involved and the WM demands.

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15:40-16:00 **(174)**

Do Bilinguals Inhibit One Language to Speak the Other? Behavioral and ERP Evidence on Language Mixing and Switching - *Judith KROLL, Susan BOBB, Maya MISRA, Taomei GUO*

Language switching has been examined for what it might tell us about the mechanisms used by bilinguals to select the language they intend to speak. Some behavioral studies suggest that switch cost asymmetries across the bilingual's two language indicate inhibition of the dominant language. Other studies find symmetric switch costs and argue that inhibition is not required. We report a study using response times and event related potentials (ERPs) to investigate picture naming in the first (L1) and second (L2) language. We extend the logic used to assess the presence of inhibition by examining switch costs on a trial-by-trial basis and the costs of language mixing and switching on a block-by-block basis. ERP data for simple switching by trial did not differ for the two languages but switching by block produced a larger cost to L1 than to L2. We consider implications for models of language selection in speech planning.

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Language production I
Amphi Charve (Physique)
Friday afternoon 14h – 16h

Chaired by Ansgar Hantsch, University of Leipzig

14:00-14:20 **(175)**

Effects of Working Memory Load on Lemma Retrieval - *Eva BELKE, Lisa GIESELMANN*

The role of working memory (WM) in lemma retrieval during language production was investigated by crossing a manipulation of WM-load with a manipulation of the ease of lemma retrieval. Participants repeatedly named sets of visually dissimilar objects that were either semantically related ("cat, duck, mouse, fish, snake") or unrelated. The participants' naming latencies were longer in the related than in the unrelated sets (semantic blocking effect), most likely due to increased lexical competition among the members of the related sets. When engaged in a digit retention task during naming, participants displayed significantly slower naming latencies and a larger semantic blocking effect. When simultaneously engaged in an object naming and a tone-discrimination task, the naming latencies increased but the magnitude of the blocking effect was unaffected. The implications for models of language production are discussed with reference to recent evidence from neuroimaging studies.

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14:20-14:40 **(176)**

Attentional Requirements for Selecting Words From Different Grammatical Categories - *Pauline AYORA, F.-Xavier ALARIO (read by F.-Xavier ALARIO)*

The ability to select and encode words for speaking is a highly practised cognitive ability. Once a communicative intention and a message are established, language encoding often seems to proceed without the speaker's explicit supervision . Despite this intuition, previous research has indicated that the lexical retrieval of nouns may be subject to a central processing bottleneck, which suggests the involvement of attentional resources (Ferreira & Pashler, 2002). We investigated the allocation of attentional resources during the retrieval of words from grammatical classes that are commonly distinguished in language production research. The open-class includes nouns, adjectives and verbs, while the closed-class includes determiners, pronouns, and prepositions. The ability to process these two word classes can be differentially affected after brain damage. Furthermore, the information that constrains their selection is different (communicative intention and/or grammatical rules). We used a dual-task paradigm in which French native speakers named pictures with determiner noun phrases while they had to identify the pitch of an auditory tone. The ease of determiner and noun retrieval were manipulated independently. The results show that the these manipulations affect picture naming and tone discrimination responses in similar ways. In the logic of the dual-task paradigm, these results suggest that the central processing bottleneck constraints word selection irrespective of word-class. Ferreira V.S., & Pashler H. (2002). Central bottleneck influences on the processing stages of word production. J Exp Psychol Learn Mem Cogn, 28(6), 1187-99.

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14:40-15:00 **(177)**

Attention, Gaze Shifting, and Dual-Task Interference From Word Planning - *Ardi ROELOFS*

Controversy exists about whether dual-task interference from word planning reflects structural bottleneck or attentional control factors. Here, participants vocally named pictures whose names could or could not be partially prepared in advance and they manually discriminated arrows presented away from (Exp. 1) or superimposed onto the pictures (Exp. 2) or they discriminated tones (Exp. 3). Pictures and arrows/tones were presented with onset asynchronies of 0, 300, and 1000 milliseconds. Earlier research showed that vocal responding hampers auditory perception, which predicts earlier shifts of attention to the tones than to the arrows. Word preparation reduced the latencies of picture naming and attention shifting, indexed by gaze shifts. The preparation benefit was reflected in the manual responses to the arrows but not to the tones, supporting the attentional account. Computer simulations showed that a simple model of attentional control quantitatively accounts for the latencies of vocal responding, gaze shifting, and manual responding.

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15:00-15:20 **(178)**

Naming Vs. Categorization: Semantic Relatedness and Task Instruction Interact in the Picture-Word Interference Paradigm - *Ansgar HANTSCH, Andreas MÄDEBACH, Jörg D. JESCHENIAK*

Depending on the task (naming vs. categorization) opposing semantic effects have been obtained in the picture-word interference paradigm (i.e., interference vs. facilitation). However, in most studies task-instruction and naming-level were confounded (basic-level naming vs. superordinate-level categorization). In two experiments we thus investigated whether the task instruction modulates semantic effects if the target's level of abstraction is held constant. Participants produced basic-level names (e.g., "flower") and ignored distractor words denoting the pictures' subordinate-level names (e.g., "rose"). Experiments only differed in details of their study/practice phase and the instruction. In Experiment 1, participants were familiarized with the pictures' basic-level names, and received a naming instruction. In Experiment 2, participants were familiarized with the pictures' subordinate-level names and received a categorization-instruction. Interference was obtained for the naming task while facilitation was obtained for the categorisation task, indicating that the facilitation effect in categorization is in fact due to the task instruction.

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15:20-15:40 **(179)**

Online Language Production: Do Men and Women Communicate Differently? - *Albert KATZ, Karen HUSSEY*

The aim of the two studies reported here was to see whether gender and familiarity of interlocutors in communication exhibited gender-linked language characteristics described in studies based on expositional language. Study 1: 128 dyads (equal numbers of friends and strangers, opposite and same gender). Participants communicated via computer-mediated chat for 40 minutes. These conversations were analyzed for gender-linked language characteristics; surprisingly few of the characteristics were found to be gender-linked. However, people tended to accommodate to these characteristics, especially when those in communication were strangers. Study 2: We demonstrate that people are able to identify whether or not a speaker was male or female even though unable to identify the characteristics that influence their correct decisions. Taken together, these findings indicate subtle and ubiquitous effects of gender and interlocutor familiarity in real-life communication, with implications for the understanding of pragmatic effects in language and experimental work on language comprehension.

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15:40-16:00 **(180)**

Do Phonemes Have Meaning? - *Vanja VUCETIC, Kim PLUNKETT, Gert WESTERMANN*

The principle of arbitrariness in language assumes that there is no intrinsic relationship between linguistic signs and their referents. There is, however, a growing body of research suggesting that some naturally-biased mappings exist between phonological properties of the sounds and perceptual properties of their referents. Two studies assessed adult behavioural and ERP brain responses during a visual categorisation task. Participants learned to classify novel objects with round or jagged features into two categories labelled as 'mot' and 'riff'. Participants in the 'congruent' condition where 'mot' corresponded to round-featured objects responded faster than those in the incongruent condition. Furthermore, congruent/incongruent conditions gave rise to distinct brain signatures in the parietal-occipital region, with a long-lasting, positively going wave starting at around 260ms for the incongruent conditions. This is the first ERP study to demonstrate the existence of an intrinsic relationship between phonological properties of object labels and perceptual properties of their referents.

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SYMP: Intentionality and Causality Induced Temporal Binding

Amphi Chimie

Friday afternoon 14h – 16h

Organized by Marc Buehner, Cardif University

14:00-14:20 **(181)**

Experiences of Action - *Patrick HAGGARD*

How do I know what I am doing? For over 100 years, psychologists have debated whether the experience of action arises primarily from motor or sensory signals. Detailed psychophysical studies have proved difficult, first because the experience of voluntary action is thin and elusive, and, second, because the voluntary character of action tends to vanish in laboratory settings. Studies of when people perceive the various events surrounding voluntary action have been relatively informative. These studies suggest that our perception of action arises at least partly from premotor signals. However, the sensory consequences of actions have a strong, additional reconstructive effect. We have recently reported that the perceived time of an action is shifted towards the time of its sensory consequences, while the perceived time of the sensory consequences is shifted back towards the action that caused it. We have called this effect 'intentional binding'. I will show that the binding effect is automatic and pre-attentive. Finally, evidence from a deafferented suggests that efferent signals are sufficient to structure this temporal aspect of sensorimotor experience.

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14:20-14:40 **(182)**

Agency and 'Prior Conscious Thought' - *James MOORE, Daniel WEGNER, Patrick HAGGARD*

Can sense of agency be modulated by extrinsic influences? Inferential theories suggest that it can, whilst forward models suggest that it cannot. We report three experiments comparing these theories directly, using priming to modulate sense of agency for active and passive movements. We used the perceived interval between movements and effects as an implicit measure of sense of agency. Lower interval estimates indicate stronger action-effect binding, and thus enhanced sense of agency. The first two experiments showed that primes modulate the sense of agency for passive but not active movements. The third experiment replicated previous findings showing that the inference of agency is supported only when the prime and the movement are sufficiently close in time. Priming is an experimental method for inducing prior conscious thoughts that may be relevant to agency. We conclude that the competing theories of agency are not mutually exclusive, but instead operate under different contexts.

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14:40-15:00 **(183)**

Motor-Sensory Recalibration and Illusory Reversals of Action and Sensation - *David EAGLEMAN*

To judge causality, organisms must determine the temporal order of their actions and sensations. However, this judgment may be confounded by changing delays in sensory pathways, suggesting the need for dynamic temporal recalibration. To test for such a mechanism, we artificially injected a fixed delay between participants' actions (keypresses) and subsequent sensations (flashes). After participants adapted to this delay, flashes at unexpectedly short delays after the keypress were often perceived as occurring before the keypress, demonstrating a recalibration of motor-sensory temporal order judgments.When participants experienced illusory reversals, fMRI BOLD signals increased in anterior cingulate cortex/medial frontal cortex (ACC/MFC), a brain region previously implicated in conflict monitoring. This illusion-specific activation suggests that the brain maintains not only a recalibrated representation of timing, but also a less-plastic representation against which to compare it.

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15:00-15:20 **(184)**

Effect Anticipation Modulates Deviance Processing in the Brain - *Florian WASZAK, Arvid HERWIG*

Only little is known about how actions influence stimulus processing. The present study investigates how performing an action that produces a particular effect influences deviance processing in the brain. Subjects first performed left and right keypresses that were always followed by a high or a low pitch tone, establishing an association between action and effect. Thereafter, subjects performed a three-tone oddball task while event-related potentials were recorded. Again, subjects performed left or right keypresses. The actions triggered randomly one of the experimental stimulus tones of the oddball task. Deviant stimuli elicited a larger P3a when the action that triggered stimulus presentation was associated with the standard tone than when it was associated with the deviant tone, indicating a larger orienting response in the former case. This suggests that the context to which incoming sensory information is compared in order to detect deviant stimuli is codetermined by anticipated action effects.

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15:20-15:40 **(185)**

Temporal Binding in Causal and Non-Causal Event Sequences - *Gruffydd HUMPHREYS, Marc BUEHNER*

Previous studies (e.g. Haggard, Aschersleben, Gehrke and Prinz, 2002) have demonstrated a subjective shortening of the perceived intervals between intended actions and their effects (compared to

equivalent intervals between unintended actions and their consequences) using the Libet Clock method. This talk outlines a new paradigm for the study of this "Temporal Binding" phenomenon involving the free numerical estimation of the duration between a pair of Causally related or unrelated stimuli. Results obtained with this new method suggest that Temporal Binding extends into much longer intervals than previously thought.

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15:40-16:00 **(186)**

Separating Intentional From Causal Binding in a Behavioural Paradigm - *Marc BUEHNER, Gruff HUMPHREYS*

We present a new behavioural paradigm which allowed us to assess temporal binding directly by measuring response times. Participants emitted responses either to pace a signal, or to generate a signal. Both conditions clearly involve intentional action, but only the latter involves causality. The task was set up in such a way that on the surface both conditions appeared identical: participants make keypresses, which are followed by auditory signals. Crucially, however, the signals were causally contingent on participants' responses in the latter "driving" condition only, but not in the pacing condition. Temporal binding was measured by comparing the time stamps of participants' responses to the objectively correct times, and was defined as an objectively early response. Results show that participants responded earlier in the driving than in the pacing condition, suggesting that causality exerts an influence on binding over and above intentionality.

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Perception and recognition
Amphi Sciences Naturelles
Friday afternoon 14h – 16h

Chaired by Gustav Kuhn, University of Durham

14:00-14:20 **(187)**

Does Face Familiarity Influence Speechreadability? - *Karen LANDER, Rebecca DAVIES*

Theories of face perception suggest independence between identity and visual speech processing (Bruce & Young, 1986). In two experiments we explore whether face familiarity influences speechreadability. In Experiment 1, we compare the speechreading performance from participants who are, or are not, artificially familiarised with the speaker. First, we measured baseline speechreading performance. Next, participants either view the speaker telling a story (familiarised group) or complete a pen and paper puzzle (control group). Speechreading performance is then measured again. Finally, participants view another story or complete another puzzle before speechreading performance is measured again. Results suggest that speechreading performance improves faster when the participant is more familiar with the speaker. In Experiment 2 we explore this effect by comparing speechreading performance from a personally familiar face and an unfamiliar one. Results are discussed with regard to the independence of facial identity and visual speech processing and the factors that influence speechreading.

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14:20-14:40 **(188)**

The Development of View-Dependent and View-Invariant Object Recognition Into Adolescence - *Martin JÜTTNER, Alexander MÜLLER, Ingo RENTSCHLER*

Theories of object recognition traditionally have been divided into two classes of models with different predictions concerning spatial generalisation: Approaches based on three-dimensional, configural object descriptions postulate, within certain limitations, a complete viewpoint independence of recognition performance. In contrast, approaches based on multiple, two-dimensional object views generally predict a pronounced viewpoint dependency. The present study explored the possibility of a co-existence of view-dependent and view-invariant object formats and their developmental trajectory. Spatial generalization skills in school children aged 8-16 were studied with regard to unfamiliar, molecule-like objects that had been previously learned in a cross-modal priming and learning paradigm involving touch and vision. A developmental dissociation was observed with younger children recognizing objects only from previously learnt perspectives whereas older children generalized acquired object knowledge to new viewpoints as well. Haptic and - to a lesser extent - visual priming improved spatial generalization in all but the youngest children. The data supports the idea of dissociable, view-dependent and view-invariant object representations with different developmental trajectories that are subject to modulatory effects of priming. Late-developing areas in the parietal or the prefrontal cortex may account for the retarded onset of view-invariant object recognition.

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14:40-15:00 **(189)**

Is Gaze Following Truly Automatic? On Our Inability to Ignore Where Another Person Is Looking - *Gustav KUHN, Alan KINGSTONE*

We investigated whether people's voluntary saccades are influenced by another person's gaze direction, even when this is counter predictive of the saccade direction. The colour of a fixation point instructed participants to make saccades either to the left or the right. These saccade directions were either congruent or incongruent with the eye-gaze direction of a centrally presented schematic face. Participants were instructed to ignore the eyes because they were congruent only 20% of the time. At short gaze-to-fixation-cue stimulus-onset-asynchronies (0ms and 100ms) participants' made more directional errors on incongruent trials and their saccade latencies were slower than on congruent trials. At a longer SOA (900ms) the pattern tended to reverse. Our results demonstrate that gaze-cues could not be ignored even if attending to them was detrimental to the task. Similar results were found for centrally presented arrow cues, suggesting that this interference is not unique to gaze.

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15:00-15:20 **(190)**

The Navon Effect with Faces: a Neurological Study Using FMRI - *Nicola WESTON, Michael LEWIS, Richard WISE*

Face recognition performance can be improved by engaging in global or impaired by engaging in local Navon letter (a large letter made of repeated smaller letters) processing prior to test (Macrae & Lewis, 2002). One explanation is that global processing promotes the use of holistic strategies conducive to face recognition whereas local processing promotes featural processing detrimental to face recognition. More recent studies, however, have shown that changes in the way Navon stimuli are presented can remove or even reverse the effect, questioning an explanation based on cognitive style (Weston et al, 2007). The current experiment investigated the Navon task effect on face recognition using fMRI. Brain areas that correlate with local Navon, global Navon and face processing where isolated. The overlap between these areas are reported and it is discussed how these data add to our understanding of the Navon effect in face recognition.

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15:20-15:40 **(191)**

What Are the Different Strategies Used for Recognising Different Race Faces? - *Michael LEWIS, Peter HILLS*

Other-race faces are harder to recognise than own-race faces but increased contact with people of the other race can reduce this own-race bias. An experiment measured recognition performance for the internal features of faces that had been learnt with external features that either made the face look like either an own-race face or an other-race face. Accuracy was greater when the face had been learnt as an own-race face suggesting different encoding strategies are employed for different race faces. Two subsequent experiments explored what differed in the way own-race and other-race faces are processed. Results indicate that we are less efficient

at encoding positional information of features of other-race faces. One final experiment illustrated that the processing strategy can be affected by a simple fixation cross. One implication of this research is that race affects the perception of an individual even before the face has been fully encoded.

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15:40-16:00 **(192)**

Perceiving the Beginning of Repeating Acoustical Rhythmical Sequences: Evidences for a New Organizing Principle - *Riccardo BRUNETTI, Giulio TIRINELLI, Marta OLIVETTI BELARDINELLI*

When we listen to a repeating rhythmical pattern, we quickly extract its structure (the regularities or invariant information) and, accordingly, we choose one of the events as the "first one". But sometimes this decision is easily changed for another one, e.g. we perceive the pattern as "temporally rotated" and we change our mind about which event should be at the beginning of the repeating sequence. This effect, called gestalt flip, is theoretically comparable to the classical re-interpretation of a visual ambiguous figure. This study has been designed to find out which principles regulate the choice of a specific event as the "first" and which patterns are more easily rotated or flipped, starting from the classical Run-Gap principles proposed by Garner and colleagues. Results of three experiments show that this effect is ruled by a hierarchy of principles. We also collected evidences to outline a new principle linked to the structure of sub-repetitions inside the pattern itself.

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SYMP: The vulnerability of selective attention to disruption by sound: Varieties of auditory distraction

Grand Amphi

Saturday morning 8h40 – 10h40

Organized by Robert Hughes, Cardiff University

8:40-9:00 **(193)**

The Role of Visual Perceptual Load in the Processing of Auditory Distractors - *Nilli LAVIE*

Much research has investigated the effects of visual distractors on focused attention. This research has highlighted perceptual load as an important determinant of focused attention in vision. Whereas irrelevant visual distractors interfere with tasks of low perceptual load, distractor interference effects are eliminated with tasks of high perceptual load. In this talk I present new research seeking the conditions under which irrelevant distractor sounds can be ignored. Adapting a visual attentional capture paradigm to assess auditory capture showed that visual perceptual load in a current task can modulate the extent to which irrelevant distractor sounds capture attention. Adapting the inattentional blindness paradigm to assess awareness for an irrelevant distractor sound also demonstrated a cross modal perceptual load effect: Subjects reported a greater rate of auditory distractor intrusions into awareness when a visual task involves low rather than high perceptual load. This research extends load theory to the case of irrelevant auditory distractors.

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9:00-9:20 **(194)**

Cognitive Set Effects on Auditory Novelty Processing During Visual Task Performance - *Iria SANMIGUEL, Carles ESCERA (read by Carles ESCERA)*

The question of how we spread our attentional resources among all the sensory inputs that reach an individual at a certain moment is a challenging question that has received a great deal of interest. A particularly relevant topic, due to the practical applicability of the results in this area, is the question of how irrelevant sounds are processed whilst concentrating on a visual task. This is a common situation in many routine tasks, e.g., ignoring contextual noise while attempting to read in a concurred place. We have repeatedly demonstrated that participants in a cross-modal oddball task respond to to-be-attended visual stimuli slower when this stimulus is preceded by an infrequent deviant/novel sound compared to a frequently repeated sound. Thus, there is a distraction effect caused by an unexpected sound that is different to the previous repeating stimulation. However, there is accumulating evidence that attention capture by novel stimuli is contingent upon the "attentional set", that is to say, that top-down, controlled processes interact with stimulus-driven mechanisms for the control of attentional resources. In line with this, we have shown that imposing working memory (WM) load on the task attenuates the distraction effect by novel sounds. This however contrasts with results emerging from other experimental paradigms in which WM load has been shown to increase distraction. In an attempt to further understand the cognitive influences on the processing of the irrelevant sounds and the present incongruence, the effects of irrelevant sounds have been tested using a different task set in which the trial structure is more complex. Surprisingly, in this scenario, a facilitating effect of novel sounds has been found, presumably due to an alerting effect. This facilitating effect is, in turn, also attenuated or cancelled when WM load is imposed on the task. The critical question is thus, on which specific variables does the impact of irrelevant sounds depend? We will review both behavioral and event-related brain potential evidence aiming to answer this question.

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9:20-9:40 **(195)**

Irrelevant Sounds From Attended Regions Cause More Serial Recall Disruption Than Sounds From Unattended Regions - *Axel BUCHNER, Raoul BELL, Klaus ROTHERMUND, Dirk WENTURA*

Participants memorized lists of digits in silence or while ignoring distractor sounds that either came from the front and thus from the direction in which participants' attention was oriented, or from behind. Distractor sounds impaired recall performance, but the largest impairment was observed when the sound source was directionally close to the visual target display. The results confirm the importance of cross-modal attentional links for models of attention.

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9:40-10:00 **(196)**

Disruption of Short-Term Memory by Changing and Deviant Sounds: Evidence for Two Distinct Varieties of Auditory Distraction - *Robert HUGHES, Francois VACHON, Dylan JONES*

Disruption of short-term memory by to-be-ignored auditory sequences (changing-state effect) has often been characterized as attentional capture by deviant events (deviation effect). However, we show that changing-state and deviation effects are functionally distinct varieties of auditory distraction. Disruption of visual-verbal serial recall by changing-state speech was additive to that of a single deviant voice embedded within the speech (Experiment 1); a voice deviation effect, but not a changing-state effect, was found on a missing-item task (Experiment 2); a deviant voice-repetition within an alternating-voice irrelevant speech sequence disrupted serial recall indicating that—unlike the changing-state effect—deviation effects are not driven by a physical mismatch between an item and its predecessor(s) but by a violation of a more abstract sequential algorithm (Experiment 3). We conclude that the changing-state effect reflects a conflict between two seriation processes applied to relevant and irrelevant material, whereas the deviation effect reflects a general attention-capture process.

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10:00-10:20 **(197)**

Time Course of Task Effects in the Processing of An Irrelevant Auditory Change: Electrophysiological Evidence - *Alexandra MULLER-GASS, Erich SCHRÖGER*

The present research focuses on the timing and extent to which the processing of a task-irrelevant auditory change depends on the specific demands made by the primary task. Task-irrelevant changes in the auditory environment are pre-consciously detected, and may subsequently involuntarily engage the listener's attention. These processes are thought to be reflected on the ERP by the MMN and P3a components, respectively. How the specific

demands of the primary task modulate these processes is not yet well understood. Two studies were conducted, one involving a perceptual difficulty and memory load manipulation on a primary auditory task, and one involving a perceptual load manipulation on a primary visual task. The MMN was not affected by the demands of the primary task, regardless of modality. In contrast, the modulation of P3a depended on the specific nature of the additional demands made by the task: it was only enhanced during the memory load manipulation. These results will be discussed in terms of attentional effects on the process underlying the P3a, and suggest that additional attention afforded to the task-irrelevant change stimuli benefits their distractive value.

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10:20-10:40 **(198)**

Automatic Auditory Sequence Processing Causes Auditory Distraction - *Bill MACKEN, Fiona PHELPS, Dylan JONES*

The role of separating task-relevant from task-irrelevant aspects of the environment is typically assigned to the executive functioning of working memory. However, pervasive aspects of auditory distraction have been shown to be unrelated to working-memory capacity in a range of studies of individual differences. We measured individual differences in automatic and deliberate auditory sequence processing and showed that while deliberate processing was related to short-term memory performance, it did not predict the extent to which that performance was disrupted by task-irrelevant sound. Individual differences in automatic sequence processing were, however, positively related to the degree to which auditory distraction occurred. We argue that much auditory distraction, rather than being a negative function of working memory capacity, is in fact a positive function of the acuity of automatic auditory processing.

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Bilingualism
Amphi Péres
Saturday morning 9h – 10h40

Chaired by Walter van Heuven, University of Nottingham

9:00-9:20 **(199)**

Morphological Processing in English: the Influence of Nonnative Accent and Visual Distortion on Patterns of Cross-Modal Facilitation - *Laurie Beth FELDMAN, Dana BASNIGHT-BROWN*

The processing of English verb forms was explored using a cross-modal primed lexical decision task. Materials included irregular nested stem (drawn-DRAW), irregular change stem (ran-RUN), and regular past tense–present tense verb pairs that were either low (guided-GUIDE) or high (pushed-PUSH) in resonance, a measure of semantic richness. Overall, semantic richness of irregular verbs (nested and irregular change) and of regular verbs (high and low resonance) was matched along with frequency and other relevant variables. Under cross modal presentation conditions with no distortion by nonnative accent or case alternation, native speakers of English revealed comparable facilitation across levels of regularity and greater facilitation for nested than for stem change irregulars such that (drawn-DRAW), (guided-GUIDE) and (pushed-PUSH) facilitation were comparable. In a second series of experiments with the same stimuli and procedure, except that auditory prime words were pronounced with a foreign accent, results revealed reduced magnitudes of morphological facilitation for all verb types and replicated comparable effects for irregular nested stem and regular pairs. Results of an ongoing experiment will reveal the effect of accented primes along with visually distorted targets on regular and irregular verb forms. Results will be discussed in terms of graded effects of form and semantics on morphological facilitation by inflectionally related primes.

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9:20-9:40 **(200)**

Masked Priming Across-Languages: Varying Language Experience and From-Based Type Manipulations in the Performance of Spanish-English and Catalan-Spanish Bilinguals - *Rosa SANCHEZ-CASAS, Christopher DAVIS, José E. GRACIA-ALBEA, Marc GUASCH, Pilar FERRE*

This communication focused on how words are represented and accessed in the bilingual lexicon, investigating how language experience and word form manipulations across-languages influenced the pattern of masked priming in visual word recognition. Experiment 1 and 2 compare cognate and non-cognate words and tested bilinguals with varying language experience (i.e., different level of competence in the second language (L2) and different age of L2 acquisition). Experiment 3 and 4 tested Spanish-Catalan and Spanish-English bilinguals, manipulated form overlap between cognate words, including also false friends as form controls. The results showed: a) that only cognate words produced facilitation effects; b) level of competence and not age of L2 acquisition determined the presence of the cognate effects; and c) form-based manipulations do not seem to affect the size of these effects. We argue that these findings suggest that the cognate effects emerge neither at the form nor at the meaning levels of representations.

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9:40-10:00 **(201)**

Effects of Cross-Linguistic Orthographic and Phonological Similarity in Chinese-English Bilinguals - *Walter VAN HEUVEN, Kathy CONKLIN*

In a series of experiments with Chinese-English bilinguals we investigated the effects of orthographic and phonological similarity between English words and Chinese words written in Hanyu Pinyin on English word recognition. Hanyu Pinyin is romanisation system for Standard Mandarin that is used in schools in Mainland China to represent the sounds in Mandarin. Interestingly, some Hanyu Pinyin words are also correctly spelled English words, for example the Hanyu Pinyin word GUN written without tone diacritics. A set of these interlingual homographs as well as English-Chinese homophones (e.g., SHOE) was presented in a purely English lexical decision task. The results revealed that Chinese-English bilinguals responded significantly faster to homographs and homophones than to English control words. This suggests that Hanyu Pinyin knowledge influences English word processing. The implications of the results for models of bilingual word processing will be discussed.

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10:00-10:20 **(202)**

Bilingual Visual Word Recognition in a Native Sentence Context: Evidence From Eye Tracking - *Eva VAN ASSCHE, Wouter DUYCK, Rob HARTSUIKER*

This study investigated the influence of sentence context on the processing of cognates (words with identical meanings and similar spellings across languages, e.g. the Dutch-English translation pair 'schip - ship') in the native language. In a first experiment, we replicated the cognate facilitation effect in isolation as found by van Hell and Dijkstra (2002). In a second experiment, cognates and control words were presented in the same low constraint sentence contexts (e.g. De man kreeg een brood - paard van de rijke boer [The man got a bread - horse from the rich farmer]). Eye tracking results showed that early target word reading times yield a cognate facilitation effect. This strongly suggests that the presence of a low constraint sentence context does not modulate the degree of language selectivity of lexical access to the bilingual lexicon, even when bilinguals were reading sentences in their native language.

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10:20-10:40 **(203)**

Inhibition in Bilingual Performance: Evidence From Language-Switching - *Iva IVANOVA, Albert COSTA*

How do bilinguals, when speaking in one of their languages, prevent massive interference from the other? It has been proposed

that they do so by inhibiting the language not-in-use (Green, 1998). However, recently this account has been challenged (Finkbeiner et al, 2006), on the grounds that what has been taken to reflect inhibition is an artefact of task-specific properties. We investigated this issue employing the picture-naming language-switching paradigm used in previous studies. We tested two groups of bilinguals: 1) high-proficiency and 2) low-proficiency, and used both bivalent and univalent picture stimuli. Our results indicate that: 1) with the less-demanding univalent stimuli, both groups apply inhibition; 2) the strength of this inhibition is modulated by current language availability; and 3) only with the more-demanding bivalent stimuli, high-proficiency bilinguals do not resort to inhibitory mechanisms. We conclude that, at present, the inhibition account cannot be discarded as an explanation of bilingual language performance.

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Language production II
Amphi Charve (Physique)
Saturday morning 9h – 10h40

Chaired by Niels Janssen, CNRS & Université de Provence

9:00-9:20 **(204)**

Semantic Access of Transparent and Opaque Compounds - *Joana CHOLIN, Jeremiah W. BERTZ, Michele MIOZZO*

Whereas transparent compounds have constituents (heads and modifiers) that both contribute to the meaning of the whole compound, opaque compounds are formed by constituents unrelated to the meaning of the whole word. We used the picture-word interference paradigm to investigate the semantic access of written compounds. Compounds were shown as visual distractors while we varied (a) whether heads and modifiers were categorically related to pictures and (b) whether compounds appeared at picture-onset (0-SOA) or before (-100-SOA). Semantic effects were observed at 0-SOA with transparent compounds but not with opaque compounds, a finding that may either reflect slower semantic access for opaque compounds or inhibition of opaque constituents. Semantic effects should be observed at -100-SOA if semantic access is slower for opaque compounds, whereas they should be absent at -100-SOA if inhibition intervenes. The finding of semantic effects with opaque compounds at -100-SOA supports the slow semantic activation hypothesis.

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9:20-9:40 **(205)**

The Dynamics of Lexical Selection in Speech Production - *Bradford MAHON, Albert COSTA, Alfonso CARAMAZZA*

The dominant view in the field of lexical access in speech production maintains that selection of a word becomes more difficult as the levels of activation of nontarget words increase—selection by competition. We tested this prediction in two sets of experiments. First, we show that participants are faster to name pictures of objects (e.g., “bed”) in the context of semantically related verb distractors (e.g., “sleep”) compared with unrelated verb distractors (e.g., “shoot”). In the second set of experiments, we show that target naming latencies (e.g., “horse”) are, if anything, faster for within-category semantically close distractor words (e.g., “zebra”) than for within-category semantically far distractor words (e.g., “whale”). In the context of previous research, these data ground a new empirical generalization: As distractor words become semantically closer to the target concepts—all else being equal—target naming is facilitated. This fact means that lexical selection does not involve competition, and consequently, that the semantic interference effect does not reflect a lexical level process. This conclusion has important implications for models of lexical access and interpretations of Stroop-like interference effects.

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9:40-10:00 **(206)**

Is Speech Production Serial Or Parallel? Processing of Parafoveal Objects in a Multiple-Object Naming Task. - *Debra MALPASS, Antje MEYER*

In two experiments, we examined whether speakers naming object triplets processed the objects and their names sequentially or in parallel. We orthogonally varied the difficulty of the first and second objects using pre-tested items that yielded short (easy) and longer (difficult) naming latencies. Speakers' eye movements and speech were recorded. As expected, difficult objects received longer gaze durations than easy objects. Moreover, when easy and difficult objects were presented in mixed blocks, the difficulty of the left object affected gaze durations to the right object and vice versa. This indicates that the two objects were processed in parallel. When blocks featuring only easy or only difficult left objects were used, the difficulty of the right object did not affect the gaze duration for the left object, implying that objects were processed sequentially. Together these results indicate that speakers can adjust their speech planning strategy according to task demands.

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10:00-10:20 **(207)**

A word order constraint on phonological activation - *Niels JANSSEN, F.-Xavier ALARIO, Alfonso CARAMAZZA*

In many languages, word-order rules impose major constraints on linguistic behavior. Despite their importance, little is known about how these rules operate. We report an influence of word-order on the activation of phonological representations during language production. Participants were presented with colored objects (e.g., blue rake), and named either the color (e.g., blue) or the object (e.g., rake). The phonological onset similarity between color and object name was manipulated (e.g., red rake vs blue rake). In Experiment 1, French speakers showed a phonological congruency effect in color but, surprisingly, not in object naming. In Experiment 2, English speakers yielded the opposite pattern: A phonological congruency effect in object, but not in color naming. Differences in the typical order of object nouns and color adjectives in French and English provide a plausible account for the cross-linguistic contrast in phonological activation.

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10:20-10:40 **(208)**

Automatic Naming of Ignored Pictures? Evidence From Children and Adults. - *Wido LA HEIJ, Harrie BOELENS, Jan-Rouke KUIPERS*

Prevor and Diamond (2005) showed that it takes children (3.5-6.6 years of age) more time to name the color of a namable picture than to name the color of a nonsense drawing. This finding seems in line with recent evidence indicating that picture naming may be an “automatic” process (e.g., Morsella & Miozzo, 2002; Navarrete & Costa, 2005; but see Bloem and La Heij, 2003). In a series of experiments we examined whether this interference effect (a) generalizes to the naming of another attribute (position), (b) is also obtained with adult participants, (c) is also obtained when manual responses are required and (d) is dependent on the availability of the picture’s name. We discuss implications of our findings for models of lexical access in word production.

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Emotion
Amphi Chimie
Saturday morning 9h – 10h40

Chaired by Rene Zeelenberg, Erasmus University Rotterdam

9:00-9:20 **(209)**

Emotion, Emotionality and Time Perception - *Jason TIPPLES*

The goal of the research was to examine the influence of emotion on time perception. In experiment 1, the temporal bisection procedure was used to test if greater overestimation of time due to negative emotion is moderated by individual differences in negative emotionality. Participants estimated the duration of facial

expressions (anger, happiness, fearfulness) and a neutral-baseline facial expression. The duration of angry expressions was consistently overestimated relative to other expressions and the baseline condition. In support of a role for individual differences in negative emotionality on time perception, temporal bias due to angry and fearful expressions was positively correlated to individual differences in self-reported negative emotionality. Experiment 2 was designed to establish whether overestimation due to emotion generalises to other emotional stimuli. Overestimation due to emotion was recorded for both positive emotional words and pictures. The results support the operation of an arousal-based moderation of temporal processing due to emotion.

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9:20-9:40 **(210)**

Detecting Deception in Facial Expressions - *Jean UNDERWOOD, Kate WILLISON*

The ability to judge whether a smile is genuinely activated by positive emotion depends on the ability to detect and correctly interpret the subtle movement of the facial muscles (Eckman & Freisen, 1997). This study investigated the effect of age of participant and age of the stimulus person on the ability to differentiate between genuine and false smiles in adults and children. Variability in the age of participant and age of the stimulus person did have a significant affect on both adult¹s and children¹s ability to differentiate between genuine and false smiles. The results indicated that children under 10 years old could differentiate between genuine and false smiles but less accurately than adults.. Adults were found to be significantly more accurate at distinguishing between the Duchenne and false smiles when observing adults¹ faces compared to child faces and the finding was reversed for child participants.

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9:40-10:00 **(211)**

Emotional Content and Age Affects How We Remember Events - *Tugba UZER, Sami GÜLGÖZ (read by Sami GÜLGÖZ)*

In studies of autobiographical memory, participant age and age of memory do not appear to be related to emotional valence as emotion is treated as a dichotomous variable. Emotional richness demands inclusion of emotional memories beyond positive and negative, to include specific emotions like anger, fear, and happiness. The goal of this study was to investigate changing properties of autobiographical remembering in relation to discrete emotions, participant age, and age of memory. Thirty young and thirty old adults participated by recalling recent and remote memories associated with seven emotional categories and then responded to Memory Characteristics Questionnaire for each. The results showed that phenomenal characteristics of recall were affected by emotions, this effect was qualified by participant age, and changes in emotions between encoding and recall showed different patterns according to age. The results are discussed within the context of social-emotional selectivity and appraisal theories.

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10:00-10:20 **(212)**

Emotional Cues Improve and Impair Visual Identification - *Rene ZEELENBERG, Bruno BOCANAGRA*

Although previous studies have demonstrated that emotionally significant stimuli are often better identified than neutral stimuli, the mechanisms underlying this perceptual enhancement remain unclear. We investigated the influence of an emotional cue word on the visual identification of a subsequent neutral target word. By manipulating cue-target intervals and cue visibility we were able to show both perceptual improvements and impairments due to emotion. These results provide direct behavioural evidence for a two-fold benefit in the visual identification of emotional stimuli: (a) a general enhancement in the efficiency of visual processing, and, (b) a stimulus-specific enhancement through which emotional stimuli attain prioritized capacity-limited processing.

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10:20-10:40 **(213)**

Affect and Mood Influences on Intuitive Decision Making. - *Robert BALAS, Joanna SWEKLEJ, Grzegorz POCHWATKO, Malgorzata GODLEWSKA*

The study tested affect and mood impact on intuitive decision making in Bowers et al. (1990) dyads of triads task. Participants were simultaneously presented with two sets of three words. One triad within each set had common associate word (a solution). Participants were asked to provide a solution to solvable triad or, if unsuccessful, to indicate the triad they thought had a solution. First study manipulated the affective valence of solutions to test the influence of unconscious affect on intuitive decisions. Results showed positive affect facilitated accuracy of decisions more than negative. The second study included additional mood manipulation. Previous effects of solutions‘ affective valence were replicated and extended by showing positive mood influence on insight rather than intuitive decision making. It is concluded that positive affect facilitates intuitive decision making by making positively valenced concepts more available for processing whereas positive mood enhances conscious access to memory content.

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Perception

Amphi Péres

Saturday morning 8h40 – 10h40

Chaired by Ronald Hubner, Universität Konstanz

8:40-9:00 **(214)**

Effects of Spatial Separation Between Stimuli in Whole Report From Brief Visual Displays - *Søren KYLLINGSBÆK, Christian VALLA, Jan VANRIE, Claus BUNDESEN*

Direct measurements of effects of spatial separation between stimuli in whole report from brief visual displays are reported. The stimuli were presented on the periphery of an imaginary circle centered on fixation. In Experiment 1, each display showed 2 capital letters (letter height = 1.3 deg., width = 0.9 deg., eccentricity = 5.5 deg.). The proportion of correctly reported letters was a strictly increasing, decelerating function of the spatial separation between the letters for center-to-center separations ranging from less than 2 deg. to more than 10 deg. of visual angle. Experiment 2 yielded similar results with triples of letters. Experiment 3 showed that accuracy increased with spatial separation for report of 2 short words, and Experiment 4 showed the same result for words presented upside-down. The results are explained by a model of lateral masking (crowding) based on competitive interactions within receptive fields of cortical neurons.

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9:00-9:20 **(215)**

Representing Natural Scenes: How Do Scene Semantics and Task-Relevance Interact? - *Emmanuelle BOLOIX, Claude BASTIEN*

Task-relevance and scene semantics are factors known to guide the eyes and the attention toward scene regions and objects we want to see in detail. Nevertheless, given that a bottleneck exists between vision and memory, it is difficult to assess witch ones of attended objects will be represented in memory, in regard to scene semantics or task-relevance. We investigated whether these two types of visual information, task-relevance and semantic-interest, could influence the visual representation of natural scenes. In a single shot change detection experiment, observers were instructed to either perform a visual search task on a natural scenes or not, and we examined the change detection performance in regard to the task-relevance and the semantic interest of the change. Exploration durations and task difficulty varied. Results indicated that scene semantics and task-relevance showed different effects at different time courses. Implications for scene perception and representation will be discussed.

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9:20-9:40 **(216)**

Hemispheric Asymmetries for Global/Local Processing of Naturalistic Objects - *Ronald HÜBNER*

Up to now, hemispheric asymmetries for global/local processing have mainly been investigated with hierarchical letters as stimuli. Therefore, a study was conducted to examine whether corresponding visual-field (VF) effects can also be obtained for more naturalistic objects. As stimuli served images of animals with a local pattern on their body. The task for the global level and for the local level was to categorize the animals and the patterns, respectively. As a result, VF-effects were also found for these stimuli and tasks. However, the effects depended on processing strategies, whereas the relative dominance of the stimulus levels was irrelevant. Taken together, the results indicate that hemispheric asymmetries for global/local processing are not restricted to hierarchical letters but also occur for naturalistic objects.

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9:40-10:00 **(217)**

Is a Large Nut Like An Apple? Studies with Real and Modified Sized Objects. - *Anna BORGHI, Bazzarin VALENTINA, Alessia TESSARI,Roberto NICOLETTI*

Two experiments investigate the role played in categorization by visual online information and information stored in memory. Participants categorized photographs of objects into artefacts or natural kinds. Before or near the object participants saw photographs of hands in a grasping posture (precision, power grip). Objects, manipulable either with a power or a precision grip, were presented in their real or modified size (e.g., strawberries were presented both in their real size and with the size of apples). RTs were faster with the power than with the precision posture, suggesting that visual hand stimuli activate a simulation of grasping. More importantly, participants categorized objects on the basis of their appearance rather than of their real size. This role of online information is remarkable in a task that implies the involvement of semantic knowledge. Results are discussed with regards to the distinction between the dorsal and ventral stream (Milner & Goodale, 1995).

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10:00-10:20 **(218)**

Functional Suppression of HMT+ by RTMS Results in Impaired Tactile Flow Discrimination in Humans - *Demis BASSO, Emiliano RICCIARDI, Daniela BONINO, Lorenzo SANI, Mario GUAZZELLI, Tomaso VECCHI*

The middle temporal complex (hMT+) responds to optic flow in humans. Recently, we demonstrated that hMT+ also responds to perception of tactile flow both in sighted and blind individuals, thus suggesting a supramodal organization. To determine whether hMT+ activity is necessary for tactile motion processing, we disrupted hMT+ function by using repetitive transcranial magnetic stimulation (rTMS), while blindfolded subjects performed a tactile velocity discrimination task. Fifteen healthy volunteers had to detect with their right index fingers changes in rotation speed of a random dot pattern on the surface of a plastic cylinder that rotated outwardly at five different speeds. The 3 conditions included: the stimulation of either hMT+, and the midline parieto-occipital (POz) sites, and no stimulation. Both accuracy and reaction time were significantly impaired only during the disruption of hMT+ (10 Hz, 110% motor threshold). These results indicate that the recruitment of hMT+ is necessary for tactile motion processing.

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10:20-10:40 **(219)**

Different Types of Change-Detection and Change-Blindness Revealed by ERPS and Induced Gamma Activity - *Niko A. BUSCH, Ingo FRÜND, Christoph S. HERRMANN*

It is currently debated whether visual changes can be "sensed" preattentively without a corresponding visual experience. While some authors have claimed that sensing and visual experience are separate processes, others hold that there is only a quantitative difference. We presented two successive visual displays (consisting of coloured objects) separated by a brief flash. Participants reported whether or not they detected any change in the second display, irrespective of whether or not they could report the object's identity. Participants were additionally asked to identify the object. While detection requires only sensing, identification requires a visual experience of the change. Both change detection and identification affected induced gamma-band activity and the selection negativity. In contrast, only identification was associated with an N2PC contralateral to a change. This qualitative electrophysiological difference between change detection and identification supports the claim that sensing and visual experience are indeed different perceptual qualities.

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Capacity limitations
Grand Amphi
Saturday morning 11h – 13h

Chaired by Nilli Lavie, University College London

11:00-11:20 **(220)**

Visual Attention Capacity and Normal Aging - *Thomas HABEKOST, Asmus VOGEL, Egill ROSTRUP, Claus BUNDESEN, Gunhild WALDEMAR*

33 non-demented elderly people (69-87 years) were tested by TVA based assessment (Bundesen, Psychological Review 1990; Duncan et al., JEP: General, 1999) to obtain measures of (a) the speed of visual recognition, C (objects processed per second) and (b) the visual apprehension span, K (maximum number of objects recognized in one view). The participants were also MR scanned to examine the degree of age-related white matter hyperintensities. Clear effects of increasing age were found for parameter K and especially parameter C. Further, the degree of white matter hyperintensities correlated significantly with parameter C. Overall, the data represent the first systematic study of TVA parameters C and K in relation to normal aging and its radiological correlates.

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11:20-11:40 **(221)**

Does Visual Short-Term Memory Capacity Defined by the Number of Objects Or by Their Complexity? - *Roy LURIA, Paola SESSA, Alex GOTLER, Pierre JOLICOEUR, Roberto DELL'ACQUA*

In a change detection paradigm, a memory array is briefly presented, followed by a test array that can be identical or different to the memory array. Visual short-term memory (VSTM) capacity is 3-4 objects, as measured by this paradigm. There is a long debate, however, whether VSTM's capacity is sensitive to the complexity of the objects or only to their number. A recent study by Awh, Barton, and Vogel (in press) attributed previous finding of lower capacity for complex stimuli to the comparison process between the test and the memory array. According to this view, the capacity per se is not influenced by the complexity of the stimuli. Here, by using the SPCN ERP component which is a marker for VSTM's capacity, and importantly, is elicited before the test array, we show that VSTM is indeed sensitive to the complexity of objects, and not only to their number.

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11:40-12:00 **(222)**

Two-Phase Nature of Working Memory Search - *Adam CHUDERSKI, Jaroslaw ORZECHOWSKI, Zbigniew STETTNER*

We present a new version of an ACT-R computational model of working memory (WM) search. The model, following Cowan's (1995) proposal, implements bipartite WM structure that consists of an easily accessible but capacity limited focus of attention (FA) and a prone to decay but more capacious activated memory area outside FA. First, the model scans serially the focus and then it may start parallel search outside FA. In two new experiments administered using modified Sternberg task, that includes a dual task imposing low or high load on FA, we identified these distinct parts of WM with different patterns of search latencies. Our model nicely replicated these non-trivial patterns of data. We will thus

provide the evidence that the way of searching WM consists of two phases and it can vary inter- and intraindividually depending both on individual's FA capacity as well as on specific experimental conditions (e.g., load level on FA).

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12:00-12:20 **(223)**

Individual Differences in the Attentional Blink: the Important Role of Irrelevant Information - *Sander MARTENS, Nikola VALCHEV*

A well-established phenomenon in the study of attention is the attentional blink (AB): A deficit in reporting the second of two targets when it occurs 200-500 ms after the first. Although the effect has been shown to be robust in a wide variety of task conditions, we recently reported that some individuals show little or no AB, and presented psychophysiological evidence that target processing differs in non-blinkers (who do not show an AB) and blinkers (who do show an AB). Here we present evidence that the level of distractor processing and subsequent interference with target identification processes also differs between the two groups. In one task, two masked targets were centrally presented at varying temporal intervals, with or without additional distractors. In a second task, the masked targets were presented eccentrically, with or without the presence of a central sequential stream of the task-irrelevant distractors. In both cases, the presence of distractors led to an increased AB magnitude in blinkers, whereas performance for non-blinkers remained relatively unaffected. The results thus seem to support the hypothesis that non-blinkers are more efficient in ignoring irrelevant information than blinkers are.

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12:20-12:40 **(224)**

Load Theory and Distractibility in Daily Life and in the Laboratory - *Nilli LAVIE, Sophie FORSTER*

Load theory suggests that irrelevant distractors can be successfully ignored in tasks of high perceptual load that exhaust full attentional capacity in their processing. Although there is much evidence for the theory (see Lavie, 2005 for review) the measures of distractor interference used in previous research typically involved distractor stimuli that were in some sense relevant to the task (e.g. the distractors were associated with task responses). In daily life however people are often distracted by stimuli that are entirely irrelevant to their current task. In the present talk I describe new studies that examine the role of perceptual load in determining the likelihood of interference by irrelevant distractors in daily life, as well as in new laboratory tasks that assess interference by entirely irrelevant distractors. Lavie, N. (2005) Distracted and confused?: selective attention under load. Trends in Cognitive Sciences, 9, 75-82.

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12:40-13:00 **(225)**

Phonological Similarity Effects and the Attentional Blink. - *Veronika COLTHEART, Lisa YEN*

When observers search for two visual targets embedded in a sequence of distractors shown at high rates, they frequently miss the second target occurring a few hundred ms after the first. This transitory deficit in second target detection is termed the attentional blink. We report experiments in which target and distractor phonological similarity were manipulated. Phonological similarity of post-Target 1 distractors impaired dual target report whereas target similarity had less reliable effects on performance. Phonological similarity of letter distractors had no effect on single target identification but affected performance even when targets and distractors came from different categories. The results provide evidence for phonological encoding of distractors despite their irrelevance. The implications for two-stage theories of the attentional blink are considered.

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SYMP: Working memory - European perspectives
Amphi Péres
Saturday morning 11h – 13h

Organized by John Towse, Lancaster University, and Klaus Oberauer, University of Bristol

11:00-11:20 **(226)**

Executive Control and the Episodic Buffer - *Alan BADDELEY, Richard ALLEN, Graham HITCH*

The initial model of working memory had three components, the phonological loop, the visuo-spatial sketchpad and the central executive. A fourth component, the episodic buffer was proposed by Baddeley (2000) to link working memory and LTM, and provide a basis for the binding of features into episodic chunks. In its initial formulation, access to the buffer from the sketchpad and loop was exclusively through the central executive. We describe a series of experiments that test this assumption by requiring participants to bind features into chunks, while concurrently performing tasks intended to disrupt specific components of working memory. We studied the binding of colours and shapes into objects, and the binding of words into sentences. The results suggest a modification of the original model, with the episodic buffer representing a passive store, fed either through the central executive or directly from the verbal and visuo-spatial subsystems.

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11:20-11:40 **(227)**

Time and Cognitive Load Within the Time-Based Resource-Sharing Model - *Valérie CAMOS, Sophie PORTRAT, Sophie BERNARDIN, Evie VERGAUWE, Pierre BARROUILLET*

According to the Time-Based Resource-Sharing model (Barrouillet, Bernardin, & Camos, 2004), the cognitive load a given task involves is a function of the proportion of time during which it captures attention, thus impeding other attention demanding processes to take place. Accordingly, we present studies demonstrating that the disruptive effect of memory retrievals and response selections on the maintenance of verbal information increases with their duration. These effects are not modality specific, as spatial processing was found to disrupt verbal maintenance. Moreover, the effect on recall performance of concurrent activities does not go beyond their duration in so far as the processes are attention demanding. We demonstrated that concurrent retrievals from long-term memory or spatial response selections have the same the effect on verbal maintenance when their durations are equated. By contrast, activities that do not solicit central processes for a sizable portion of time have no measurable impact on span. These results suggest a sequential and time-based functioning of working memory in which processing and storage rely on a single and general purpose attentional resource needed to run executive processes devoted to construct, maintain and modify ephemeral representations.

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11:40-12:00 **(228)**

Binding Across the Life Span in Visuo-Spatial Working Memory - *Robert LOGIE, James BROCKMOLE, Annelinde VANDENBROUCKE*

The problem of binding and retaining the binding of features in visuo-spatial working memory was addressed in a large scale internet based study via the BBC Science Web site. Here, we report results from around 110,000 participants spread across 150 countries, covering the age range 8 to 80 years. Participants were first presented with sets of up to four stimuli each in a particular colour, shape and location. Shapes were either geometric or animal shapes. Participants were then required to reconstruct from memory the colour, shape and location combinations for each stimulus. Results indicated that overall binding score increased with age between 8 and 22 years, and then declined in young adulthood steadily through middle age to older age, with binding for geometric shapes more sensitive to ageing than were animal shapes. The relationship in adulthood between binding and age

was also shown for visual pattern memory and both were more closely linked with age than was a measure of working memory span or self-reported memory ability.

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12:00-12:20 **(229)**

Feature Overwriting in Immediate Serial Recall - *Klaus OBERAUER, Elke B. LANGE*

Similarity between list items impairs immediate serial recall. This effect has mostly been attributed to confusion of similar items at retrieval. A formal model of working memory capacity (Oberauer & Kliegl, 2006) is based on the assumption that representations held in working memory simultaneously overwrite each other's shared features. Direct evidence that feature overwriting contributes to similarity effects in working memory has been scarce. We present two new experiments in which participants recalled lists of 4 words and 4 letters. The letters' phonemes had maximal overlap with one of the word (target word) and minimal overlap with the other words. When the letters followed the words, the target word was recalled worse than comparable control words, demonstrating retroactive interference through overwriting of phonemes. The second experiment tests whether overwriting also produces proactive interference. Oberauer, K., & Kliegl, R. (2006). A formal model of capacity limits in working memory. Journal of Memory and Language, 55, 601-626.

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12:20-12:40 **(230)**

The Assessment of Children's Working Memory Span: When Peripheral Details Are Not So Peripheral - *John TOWSE, Graham HITCH, Neil HORTON*

It is widely recognised that among children and adults, working memory capacity forms a highly important individual difference construct. However, a number of common assumptions about the task have not been extensively examined. For example, there is a general expectation that working memory is robust across peripheral details in the way the task is administered, even to the extent of varying the processing content (eg reading span vs. operation span). We describe the results of a study among 108 primary school children (ages 7-11 years) who were administered two different versions of a reading span task, varying the link between the memoranda and the reading task that accompany them. We show that absolute levels of recall and the profile of individual differences can be affected by superficially subtle changes in task format, and consider the theoretical ramifications of these findings.

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12:40-13:00 **(231)**

Is Memory Updating Really An Autonomous Executive Function? - *Andre VANDIERENDONCK, Arnaud SZMALEC*

Memory updating refers to changing the contents of working memory to accommodate new input. A predominant view is that memory updating is an executive function which is separable from other often postulated executive functions such as mental shifting, task coordination, planning and inhibition. However, a number of researchers have suggested that updating requires inhibition processes that result in a decrease of the activation of old memory traces so as to enable new information to become sufficiently active. On the latter view, memory updating is not conceptualized as a separable executive process, but rather as a task demand that requires some form of inhibition. The purpose of the present study is to explore this inhibition hypothesis by varying the amount of interference from previous or current memory traces (i.e. by using "lure" trials). The results indicate that performance on the n-back task is related to the ability of efficiently suppressing (old and current) activations in memory. By and large, this is in agreement with the view that updating the contents of memory involves inhibition. The implications of the results for current views on memory updating are discussed.

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Word and letter processing
Amphi Charve (Physique)
Saturday morning 11h – 13h

Chaired by Manuel Carreiras,

11:00-11:20 **(232)**

Are Vowels and Consonants Processed Differently? ERP Evidence with a Delayed Letter Paradigm - *Manuel CARREIRAS, Margaret GILLON-DOWENS, Marta VERGARA, Manuel PEREA*

In the present study, ERPs were recorded to investigate the neuronal basis of consonant and vowel processing while reading in a lexical decision task. The stimuli were displayed in three different conditions: a) simultaneous presentation of all letters (baseline condition); b) presentation of all letters, except that two internal consonants were delayed for 50 ms (delayed consonant condition); and c) presentation of all letters, except that two internal vowels were delayed for 50 ms (delayed vowel condition). The ERPs showed that, starting as early as 150 ms, words in the delayed consonant condition produced a larger negativity than the delayed vowel condition. This negativity was sustained up to 550 ms after target presentation. Latency differences were found between the baseline and the two delayed letter conditions. We examine the implications of these results for models of reading.

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11:20-11:40 **(233)**

The Onset of the Onset Effect in Reading Aloud - *Niels SCHILLER, Sachiko KINOSHITA*

We report four experiments that investigated the masked onset priming effect (MOPE) in reading aloud. We investigated whether two factors – presence of mismatching segments beyond the onset, and match/mismatch of the structure of the onset (simple or complex) – modulate the size of the MOPE. Dutch native speakers read aloud four-letter target words (e.g., BANK) preceded by visually masked primes that were either whole words or letters followed by percent signs. In Experiment 1, the primes either matched or did not match the onset segment of the target (e.g., beer, heer, b%%% or h%%%); in Experiment 2, they had either the same or different onset structure as the target (e.g., beer, brug, be%% or br%%). We used prime exposure duration of 33 ms and 66 ms to investigate the time course of the effects of these factors. Whole-word primes behaved the same as letter primes at the short (33 ms) prime exposure duration, whereas at longer prime exposure (66 ms) effects of mismatching segments present in the whole-word but not in the letter primes led to slower overall naming latencies, suggesting that interference from mismatching segments beyond the onset needs time to build up. Both effects of match/mismatch in onset segments and onset structure emerged surprisingly early, at the 33 ms prime duration. We suggest that the apparent early locus of these effects may be due to the early availability of the grapho-syllabic and graphemic segment information that facilitates a later phonological encoding process.

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11:40-12:00 **(234)**

Does the Activation of Syllabes Depend on Their Frequency : a Study with Illusory Conjunction Paradigm - *Nadège DOIGNON-CAMUS, Daniel ZAGAR*

Surprisingly, words with high-frequency first syllables were recognized slower than words with low-frequency first syllables (Alvarez, Carreiras & de Vega, 2000). Carreiras and Perea (2002) showed that this 'reversed' syllable frequency effect was produced by word enemies that share the same first syllable with the target word. Nonetheless the question remains open whether syllables are sensitive to frequency, notably whether high-frequency syllables are more rapidly activated than low-frequency syllables. Illusory conjunction (IC) paradigm showed that syllables are reading units automatically evoked at a perceptual level of processing (Doignon & Zagar, 2005; Prinzmetal, Treiman & Rho, 1986). This experiment was designed to test whether syllable frequency affects the pattern of IC in bisyllabic pseudowords. The results showed that participants

produced more errors that preserved the syllable than errors that violated it; this effect interacted with the first syllable frequency: the syllable perception was greater for high-frequency syllables than with low-frequency syllables.

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12:00-12:20 **(235)**

How Does Length Affect Reading in Languages of Intermediate Orthographic Consistency? Evidence From Portuguese - *César LIMA, São Luís CASTRO (read by São Luís CASTRO)*

Given that processes involved in reading depend on the orthographic characteristics of the language, some variables may be more influential in inconsistent orthographies than in consistent ones. We investigated the effect of length in word and non-word reading in Portuguese, an intermediately consistent orthography. Two-syllable words differing in frequency and length, and non-words derived by changing one letter of words, were presented as stimuli in naming and lexical decision tasks (between-subject design). Naming results revealed a robust effect of length for words and non-words (larger for non-words). In lexical decision, a lenght effect was found only for non-words (larger for non-words derived from low frequency words). These findings show that, in Portuguese, the effect of lenght is modulated by task. This may be more apparent in intermediate orthographies as compared to highly consistent ones, because reading cannot rely almost exclusively on serial grapheme-phoneme conversion.

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12:20-12:40 **(236)**

New Evidence for a Letter Frequency Effect - *Boris NEW, Jonathan GRAINGER, Magali BOIBIEUX*

While the word frequency effect has lead to many studies, only very few experiments have investigated whether there also exists a letter frequency effect. To investigate the frequency effect on lowercase letters we ran two experiments using an alphabetic decision task (the subject has to decide whether the target character is a letter or not). In our first experiment target characters appeared in isolation to the left, at the centre, or to the right of a central fixation point ("b ", " b ", " b"). In our second experiment, the characters were embedded in a string of xs ("bxxxx", "xxbxx", or "xxxxb"). The results of Experiment 1 showed that there was no letter frequency effect for isolated letters, while in Experiment 2 we observed a strong letter frequency effect at initial and final positions. These results suggest that that there is a letter frequency effect for lowercase letters, but only when they appear at the beginning or the end of strings of letters.

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12:40-13:00 **(237)**

Event-Related Potentials Reveal Stem Access in Semantically Transparent and Opaque Derivations - *Eva SMOLKA, Matthias GONDAN, Frank RÖSLER*

This study investigated whether semantically transparent and opaque derivations are accessed via their constituent units or as whole words. Reaction times (RTs) and event-related potentials (ERPs) were measured when German verb targets (e.g. ziehen, 'pull') were preceded by a purely semantically related verb (zerren, 'drag'), by a morphologically and semantically related verb (zuziehen, 'pull together'), by a purely morphologically related verb (erziehen, 'educate'), by an orthographically similar verb (zielen, 'aim'), or by an unrelated verb (tarnen, 'mask'). Morphological relatedness produced robust RT facilitation and N400 modulations regardless of semantic relatedness. These morphological effects were even stronger than pure semantic effects. Moreover, morphological derivations induced an early left anterior negativity indicating prefix-stripping. Orthographic similarity produced RT interference and early anterior effects that differed from those of the morphological effects. Behavioral and ERP data favor a single system that accesses the stems of both semantically transparent and opaque derivations.

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SYMP: Spatial Memory and Wayfinding: Cognitive and Neurocognitive Approaches

Amphi Chimie

Saturday morning 11h – 13h

Organized by Michel Denis, LIMSI-CNRS, and Albert Postma, Utrecht University

11:00-11:20 **(238)**

Children's Memory for Locations Defined by a Single Landmark Or Boundary - *Jessie BULLENS, Marko NARDINI, Christian F. DOELLER, Oliver BRADDICK, Albert POSTMA, Neil BURGESS*

It has been demonstrated (Doeller, King & Burgess, submitted for publication) that within spatial memory the error corrected learning of an objects location to an intramaze landmark and the incidental learning of an objects location to the boundary of an environment act in parallel. The current study, based on the VR study of Doeller and colleagues, tested children between 5 and 7 years of age and students on a more naturalistic task in which both memory systems were addressed. Overall performance did not differ between the 5 and 7 year olds, however, they differed markedly from the adult students. That is, the students learned between as well as within test blocks on both the landmark related object and the boundary related object, whereas the children did not. Bias measures towards the landmark or boundary and the potential influences of the starting position on participant's overall orientation are currently being examined.

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11:20-11:40 **(239)**

Structural Properties of Spatial Representations in Blind People - *Michel DENIS, Amandine AFONSO*

Can people build mental maps from non-visual experience of spatial configurations? We report two studies where blind and blindfolded sighted participants learned such configurations through verbal, haptic, or locomotor learning. The results show that late blind people can build representations that preserve the metric properties of verbally described or manually handled spatial configurations whereas congenitally blind people experience more difficulty in constructing valid representations of the configurations. The processing cost is higher than for sighted and late blind persons. The permanent absence of vision does not prevent people to build representations in which metric information is validly represented, but the transient absence of vision places blindfolded sighted people in a situation that reveals their special difficulty of elaborating a metrically accurate mental representation of an environment learned by locomotion.

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11:40-12:00 **(240)**

Neuropsychological Studies of Spatial Memory and Wayfinding: Why Getting Lost? - *Cecilia GUARIGLIA, Laura PICCARDI, Giuseppe IARIA*

In the present presentation some studies underlying the role of mental imagery deficits in perturbation of spatial memory and wayfinding will be reported. By using an human version of Morris Water maze, authors demonstrate that right brain damaged patients with representational neglect are not able to construct and store cognitive maps, underlying the importance of visual mental imagery in spatial memory. A second set of studies will also been presented analysing the different systems processing and memorizing spatial information relative on one hand to objects and objects arrays and on the other hand to environments and environmental features.

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12:00-12:20 **(241)**

Orientation Specificity in Long-Term Memory for Environmental Spaces - *Tobias MEILINGER, Bernhard E. RIECKE, Heinrich H. BÜLTHOFF*

This study examined orientation specificity in human long-term memory for environmental spaces. Thirty-eight participants learned an immersive virtual environment by walking in one direction. The environment consisted of seven corridors within which target objects were located. In the testing phase, participants were teleported to different locations in the environment and were asked to identify their location and heading and then to point towards previously learned targets. As predicted by view-dependent theories, participants pointed more accurately when oriented in the direction in which they originally learned each corridor; even when visibility was limited to one meter. When the whole corridor was visible, participants also self-localised better when oriented in the learned orientation. No support was found for a global reference direction underlying the memory of the whole layout or for an exclusive orientation-independent memory. We propose a ?network of reference frames? theory to integrate elements of the different theoretical positions.

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12:20-12:40 **(242)**

Conservation of Basic Navigation and Memory Functions Between Humans and Animal Models - *Celine FOUQUET, Kinga IGLOI, Alain BERTHOZ, Laure RONDI-REIG (read by Laure RONDI-REIG)*

To navigate toward an invisible goal, multiple strategies can be used. We investigated two of them: the allocentric and the sequential egocentric strategies. In order to study these strategies, a new task named 'starmaze,' was designed for mice and then adapted to human using virtual reality. In this maze, the subject can either use distal cues (allocentric strategy) or a sequence of action leading to the goal (sequential egocentric strategy). This paradigm allows the identification of the navigation strategy spontaneously used by a subject. Our results show that animals and people can simultaneously use allocentric and egocentric strategies and switch from one to another during the training period. The different identified strategies have the same learning profiles, and their performances during navigation are similar. This ensemble of results points towards a mental coexistence of multiple strategies of navigation and possible conservation of basic navigation functions between humans and animal models.

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12:40-13:00 **(243)**

Spatial Detour Planning - *Armelle VIARD, Christian DOELLER, Chris BIRD, Neil BURGESS*

The neural basis of spatial navigation by humans has been extensively studied in the past decade, but few have specifically examined spatial planning. We designed an experimental paradigm, using fMRI, to assess spatial planning in more detail, in particular to determine what brain regions activate when planning a short route and what brain regions additionally activate when the subject has to make a detour. We detected activation of a prefrontal-parietal network during spatial detour planning, in line with previous findings (Maguire et al., 1998; Spiers & Maguire, 2006).

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SYMP: Temporal orienting
Amphi Sciences Naturelles
Saturday morning 11h – 13h

Organized by Joachim Hoffmann and Annika Wagener, Julius-Maximilians-Universität Würzburg

11:00-11:20 **(244)**

Behavioral Adaptations to Redundant Distributions of Stimuli in Time - *Annika WAGENER, Joachim HOFFMANN*

In Experiment 1, one stimulus was presented after one of 15 foreperiods. The stimulus appeared either equally often after each foreperiod or most frequently after one of the foreperiods (peaked distribution). In Experiment 2, participants were to identify one of two stimuli, one of which was equally distributed whereas the other one was again peaked distributed over 15 foreperiods. Finally, in Experiment 3, the distribution of each of two stimuli peaked at different foreperiods; resulting in an early peak for the one and a late peak for the other stimulus. Besides the typical foreperiod effects (reduced RTs with longer foreperiods), responses after frequent foreperiods were faster than responses after seldom ones. However, the frequency effect was restricted to the stimulus which appeared most often at the respective frequent foreperiod, indicating the formation of associations between foreperiods and stimuli/responses. Frequency related benefits extend more to foreperiods after than to foreperiods before the peak foreperiod. The results are discussed in relation to trace conditioning models.

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11:20-11:40 **(245)**

A Common Neuroanatomical Basis for Temporal Orienting and Time-To-Contact - *Jennifer COULL, Cathy CRAIG, Ceydric GOULON, Bruno NAZARIAN, Franck VIDAL*

Previous neuroimaging studies of temporal attentional orienting (e.g. Coull and Nobre, 1998, Coull et al, 2001) required subjects to make speeded responses to targets appearing at expected intervals, thus emphasising the motor benefit of temporal orienting. Activation of left inferior parietal cortex in these studies could thus potentially be explained by co-activation of motor attention systems that have also been linked to this area (Rushworth et al, 1997). However, more recent psychophysical evidence (e.g. Correa et al, 2005, 2006) suggests temporal orienting can improve perceptual sensitivity, as well as motor speed, though the neural substrates of this effect are, as yet, unknown. We collected fMRI data during performance of a time-to-contact (TTC) paradigm. in which subjects judged whether or not a braking car would collide with a stationary wall by anticipating the moment at which it would theoretically stop given its current trajectory. Event-related fMRI analysis was time-locked to the visual presentation of the braking car. When compared to a colour control condition, the TTC task activated left inferior parietal and ventral premotor cortices. These were precisely the areas activated by our previous temporal orienting tasks in which expectancies were established explicitly by an attentional cue and temporal orienting was indexed by speed of motor response. By contrast, the current task established expectancies implictly from object motion and, moreover, was purely perceptual, requiring a discriminatory, rather than speeded, response. This neuroanatomical overlap suggests that the role of left parietal and premotor cortices can thus be generalised to control of an amodal temporal orienting network, independent of motor requirements.

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11:40-12:00 **(246)**

Which Level of Information Processing Is Enhanced by Temporal Preparation? - *Bettina ROLKE, Karin BAUSENHART, Rolf ULRICH (read by Rolf ULRICH)*

When participants can anticipate the temporal occurrence of a stimulus, reaction time (RT) to this stimulus is especially short. In order to unravel the mechanisms that underlie this temporal preparation effect, we employed the psychological refractory period (PRP) paradigm to localize this effect within the processing stream from perceptual input to motor output. Temporal preparation was manipulated in a blocked foreperiod paradigm, in which a warning signal announces the temporal occurrence of a forthcoming imperative stimulus. Contrary to the prevailing view that attributes the effect of temporal preparation to a facilitation of motor processing, our results show that temporal preparation influences the speed of early processes. To further constrain the temporal preparation effect, we employed a perceptual discrimination task. The results demonstrate that temporal preparation improves discrimination performance. Thus, we argue that the influence of temporal preparation is not restricted to late processes, but also includes early levels of processing.

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12:00-12:20 **(247)**

Temporal Orienting Facilitates Perception: Electrophysiological Evidence Based on Steady-State Visual Evoked Potentials - *Angel CORREA, Rozelle KANE, Juan LUPIAÑEZ, Anna NOBRE*

Pioneer research assigned motor preparation as the main effect of temporal orienting on stimulus processing (Coull & Nobre, 1998; Griffin, Miniussi, & Nobre, 2002; Miniussi, Wilding, Coull, & Nobre, 1999). Later studies challenged this conclusion by showing that temporal orienting can also produce perceptual preparation under conditions of high perceptual demands (Correa, Lupiáñez, & Tudela, 2005; Doherty, Rao, Mesulam, & Nobre, 2005; Lange, Rösler, & Röder, 2003). By using a perceptually-demanding unspeeded task, in which stimuli appeared in rapid serial visual presentation, we found that temporal orienting enhanced visual processing as indexed by concomitant amplifications of perceptual sensitivity (d') and steady-state visual evoked potentials (SSVEPs) recorded at occipital electrodes. The results will be further discussed by comparison with a spatial orienting condition that was tested in the same experiment. The findings provide converging psychophysical and electrophysiological evidence that temporal orienting enhances perceptual processing.

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12:20-12:40 **(248)**

Temporal Attention in the Perception of Tone Sequences - *Kathrin LANGE, Martin HEIL*

Focusing attention on a point in time can improve stimulus processing. Event-related potential (ERP) studies have provided evidence that this temporal attention can operate on early, possibly perceptual processing stages. The present study analyzed the influence of temporal attention on the processing of single tones within a melody with behavioral measures and ERPs. In each trial, a standard and a comparison melody were presented (isochronous or non-isochronous). Temporal attention was varied by presenting the third tone at the same or at a different time point in the two melodies. Participants had to indicate whether the pitch of this third tone was identical or not. For isochronous but not for non-isochronous melodies, faster responses and an enhancement of early negativities in the ERPs (140-220 ms) were observed for targets at an attended versus unattended time point. This is consistent with a modulation of stimulus processing at relatively early, possibly perceptual, levels.

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12:40-13:00 **(249)**

The Effects of Temporal and Spatial Expectations on Induced Frequency Activity - *Anna Christina NOBRE, Anling RAO, Angel CORREA*

We have previously shown that temporal and spatial expectations operating in isolation modulate evoked potentials liked to different stages of perceptual and motor analysis. Furthermore, when these expectations are combined synergistic effects are obtained during perceptual analysis. In the current investigation, we have analysed the frequencies of neural activity induced during anticipation of events appearing at predictable versus unpredictable temporal intervals versus spatial locations. The analyses concentrated on brain activity induced in the alpha and mu rhythms, which have been specifically linked to dynamic processes within visual and motor circuits respectively. Dissociable patterns of modulation were observed. During temporal expectations, the time-course of oscillatory activity was further modulated according to the specific intervals predicted.

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Applied Cognitive Psychology I - 17:30-19:30

(1001)**Cognitive Strategies Involved in Triangle Tests: What Subjects Can Tell Us?** - *Vanda GUFONI, Catherine DACREMONT*

This work aims to explore cognitive strategies subjects use in performing the triangle test, a classical procedure in sensory science, and compare their efficiency. First, we compared three types of strategy reported in the literature: choice, thurstonian, and categorization. Forty-one subjects performed one triangle test with soft drinks and described how they proceeded, either through semi-directive interview or by picking one of the scenarios describing possible strategies. Subjects reported choice and thurstonian strategies equally often when interviewed, whereas the choice model was favored when they picked a scenario. Then, from verbalizations, we identified subjects' basic steps of reasoning and designed a questionnaire in which subjects could choose among several propositions to describe what they did at each step. One hundred subjects performed one triangle test and completed the questionnaire. Their described strategies were identified according to the alternatives chosen, and subjects' performances were compared across "strategy groups."

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Applied Cognitive Psychology I - 17:30-19:30

(1002)**Acceptation of False Actions and Details of High and Low Typicality in the Misinformation Paradigm** - *Karlos LUNA, Malen MIGUELES*

The memory of an eyewitness can be altered due to the presentation of false information. In this study we introduced false actions and details of high and low typicality to explore witch contents produce higher acceptance in a cued recall test. This test is more ecological than the commonly used recognition test. Participants watched a video about a bank robbery and received false misinformation through a narrative. Then, participants completed the cued recall test and gave a confidence rating. There were more correct answers with actions and with high typicality contents. There were also more intrusions of critical misinformation when previously presented than not (that is, the misinformation effect), and with high typicality actions, suggesting that scripts have an important role in the acceptation of misinformation and that scripts are mainly formed by actions. We found no differences in confidence in critical intrusions, but the greatest confidence in correct answers were with low-typicality details.

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Applied Cognitive Psychology I - 17:30-19:30

(1003)**Dissociation, Memory and Suggestibility in Adults** - *Alexandra CUNHA, Pedro ALBUQUERQUE, Teresa FREIRE*

The analysis of the truth of abuse victims is a controversial debate in the domain of the research on false memories. Some individual variables related to the victim, such as dissociation and suggestibility, play an important role in this context. Definitions of dissociation in the literature are often ambiguous and recall errors arise in the context of a number of different paradigms of suggestibility. The current study analyses the relationship between interrogative suggestibility, memory and dissociation, in a sample of 48 undergraduate psychology students. The Gudjonsson Suggestibility Scales (GSS1 e GSS2), the Dissociative Experiences Scale and the Tellegen Absorption Scale were used in order to clarify some contradictions in previous studies. In fact, in spite of the positive correlations between dissociation and interrogative suggestibility supported by the majority of results, some studies point out the inexistence of significant relations when considering separately measures of non-pathologic dissociation.

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Applied Cognitive Psychology I - 17:30-19:30

(1004)**Attentional Task to Assess Presence Feeling in Environmental Simulation Laboratory** - *Delphine GUERIN - PRESSELIN, Rémy VERSACE, Patricia CHAMPELOVIER*

This work was carried out to improve a new objective method to assess Presence feeling in the Environmental Simulation and Assessment Laboratory of INRETS (France). The ESAL aims at reproducing the resident's surrounding close to road infrastructure. One of its objectives is to compare perception of different levels of virtual environments. For that, a paradigm of attentional task (sound detection) adapted to observe the effects of context induce by three types of landscape films: video (V), augmented reality (AR) a virtual reality (VR) was created. We put forward the hypothesis that more people has the feeling of being in the simulated place, more it is easy to realize an attentional task. The attentional performances were cross with a scale of Presence feeling perceived at the ESAL. The first results obtained make it possible to highlight the type of simulation making it possible to induce the highest feeling of Presence.

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Applied Cognitive Psychology I - 17:30-19:30

(1005)**Attentional Networks Performance At Different Levels of Effort in Cycling.** - *Florentino HUERTAS, Javier ZAHONERO, Ana PABLOS, Alicia CALLEJAS, Didac NAVARRO, Juan LUPIAÑEZ*

The present study examined the effects of acute aerobic exercise on attentional orientation, executive control and alertness. Participants completed an incremental test to determine anaerobic threshold heart rate (ATHR). On different experimental sessions, the functioning of the attentional networks was measured during the counterbalanced conditions of rest, upright cycling at 80% an 100% of ATHR. The level of physical effort did not modulate the alertness response, but the increase in the intensity of exercise led to a reduced attentional orienting and a better filtering of distractors (reduced conflict). The interaction between the attentional networks was quite independent of level of physical effort. These data altogether might indicate general exercise-induced decrements in cognitive processing of distracting information (reduced interference and effects of non predictive cues) while performing acute aerobic exercise in order to optimize the motor control in action.

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Applied Cognitive Psychology I - 17:30-19:30

(1006)**Representing Information in Complex Dynamic Systems – Diagrammatic Elements** - *Mihaela TABACARU*

When dealing with a complex, dynamic system, experts have been found to be able to relate the data structure of a system to its behaviour. Novices, on the other hand, are generally able to grasp only the structure. Representing these systems through diagrams, for teaching purposes, has been generally thought as an extremely difficult and usually ineffective task. Most conventional diagrams are of limited use when trying to convey structural information or information about how a dynamic system behaves. Additionally, they need to be supplemented by text. A big challenge, therefore, is to show structure and suggest behaviour in the same picture. We present a method for representing both data structure and its suggested behaviour of complex systems, in one single diagram, using arrows-and-boxes diagrams that previous independent research has shown to easily conveying meaning.

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Applied Cognitive Psychology I - 17:30-19:30

(1007)**Memory for Items (Vocabulary) and Memory for Rules (Grammar) in Second Language Acquisition (SLA)** - *Francisco Javier GUZMAN MUÑOZ, Sanne KUIJPER, Addie JOHNSON*

Pushing learners to focus on the form of linguistic input has been used as a strategy to promote explicit learning and increase conscious awareness of what is being learned (Schmidt, 2001). We manipulated instructions and stimuli in a language-learning task to create conditions with a focus on form or a focus on meaning. We combined this manipulation with another variable that has been related with differential development of conscious knowledge: error-free vs. errorful training (Heimbeck, Frese, Sonnentag & Keith, 2003). Participants in the focus on form condition performed better in tests of grammar whereas those in the focus on meaning condition did better in tests of vocabulary. There was no influence of the manipulation regarding error

training. Results seem to support the existence of two ways of storing linguistic knowledge that can be differentially promoted through external (teacher) intervention.

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Attention I - 17:30-19:30

(1008)**Spatial and Temporal Binding Errors Are Regionally Dissociable Within the Human Pulvinar** - *Isabel AREND, Robert WARD*

Accurate visual processing requires the activity of both cortical and subcortical brain structures. The pulvinar is the largest nucleus of the thalamus and it is known to be highly involved in visual attention processes. In monkeys, it has been found that the different anatomical subdivisions of the pulvinar are responsible for different aspects of visual behaviour, but in humans such differentiation has not yet been provided. Here we studied spatial and temporal binding in three patients with varying pulvinar lesions. Focal lesion to the anterior pulvinar disrupted mainly the ability to integrate features presented across spaces, whereas lesions to the posterior pulvinar produce additional deficits in temporal feature integration. These findings are discussed within the scope of neural network models of visual attention processes in which the pulvinar is theorized as a central structure in facilitating communication between different brain areas.

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Attention I - 17:30-19:30

(1009)**Measurement of the Spatial Distribution of Attention: Confrontation of Two Techniques** - *Serge CAPAROS, Karina LINNELL*

Classically, two paradigms have been used to assess the spatial distribution of attention around a selected location: (1) the cueing paradigm, in which a target (the probe) appears at different separations from a cue; (2) the flanker paradigm, in which a distractor (the probe) appears at different separations from a target. These paradigms have yielded contradictory conclusions (Yantis & Johnston, 1990; Mueller et al., 2005) making it possible that they assess different processes. A composite paradigm was developed in which the tasks from the two paradigms were performed on exactly the same stimuli. Results showed that the same attentional distribution was obtained with both the cueing and flanker tasks. The distribution was one of surround-inhibition; previous findings of a gradient distribution are likely to result from methodological issues (such as the precision of spatial sampling) rather than attentional ones.

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Attention I - 17:30-19:30

(1010)**Time Course of Attentional Bias for Emotional Faces. Evidence From Inhibition of Return in the Dot-Probe Paradigm.** - *Dariusz ASANOWICZ*

The dot probe task is often used to examine selective attention to threat, especially in anxious individuals. A facilitated response to probes that appear at the same location of threat stimuli in comparison with responses to probes at the opposite location of threat stimuli is interpreted as vigilance for threat. The present study uses the occurrence of facilitation and inhibition of return as a diagnostic tools to determine time course of attentional bias for emotional faces in the dot probe paradigm. Results indicated that all participants, not only anxious individuals, attended to threat pictures at very short exposure duration (150 ms). At 850 ms picture presentation, inhibition of return was observed. The initial involuntary shift of attention towards threat produce facilitation. However, because the probes is not-task relevant and attention had time to disengage from it, an inhibitory after effect is observed in longer reaction time.

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Attention I - 17:30-19:30

(1011)**Temporal Orienting Increases Motor Conflict Whereas Reduces Perceptual Interference** - *Paola CAPPUCCI, Ángel CORREA, Anna C. C. NOBRE, María Jesús FUNES, Juan LUPIAÑEZ*

Top-down temporal anticipation of event onsets (temporal orienting) is known to facilitate processing flexibly at early perceptual (Correa, Lupiáñez, & Tudela, 2005) and late motor stages (Miniussi, Wilding, Coull, & Nobre, 1999). Can temporal orienting also modulate intermediate stages related to cognitive control (i.e., conflict resolution involving selection of stimulus and responses, S-R)? Temporal cuing was combined with a Simon-Stroop task (Lupiañez & Funes, 2005) that measures motor conflict between S-R (Simon) and perceptual conflict between stimulus dimensions (spatial Stroop). The results showed that the motor-preparation component of temporal orienting was expressed as an increase in motor conflict (larger Simon effects), whereas the perceptual-preparation component led to a decrease in perceptual conflict (smaller Stroop effects). Therefore, we dissociated perceptual and motor influences of temporal orienting on conflict processing, also suggesting the involvement of separable brain systems in the processing of specific types of conflict (Liu, Banich, Jacobson, & Tanabe, 2004). Correa, Á., Lupiáñez, J., & Tudela, P. (2005). Attentional preparation based on temporal expectancy modulates processing at the perceptual-level. Psychonomic Bulletin and Review, 12(2), 328-334. Liu, X., Banich, M. T., Jacobson, B. L., & Tanabe, J. L. (2004). Common and distinct neural substrates of attentional control in an integrated Simon and spatial Stroop task as assessed by event-related fMRI. NeuroImage, 22, 1097-1106. Miniussi, C., Wilding, E. L., Coull, J. T., & Nobre, A. C. (1999). Orienting attention in time: Modulation of brain potentials. Brain, 122, 1507-1518.

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Attention I - 17:30-19:30

(1012)**Salient Signals That Capture Attention Produce Inhibition, Not Inhibition of Return: Evidence From Their Aftereffects** - *Mélanie ARNAL, Chloé LIGER, George A. MICHAEL*

The present study assessed the differences between inhibition of return (IOR) and active inhibition of distractors (IOD) through their after-effects in a dot-probe detection task. Participants had to define the orientation of a target in a primary visual search task in the presence of a salient distractor-to-ignore. Subsequently, they had to detect a small dot which appeared 17 or 300ms after the disapperance of the search display. The probe could appear in (a) a previously empty location, (b) a location previously occupied by an ordinary item, or (c) a location previously occupied by the salient item. Different patterns of results were found for the detection of the probe as a function of its location. More precisely, response times (RT) were faster in the 300ms interval when the probe was presented at the location of a previous salient item than when presented at the location of a previous ordinary item. The same pattern was found both after serial and parallel search, and shows that IOR and IOD are two distinct mechanisms, just as suggested in a recent model of attetion (Michael et al., 2006).

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Attention I - 17:30-19:30

(1013)**Practicing the Attentional Dwell Away?** - *Anders PETERSEN, Søren KYLLINGSBÆK, Claus BUNDESEN*

Studies of the time course of visual attention have identified a temporary functional blindness to the second of two spatially separated targets: attending to one visual stimulus may lead to impairments in identifying a second stimulus presented about 200-500 ms later than the first. The phenomenon is known as the attentional dwell time (e.g. Duncan, Ward, Shapiro, 1994). Previous studies of attentional dwell time have all used naive subjects running few (<500) trials each. We have examined the outcome of practice running more than 1000 trials in each subject while recording eye movements. The results suggest that the majority of subjects may learn to optimize their performance reducing the attentional dwell time effect substantially. Further, the reduction in the attentional dwell time effect seems to be closely linked to the ability of the subject to inhibit eye movements while performing the task.

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Attention I - 17:30-19:30

(1014)**Response Time Patterns and Perceptual Load Effects in Words and Letter Strings.** - *Doug CULLEN, Paloma MARI-BEFFA*

The negative priming (NP) elicited by irrelevant distractors has been shown to be influenced by the perceptual load imposed by the size of the stimulus set (Lavie & Fox, 2000). Through two experiments the load effects of real English words on NP was investigated. Experiment 1 successfully replicated Lavie and Fox (2000) first study with a different set of letters. Experiment 2 presented the target stimuli from Experiment 1 within English six letter words and demonstrated a word load effect on the NP elicited. Analysis of the response time (RT) and error rate patterns to the primes (letter string or real word) revealed a grouping effect for letters within English words compared to letter strings. The Authors conclude that, due to the semantic information, searching for letters within words adds an additional attentional load that can be seen in NP, RT patterns, and error rates.

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Attention I - 17:30-19:30

(1015)**Affordance Effects in the Peripersonal and Extrapersonal Spaces** - *Sabrina FAGIOLI, Stefano SDOIA, Fabio FERLAZZO*

An open issue in the study of the affordance effects is whether they depend on the knowledge of the objects' identity or function. Here we report the results of three experiments aimed at investigating whether the affordance effects depend on the space wherein the object is located (peripersonal, where manipulation can occur vs extrapersonal, where manipulation cannot occur). In three experiments, we found that a distractor stimulus interferes more on the reaction times to a target stimulus when the objects are placed in the peripersonal space than when they are placed in the extrapersonal space. On the contrary, when the action in made impossible (by interposing a transparent screen between the observers and the objects, or removing the objects), the distractor stimulus interference effect was the same across the spaces. These results suggest that the affordance effects may not only depend on the semantic coding of the objects.

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Attention I - 17:30-19:30

(1016)**Temporal Expectancies Modulate Spatial Cueing Effects** - *Gabriella ANTONUCCI, Giovanna GIRARDI, Francesco DI NOCERA*

The present study investigates the functional interaction between temporal expectancies and spatial orienting of visual attention. In a spatial cueing task, we manipulated stimulus onset asynchronies (SOAs) within blocks and observed that the effect of spatial orienting varied as a function of the range of SOAs and their central value. Temporal expectancies influenced spatial orienting in one of two ways: first, decreasing the SOA range while holding mean SOA constant speeds up the time course of spatial orienting; second, decreasing mean SOA while holding SOA range constant reduces spatial cueing effects. Together, our findings suggest that temporal and spatial features of attention do not operate independently of each other and support the proposition that individuals might flexibly control the allocation of attentional resources.

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Attention I - 17:30-19:30

(1017)**Sensory Competition and Its Effects on Perceptual Load and Response Competition** - *Ana TORRALBO, Paige SCALF, Diane BECK, Arthur F. KRAMER*

Stimuli presented simultaneously in the visual field are not processed independently, but instead interact in a mutually suppressive way that suggests a competition for neural representation at the level of visual cortex. This competition can be biased according to the top down orienting of attention or by stimulus-driven factors, such as visual saliency. It has also been shown that interference due to competing response tendencies produces conflict at later stages of processing. We are interested in how these two systems of competing tendencies interact. We manipulated a flanker design where the flanker can be response compatible or incompatible with respect to the target. The target or the flankers were either surrounded by irrelevant letters (i.e. sensory competition condition) or not. Our results show that flanker interference effects can be modulated by sensory competition. Results are discussed in terms of attenuated representation of target and distractors due to sensory competition.

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Attention I - 17:30-19:30

(1018)**On the Relationships Between Exogenous Orienting of Attention and Visual Working Memory** - *Fabiano BOTTA, Valerio SANTANGELO, Antonino RAFFONE, Juan LUPIANEZ, Marta OLIVETTI BELARDINELLI*

Several previous studies have shown that spatially-uninformative peripheral (exogenous) cues can affect the access of perceptual information into the visual working memory (VWM). We investigated in 4 experiments the role of spatial attention and the right/left arrangement of space on VWM, using a change detection paradigm. In the first three experiments, to-be-remembered objects (i.e., coloured squares) were grouped throughout the left or right hemifield, and were preceded (Experiments 1 and 2) or followed (Experiment 3) by a lateral visual (Experiment 1 and 3) or auditory (Experiment 2) exogenous cue. In the fourth Experiment, a circular arrangement of cues and objects was used in order to keep constant the distances between cues and objects. Overall, the results showed attentional modulation in the transfer of perceptual information into VWM, although the spatial arrangement in which the orienting of exogenous attention takes place may modulate this effect.

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Attention I - 17:30-19:30

(1019)**Evidence That Disorganization Symptoms Disrupt IOR in Schizophrenia:Preliminary Results** - *Fenia KALOGEROPOULOU, Ana Belen VIVAS, Peter WOODRUFF*

This study aimed at examining the relationship between disorganization symptoms and inhibition of return -IOR- (Posner & Cohen, 1984) in patients with schizophrenia. Fifteen (Experiment 1) and 11 (Experiment 2) schizophrenia patients run, the single and the double cue IOR procedures with seven SOA manipulations (140, 230, 350, 450, 600, 2000, and 3200 ms). Patients' symptoms were assessed through the SAPS and SANS scales. Results did not show significant IOR effects at any of the SOA values. However, there was a significant negative correlation between FTD scores and cueing scores (RTcued-RTuncued) at the 2000ms SOA value in both experiments. That is patients who scored high for FTD displayed more facilitation; where patients who scored low for FTD tended to show inhibition. This finding suggests that in addition to impaired inhibitory processing in the semantic domain, FTD is also associated with impaired inhibitory processes in the visuospatial domain.

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Bilingualism I - 17:30-19:30

(1020)**Yes: Bilinguals Inhibit One of Their Languages But Only When It Competes for Selection** - *Pedro MACIZO, María Teresa BAJO, María Cruz MARTIN*

We examined how Spanish-English bilinguals inhibit the non-target meaning of interlexical homographs such as pie, meaning foot in Spanish. In Experiments 1, 2, 3, bilingual decided whether pairs of English words were related. When interlexical homographs were presented along with words related to the Spanish meaning of the homograph, participants were slower to respond as compared to control words. This result indicates the activation of the non-target language. In addition, they also slowed their responses when English translations of the Spanish homograph meanings were presented right after responding to homographs. This last result demonstrates the inhibition of the non-target homograph meaning. Moreover, this inhibition only occurs when the two homograph meanings compete for selection since the inhibition was not observed when

homographs were presented along with unrelated words which were also unrelated to the homograph irrelevant meaning (Experiment 4). Bilinguals thus, inhibit their irrelevant language when it competes for selection.

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Bilingualism I - 17:30-19:30

(1021)**Morpho-Syntactic Processing in Beginning and Proficient Bilinguals: Evidence From Grammaticality Judgments, Self-Paced Reading, and ERPs.** - *Pascal BRENDERS, Janet G. VAN HELL, Ton DIJKSTRA*

To gain more insight into the initial steps of learning morpho-syntactic skills in a second language (L2), we studied Dutch child classroom L2 (English) learners in a mainstream educational setting. Their skills are compared with proficient Dutch-English bilinguals. The L2 grammatical structures were manipulated on the basis of their similarity to corresponding structures in L1, and were either similar, different, or unique for the L2 (Tokowicz & MacWhinney, 2006). We also discerned lexically-based versus rule-based structures (Flege, Yeni-Komshian, & Liu, 1999). The beginning and proficient bilinguals' sensitivity to violations of the morpho-syntactic rules were studied in three experiments, using a grammaticality judgment task, a self-paced reading task, and ERPs. Individual variation in working memory capacity was also examined. Implications for the development of L2 morpho-syntactic knowledge will be discussed.

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Bilingualism I - 17:30-19:30

(1022)**Number and Dominance of Translation Equivalents in Translation Recognition and in Lexical Decision** - *Jannika LAXEN, Jen-Marc LAVAUR*

French-English bilinguals were tested in translation recognition (they had to decide whether two presented words were translation equivalents or not) and in lexical decision. The main variables were: the language presentation order (L1L2 vs L2L1), number of translation equivalents of the French and English words (one translation equivalent vs two translation equivalents) and the relative dominance of the two translations for the words which had two translations (dominant translation vs non dominant translation). A main effect of number of translations and of dominance was obtained for both language conditions. The results are discussed in a distributed model of bilingual memory (Van Hell & De Groot 1998). The results indicate that the translation recognition depends on the number of conceptual features hypothetically shared by the translation equivalents but also of the proportion of semantic features of the second word activated by the first word (Finkbeiner, Frost, Nicol & Nakamura, 2004).

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Bilingualism I - 17:30-19:30

(1023)**Differential Semantic Processing in Korean and English Word Naming** - *Ju Young Her HER, Min-Mo Koo KOO, Kichun NAM*

The present study was carried out to investigate how two languages are represented and processed for the late Korean-English bilinguals. To this end, we compared the naming times of Korean-English bilinguals on a series of the picture-word interference tasks. The entire experiment is divided into four parts, each of which required participants to name the pictures in Korean or in English with distractor words visually presented either in Korean or English. The distractor words were semantically related or unrelated to the picture. In the results, two points was considered. Firstly, In L1 (Korean) naming conditions, there were the semantic interference effects. And, the effect was stronger in the context of L1 distractor than in the context of L2 distractor words. On the contrary, in L2 (English) naming conditions, the semantic facilitation effects were observed. This facilitation effect was also bigger when naming was executed under the condition of L1 distractor words. These results suggest that two languages are processed in a different fashion for the late Korean-English bilinguals.

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Bilingualism I - 17:30-19:30

(1024)**Masked Translation Priming and Concreteness Effects in Bilinguals: Evidence From RTs and ERPs** - *Sofie SCHOONBAERT, Phillip HOLCOMB*

In this study English-French bilinguals performed a lexical decision task during masked translation priming. Both reaction times (RTs) and event related potentials (ERPs) were measured. We manipulated the direction of priming (L1 to L2 versus L2 to L1) and prime/target concreteness (fromage-CHEESE versus conseil-ADVICE). Firstly, we observed translation priming, indicated by a decreased N400 for translation pairs as opposed to unrelated pairs, but only in the L1-L2 priming direction. Secondly, we observed main concreteness effects for L1 targets (indicated by an increased N400 for concrete as opposed to abstract words), and a similar but delayed N400 concreteness effect in L2. However, there was no interaction between priming and concreteness in either direction (L1-L2 or L2-L1).

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Cognitive Aging I - 17:30-19:30

(1025)**Adult Age Differences in False Recognition in the Deese/Roediger/Mcdermott Paradigm: the Nature of the Critical Words Matters** - *Maria MEGINA, Carlos J. GOMEZ-ARIZA*

Results from a variety of studies show that older adults are more prone than younger adults to false memories. In the present study, we explored this issue by using the Deese-Roediger-McDermott paradigm. In it, participants are presented with lists of words that share a strong association with a critical (non-presented) word. Participants tend to (incorrectly) recognize the highly associated critical word as much as the studied items. In our experiment, separate groups of young and older adults were unwarned or warned about the false memory effect just before a recognition test. This test consisted of studied, strongly-related critical, weakly-related critical and non-related items. Results confirmed the higher vulnerability of older adults to false recognition (FR). Whereas the young adults mainly showed FR with strong critical items, the older group showed a similar level of FR with both types of critical items. These findings support the hypothesis that consciously controlled uses of memory decline with age.

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Cognitive Aging I - 17:30-19:30

(1026)**Glucose and Cognition: the Effects of Glucose Ingestion and Glucose Regulation on Memory Performance in Older Adults With Mild Cognitive Impairment** - *Leigh M RIBY, Anna MARRIOTT, Roger BULLOCK, Jude HANCOCK, Jonathan SMALLWOOD, Jennifer MCLAUGHLIN*

Previous research investigating the effects of glucose on cognition has found selective facilitation on episodic memory in successful ageing and dementia. The present study aimed to extend this research to mild cognitive impairment (MCI). Twenty four older adults with and 24 older without MCI performed a battery of cognitive tasks after 25g of glucose or a sweetness matched placebo. To assess the impact of individual differences in glucose regulation, blood glucose measurements were taken throughout the testing session. As expected, the specificity of the glucose facilitation effect was restricted to episodic memory in both successful ageing and MCI. Notably, higher levels of blood glucose throughout the testing session were associated with impaired memory performance in both the glucose and placebo conditions. Importantly, both blood glucose and memory performance indices were significant predictors of MCI status. The link between glucose, cognition and the ageing process are discussed in relation to these data.

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Cognitive Aging I - 17:30-19:30

(1027)**Effect of Aging and Generation of Words on Feeling of Knowing Accuracy** - *Laurence TACONNAT, Mathilde SACHER, Charlotte FROGER, Céline SOUCHAY, Séverine FAY, Michel ISINGRINI*

Monitoring processes in metamemory are considered as an essential part of the process of adapting control behavior in order to optimize learning. Monitoring can be assessed with a

task of feeling of knowing (FOK) corresponding to the individual's predicted recognition for non recalled words that have been recently learned. FOK accuracy is then assessed by the correlation between prediction and effective recognition. Like memory performance, accuracy of FOK declines with aging (Souchay et al., 2000). Generation of words (wall-hou___) is known to enhance memory performance in comparison with reading. This effect is of the same size in young and elderly adults (Taconnat & Isingrini, 2004). Generation of words enhances also the accuracy of FOK in young adults (Lupker et al., 1991). The goal of this study was to examine the role of the generation of words on both memory and FOK accuracy in young and elderly adults. The results showed that the generation increased the recall of words in old adults as much as in young adults, but increased accuracy of FOK more in elderly than in young adults. This indicates that elderly adults can compensate their deficit in monitoring accuracy when the encoding task allows them implementing an elaborative processing.

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Cognitive Aging I - 17:30-19:30

(1028)**Aging and Executive Functions: the Role of Cues in Alternate Semantic Fluency Task** - *Isabelle TOURNIER, Virginie POSTAL, Stéphanie MATHEY*

Switching and inhibition are executive functions that permit flexible behaviours. The executive functions should decline with aging, but this age effect is inconsistent in the literature. A recent task, the alternate semantic fluency (ASF), adds task switching to semantic fluency. Participants alternate fluency probes when generating words (e.g. animals and vegetables). What produces a failure in switching: deficit of flexibility or deficit of working memory? The aim of this study was to compare a cued and a no cued ASF, with young and older adults. For the total number of produced words, we did not observe an age effect for the no cued version, but a better performance for older adults in the cued version. In each case, repetitions and forgetfulness to alternate increased with aging. These results were supported by the hypothesis that inhibition declines with aging. The different processes implied in the ASF will also be discussed.

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Cognitive Aging I - 17:30-19:30

(1029)**What's the Impact of Education, Work Complexity and Leisure Time Activities on Executive Functioning in Older Subjects?** - *Emiline LAPRE, Virginie POSTAL, Stéphanie MATHEY*

The aim of this study was to examine the impact of intellectual stimulations throughout education level, work complexity (occupational status) and leisure-time activities on executive functioning in elderly participants. The Stroop task, the running span task and the connection test were used to assess inhibition, updating and switching processes respectively. A score of intellectual stimulations was computed on the basis of work complexity and leisure time activities. Two groups of 15 elderly participants were constituted in function of education and stimulations levels. The first results indicated a differential effect of these factors on executive performance. A positive and independent impact of education and stimulations levels was observed for the connection test and for the running span test but not for the Stroop task. The results suggest that scores should be interpreted both within the context of participant education and intellectual stimulations. The compensation hypothesis was used to interpret these findings.

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Cognitive Aging I - 17:30-19:30

(1030)**Metamemory in Aging: When do Older Adults Spontaneously Self-Test While Preparing for a Memory Test?** - *Sara BOTTIROLI, John DUNLOSKY, Kate GUERINI*

Murphy et al. (1987) reported that older adults do not self test themselves spontaneously while studying as they prepared for a criterion test. In recent research, however, we have found that quite a few older adults do self test (Roth, Dunlosky, & Hertzog, submitted). In the present study, we explored these differences by examining how various factors moderated self testing. In particular, younger and older adults paced their study of either single words or paired associates, which were either presented on a board in front of participants or on individual cards that participants held during study. The kind of item studied had the largest effect, with people of all ages spontaneously self-testing more often when they studied paired associates than when they studied a list of words. Self-testing was largely equivalent across age groups. Implications of this research for memory training will be discussed.

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Cognitive Aging I - 17:30-19:30

(1031)**Emotion, Executive Function and Decision-Making in Normal Aging: the Gambling Task's Example** - *Sylvain MOUTIER, Aude JABOULEY, Anne-Marie ERGIS*

Previous studies have demonstrated that aging has an adverse effect on decision-making about events that have emotionally significant consequences. One of the most widely used measures of affective decision-making is the Iowa Gambling Task (IGT) which simulates real-life decision-making, in the way it factors uncertainty, rewards, and penalties. Here, we had two objectives: to investigate the evolutionary impact of emotion on decision-making in 13 young adults (22-33 years) and 13 elderly participants (60-74 years), using the IGT; and to dissociate emotional processes from executive processes. Our results show no IGT impairments for the older subjects although they are distinguished by specific strategies and executive inefficiency assessed by the Stroop and the Hayling tests. Our data lead to the suggestion that strong affective decision making abilities among older adults may be a function of adaptative strategies in IGT device’s exploration, whereas poor decision-making abilities may arise from an abnormal executive efficiency.

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Cognitive Development I - 17:30-19:30

(1032)**How do Individuals With Williams Syndrome and Autism View Social Scenes Containing People?** - *Deborah RIBY, Peter HANCOCK*

The research presented in this paper utilises eye-tracking techniques to identify the visual viewing patterns of participants with Williams syndrome (WS) and autism when looking at social scenes containing people. Previous research has identified atypicalities in the viewing patterns of individuals with autism but has not previously included participants who have WS. The way that participants with WS and autism view their social environment may have implications for the specific and differential social phenotypes associated with them. The viewing patterns of individuals with these two developmental disorders are compared to each other, and to typical development, to identify any possible atypicalities in the way the groups look at social scenes. Participants view still pictures or short movie extracts containing real people or cartoon characters in social situations. The inclusion of real people and cartoon characters, as well as the inclusion of still images and movie extracts, provide a true insight into the viewing demands and their effect on perceptual characteristics. The results have implications for the design of teaching materials for working with these groups and understanding how different groups have different perspectives of their visual world.

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Cognitive Development I - 17:30-19:30

(1033)**Ex-Gaussian Analysis in the Stroop Color-Naming Task With Children, Young Adults and Old Adults** - *Delphine FAGOT, Judith DIRK, Paolo GHISLETTA, Anik DE RIBAUPIERRE*

The ex-Gaussian analysis is a recent approach that allows to describe the totality of an RT distribution. This analysis estimates three parameters: Mu, Sigma and Tau. Mu represents the mean of the Gaussian component, Sigma its standard deviation, and Tau both the mean and the standard deviation of the exponential component. The ex-Gaussian analysis was applied to RT distributions on the Stroop task within the Geneva Variability Study, focusing on interference effects. We assessed 30 children per group (9-12 years), 30 young and 30 old adults.

We replicated results of the extant literature with respect to young adults (Spieler et al., 2000): The three parameters increased in the incongruent compared to the neutral condition. We provided new evidence with respect to children and old adults. The ex-Gaussian analysis provides further insight into interindividual age differences in cognitive performance across the lifespan by relying on a finer analysis of intraindividual information.

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Cognitive Development I - 17:30-19:30

(1034)**The Role of Efficiency in Goal-Directed Action Interpretation in Infants** - *Stephan VERSCHOOR, Esther COALTER, Szilvia BIRO, Bernhard HOMMEL*

Numerous studies find the ability to understand actions as goal-directed in infants as young as six months. However, the mechanisms governing this emerging ability are under fierce debate. Csibra and Gergely (1998) hypothesized that goal attribution is aided by a non-mentalistic teleological interpretational system that interprets an action as goal-directed if it satisfies the principle of (rational) efficient action. We tested this theory with a modified video-version of the widely used looking-time paradigm by Woodward (1998). In our study, we varied whether the observed goal was achieved in an efficient vs. non-efficient way in the familiarization phase. We found that seven and nine month old infants showed strong evidence for goal attribution in the test phase only when the goal-approach in the familiarization phase was efficient.

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Cognitive Development I - 17:30-19:30

(1035)**Theory of Mind in a Child With Traumatic Brain Injury** - *Alessandra CARTONI, Maria DE MARTINO, Silvia MIGNANI, Enrico CASTELLI*

The aim of this study is to investigate the theory of mind (ToM) functioning in a child with traumatic brain injury (TBI) and frontal lobe damage compared to non-injured children. All participants completed a series of first-order, second-order and advanced ToM tests. Measures of executive functions and memory were also included. The brain injured patient was administered with a behavioural questionnaire (CBCL) in order to assess social functioning. TBI child performs poorly in second-order and advanced ToM tests but not in the remaining tasks. Additionally, behavioural and social problems were found. These findings indicate that a ToM deficit can be present in TBI and suggest that it could be useful in the rehabilitation of TBI to adapt treatment strategies for ToM deficits used in other pathologies.

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Cognitive Development I - 17:30-19:30

(1036)**Goal Setting and Task Switching in Middle Childhood** - *Nicolas CHEVALIER,*

Cognitive flexibility has recently been shown to depend on goal setting, that is, the ability to build a clear verbal representation of the task to be performed next (Miyake et al., 2004). As goal setting is thought to rely on inner speech which develops during middle childhood, it may also improve in this age range. The present study assessed goal setting in 5-, 7- and 9-year-old children using the Advanced-DCCS (Zelazo, 2006) that requires to switch between shape and colour matching rules. The difficulty of goal setting was manipulated by graduating the degree of explicitness of task cues (transparent verbal cue, transparent iconic cue, arbitrary iconic cue). Results showed that performance increased as a function of task-cue explicitness. Overall performance improved with age but the effects of task cue and age did not interact, suggesting that, despite more advanced inner-speech abilities, 9-year-olds still have difficulty setting task goals.

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Cognitive Development I - 17:30-19:30

(1037)**Errors in the Raven's Standard Progressive Matrices for Children and Young Adults** - *Joëlle NEIMER, Sébastien FERNADEZ, Thierry LECERF*

The two aims of this study were, first to analyse items and to determine the type of errors for each items on the Raven Standard Progressive Matrices (SPM). To our knowledge, many procedures of this kind were applied to the Advanced but none to the Standard version. Second, this study attempted to determine whether young adults and children differed in the way they produce erroneous responses on the SPM. Analysis was made according to six rules identified to solve items (Deshon, 1995) and according to five types of errors (eg. Repetition, Incomplete Correlates) as proposed partly by Babcock (2002). 178 children between 9 and 12 years old and 113 young adults were tested. Results showed, for example, that the two groups made essentially "incomplete correlate" errors (72 and 68% respectively), which could be defined as the identification of one part of the relevant rules needed to determine the correct response.

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Emotion I - 17:30-19:30

(1038)**The Time-Course of Emotional Judgments to Musical Stimuli: Role of Rhythmic and Harmonic Features** - *José M IGOA, Esther CHICO, Noemy MARTIN, Alfredo BAUTISTA*

Two experiments on the processing of emotional components of musical stimuli are reported. Judgments of activation and valence to computer-generated musical phrases with rhythmic and harmonic variations were examined. In Experiment 1, participants judged activation and valence of 8-bar musical phrases on a 6-point scale. Musical stimuli varied along three dimensions: rhythm (fast-slow), mode (major-minor), and texture (simple-complex). Activation judgments were sensitive to rhythm and, to some extent, texture. Valence judgments were independently influenced by all three musical features. In Experiment 2, two-phrase musical stimuli were constructed with variations in the same three features plus harmonic modulations between phrases. Speeded responses and scalar judgments on activation and valence were recorded. Again, different musical features of both phrases, as well as variations among them, were shown to affect activation and valence judgments. Moreover, speeded responses recorded online and off-line scalar judgments rendered different patterns of results for each dimension of emotion.

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Emotion I - 17:30-19:30

(1039)**Norms for Emotional Valence Collected From 230 Young French Children** - *Arielle SYSSAU, Catherine MONNIER*

Emotional valence of words has become an important semantic variable for experimental research in psycholinguistics and emotional development. This study provides a database of emotional valence norms for a set of 200 words collected from 90 five-year-old French children and for a set of 588 words collected from 140 seven-year-olds. The words selected in this study were previously evaluated on emotional valence by Bonin et al. (2003) and Syssau and Font (2005) for French adults. Emotional valence was judged by children on a 3-point nominal scale (negative, neutral, positive). At five, our results indicated that words were essentially positive for children. Only 4 words were negatively evaluated by more than 50% of the children and none of the words had been neutrally evaluated. At seven, the distribution of pleasant, unpleasant and neutral words tended to be similar to the distribution of words observed with adults.

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Emotion I - 17:30-19:30

(1040)**Time Course of Emotional Information in Emotional Stroop Task** - *Moon-Gee CHOI, Kichun NAM*

In non-anxious individual, no different response latency between negative and neutral words was generally found in emotional Stroop task. A number of studies supposed that this resulted from the fact that the selective attention to negative information presented as a distractor can be easily controlled or inhibited in non-anxious individuals. The present study investigated the time course of negative information processing with normal participants to determine whether they can also

effectively inhibit negative information in emotionally primed Stroop task (manipulation of SOA between emotional information and color patch). In Experiment 1, non-anxious participants showed no difference of response latency in SOA of 0ms as respected, but faster RT with negative than neutral words in SOA of 120 ms and 240ms. This effect disappeared in SOA of 420ms. In Experiment 2 in which masked primed task was conducted with SOA of 120ms, the results showed same pattern of response latency with Experiment 1. Experiment 3 conducted to determine whether the faster RT with negative words resulted from the inhibition of negative information when they presented before target. The results showed that priming of negative information with short SOA, the selective attention to target is increased rather than selective inhibition of negative information.

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Emotion I - 17:30-19:30

(1041)**Suppression of Neutral But Not of Emotional Words** - *Simon NØRBY*

Using a go/no-go paradigm Anderson & Green (2001) found weakened memory for neutral words after repeated attempts of suppression. The present study used the Anderson & Green (2001) paradigm to investigate suppression in relation to emotional versus neutral nouns and tested the long-term effect of suppression. Emotional material is normally remembered better than neutral material. It was therefore hypothesized that strongly negative emotional words would be more difficult to suppress than neutral words. A retest was done after one week to test the long-term effect of suppression. Anderson and Green's (2001) results were replicated. Overall recall of neutral suppress items were inferior to recall of neutral baseline items. However, the suppression effect on the emotional words was almost non-existent. Emotional material didn't seem to be as easily forgotten as neutral material. One week after the initial test no suppression effect on either neutral or emotional items seemed to be present.

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Emotion I - 17:30-19:30

(1042)**The Contribution of Associative Processes and Affective Transfer to Evaluative Conditioning.** - *Iga GRZEGRZOLKA, Joanna SWEKLEJ, Robert BALAS*

Current theorizing and research do not make clear predictions whether evaluative conditioning relies on associative mechanisms or transfer of affective value between US and CS. Thus, the experiment was design to assess relative contribution of the associative process and tranfer of affective value to the EC effect. The crucial manipulation involved the number of US asscociated with neutral stimulus. The results showed stronger EC effect when CS was paired with negative US. Also, the data suggests that differential contribution of associative mechanism and transfer of affect in EC depends on the affective value of the US. Both association and affective transfer contribute to negative conditioning wherease in case of positive only the influence of associations on EC was observed. These data suggest different mechanisms of EC in case of positive and negative conditioning.

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Emotion I - 17:30-19:30

(1043)**Control of Facial Muscles During the Evaluation of Emotional Pictures** - *Ana FERREIRA, Francisco ESTEVES*

The aim of the present study was to investigate effects of the manipulation of facial muscles on the evaluation and perception of emotional stimuli. Twenty-eight participants were exposed to 21 pictures from the International Affective Picture System presented randomly. Positive, negative, and neutral pictures were exposed for six seconds. Participants' expressive behaviour (electromyography) and autonomic responses (heart rate and skin conductance) were recorded continuously. After each picture, affective valence and arousal were evaluated using the Self Assessment Manikin. Two manipulation conditions were used: 1) inhibition of the zygomatic muscle, by holding a pen with the lips; 2) contraction of zygomatic muscle, by holding a pen with the teeth. A third group, without manipulation, served as control condition. The results showed a general differentiation on all measures depending on the emotional content of the stimuli. Furthermore, in the condition of inhibition of zygomatic muscle, negative pictures were rated as more negative.

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Episodic Memory I - 17:30-19:30

(1044)**Age Differences in the Interrogative Suggestibility of Children's Memory: do Shift Scores Peak At 5-6 Years of Age?** - *Thomas HUENEFELDT, Augusta FURIA, Clelia ROSSI-ARNAUD*

This research was aimed at testing Scullin & Ceci's (2001) hypothesis that the tendency to Shift answers in response to negative feedback follows an inverted U-shape developmental trajectory peaking some time after the age of 5 years. In a first experiment, we found a peak at 5.5-6 years for Shift from correct answers before feedback to incorrect answers after feedback (Shift[Correct --> Incorrect]), but no effect of Age for the opposite direction of Shift (Shift[Incorrect --> Correct]). In a second experiment, we found two different peaks of Shift[Correct --> Incorrect]: a first peak at 5-5.5 years for questions concerning central interior information (emotions), and a second peak at 5.5-6 years for questions concerning peripheral exterior information. Results suggest that the peak of Shift is not just due to a better understanding of conversational rules, but to some more cognitive mechanism such as the acquisition of a "Theory of Mind".

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Episodic Memory I - 17:30-19:30

(1045)**Are Various Aspects of Episodic Memory Affected Similarly by D-Amphetamine?** - *Inge ZEEUWS, Natacha DEROOST, Eric SOETENS*

A long-term memory improvement following d-amphetamine administration has been demonstrated on item memory and its temporal aspects. We explored whether this improvement can also be found for other aspects of episodic memory. A double-blind placebo controlled design with drug treatment, manipulated within-subjects, was used. Two types of recognition tests were employed, a yes-no and a forced-choice recognition test, to examine a possible d-amphetamine effect on visual and verbal aspects. In addition, a source memory task was adopted to determine the influence of d-amphetamine on spatial contextual information. The data demonstrated a significant effect on the long-term retention of the objects meaning following d-amphetamine. In contrast, the current results failed to find a reliable effect of d-amphetamine on visual and spatial features of a previously encountered object. In conclusion, the present findings suggest that the different features, which constitute episodic memory traces, are stored in a different way.

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Episodic Memory I - 17:30-19:30

(1046)**Electrophysiological Evidence That Voluntary Control of Conscious Recollection is Strong and Flexible** - *Zara BERGSTRÖM, Jan DE FOCKERT, Alan RICHARDSON-KLAVEHN*

Two experiments using the Event Related Potential (ERP) correlate of conscious recollection to study voluntary control of recollection are reported. Participants were trained on word-pairs, then repeatedly presented with the first word and asked to either recollect or to avoid recollection of the associate word. Experiment 1 revealed that avoiding recollection of a learned word reduced the amplitude of the ERP correlate of conscious recollection to the same level as for words that participants were trying to recollect but had failed to successfully learn in the first place. Experiment 2 demonstrated that reversing recollection instructions for some items halfway through the phase led to a within-item, within-participant reversal of the ERP effect, so that the ERP correlate of conscious recollection was significantly reduced during recollection avoidance even for items that had previously been repeatedly recalled, and vice versa. Our results suggest that voluntary control of recollection is strong and flexible.

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Episodic Memory I - 17:30-19:30

(1047)**Lateralized Executive Functions in Memory Retrieval** - *Mónika ALBU, Mihály RACSMANY*

Our study was designed in a way to contrast hypothesis of two dominant theory of PFC' role in retrieval processes. The so-called "systematic – heuristic" hypothesis states that left PFC is more involved in systematic retrieval, while right PFC more active in heuristic retrieval. The "production- monitoring" hypothesis proposes that left PFC is primary involved in semantically guided production of information, while right PFC is more involved in monitoring processes. Involving frontal and temporal lobe patients with left or right-sided lesions, we used ten different recall and recognition tasks loading differentially processes of production and monitoring, and also of analytical and heuristically processes. The results support the assumption that "production- monitoring" hypothesis is more appropriate in explaining the effect of frontal lobe lesion on memory performances, while the heuristic-systematic hypothesis is suited to explain the effect of temporal lobe lesions in episodic memory.

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Episodic Memory I - 17:30-19:30

(1048)**Two Separate Mechanisms Underlie Forgetting and Enhancement in the Context-Change Paradigm - an Analysis of Oscillatory Brain Activity** - *Bernhard PASTÖTTER, Simon HANSLMAYR, Karl-Heinz BÄUML*

If after study of a first list (List 1) and before study of a second list (List 2) subjects change their internal context, List-1 recall typically declines on a later test (forgetting) whereas List-2 recall inclines (enhancement). The two context effects are often explained in terms of a one-mechanism account, according to which forgetting and enhancement are caused by the same mechanism. An EEG experiment was conducted to correlate contextual memory effects as they are studied in the context-change paradigm with electrophysiological measurements of oscillatory brain activity. We found the forgetting to be accompanied by an increase of theta phase coupling between scalp electrodes and the enhancement to be accompanied by an increase in the alpha band power. The results point to separate physiological mechanisms underlying forgetting and enhancement in the context-change paradigm and thus challenge the standard view of the two effects of context changes.

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Episodic Memory I - 17:30-19:30

(1049)**Mapping Encoding and Retrieval of Melodic and Rhythmic Redundancies in Music Processing: an fMRI Study** - *Marta OLIVETTI BELARDINELLI, Davide NARDO, Ralf VEIT, Niels BIRBAUMER*

Previous behavioral research highlighted the important role musical redundancy plays in anchoring recognition memory: Then such redundancy has been studied with distinct reference to its melodic and rhythmic components respectively. Aim of this study is to investigate the neural correlates of encoding and retrieval of stimuli characterized by a different content of melodic and rhythmic redundancies. 20 healthy right-handed non-musicians were scanned while performing two tasks: Intentional Encoding, where they had to learn a study list of 30 short musical excerpts, and Recognition, where they were administered a test list of 48 stimuli (30 old, 18 new), and had to press a different button according to Tulving's paradigm, distinguishing between Remember and Know responses. Results have shown that encoding recruits different neural districts for melodic (superior temporal, temporal polar, inferior frontal regions bilaterally) and rhythmic redundancies (precunei, posterior cingulate, angular gyri bilaterally, right superior frontal cortex). As regard recognition, the two kinds of redundancy rely on a partially overlapping network (bilateral posterior superior temporal, inferior middle frontal, precentral regions) plus a series of specific areas (melodic: left fusiform, bilateral angular gyri. Rhythmic: left dorsal/medial prefrontal, right superior parietal gyri).

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Implicit Learning I - 17:30-19:30

(1050)**Effects of Divided Attention on Implicit Sequence Learning** - *Michal WIERZCHON, Vinciane GAILLLARD, Dariusz ASANOWICZ*

It is typically argued that implicit sequence learning require minimal attentional resources. However, recent data suggest that dividing attention during learning with a tone-counting task impairs sequence learning. The studies presented here are aimed at further exploring the role of attention in sequence learning, by using a more demanding secondary task. Two groups of participants performed a serial reaction time task (SRT), either with a secondary task (random number generation or tone-counting), or under full attention condition (process dissotiation procedure). After the learning phase, participants generated either regular (inclusion condition) or irregular (exclusion condition) sequences. Preliminary data indicate that participants showed sensitivity to the sequential regularities in both groups. However, the experimental group performance was impaired by the secondary RNG task, with overall slower reaction times and a smaller transfer effect. Generation results are inconclusive. Conclusions on attentional requirements of implicit learning process are discussed.

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Implicit Learning I - 17:30-19:30

(1051)**Artificial Grammar Learning: Influence of Number of Exemplars and Exemplar Prototypicality** - *Jarry, T. PORSIUS, Fenna, H. POLETIEK*

The number of exemplars presented during training in an artificial grammar learning (AGL) task has been shown to affect the basis for subsequent grammaticality judgments. Specifically, with few exemplars, participants rely on fragment knowledge whereas with many exemplars, they rely on grammaticality (Meulemans & van der Linden, 1997). This suggests that the amount of information about a grammar provided at training, affects how the exemplar information is processed. However, we propose that the amount of information displayed in a sample not only depends on its size, but also on the prototypicality of the exemplars. In this study, number of exemplars and exemplar prototypicality are manipulated independently to uncover the specific influence of both factors on performance in AGL. We define exemplar prototypicality by its probability to be produced by the underlying grammar. The results will be discussed in terms of the importance of sample information in AGL.

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Implicit Learning I - 17:30-19:30

(1052)**No Role for Perceptual Fluency in the Implicit Learning of Artificial Grammars.** - *Ryan SCOTT, Zoltan DIENES*

A perceptual clarification task was used to examine the relationship between perceptual processing fluency, familiarity, and grammaticality judgments in artificial grammar learning (AGL). Four experiments examined the effects of naturally occurring differences and manipulated differences in fluency, where decisions were based on a brief exposure to test strings (during the clarification task only) or normal exposure. When fluency was manipulated, faster clarifying strings were rated as more familiar and were more often endorsed as grammatical, re-creating Kinder et al's (2003) finding, but only when test string exposure was brief. When fluency was not manipulated, it was only weakly related to familiarity and grammaticality judgments, and unrelated to grammaticality. Contrary to Buchner (1994), when the complexity of grammatical and ungrammatical strings was counterbalanced, they did not differ in perceptual fluency. Results indicate that familiarity not derived from perceptual processing fluency is the primary source of accuracy in AGL.

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Implicit Learning I - 17:30-19:30

(1053)**Implicit Learning – the Role of Motivation and Cognitive Styles** - *Agnieszka POPLAWSKA*

The aim of the study was to assess the role of motivation and cognitive style (global vs. analytic) in implicit learning process measured by the artificial grammar learning task. The previous studies did not take into account the necessity of the motivation and the role of cognitive style in this paradigm. The Navon test defined the cognitive style of participants. The motivation was manipulated by an instruction which suggested that results of the experiment are connected with the level of intelligence. The results indicate that motivation has influence on implicit learning process, especially in interaction with cognitive style. The global cognitive style is more effective in condition without motivation, only in experimental group. The analytic cognitive style is more effective in the same condition but in control group. The result are differ in condition with motivation – both styles are effective in experimental group and non effective in control group.

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Implicit Learning I - 17:30-19:30

(1054)**Implicit Learning of Uncorrelated Perceptual and Motor Sequences** - *Freja GHEYSEN, Wim GEVERS, Wim FIAS*

Sequencing of information is an important aspect of everyday life. Sensitivity to serial order can optimize human behavior because it allows predicting forthcoming events on the basis of the preceding events. Many of these sequential skills occur in absence of conscious knowledge about the underlying rules. A model task to study implicit sequence learning is the 'Serial Reaction Time Task' developed by Nissen & Bullemer (1987). This SRT task has been very useful in investigating implicit sequence learning in healthy and clinical populations but it fails to identify what exactly participants are learning. Usually stimulus sequence, response sequence, response-stimulus and stimulus-response associations are confounded. In the present study, we designed a variation of the original SRT task to address the question of whether perceptual and motor sequences can be acquired not confounded with each other. Pure perceptual and motor sequence learning were demonstrated.

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Language Comprehension I - 17:30-19:30

(1055)**Emotion Nouns Pulverize Spanish Relative Clause High-Attachment Preferences** - *Isabel FRAGA, Ana PIÑEIRO, Carlos ACUÑA, Jaime REDONDO*

The aim of this sentence completion study is to test if in relative clause disambiguation after complex NPs, the emotional valence of the nouns involved affects adjunction preferences in Spanish. With this aim, we manipulated the valence of the nouns (at the same time as maintaining arousal constant), which could be Pleasant (P), Unpleasant (U), or Neutral (Neu), in such a way that subjects were presented with five different experimental sentences: PU, UP, NeuP, NeuU, and NeuNeu. The dependent variable was the proportion of NP2 adjunctions. Results showed a shocking preference for the NP2 site in all the conditions with one or two emotion NPs, differently from the NeuNeu condition, where the typical Spanish high attachment preference was found. This seems to suggest massive interference of conspicuously non-syntactic forces in a putatively syntactic process.

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Language Comprehension I - 17:30-19:30

(1056)**The Role of Lexical, Morphological and Syntactic Cues on Grammatical Gender Assignment in Italian Speakers** - *Carmen BELACCHI, Roberto CUBELLI*

The present study investigated the influence of lexical (nouns), syntactic (determiners) and morphological (nominal endings) cues on gender assignment in Italian children (from 5- to 13-year-old) and adults. Participants were shown 64 photographs of animals named by the experimenter and were asked to classify them as male or female. The animals' names had grammatical gender depending on three different cues: lexical (nouns with referents having defined biological sex); morphological (nouns requiring the opaque determiner l', but ending with the masculine marker –o or the feminine–a); syntactic (nouns ending with the opaque marker –e, but requiring the masculine determiner il or the feminine la). Results showed that lexical cues were more effective than morphological cues and morphological cues more effective than syntactic cues. The same pattern of performance was found in pre-school children. The present findings suggest that grammatical gender is acquired as an intrinsic property of nouns.

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Language Comprehension I - 17:30-19:30

(1057)**Top-Down Effects on Auditory Detection** - *Carine SIGNORET, Barbara TILLMANN, Nicolas GRIMAULT, Samuel GARCIA, Fabien PERRIN*

The perception of our environment is facilitated by the experiences gained in this environment. Many studies showed that the sensory analysis of an event activates knowledge associated with this stimulation, thus allowing a facilitation of the process of the following stimulus. The influence of knowledge can also intervene during the perception of the stimuli. For example, the recognition of the letters composing of the words is faster than recognition of the letters composing of the non-word. This study proposed to determine if knowledge of the listener can have an early effect on the first levels of process, in particular on the detection of the sound events. During two behavioural experiments, words, pseudo-words and sounds were presented at various levels of intensity. The participants were asked to carry out a task of detection (to decide if one item were present or not) following or not by a forced choice task (to choose between 2 items which was presented in the task of detection). The results show that, on the same level of intensity, the words are more easily detected than the pseudowords, which themselves are more easily detected than the sounds. Moreover, the difference in performance of detection between the words and the pseudowords disappear when the participants were not asked to make the forced choice task. These results suggest that the linguistic knowledge of the listener facilitate the low levels of sensory process, like detection, and that lexical knowledge improve this detection when the listener must identify the stimulus.

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Language Comprehension I - 17:30-19:30

(1058)**Reaction to Positive and Negative Words: Attraction or Repulsion?** - *Giulia BARONI, Laura FREINA, Anna BORGHI, Roberto NICOLETTI*

According to the "embodied cognition" approach, understanding language implies creating a "simulation" of what is described. We investigated the influence of the simulation on motor responses and its dependence on the chosen answer modality. Chen and Bargh (1999) demonstrated that participants were faster in classifying negative words by pushing a long lever away than by pulling it towards themselves; the opposite was true for positive words. In our experiments, participants had to press two big buttons, one near their body and the other far away from it. In experiment 1 buttons were hit with the hand open. Results suggest that participants "simulate" reaching for something, therefore perform better in withdrawing from negative words and reaching for positive ones. In experiment 2 buttons were hit while holding a tennis ball. As expected, results are the opposite, suggesting that participants "simulate" pushing something away or drawing it towards them.

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Language Comprehension I - 17:30-19:30

(1059)**The Effect of Feedback Activation From Semantic Level on Lexical Decision Task in Korean Visual Word Recognition** - *You-An KWON, Kichun NAM*

The lexical decision task (LDT) commonly postulates the activation of semantic level. However, there are few studies for the feedback effect from semantic level. The purpose of the present study is to investigate whether the feedback effect from semantic level is facilitatory or inhibitory in Korean LDT. In Experiment 1, we manipulated the number of phonological

syllable neighbors (PSN) and the number of semantic neighbors (SEN) orthogonally while orthographic syllable neighbor (OSN) is dense. In the results, the significant facilitatory effect was shown in words with many SEN. In Experiment 2, we examined same conditions as Experiment 1 but OSN was sparse. Although the similar lexical decision latency pattern was shown, there was no statistical significance. These results can be explained by the feedback activation from semantic level. If a target has many SENs and many PSNs, it receives more feedback activation from semantic level than a target with few SENs and PSNs.

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Language Comprehension I - 17:30-19:30

(1060)**The Effect of the Type of Relativiser on Attachment Preferences** - *Claire DELLE LUCHE, Roger, P. G. VAN GOMPEL, Frédérique GAYRAUD, Bruno MARTINIE*

Studies on anaphor processing have demonstrated that pronouns are easier to process when their antecedent is accessible, whereas names are easier when their antecedent is less accessible. We argue that relativisers, like names or pronouns, can be considered anaphors and that their form indicates the accessibility of their antecedent. We tested this in two experiments, a questionnaire study (Experiment 1) and a self-paced reading experiment (Experiment 2). We compared sentences in French containing a relative clause that could be attached to one of two possible antecedents. We predicted that qui has a stronger preference to attach to the first antecedent than lequel, because qui signals that the antecedent is more accessible than lequel does. Experiment 1 showed that the preference for the first antecedent was stronger for qui than lequel. Experiment 2 confirmed those results with reading times measures. Relativisers are thus used as accessibility markers.

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Long-Term Memory - 17:30-19:30

(1061)**The Respective Roles of Feature Overlap and Association Strength in Semantic Priming in Young Adults** - *Isabelle BONNOTTE, Séverine CASALIS*

Semantic priming was analyzed in young adults with a visual lexical-decision task at different SOAs to examine its time course and to determine if automatic priming is due to feature overlap or association strength. Manipulating both pure semantic relatedness (categorical vs. functional) and association strength (strong vs. weak) permitted to disentangle their respective influence. Related, unrelated, and neutral primes preceded targets. At the 100-ms SOA, semantic priming was shown for category-related words, whatever their association strength, and without any evidence for an associative boost, whereas no priming effects were displayed on function-related words. The time course of semantic priming was fast and some results shown at the 100-ms SOA were not exhibited at the 200-ms SOA. These results accredited the hypothesis that a pure semantic priming effect in automatic priming could occur without association and agreed with Lucas (2000), but not with Hutchison (2003).

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Long-Term Memory - 17:30-19:30

(1062)**Opposite Developmental Trends for False Recognition of Basic and Superordinate Names** - *Paula CARNEIRO, Pedro ALBUQUERQUE, Angel FERNANDEZ*

The DRM paradigm is an efficient procedure to study false memories in laboratory, consisting in the presentation of lists of words highly associated to nonpresented converging words. Although the DRM paradigm is originally applied with associative lists, there have been several studies that showed similar effects with the application of categorized lists. The present study investigated the developmental trend of false memories for basic and superordinate names using the DRM procedure with categorized lists. Children of two age groups (3-5 year-olds and 10-12 year-olds) were tested in a recognition task for nonpresented dominant exemplars (basic level) and nonpresented category names (superordinate level). False recognition for basic and superordinate names showed opposite developmental trends. False recognition increased for critical-basic items and decreased for critical-superordinate items with age. These opposing results are mainly explained by age differences in conceptual knowledge and monitoring processes.

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Long-Term Memory - 17:30-19:30

(1063)**Differences Between 'Monitoring Not' and 'Not Monitoring' in Automatic Memory for Context** - *Yaakov HOFFMAN, Joseph TZELGOV*

Automatic memory (AA) refers to memory which was neither monitored at encoding nor retrieval. Direct measurement of AA memory is examined with a recognition context paradigm, where larger grey perceptually non-salient words appear behind smaller black salient words. Context was manipulated by instructions telling participants to either monitor the grey (grey=target--black=context) or black word (black=target--grey=context). Significant AA memory was obtained for both contexts, yet the pattern of results differed. Shorter-lists, deeper-encoding and full-attention, enhanced memory for non-salient context, yet diminished AA memory for salient context. Longer-list, shallower-encoding and divided-attention, manipulations which weakened both target and AA memory for non-salient context, enhanced AA memory for salient context. Non-salient context is neither formally nor informally triggered by task requirement and is thus not monitored. However, salient context interferes with target monitoring and has to be intentionally ignored, i.e., monitored not. Implications of these results are addressed.

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Long-Term Memory - 17:30-19:30

(1064)**Automatic Encoding of Personal Significance by the Human Brain : an ERP Study With Ringtones** - *Anja ROYE, Thomas JACOBSEN, Erich SCHRÖGER*

In this two-deviant passive oddball study, we addressed the question whether personal significance of a sound, namely of one's own ringtone, is extracted automatically and to what extent the processing is qualitatively and chronometrically different compared to a non-significant sound. Analysis of event-related potentials (ERPs) revealed additionally to the usual Mismatch Negativity (MMN) and P3a component, elicited by deviants in contrast to standard stimuli, a posterior ERP directly following MMN for the personally significant deviant only. This specific effect of personal significance started around 200 ms after sound onset and involved neural generators that differed from the mere deviance detection mechanism. Enhancement of P3a to the personally significant deviant followed by a widely distributed deflection for this deviant only, suggests that the own ringtone was more powerful to attract attention involuntarily and that this stimulus might have evoked further analysis involving evaluation of relevance or reorienting to the primary task.

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Long-Term Memory - 17:30-19:30

(1065)**I Know the Theme, So I Don't Say It': the Role of Identifiability on False Recall** - *Paula CARNEIRO, Ana Rita DIAS, Angel FERNANDEZ*

Research with the DRM paradigm has shown that when lists of associates are presented omitting its converging word, subjects tend to recall that converging word as having been presented. One major explanation for this effect comes from thematic consistency theories, which attribute the false recall to the extraction of the theme of the lists and its encoding into memory. According to this view, lists with more easily identifiable theme words should produce more false recall. We investigated this prediction in two experiments. In the first experiment, subjects were asked to find the theme for each of 40 associative lists. In a second experiment, false memory for high- and low-identifiable theme words was analysed in a recall task. Contrary to the initial expectation, lists with more identifiable theme words produced less false recall. These results emphasise the power of the editing or monitoring processes in the suppression of false recall.

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Memory I - 17:30-19:30

(1066)**Inhibitory Dynamics in Part-List Cuing** - *Sergio IGLESIAS-PARRO, Almudena ORTEGA, Ana ARIAS ORDUÑA*

The aim of this work is to study the inhibitory nature of the detrimental effects of part-list cuing. The inter-item similarity is manipulated in two experiments using the part-list cuing paradigm. The results obtained in Experiment 1 show that the detrimental effect of cue presentation is not observed when the target-competitor similarity in part-list cuing is increased. In Experiment 2, although a detrimental effect is observed when part list cues are given, the manipulation of the competitor-competitor similarity does not affect differentially the percentage of the observed recall. These results cast doubts on an exclusively inhibitory explanation of the part list cuing effect.

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Memory I - 17:30-19:30

(1067)**Spontaneous Retrieval Vs. Monitoring: Differences Between Prospective Memory and Sustained Attention.** - *Valeria NATALI, Serena MASTROBERARDINO, Francesco S. MARUCCI*

Aim of this study was to examine whether the retrieval processes underlying event-based prospective memory (PM) can be distinguished from those underlying sustained attention (SA). Participants performed a categorization task (ongoing task, OT), in which they were required to push the space bar whenever a specific target stimulus appeared on the computer screen (PM task). In addition, participants performed a SA task (Continuous Performance Task, CPT). One-way ANOVA on reaction time (RT) showed a main effect for type of task. In fact, higher RTs were found in PM task compared to OT, and in OT compared to CPT. These results support the hypothesis that performing a PM task is different from performing a SA task. This difference can be attributed to differences in retrieval mode. In fact, while SA task required continuous monitoring for the target, PM task required the spontaneous retrieval of the target-action association.

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Memory I - 17:30-19:30

(1068)**Test-Induced Activation and False Recognition Under Speeded Response Conditions** - *Elena S. ZABALLOS, Maria A. ALONSO, Angel FERNANDEZ, Emiliano DIEZ*

Two DRM experiments were conducted with the aim of studying the effect of test-based activation on the false recognition. In both experiments, participants studied lists of words strongly associated to unstudied critical words and were subsequently tested in a timed recognition task. At the time of the test, the critical words were either preceded or not preceded by a set of previously studied associates. In Experiment 1 the preceding associates had a strong backward association to the critical words, and in Experiment 2 the backward association of the preceding associates was weak. The results of both experiments showed that prior processing of associates during the test increased false recognition of the critical words, and that the increment was significant with both strongly and weakly related associates. Furthermore, this precedence effect was more likely when participants were required to produce fast recognition responses. The results are interpreted within the activation/monitoring framework.

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Memory I - 17:30-19:30

(1069)**Retrieval-Induced Forgetting and Unwanted Memory Intrusions** - *David GROOME, Panayoula PIPILIS*

Retrieval-Induced Forgetting and Unwanted Memory Intrusions Goal: This study investigated the hypothesis that unwanted memory intrusions would be associated with a low level of retrieval-induced forgetting (RIF). Method: 59 Greek male military rescue workers who had experienced traumatic events carried out the RIF procedure, the White Bear Thought Intrusion Scale, and the State-Trait Anxiety Inventory. A control group comprising 47 male Greek civilians carried out the same tests. All test materials were translated into Greek for the purpose of this study. Results: A significant inverse correlation was found between RIF and intrusive thoughts for the military group, but not for the civilian group. State Anxiety was found to be positively correlated with RIF for the civilian group only. Conclusions: The inhibitory process underlying RIF may assist in the suppression of intrusive thoughts. These findings have implications for theories of PTSD and for models of cognitive inhibition. Keywords: Retrieval-induced forgetting Intrusive memories PTSD

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Memory I - 17:30-19:30

(1070)**Absence of Trait Anxiety Effects on False Recognition** - *María Soledad BEATO, Emiliano DIEZ, Margarita GOZALO, Francisco José RODRIGUEZ*

The main goal of this study was to analyze the influence of individual differences in trait anxiety on false memories. In a previous study, studying list items under imagery instructions led to a reduction in the levels of false recall, an indication that imagery processing tends to increase item-specific information at encoding and to facilitate effective source monitoring at retrieval. But no trait anxiety effects were found. In the present experiment, we analysed the interaction between the participant's level of trait anxiety, as measured by the State-Trait Anxiety Inventory (STAI), and the type of study instructions (shallow vs imagery processing) in a DRM recognition memory test. In contrast to the recall findings reported above, the results showed that imagery instructions increased the level of false recognition. And, again, individual differences related to trait anxiety failed to affect levels of false recognition.

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Memory I - 17:30-19:30

(1071)**Production of False Memories in the DRM Paradigm Using Lists With Two Critical Items** - *Helena OLIVEIRA, Pedro ALBUQUERQUE, Armando MACHADO*

The production of false memories has been studied through a procedure that consists in presenting lists of words followed by recall and recognition tests. Each list of words is associated with a critical item, which is not part of the list. A false memory occurs when the subject recalls or recognizes the critical item as a list member (Roediger & McDermott, 1995). College students (n=209) were exposed to lists of words associated with two critical items (e.g. the first six words were associated with "sweet", and the other six with "slow") The aim was to determine the limits of the false memory effect considering that in this task each list contained two themes or gists. Results showed that the amount of recall and recognition of the words from the lists was not significantly changed, but the amount of false recall of the critical item was significantly reduced.

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Memory I - 17:30-19:30

(1072)**Personality Variables and Prospective Memory: the Role of Field Dependence on Performance** - *Vincenzo Paolo SENESE, Giovanna NIGRO, Pier Carla CICOGNA, Marina COSENZA, Ida SERGI*

Prospective Memory (PM) refers to remembering to perform an intended action in the future. To date, in PM research very few studies have empirically explored the link between personality and remembering to do things. The aim of this study was to investigate whether and, if so, to what extent field-dependence affects PM performance in event-based tasks. Fifty-two participants, 26 men and 26 women, completed the Italian version of the Group Embedded Figures Test (GEFT). All participants were given an event-based PM task, which required pressing a designated key whenever a monosyllabic target word, embedded in other polysyllabic words ("guest-word"), appeared. Results showed that field-dependence affects PM performance. More specifically, field-independent individuals performed better than the field-dependent ones. Furthermore, people performed better when the cue was more distinctive or "focal", that is when the target word was placed at the beginning and/or at the end of the guest-word.

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Memory I - 17:30-19:30

(1073)**Function and Mechanism of Source Monitoring** - *Malgorzata OCZAK*

A central claim of the source – monitoring model is that people do not directly retrieve source memory like a tag, rather, activated characteristics of memory are attributed to different sources through evaluative or decision processes. Purpose of the study was to show that although in most cases sources are attributed there are exceptional situations when source is retrieved with information as a tag. Two exceptional conditions studied were the cases when information is ambiguous and needs to be validated by the source and when the source is the main object of attention more important than information delivered. Two different indicators were used to show that attributions are not engaged in this cases. Combination of this situations and indicators gave four experimental plans. The data partly confirmed hypothesis and suggests that memory monitoring is based on two different processes (attribution and retrieval) which can sometimes act separately.

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Memory I - 17:30-19:30

(1074)**When Two is Less Than One: the Role of Others in Prospective Remembering** - *Francesco MARCATTO, Donatella FERRANTE, Lara PELIZZON, Maria BRANDIMONTE*

The aim of the present work was to investigate the influence of social interaction on prospective memory. In three experiments, we manipulated the kind of social interaction (pure presence of others vs. shared responsibility), the length of interaction (no interaction/only at encoding/only at retrieval/full interaction), the kind of prospective task (activity-based vs. event-based) and the length of the ongoing task (random vs. ability determined). Results showed effects of social facilitation and inhibition in the "Pure presence of others" condition and effects of motivation reduction in the shared responsibility conditions. Contrary to common beliefs, we found a decrement in the likelihood of executing the prospective task in the shared responsibility conditions compared to the no-interaction condition. The finding that a couple is less likely to execute a task than a single individual may have important theoretical and practical implications.

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Memory I - 17:30-19:30

(1075)**Gaze Direction and Awareness States in Recognition Memory for Faces** - *Serge BREDART, Noémy DAURY*

Previous research has demonstrated that faces displaying direct gaze elicit more hits than faces displaying averted gaze in an episodic recognition task. The aim of the present study was to evaluate whether the state of awareness that accompanied recognition was different for faces with eye gaze directed towards the observer as compared with faces looking elsewhere. We examined whether the subjective memory experience differed for these two kinds of faces by using the "Remember-Know-Guess" paradigm. In the present study, participants performed a gender classification task at the encoding phase. To prevent gaze as a retrieval cue, faces were displayed with closed eyes in the recognition task during which participants judged whether a face had been seen previously, and reported the state of awareness associated with recognition. Results indicated that the rates of Remember responses were significantly higher for faces that showed direct gaze at encoding than for faces with averted gaze. However, the rates of Know responses and Guess responses were not significantly different between both kinds of faces. The results support the hypothesis that eye contact elicits deep processing of faces.

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(1075b)**Glucose Tolerance and Cognitive Performance: The impact of individual differences in the glucose facilitation effect.** - *Cheryl. A. GRAHAM, Leigh. M. RIBY*

The beneficial effects of glucose ingestion on cognitive performance are widely reported. The current study sought to expand this research by additionally examining individual differences in glucose tolerance and the resultant impact on cognitive performance. Healthy adults (n=40, age range 18-65) attended four testing sessions. The first measured glucose tolerance by administering 75g glucose in a drink and monitoring regulation over two hours, extracting blood glucose readings every thirty minutes. The following three sessions counterbalanced the administering of 25g glucose, 50g of glucose and a sweetness matched placebo drink. The participants thereafter completed a battery of cognitive tasks, focussing on aspects of attention and memory using Stroop and California Verbal Learning Task (CVLT) paradigms. An assessment was made of blood glucose levels throughout the testing session. As anticipated, glucose was found to impact on cognitive performance and the ability to regulate said glucose was a determining factor in the observed effects.

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Motor Control - 17:30-19:30

(1076)**Simultaneous Performing Different In-Action Intentions** - *Blandyna SKALSKA*

We investigated how the selection of information-processing strategies is organized. Two different ways were contrasted in which strategies might be controlled: a hemisphere-specific mechanism or a hemisphere-independent mechanism. We were interested in information-processing strategies which can simultaneously be applied in a sensorimotor task. Previous observations suggest that the size of the noise-compatibility effect (flanker effect) is influenced by observers' expectancies for compatible or incompatible strings of letters and observers can match their strategies independently for the left and right hemifields (as indicated by changes in the size of the noise-compatibility effect) (Corballis, Gratton, 2003, Biol. Psych.). We successfully replicated the previous results suggesting that the processing strategy can be developed independently in the right and left side of visual field (hemisphere-specific mechanism). Additionally, we found that similar strategic control can be developed independently for the upper and lower location (hemispheric independent mechanism). This effect was even more pronounced if the flankers preceded the target by 300 ms (a priming paradigm). These data support the Gratton & Corballis's conclusion that there are at least two supervisory systems which can act simultaneously. It is unlikely that this independency of strategies is related to hemispheres division.

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Motor Control - 17:30-19:30

(1077)**Internal Models in Tool Use** - *Cristina MASSEN, Arvid HERWIG*

In tool use, the tool-specific mapping of bodily movements into associated tool effects must be taken into account. However, this mapping may depend on the part of the tool that is operated and the effector used (e.g. two rudders operated by the left and right arm moving in opposite directions in order to generate the same boat movement). We investigated whether participants have a higher-order representation of a tool, with associated representations of effector-specific mappings at a subordinate level. Participants touched target locations with a two-jointed lever, using either the left or the right hand. In the first condition, the joint of the lever was constant and switching between hands was associated with switching the target-to-movement-mapping. In the second condition, switching between hands was associated with switching the joint, but the target-to-movement-mapping remained constant. Results indicate superior performance of participants in the condition with constant target-to-movement-mapping.

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Motor Control - 17:30-19:30

(1078)**Cue Validitity Effects in Response Preparation: a Pupillometric Study.** - *Sofie MORESI, Jos J. ADAM, Jons RIJCKEN, Pascal W.M. VAN GERVEN*

This study examined the effects of cue validity and cue difficulty on response preparation to provide a test of the Grouping Model (Adam et al 2003a, 2005). We used the pupillary response to index the cognitive processing load during and after the

preparatory interval (2 s). Twenty-two participants performed the finger-cuing tasks with valid (75%) and invalid (25%) cues. Results showed longer reaction times, more errors, and larger pupil dilations for invalid than valid cues. During the preparation interval, pupil dilation varied systematically with cue difficulty, with easy cues (specifying fingers on one hand) showing less pupil dilation than difficult cues (specifying fingers on two hands). After the preparation interval, this pattern of differential pupil dilation as a function of cue difficulty reversed for invalid cues, suggesting that cues which incorrectly specified fingers on one hand required more effortful reprogramming operations than cues which incorrectly specified fingers on two hands. These outcomes were consistent with predictions derived from the Grouping Model. Finally, we observed two distinct pupil dilation strategies, which provide a new, interesting path to interpret pupillary data in the future.

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Motor Control - 17:30-19:30

(1079)**Pressing a Key in Typewriting - Activation of Movement Direction and Movement Endpoint** - *Martina RIEGER*

In persons skilled in using the 10-finger system for typing fingers are automatically activated when they see a letter (Rieger, 2004). Here it was investigated whether this activation includes representations of movement direction and movement end-position, and whether a special representation of letters from the home row of the keyboard exists. In several experiments participants reacted to the colour of coloured letters. In different conditions they had to a) press a key, b) move down and press a key, or c) move up and press a key. Reactions occurred either on a computer keyboard or on an external response device. The pattern of congruency effects indicated that movement direction and movement end-position are automatically activated when participants see a letter. There was also evidence for a special representation of letters from the home row. Multiple representations seem to be contributing to skilled performance.

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Motor Control - 17:30-19:30

(1080)**On the Acquisition of Transferable and Non-Transferable Components of Sequencing Skill** - *Michael P. BERNER, Joachim HOFFMANN*

In a serial reaction time task, participants practiced a repeating sequence with one hand. In interleaved blocks they responded to random sequences with the other hand (Experiment 1). Vertically arranged stimulus locations and response keys ensured optimal conditions for intermanual transfer (same sequence of stimuli, keys, and homologous fingers). Considerable intermanual transfer reflected an effector-independent component of sequence knowledge, which increased significantly across five sessions. A smaller, but significant, non-transferable, hand-specific component was evident in session 1 and remained constant across sessions. In Experiment 2, which comprised only one session, the interrupted practice schedule as implemented in Experiment 1 was contrasted with uninterrupted practice (no interleaved random blocks). Uninterrupted practice improved effector-independent sequence learning compared to interrupted practice, whereas effector-specific sequence learning was unaffected by this between-subjects manipulation. These findings suggest separate mechanisms for learning effector-independent regularities (e.g., of stimuli, keys etc.) and for effector-specific acquisition of optimized response coarticulation.

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Motor Control - 17:30-19:30

(1081)**Strategies in Imitation of Action in Predictable and Unpredictable Switches** - *Alessia TESSARI, Miriam GADE, Raffaella RUMIATI*

In the context of a dual route model for action imitation, we investigated the strategic selection of imitation routes in meaningful and meaningless actions. Four experiments were carried out: predictable switches between meaningful and meaningless actions and pseudorandom unpredictable switches between those actions. Two experiments used cues, whereas two did not contain cues. A significant switch cost emerged only in the predictable switch condition without cues, that is when subjects had to observe the action to decide which route to choose and/or base their selection of routes on working memory; in the remaining experiments we found no costs. This suggests that when subjects were presented with cued switches the selection of the appropriate route can be prepared. With regard to pseudorandom, uncued sequences, subjects may decide to rely only on the direct route to decrease cognitive effort. These results confirm that we strategically select the most suitable route for action imitation.

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Motor Control - 17:30-19:30

(1082)**The Internal Structure of Stopping as Revealed by a Sensory Detection Task** - *Eamonn WALSH, Patrick HAGGARD*

An important aspect of everyday behaviour is the ability to inhibit a prepared action. In Experiment 1, participants completed a Go/NoGo task with or without prior instruction as to whether or not they would move. We found that detection of a weak shock on move trials was lower than on non-move trials confirming previous reports of sensory suppression of movement (Williams, Shenasa & Chapman, 1999). Furthermore, we found that there was no difference between conditions in detection for move trials. However, detection rates for non-move trials were significantly lower in the Go/NoGo compared to when a prior instruction was given. In Experiment 2, detection rates improved as the interval between the NoGo signal and the shock increased from 0 up to 200ms. The recovery from sensory suppression offers a new way of measuring stopping. Our results suggest that inhibition processes responsible for stopping a prepared movement last for approximately 200ms.

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Motor Control - 17:30-19:30

(1083)**Automatic and Intentional Processes in the Inverted Simon Effect** - *Marko PAELECKE, Wilfried KUNDE*

The "Simon effect" denotes the often replicated finding that the performance in choice reaction tasks depends on task irrelevant stimulus features matching response features. By introducing response-incongruent response effects, Hommel (1993, Psychol Res, 55, 270–279) demonstrated that the direction of the Simon effect can be inverted. In the present study, we examined the contribution of several dissociated processes to this inversion of the Simon effect. Participants made two choice reactions in response to stimuli presented in rapid succession at variable stimulus onset asynchronies (SOA). In task 2 we varied the compatibility between the stimuli and the intended (to-be produced) action effects as well as the required transformation of action effects into the responses. We found an inverted Simon effect only with a long SOA, but an influence of the effect-response transformation with all SOA levels. These results suggest that at least two processes underly the inversion of the Simon effect.

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Motor Control - 17:30-19:30

(1084)**Effect of Number of Alternatives on the Central Motor Command: Comparison Between a Simulation Study and an ERP Study** - *Chloé MEYNIER, Karen DAVRANCHE, Clémence ROGER, Boris BURLE, Franck VIDAL, Thierry HASBROUCQ*

Inhibition, a psychological concept, has been introduced in Cognitive Neuroscience in attempts to account for reaction time (RT) effects. In between-hand 2 choice RT tasks, neurophysiological studies suggest that during the RT interval, the motor cortex involved in the required response is activated, while the motor cortex involved in the non-required response is inhibited. This cortical activation patterns implemented with more complex tasks remained, however, unknown. For this purpose, we intended to determinate the dynamics of the cortical inhibition when number of response alternatives is increase. In order to formulate precise predictions, we first implemented a

modified version of a simple feed-forward model (Heuer, 1987) that simulated the dynamics of inhibition. Then, we tested these predictions in an electroencephalographic (EEG) experiment. Both activation and inhibition activities are affected by the increase of response alternatives and cortical inhibition seems to be divided among the non-required responses.

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Numerical Cognition I - 17:30-19:30

(1085)**Adaptation From Symbolic Numerals in the Parietal Cortex** - *Karolien NOTEBAERT, Bert REYNVOET*

It is a well-established finding that the parietal cortex is involved in number processing. However, how magnitude is actually encoded at a neural level still remains an unclarified issue and forms the focus of the present study. The detection of number sensitive neurons in animals (Nieder & Miller, 2004) and the observation of fMRI adaptation to sets of items with a variable number in the human parietal cortex (Piazza et al., 2004) led to important insights in the magnitude coding. In the present study, we investigated whether similar effects can be found when symbolic stimuli (i.e. digits and number words) are presented to the subjects. In an event-related fMRI study, a digit and a number word were presented sequentially and the numerical distance between both was manipulated. Subjects were instructed to respond as fast as possible when the second stimulus matched a predefined magnitude (number detection task). We found that in both hemispheres, the inferior parietal region responded selectively to processing quantities, independently of the notation of the quantity. ROI-analyses showed that repetition of the same quantity (e.g. NINE – 9) resulted in reduced activation in the inferior parietal cortex, compared to changes in quantity. When the quantity was changed, recovery of the BOLD signal was observed. However the recovery of the BOLD signal was observed to the same extent for the condition where two numerically close numbers were shown (e.g. '1' – 'TWO') and two numerically far numbers were shown (e.g. 'EIGHT' – '1'). The results will be presented in the context of recent adaptation studies.

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Numerical Cognition I - 17:30-19:30

(1086)**The Role of Phonology in the Unit-Decade Compatibility Effect** - *Pedro MACIZO, Amparo HERRERA*

Participants deciding the larger of a pair of two-digit Arabic numbers respond faster when unit and decade lead to the same response (75-24) than when they lead to different response (75-27). However, the unit-decade compatibility effect (UDCE) depends on the number format since it disappears when English number words are used (Nuerk, Weger, & Willmes, 2005). We investigated whether the absence of UDCE with number words depends on phonology. Experiments 1-2 (Arabic and number words) replicated in Spanish the pattern of UDCEs observed in English. To explore the role of phonology in perceiving numbers, in Experiment 3-4 participants named filler numbers randomly embedded in the comparison trial list. To explore the role of phonology in producing numbers, in Experiments 5-6 participants named the larger of the two compared numbers. The pattern of UDCEs was preserved across phonological manipulations suggesting that phonology is not the only factor determining differences in UDCE.

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Numerical Cognition I - 17:30-19:30

(1087)**Complex Mental Arithmetics: the Contribution of the Number Sense** - *Alain CONTENT, Julie NYS , Alain CONTENT*

How do we solve arithmetic problems, such as "43+78" ? Although different strategies are available, and different people use different strategies for different problems, little is known about the parameters influencing strategy selection. Adults were asked to solve complex additions by saying aloud each result (intermediate and final) they computed. We manipulated the numerical distance between the addends, and the spatial position of the largest addend (e.g., 43+78 vs. 78+43) to examine the influence of the semantic characteristics of the problems. The mathematical level was assessed with the WAIS arithmetic subtest. Our results reveal that the participants with a fair level on the WAIS subtest use the magnitude of the addends to select a strategy. They demonstrate a preference to take the largest addend as a starting point for their calculations. In contrast, the magnitude of the addends had less impact on the strategy selection for the low-level group.

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Numerical Cognition I - 17:30-19:30

(1088)**Brain Potentials to Arithmetical Calculation: the Problem Size Effect** - *María Isabel NÚÑEZ-PEÑA,*

This study explored the problem size effect on arithmetical calculation using ERPs. Twenty-two participants were tested on a classic equality verification task (e.g., 3 + 4 = 7, True/False?). The problem size was manipulated by presenting small (both operands smaller than 5), medium (both operands between 6 and 9), and large (one operand between 16-19 and other between 26-29) problems. Behavioral results showed the well-known problem size effect: reaction time was longer and more errors were made when the problem size increased. As for the ERP data, small problems elicited a late positive peak around 400 ms, whereas medium and large problems elicited a positive slow wave. The amplitude of the positive slow wave was modulated by size of the problem: the more the size the larger the amplitude. As previous studies have reported that a positive slow wave is related with calculation, the present results suggest that no calculation but direct retrieval from memory may be involved in small problems and calculation strategies may be involved in medium and large problems.

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Numerical Cognition I - 17:30-19:30

(1089)**Mapping Numbers onto Space: Further Support for the Cognitive Illusion Hypothesis** - *Gelsomina PERRONE, Maria-Dolores DE HEVIA, Luisa GIRELLI*

Numbers and space are related to one another in ways suggestive for a mental number line (Dehaene, 1992). Evidence for a spatially oriented number representation comes from the SNARC effect. Further evidence from bisection and reproduction tasks with numerical flankers suggests that numbers impact visuo-spatial representations by inducing a 'cognitive illusion' of length; according to it, processing of large-magnitude numbers brings about an illusory expansion of space and processing of small-magnitude numbers brings about an illusory compression of space (de Hevia et al, 2006; 2007). The present study tests the 'cognitive illusion' hypothesis in three experiments exploiting a digitizing tablet to control for reproduction performance. Magnitude effects emerge not only in the reproduction of horizontal extensions but also in reproduction of circles enclosing irrelevant digits, suggesting that numbers are also mapped onto a non-linear space. Moreover, this effect is only marginally modulated by presenting numerical and spatial information sequentially.

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Numerical Cognition I - 17:30-19:30

(1090)**When 9 is Not on the Right: Implications From Number-Form Synaesthesia.** - *Limor GERTNER, Avishai HENIK, Roi COHEN-KADOSH*

Individuals with number-form synaesthesia experience numbers in spatially-defined locations. A similar association of numbers and space appears in the mental number line as indicated by the distance effect;reaction time decreases as the distance between compared numbers increases. Three number-form synaesthetes and 12 controls performed a number comparison task in which pairs of digits appeared horizontally or vertically. The synaesthete participants exhibited a sizeable distance effect only when presented numbers were congruent with their number-form. In contrast, the controls exhibited a distance effect regardless of the presentation type. Our findings suggest that: a) number-form synaesthesia impairs the ability to represent numbers in a flexible manner according to spatial characteristics of the task, b) number-form synaesthesia is a genuine experience, triggered involuntarily, and c) the widely accepted idea of the mental number line (i.e. an automatically activated visuo-spatial representation of numbers) needs to be amended.

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Numerical Cognition I - 17:30-19:30

(1091)**Interference Effects in the Number Matching Task: Where They Come From?** - *Jesus DAMAS-LOPEZ, Javier GARCIA-ORZA*

In the study of numerical processing, the mandatory character of arithmetic fact solutions retrieval has been proved using verification tasks, number matching tasks, tablerelated errors and auto-questionnaires. The present work particularly centres on the number matching task and the common assumption that it provide evidence of the obligatory retrieval of arithmetic facts. We claim that the interference effect found in matching tasks (2 3, 6 is rejected slower than 2 3, 7) is not due to the fact that 2 and 3 activate 6, but to the detection of a relationship -a correct multiplication- once the 6 is presented. Empirical data from two experiments using non-mandatory relationships between cues and probes [non-familiar series (e.g., cues: 10 17, probe: 24) and two-digit additions (e.g., cues: 11 27, probe: 38)] support this assumption.

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Perception And Action I - 17:30-19:30

(1092)**The Effect of Different Types of Transformations on Unimanual Circling Movements** - *Sandra DIETRICH, Martina RIEGER, Wolfgang PRINZ*

In order to investigate the effect of different transformations on coordination performance we compared two experiments with identical visual setup. Participants saw two dots circling next to each other on a screen. The right dot was controlled by the participants' movement and had to be coordinated with the left dot (target stimulus). Participants' movements were dissociated from their effects on the screen by means of transformed feedback. When the transformation was a phase shift (experiment 1) the results show that unimanual coordination occurs in reference to perceptual rather than motor space. When the transformation turned a symmetric movement into a parallel movement and vice versa (experiment 2) the results show neither an advantage for effect-based nor motor-related coordination in the transformed condition. Together, the results indicate that movements are coordinated with the environment in terms of their external effects. However, this coordination mode may break down with certain transformations.

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Perception And Action I - 17:30-19:30

(1093)**Time Perception and the Timing of the Heart Beat** - *Riek SOMSEN, Maurits VAN DER MOLEN*

Participants performed a time-perception task asking them to indicate, by a button-press response, whether the duration of a probe stimulus (either 2250, 3750, 5000, 6250 or 7750 ms) was equal or shorter/longer than the duration of a target stimulus (5000 ms) presented prior to the probe stimulus. Inter-beat-intervals were recorded during task performance. The performance results showed a U-shaped probe-target distance accuracy function with highest accuracies for the shortest and longest probes. The cardiac findings revealed heart rate slowing during probe processing followed by a recovery to baseline that is timed at stimulus offset for short probes (i.e., 2250 and 3750 ms) but, importantly, at the target offset time (around 5000 ms) for long probes (i.e., 6250 and 7750 ms). A similar patterns of results was obtained when participants were required to continuously pronounce ‘la, la, la..’ in order to prevent them from adopting a counting strategy for keeping track of time. The current findings provide support for the interaction between the parasympathetic nervous system and the frontostriatal circuits involved in time perception.

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Perception And Action I - 17:30-19:30

(1094)**Adapting Conflict by Morphing Features** - *Michiel SPAPE, Bernhard HOMMEL*

When people are required to respond with the right hand to a left-appearing stimulus, they are slower than when the location and response features are corresponding. Such effects, however, can drastically change and even reverse after non-corresponding trials, which is typically thought to be caused by adapting to conflict. To measure sequence of conflict, though, is to measure patterns of stimulus- and response repetition. According to the Theory of Event Coding (Hommel et al. 2001), performance is attenuated when repeating a stimulus but alternating a response, since the previously created binding overlaps with the newly required binding. To distinguish between these two confounded effects, we hypothesised that when a stimulus display is gradually changed between two trials, the alternated feature should look as if it were repeated. Thus, by employing concepts from object-based attention and multiple object tracking, we show that binding can account for sequential Simon-effects to a greater extent than conflict adaptation.

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Perception And Action I - 17:30-19:30

(1095)**The Effect of Tool Use on Body Schema: a Kinematic Study** - *Lucilla CARDINALI, Francesca FRASSINETTI, Claudio BROZZOLI, Alice ROY, Christian URQUIZAR, Alessandro FARNE*

The aim of this study was to investigate the effect of tool-use training on the Body Schema (BS) by using the kinematics of free-hand movements. To this purpose we asked 12 healthy subjects to perform 2 types of movements (grasping and pointing) directed toward 2 targets (an object and their own nose) both before and after a period during which they were trained in using a 40 cm long mechanic grab. Results showed that tool-use changed the kinematic pattern of free-hand movements: the acceleration, velocity and deceleration peaks were reduced in amplitude and occurred later. The effect was specific for the transport component, as no change was found in the grasping kinematics, and for the external object, as no change occurred for the nose-oriented actions. The finding that free-hand movements are updated after training suggests that the tool may be dynamically incorporated in the representation of BS

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Perception And Action I - 17:30-19:30

(1096)**How We See Depends on How We Move! Movement-Related Influences on Visual Search.** - *Agnieszka WYKOWSKA, Bernhard HOMMEL, Anna SCHUBÖ*

The human perceptual system needs to select relevant information from the abundance of input it receives, but little is known about how selection processes are controlled. Based on the assumption that perceptual and action systems are tightly coupled (Theory of Event Coding: Hommel, Müsseler, Aschersleben & Prinz, 2001), we hypothesized that preparing for a particular action might establish attentional biases towards perceptual dimensions that are likely to provide action-relevant information. We investigated how the intention to perform a particular action influences the detection of visual targets defined by action-related versus action-unrelated feature dimensions. Our results show that, in a visual search task, detection of targets defined on an action-relevant dimension (e.g. size targets when intending to grasp) was faster than the detection of targets defined on action-irrelevant dimensions. These effects were observed when feature-search was a more probable search strategy but not when detection was presumably based on saliency signals.

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Perception And Action I - 17:30-19:30

(1097)**Visual Perception of Handwriting and Pointing Movements: Influence of Motor Simulation ?** - *Christel BIDET-ILDEI, David MEARY, Jean-Pierre ORLIAGUET*

This experiment investigates the role of motor simulation in the visual perception of human movements. The stimuli consisted on handwriting movements (“e”) and on pointing movements. The movements presented different amplitudes and different durations, and their velocity profile respected (normal profile) or not (constant and inverse profile) the kinematics rules. Participants had to judge if the speed of movements was “too fast”, “too slow” or “neither too fast nor too slow”. The aim was to know if the visual preferences conformed to the motor rules

(Fitts'law for the pointing movements and the isochrony principle for handwriting movements) in particular when the movements could not be simulated (constant and inverse velocity). Results showed that the modification of the velocity profile has only an effect on perceptual judgements of handwriting movements. Therefore visual perception of human movements does not imply necessarily a motor simulation: it depends on the type of perceived movement.

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Reasoning - 17:30-19:30

(1098)**The Relevance of Irrelevance - the Truth About Truht Table Tasks** - *Aline SEVENANTS, Walter SCHROYENS, Kristien DIEUSSAERT, Walter SCHAEKEN, Géry D'YDEWALLE*

Throughout psychological reasoning literature devoted to the mental representation of conditionals, one can broadly discern between two types of truth-table-tasks: the possibilities-task and the truth-task. Generally, in a truth-table-task, participants are asked to evaluate four cases produced by permuting the truth values of the antecedent and the consequent. In the possibilities-task, they have to indicate whether a case is either possible or impossible according to a given rule. In the truth-task, participants have to evaluate whether the case makes the rule either true, false or is irrelevant with respect to the truth of the rule. Although both task-types have a long research tradition, the difference in number of answer alternatives (two vs. three) and directionality (from rule to instance vs. from instance to) previously has never been taken into account. In a series of experiments, a comparison is drawn between the results and answer patterns yielded by different truth-table-task formats.

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Reasoning - 17:30-19:30

(1099)**Can the Mental Model Theory Account for Reasoning About Truth Values?** - *Caroline GAUFFROY, Pierre BARROUILLET, Jean-François LECAS*

In the field of propositional reasoning, we can distinguish two different kinds of reasoning: reasoning about possibilities given the truth of a set of statements and reasoning about the truth values of a statement given some current states of affairs. Concerning conditional reasoning development, the age-related evolution from a conjunctive to a biconditional and then a conditional interpretation of the "if p then q" statement is achieved later in reasoning about truth values than in reasoning about possibilities (experiment 1). In the same way, the development of disjunctive reasoning from an exclusive to an inclusive interpretation is slower in reasoning about truth values than in reasoning about possibilities. Because only one explicit model is constructed to understand the logical connective "and", the developmental lag between the two kinds of reasoning disappears in conjunctive reasoning (experiment 2). We discuss how the mental model theory can account for these two kinds of reasoning.

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Reasoning - 17:30-19:30

(1100)**Motivational Approach to Asymmetry in Loss-Gain Perception** - *Simona SACCHI, Giuseppina CIOFFI*

The Value Curve and the Loss Aversion hypothesis (Khaneman & Tversky, 1979) predicted an asymmetry in perceiving losses and gains. On this topic, Liberman et al. (2005) showed that people judge gain as more positive than non-loss and loss as more negative than non-gain, although economically equivalent. The authors explained the results in terms of regulatory focus (prevention vs. promotion). In the present contribution we disentangle the regulatory focus effect from the framing one. In the studies, the motivational status (prevention vs. promotion), the frame (gain vs. loss) and the outcome valence (positive vs. negative) have been orthogonally manipulated. The three-way interaction between variables reveals that prevention-focused people perceive a non-loss as positive as a gain; on the other side, promotion-focused people judge a non-gain as negative as a loss. Implications for the analysis of economical and risk behavior are discussed.

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Reasoning - 17:30-19:30

(1101)**How Non-Experts Fail Where Experts Fail Not: Implications of Expertise for Resistance to Cognitive Rigidity** - *Tomasz KUBIK, Edward NOCKA*

Experts' resistance to cognitive rigidity is discussed with reference to task content. This criterion allows for discerning two aspects of the phenomenon of rigidity: inter-domain rigidity and intra-domain rigidity. In two experiments, Experts, Intermediates and Novices solved intra-domain tasks fostering mental set. Experts proved more resistant to intra-domain rigidity. In addition, they were faster and more accurate, thus replicating classic effects of expertise. The results regarding impact of anxiety on resistance to rigidity are unclear. Experiments suggest that, with reference to rigidity of experts, it is justifiable to distinguish between inter-domain rigidity and intra-domain rigidity.

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Reasoning - 17:30-19:30

(1102)**Effect of Contradictory Anecdotal Evidence on Belief Revision: the Role of Systemic Variability and Direct Experience** - *Christophe SCHMELTZER, Henry MARKOVITS*

The influence of systemic variability and direct experience of a "if A then B" conditional relation (ABcr) on belief revision was examined using a computerised task that consisted of pressing one of five boxes presented on the top row, resulting in one of the bottom boxes liting up. Conditions differed on levels of direct experience (five vs. fifteen trials) and apparatus configuration (completely uniform vs. one variable). In all conditions, pressing on the top middle box (A) systematically resulted in the bottom middle box (B) liting up. Participants were asked to rate their certainty about this ABcr. They were then told that someone had pressed A, but that B had not lit up, and were asked whether they found this anecdotal observation more credible than the ABcr. Results showed that whereas for the uniform apparatus the ABcr was most credible with increasing direct experience, the opposite was observed for its variable conterpart, providing insight into the complex factors involved in belief revision.

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Reasoning - 17:30-19:30

(1103)**Propositional Priming With Concessive and Conditional Assertions** - *Isabel GOMEZ-VEIGA, Juan A. GARCIA MADRUGA, Sergio MORENO RÍOS*

The aim of the paper is to study the comprehension and representation of concessive assertions (although p, q), compared with factual and counterfactual conditionals (if p, then not-q). Relying on a priming methodology, we measured participant´ s reading time of a conjunctive description ("p and q", "p and not-q", "not-p and q", "not-p and not-q") after it has been primed by different sorts of assertions (Santamaría, Espino & Byrne, 2005). Results showed that: (a) indicative concessives primed "p and q" conjunction; (b) subjunctive concessives primed "p and q" and "not-p and q" conjunctions; (c) factual conditionals primed "p and not-q"; (d) and, counterfactual conditionals primed "p and not-q" and "not-p and q". Authors discuss the implications of the results in terms of Mental Model Theory (Johnson-Laird & Byrne, 2002), which holds that people understand a conditional by keeping in mind different possibilities or mental models.

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Reasoning - 17:30-19:30

(1104)**Couterfactual Inducements** - *Suzanne EGAN, Ruth BYRNE*

Previous research has shown that reasoners tend to make more negative inferences from counterfactual than factual conditionals. It has been suggested that reasoners keep a single possibility ('A and B') in mind to understand a factual conditional, (e.g., if A then B), but they keep two possibilities ('A and B', and 'not-A and not-B') in mind to understand a counterfactual (e.g., if A had been then B would have been). We report the results of two experiments that compare factual and

counterfactual promises and threats, such as "if you had mowed the lawn then I would have given you ice-cream" or "if you had been bold then I would have grounded you". The results suggest that reasoners may keep a single possibility in mind to understand a counterfactual inducement: not-A and not-B. We discuss the implications of the results for the mental representations of inducements and counterfactuals.

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Reasoning - 17:30-19:30

(1105)**The Dramatic Effect of Content on Children's Unless Reasoning: Pragmatic Modulation or Reconstruction?** - *Walter SCHAEKEN, Juan GARCIA MADRUGA*

Reasoning on the basis of sentences with the connective unless is rarely studied by cognitive scientists. Our investigation starts from the mental model theory of reasoning (e.g., Johnson-Laird, 1983). An assertion such as not-p unless q has the same truth conditions as if p then q, but we argue that it is represented differently, that is, the initial mental models for these two connectives are not the same. The experiment is the first to investigate the role of age (by testing three age groups: nine-year-old, eleven-year-old and thirteen-year-old children) on reasoning with unless (en ook met if-then?dus misschien anders formuleren). Other investigated factors are type of conditional (if-then vs. unless), and content (by comparing abstract and concrete problems). We discuss the results in terms of recent modifications to the original mental model theory.

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Spatial Cognition I - 17:30-19:30

(1106)**Behavioural and ERP Evidence for Hemispheric Lateralization of Spatial Representations.** - *Ineke VAN DER HAM, Richard VAN WEZEL, Anna OLEKSIAK, Albert POSTMA*

Spatial relations can be expressed in a precise, metric way (coordinate), or in an abstract manner (categorical) (Kosslyn, 1987). It is hypothesised that coordinate relations are mainly processed by the right hemisphere, and categorical relations are processed by the left hemisphere. In our experiments, visual half-field tasks in a match-to-sample format were conducted to examine these hypothesized lateralization effects. This design enables the examination of the time course of the lateralization at brief (500 ms), intermediate (2000 ms), and long (5000 ms) intervals. The often used dot-and-bar task was converted into a more complex cross-dot task. Behaviourally, the hypothesised lateralization effect was found, but only in the brief retention interval. The lateralization effects in spatial relation processing therefore appear to diminish when information is kept in working memory. The same design was used for EEG measurements to examine the lateralization and time course of brain activity during task execution.

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Spatial Cognition I - 17:30-19:30

(1107)**Gender Differences in Automatic & Controlled Encoding and Retrieval of Objects & Object Locations** - *Maartje DE GOEDE, Albert POSTMA*

One of the most consistent findings in the area of cognitive sex differences is that males outperform females on many spatial tasks. One exception seems to be object location memory. On this task, females tend to perform better than males. However, the existing studies have provided quite mixed results and the picture is far from clear. Important moderators can be encoding context, the way information is retrieved from memory and the multiple component aspect of object location memory. The aim of the present study was a systematic comparison of men and women on components of object location memory and the conditions under which object locations are encoded and retrieved from memory. Most important, while most studies focus on either level, in this study possible interactions between different memory components and conditions could be investigated in an explorative fashion. Object location memory was assessed by a task in which objects had to be relocated within (pictures of) different rooms. Different encoding contexts were created by varying instructions between subjects. The way in which subjects retrieve the object locations was assessed by means of the Processing Dissociation Procedure developed by Jacoby. Object identity memory was measured by a separate object recognition task. In general, females performed better than males on the object location memory task. However, when controlled for object memory, females no longer outperformed males, whereas they did not obtain a higher general object identity memory score, nor did they have more explicit recollection of the object identities. In general, participants had more explicit (conscious) recollection than implicit (unconscious) recollection. No effect of encoding context was found, nor any interaction effect of gender, encoding and retrieval context. Currently, hormonal salivary analyses are being conducted, which will provide new insights in the psychoneuroendocrinological basis of object location memory.

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Spatial Cognition I - 17:30-19:30

(1108)**Opportunistic Planning in the Travelling Salesperson Problem: Evidence From Preplanning Time** - *Valentina CAZZATO, Simone CUTINI, Demis BASSO, Patrizia Silvia BISIACCHI*

The Travelling Salesperson Problem (TSP) allows the study of visuo-spatial planning: in this task subjects are asked to find the shortest route in the shortest time. A computerized version of the TSP with several levels of numerosity (number of sub-goals) was used to investigate the following variables: preplanning time (the time between the presentation of the trial and the first move) and optimization level (the ratio between the length of the route and the shortest route). The aim of the present study was to verify whether the increased numerosity causes an exponential increase of preplanning time or human performance is characterized by no exponential increase of preplanning time. Results confirmed the second hypothesis, showing an overall high optimization level, and an execution time linearly related to numerosity. It follows that human planning is opportunistic: not based on a exhaustive search strategy, but on a proficient trade-off between the given constraints.

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Spatial Cognition I - 17:30-19:30

(1109)**Girls Can Reach the Top in 3D Mental Rotations as Well: Stereotype Falsification Helps** - *Jean DELPECH, Pascal HUGUET, Julien CHANAL, Jean-Paul CAVERNI, Maude FANTONI*

No other test than Vandenberg and Kuse's mental 3-D rotation task (MRT) better exhibits how strongly men outperform women in visuo-spatial Abilities. Here, we offer evidence that this sex difference can be due to the intervention of a negative stereotype (i.e., the socially shared belief that women and girls are generally inferior to men and boys regarding spatial abilities). Participants (900 middle school pupils) performed the MRT either in a "standard" condition (where only the basic test instructions were given) or a « stereotype falsification » condition, in which they were also informed that participants' sex does not matter on this task. As expected, whereas the classic sex difference occurred in the former condition, it was no longer significant in the latter (despite huge statistical power). These impressive findings offer further support for stereotype threat theory, which indeed predicts lower processing efficiency when the focal task has the potential to trigger a negative stereotype about one's social group.

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Spatial Cognition I - 17:30-19:30

(1110)**Can We Rely Equally on Both Geometric and Featural Information Across Life Span?** - *Luciana PICUCCI, Guido D'ANGELO, Rossella DI LEO, Angela FILANNINO, Andrea BOSCO*

The ability to integrate the available information in the environment can vary as a consequence of developmental processes (Hermer & Spelke 1994). This study evaluates which spatial information (surface geometry, landmark position or both) are used across life span. The Reorientation Paradigm in a virtual environment was adopted, manipulating in addition the shape of the environment and the proximity of the landmark to the target. Six groups of participants took part at the experiment:

three groups of children (M= 5.6; M=7.8; M= 9.9), one group of adults (M= 25,7), and two groups of elderly (young elderly =56.67 and old elderly =71.69). Results reveal that (a) participants progressively acquire both the ability to use landmark information and the ability to integrate both geometry and landmark, yet a drop emerges in the oldest group; (b) the geometrical information seems the less involved in the developmental processes, since children are able to reorient when only geometry is available, moreover this ability is preserved across life span.

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Speech Perception - 17:30-19:30

(1111)**Word and Sub-Word Units in Speech Perception** - *Ibrahima GIROUX, Arnaud REY*

Saffran, Newport, and Aslin (1996) found that human infants are sensitive to statistical regularities corresponding to lexical units when hearing an artificial spoken language. To account for this early word-segmentation ability, Simple Recurrent Networks (SRN: Elman, 1990) suggest that associations between sub-word units are strengthened with time. Alternatively, according to Parser (Perruchet & Vinter, 1998), only lexical units are strengthened, independently from the weight of sub-word units. In the present study, we compared the word and sub-word recognition performance of adults after hearing two or ten minutes of an artificial spoken language. The data are consistent with Parser's predictions, showing improved performance on words after ten minutes but not on sub-words. This result suggests that word segmentation abilities are not merely due to stronger associations of sub-word units but to the emergence of stronger lexical representations during the development of speech perception processes.

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Speech Perception - 17:30-19:30

(1112)**If Syllables Were Classification Units in Speech Perception, Auditory Priming Would Show It** - *Nicolas DUMAY, Alain CONTENT, Monique RADEAU*

Two auditory priming experiments tested whether the final overlap effect relies on syllabic representations. Amount of shared phonetic information and syllabic correspondence between prime and target nonwords were varied orthogonally. In the related conditions, CV.CCVC primes and targets shared the last syllable (pinclude-viclude) or the last syllable minus one phoneme (pinclude-viflude); conversely, CVC.CVC primes and targets shared the last syllable (goltibe-purtibe) or the last syllable plus one phoneme (goltibe-pultibe). Both experiments required to repeat back the targets, with Experiment 2 including foils. Foils had no influence on latencies. The facilitation induced by related primes increased with the number of shared phonemes and was by and large independent of syllabic correspondence. Priming was also found on error rates, which were equally smaller in the related than in control conditions, with again no influence of the syllabic structure. In view of these findings, there is thus little evidence for pre-lexical syllabic classification.

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Speech Perception - 17:30-19:30

(1113)**Integration of Multiple Speech Segmentation Cues in Lexical Segmentation and Storage** - *Odile BAGOU, Alain CONTENT, Ulrich H. FRAUENFELDER*

This study investigates how French listeners exploit phonological and phonetic cues in segmenting continuous speech into words. We examined how the listener integrates these multiple sources of information not only during lexical segmentation, using word spotting and cross-modal priming, but also in the storage of new representations, using an artificial language learning paradigm. Results showed that the specific cues examined had different weights in the segmentation and the acquisition processes. Syllable onsets, simultaneously cued by allophonic variations and phonotactics, played a predominant role in lexical segmentation where stress was a "last-resort" segmentation cue. In contrast, rhythmic information, particularly primary stress, played a greater role in lexical acquisition. The mechanisms involved in lexical segmentation and storage are discussed.

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Speech Perception - 17:30-19:30

(1114)**The Visual Discrimination of Rhythm in Speech** - *Jordi NAVARRA, Charles SPENCE, Salvador SOTO-FARACO*

Recent studies have demonstrated that it is possible to discriminate between languages using only visual information regarding articulatory gestures. Although this ability is present in adults as well as in young infants, the bases for visual speech discrimination are, at present, unknown. In the auditory domain, discrimination between languages such as English and Japanese is possible on the basis of their different rhythmic patterns, even in the absence of any other linguistically-relevant cue (Ramus & Mehler, 1999, Journal of the Acoustical Society of America). Here, we replicate this result and, crucially, extend it for the first time to the visual domain, demonstrating that language discrimination is possible on the basis of visually-presented silent 'aperture-close' movements of robot-like articulators (mouth and jaw). That is, discrimination performance that is significantly better than chance can occur in the absence of any other distinctive cue (e.g., prosody, phonology), be it visual or auditory. On the basis of these findings, we conclude that rhythm is a likely candidate to account for previous findings showing the visual discriminability of languages.

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Speech Perception - 17:30-19:30

(1115)**Phonetic Content Shapes Voice Categories** - *Attila ANDICS, James M. MCQUEEN, Miranda VAN TURENNOUT*

Dutch listeners were familiarized with four Dutch voices through exposure to stories and lists of six monosyllables ("met", "mot", "mos", "let", "les" and "los"), with no explicit speaker-identity information. At test they judged whether they heard old (trained) voices or new ones. Test stimuli were utterances of two non-trained words ("mes" and "lot") from voice-morphed continua constructed between natural endpoints spoken by the trained voices. There were more old responses for the endpoints than for the morphed utterances. Furthermore, there were more old responses for "lot" than for "mes" for each intermediate voice-morph, but not for the endpoints. These results demonstrate that listeners are able to acquire categories for individual voices without feedback on speaker identity. They also show that the amount of deviance which is accepted within a voice category varies with phonetic content: Voice category boundaries are thus shaped by the speech sounds voices carry.

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Speech Perception - 17:30-19:30

(1116)**The Pre-Lexical Locus of the Inhibitory Phonetic Priming Effect** - *Sophie DUFOUR, Ulrich H. FRAUENFELDER*

The demonstration of inhibitory phonetic priming by primes that are phonetically similar to targets, but share no phonemes with them (e.g., LOB - ROPE) raises interesting questions about the nature of the representations mediating the word recognition process. To shed light on these representations, we examined the locus of such priming by manipulating the lexical status (word / non-word) of the primes. In a shadowing task, we found an inhibitory priming effect only when non-words were used as primes. These findings suggest a pre-lexical locus of inhibitory phonetic priming and an intermediate level of representation between featural and lexical representations.

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Speech Perception - 17:30-19:30

(1117)**Neighborhood Density Effects on Spoken Word Recognition by European Portuguese Seven Grade Students** - *Selene VICENTE, São Luís CASTRO*

Twenty-five seven grade students (M = 12.7 years old, SD = 0.3), native speakers of European Portuguese (EP), were evaluated in an auditory lexical decision task previously used with university students. The main goal of this study is to examine the influence of word frequency, neighborhood density

and neighborhood frequency on spoken word recognition in EP from a developmental point of view. The stimuli, 80 disyllabic nouns and 80 nonwords, were presented by headphones. Participants were asked to decide as quickly and accurately as possible whether the stimulus they heard was a real word or a nonsense word. Reaction times (RTs) and accuracy rates were calculated. Main effects of word frequency, neighborhood density and neighborhood frequency were observed both for RTs and accuracy measures. These results are compared with those obtained with the university students, and are discussed in the context of the Neighborhood Activation Model and cross-linguistic comparisons.

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Speech Perception - 17:30-19:30

(1118)**Temporal Modified Speech Perception in Dyslexia** - *Caroline JACQUIER, Fanny MEUNIER*

There are two major competing theories explaining the cognitive deficit in dyslexia: the phonological and the auditory hypothesis. In the experiments presented here we investigated time-compressed speech perception in dyslexic adults in behavioural and ERPs studies. We argue that dyslexics will have more difficulties processing artificially time-compressed speech than controls. This difference will be observed with an electrophysiological marker (MisMatch Negativity) reflecting central auditory-system dysfunctions for dyslexic adults. In particular, we focused the time-compression on rapid transitions and brief sounds of speech signal. In this paper, we focused on the temporal modulation of two acoustic cues: the Voice Onset-Time and the transition of the second formant which are mainly implicated in speech perception. Here we present evidence in favour of a general auditory deficit in temporal processing, showing that discrimination of temporal information would be inefficient by dyslexics. This failure could be traced to early cortical mechanisms that process auditory information independently of attention.

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Speech Perception - 17:30-19:30

(1119)**Orthographic Effects in Auditory Priming: an ERP Study** - *Laëtitia PERRE, Katherine MIDGLEY, Johannes ZIEGLER*

The present experiment examined the contribution of orthography in spoken word processing using a primed auditory lexical decision task while recording event related potentials (ERPs). In one condition, primes and targets only shared rhyme phonology but not orthography (e.g., scheme-gleam). In the other condition, primes and targets shared both rhyme phonology and orthography (e.g., dream-gleam). While the behavioural data showed not much evidence for a modulation of phonological priming by orthographic overlap between primes and targets, the ERP data revealed a strong orthography effect in the first part of the N400. ERPs were more negative-going to orthographically unrelated than related word pairs between 380 and 500 ms. In addition, a later component, the Late Positive Complex (LPC), was also modulated by orthographic overlap between primes and targets (enhanced LPC for unrelated condition).These results confirm the involvement of orthography in auditory word recognition, and provide clear evidence for automatic orthographic activation during spoken word recognition.

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Visual Perception I - 17:30-19:30

(1120)**Body Representation and Visuomotor Abilities: an Experimental Approach With Upper Limb Amputees.** - *Pascale TOUZALIN-CHRETIEN, Solange EHRLER, André DUFOUR*

Correct integration of visual and proprioceptive information involved in visuomotor activities depends on the body representation. The present study was designed to clarify whether visuoproprioceptive interactions are preserved in upper limb amputees. Two experimental groups (congenital and traumatic amputees) and one control group performed a mirror-drawing task inducing discordant visual and proprioceptive information. Traumatic amputees and control subjects showed similar performances: when visual feedback of the drawing hand was lateral (i.e., in a proprioceptive possible position of the non-drawing or missing hand) performances were better than when feedback was given in the frontal plane. Conversely, congenital amputees were slower and less accurate with lateral feedback than with frontal feedback. These results suggest that the organization of visuomotor behavior depends on the perception of body representation established through prior experience. The differences between traumatic and congenital amputees are discussed in terms of the presence or absence of bilateral proprioception co-activation.

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Visual Perception I - 17:30-19:30

(1121)**The Influence of Odor on an Emotional Color Judgment Task** - *Anouk STREFF, Laurent FERRIER, Manuel JIMENEZ*

Color has an effect on the perception of odors (Morrot et al. 2001): neurological proof for this behavioral change has been given recently (Österbauer et al. 2005). What about the effect of odor on emotional judgment of color? In a pre-experiment, 200 students had to evaluate 20 colors on a scale from “1” (“unpleasant”) to “5” (“pleasant”). Three pleasant and three unpleasant colors were selected for the experiment, as well as one good smelling and one bad smelling substance. 60 students were asked to judge these six colors under different olfactory conditions (i.e. color combined with either a good or a bad smell, or no smell). The results show that the presence of an odor influences the judgment of a color through a crossmodal interaction, regardless of the fact that the participant may or may not have been aware of the presence of the odor during the experiment.

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Visual Perception I - 17:30-19:30

(1122)**Neural Correlates of Color Category Processing** - *Elisabeth FONTENEAU, Jules DAVIDOFF*

Previous research reveals that within-category stimuli are harder to distinguish whereas between-category stimuli are easier. We compared event-related potentials (ERPs) elicited by physically identical colors in three different contexts in an oddball paradigm. Two of the contexts were different color categories (large distance vs. small distance) and the third context was different colors from the same category. Our results showed that deviant stimuli in all three different contexts elicited a deflection in the posterior regions, the change-related positivity, compared to standard stimuli. Both magnitude of color difference and category difference reduced the latencies of the change-related positivity. We conclude that the change-related positivity reflects color category as well as color deviancy processing. Moreover, category effects were not lateralised and suggest that, even if color categories are derived from the color terms of a speaker’s language, the changes to color appearance have been effected at a site within visual cortex.

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Visual Perception I - 17:30-19:30

(1123)**Prior Knowledge and Perceptual Grouping** - *Essid SASSI, Ripoll THIERRY*

This study examines if prior knowledge exerts an influence on the process of perceptual grouping. According to the classical theory, grouping occurs before other operations of the attention process; thus, the grouping seems not to be affected by the top-down and endogenous process. However, recent research demonstrates that the viewer’s knowledge can influence the grouping. In order to examine whether grouping is influenced by knowledge of the configuration, we used a paradigm in which the participants are asked to identify two numbers among several letters. The targets are located on elements (four squares) that share two basic properties: color and form. In the first condition, observers are informed about the color of the elements in which the target will appear. In the second condition, participants are given information beforehand regarding the organization of the elements. Finally, in the third condition, they are given prior information about the position of

the elements. The results suggest that grouping is modulated not only by the knowledge of the color and position of these elements, but also by their organization. In fact, the best performance was observed when subjects had prior information concerning the organization (participants easily identify the target) is essentially connected to prior knowledge of the configuration.

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Visual Perception I - 17:30-19:30

(1124)**New Visual Illusion by Mutual Interactions Between "Noise" and "Pattern" in Visual System** - *Sohei WAKISAKA, Yukio GUNJI, Hiroyuki OHTA*

What do you see when you close only one eye? We found a vivid visual phenomenon during binocular rivalry between visual noise and an repetitive pattern (high-contrast gratings), in which the former is highly organized as “diagonal mesh pattern” by the latter, irrespective of the noise kinds. We psychophysically studied its qualitative properties, and discuss the relation to known phenomena, and propose a simple neurological model, in which the phenomenon is formed by the recurrence of mutual lateral interactions between spontaneous “oriented” activity and stimulus-driven “oriented” activity in the visual system. This is new striking example of the interaction between “noise” and “pattern”, which is topical in various scientific fields.

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Visual Perception I - 17:30-19:30

(1125)**Ths Spatial-Configuration Effect in Visual Memory Storage** - *Mohamed Aymen BEN ABBES, Thierry RIPOLL*

Due to limitations in the visual short-term memory (VSTM), the visual system is equipped with sophisticated mechanisms that enable the biasing and tranferring the most “important” inputs into the VSTM itself. We formed the hypothesis that one of the determinants of this attentionnel selective capacity is the spatial status of visual information. Using an original paradigm in which subjects must memorize objects that have been combined with previewed distractors, we showed that, in contrast to classical theories of spatial attention, subjects were able to select efficiently four targets among the distractors. More importantly, we found that this capacity is very sensitive to the spatial distribution of targets among distractors. Indeed, targets were better memorized when presented at non contiguous locations. It appeared that the regularity of the targets’ organization (e.g. Good Gestalt) may constitute one of the most important factors to be likely involved in such phenomenon. We therefore performed a second experiment that tested the impact of the configuration’s regularity. We found that the extraction and storage of targets are affected by the uniformity of their spatial repartition. These results indicate that visual memory storage is highly dependent upon the spatial configuration of targets.

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Word And Letter Processing I - 17:30-19:30

(1126)**Effects of Phonology on Letter-Position Encoding** - *Nicola PITCHFORD, Joanna WAGSTAFFE*

We investigated whether letter-sound correspondence influences letter-position encoding using a visual search task which required detection of previously cued target letters embedded within five-letter words. Forty adult participants were each given four conditions in a counterbalanced order: words where the initial and final letters are pronounced (e.g., BRINK); words where the initial letter is silent (e.g., GNARL); words where the final letter is silent (e.g., CRUMB); and words where both the initial and final letters are silent (e.g., WRITE). Results showed significant initial letter facilitation for all words, except those in which both the initial and final letters are silent. In contrast, significant final letter facilitation was shown only for words in which the final letter was pronounced. These results suggest that phonology influences the encoding of letters within letter strings, especially in the final position. Backward activation from phonological representations to letter units could account for this finding.

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Word And Letter Processing I - 17:30-19:30

(1127)**The Effect of Emotional Orthographic Neighbours in Primed Lexical Decision Tasks** - *Stephanie MATHEY, Pamela GOBIN*

This study investigated the influence of emotional information indirectly associated to word targets presented in primed lexical decision tasks in French. In the experimental condition, pairs of stimuli were constructed so that each target word (e.g. FOISON [plenty, abundance]) had at least one higher frequency orthographic neighbour with a high emotional valence (e.g., poison). In the non-emotional condition, the target word (e.g. BISON) had a “neutral” higher frequency orthographic neighbour (e.g. vison [mink]). Words were presented with the neighbour as a prime or with a control prime in two experiments (SOAs = 67 and 173 ms). The results of both experiments replicated an inhibitory orthographic priming effect. More importantly, an inhibitory effect of the emotional valence of the orthographic neighbours was found. The results are discussed in an interactive activation model of lexical access connected to the affective system (Ferrand, Ric, & Augustinova, 2006).

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Word And Letter Processing I - 17:30-19:30

(1128)**Development of Letter-Position Processing: Effects of Age and Orthographic Transparency** - *Maria KTORI, Nicola PITCHFORD*

We investigated the relative extent to which developing readers (6- and 9-year-olds) of English (deep) or Greek (transparent) orthography exhibit serial position and exterior letter effects in letter-position encoding. We used a visual search task that required participants to detect a prespecified target letter within a random five-letter string. Stimuli comprised of letters either specific to English or Greek, or shared by both orthographies. When searching for letters of their native orthography, all readers showed significant initial letter facilitation. In contrast, significant interactions were found between age and orthography for final letter and serial (left-to-right) processing. No difference was found between English and Greek 6-year-old readers. However, for 9-year-olds, English readers identified letters in the final position significantly faster than Greek readers, and English readers showed significantly less serial (left-to-right) processing than Greek readers. This suggests letter-position encoding is adaptive to the nature of the orthography acquired during reading development.

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Word And Letter Processing I - 17:30-19:30

(1129)**Effect of the Morphological Structure in Beginning Readers' Visual Word Recognition: Effects of Initial Fixation Position** - *Marion DUSAUTOIR, Severine CASALIS, Stéphanie DUCROT*

Recent studies have shown that morphological information facilitates visual word recognition in beginning readers. The aim of this study was to elicit effects of morphological structure by manipulating word initial fixation position. Fourth-graders performed a word identification task in a paradigm designed to elicit the optimal viewing position effect: words (suffixed, pseudo-suffixed and non morphological words) were presented in such a way that participants initially fixated either the left, the centre or the right of each word. Surface frequency and length (mean 7 letters) were controlled. Results indicated that identification of suffixed and pseudo-suffixed words was higher than non morphological words when the initial fixation position was at left or in the centre of words. When initial fixation position was at right of words, the recognition of non morphological words was better. It is concluded that morphemes are functional perception units of reading in young readers.

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Word And Letter Processing I - 17:30-19:30

(1130)**The Acquisition of the Lexical Route of Reading in a Shallow Orthography: the Case of Italian Language** - *Chiara Valeria MARINELLI, Alessandra NOTARNICOLA, Paola ANGELELLI*

Some authors (e.g., Frost et al., 1987) claim that in shallow orthography the lexical strategy of reading is not necessary. However, results at variance with this hypothesis have been reported (e.g., Colombo, 1992). Indeed there is not agreement about when this strategy may be come efficient. This study evaluates the efficiency of the lexical route of reading in 258 Italian normal-readers from Grade 2 to Grade 8. We used a computerized orthographic judgment task in which subjects had to judge the orthographic correctness of 40 regular and 40 ambiguous words and their derived fake versions. Fake versions of the ambiguous words were phonologically plausible, and so detectable only through a lexical strategy. Regular and ambiguous words were controlled for length and word frequency. Data prove that normal readers in a shallow orthography also use the lexical reading strategy. The trend analysis showed that, as in opaque orthographies, the acquisition of this strategy is delayed with respect to the phonological strategy but, as more time is spent in an education program, there is an increasing use of the lexical reading strategy. In particular, the ANOVA showed that Italian children use the lexical route since Grade 2 (even if limited to familiar words), although reliance on lexical processing became prevalent from Grade 4.

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Word And Letter Processing I - 17:30-19:30

(1131)**Still Troubles in the Neighborhood? Competing Syllabic & Orthographic Cohorts** - *Florian HUTZLER, Mario BRAUN, Thomas F. MÜNTE, Michael ROTTE, Arthur M. JACOBS*

During lexical decision, response times to words with high-frequency first syllables are slower than to words with low-frequency first syllables. This so called inhibitory effect of first syllable-frequency in visual word recognition was interpreted (Carreiras et al., 1993, 2006) in terms of lexical competition in an interactive activation model. Functional imaging data recorded during a lexical decision task in German is presented, directly comparing activations resulting from syllable-frequency and neighborhood size in order to further explore the above mentioned notion.

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Word And Letter Processing I - 17:30-19:30

(1132)**What is Lexical Processing Model of Korean Morphological Complex Verb Word?** - *Jaebum JUNG, Kichun NAM, Heisoek IM*

The present study investigated the hypothesis that lexical representations are stored in morphologically decomposed form or whole form in Korean Eojeols.(korea spacing unit in write). Two semantic primed lexical decision tasks in which meaning of eojeol stimuli was varied are conducted. In Experiment 1, the materials were only inflect verbs, but the included stem morpheme has noun and verb stem meanings, and a stem had ambiguous meanings, and suffix constrained the meanings of stems, like '/jui-uh/(grab)', '/gam-uh/(wind)'. The result indicated facilitatory priming effects to target words associated with only the verb meanings of prime word stems in the short SOA condition. This result indicated that the decomposing processing toward Korean eojoel is wrong. Only the whole eojeol processing is recommended. In experiment 2, materials were inflected verbs composed of stems and suffixes like '/muk-ul/(ink+object case marker or inflection of eating)', '/gam-ul/(a persimon+object case marker or inflection of winding)', and each of the stems of the prime has two meanings of different syntactic categories(verb and noun). The result indicated facilitatory priming effects to target words associated with both the verb and noun meanings in short SOA condition. In Sum, these results support that lexical representations are whole morphemic processing (full-list) in Korean Eojeol processing.

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Word And Letter Processing I - 17:30-19:30

(1133)**The Consonant/Vowel Status in Letter Position Encoding: Evidence With a Letter Search Task** - *Joana ACHA, Manuel PEREA*

The orthographic transparency of a language seems to determine the easiness to detect the identity of a letter in an array (Hammond & Green, 1982; Ktori & Pitchford, 2007). In addition, the vowel-consonant status may constrain the letter encoding process (Caramazza & Micelli, 1990; Tanturier & Rapp, 2004). To examine the role of consonants/vowels in the letter encoding process, we designed an experiment in which participants had to detect whether a given vowel/consonant was present or not in a five-letter word. To that end, we selected five vowels/consonants, and three letter positions (initial, central, and final). Results showed that consonants were particularly easy to detect at the initial letter position, whereas vowels were particularly easy to detect at the final letter position. This implies that even in a transparent orthography, serial processing is constrained by the consonant/vowel status of the letter within the array.

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Word And Letter Processing I - 17:30-19:30

(1134)**An ERP Investigation of the Modulation of Subliminal Masked Priming by Exogenous Cues –** *Yousri MARZOUKI, Katherine MIDGLEY, Phillip J. HOLCOMB, Jonathan GRAINGER*

Marzouki, Grainger and Theeuwes (2007) demonstrated that masked repetition priming of letter identification is affected by the allocation of spatial attention to the prime location by an exogenous cue. Priming is obtained only when the exogenous cue is valid (prime at the same location as the cue). The present ERP study was designed to explore the time course of such exogenous influences on masked priming. Results showed a significant modulation of the amplitude of the P300 ERP component as a function of repetition and cue validity. The amplitude difference between repeat and unrelated primes was found to be enhanced in the presence of a valid exogenous cue. This result provides evidence for early automatic attentional modulation of subliminal priming effects by exogenous cues, and furthermore shows that such effects can be obtained in the absence of any eye movements.

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Working Memory I - 17:30-19:30

(1135)**Visuospatial Short-Term Memory and Working Memory? a Latent-Variable Approach** - *Thierry LECERF, Sébastien FERNANDEZ*

Controversies exist regarding the relations between Short-Term-Memory (STM) and Working-Memory (WM). Within the verbal WM domain, experiments have shown that STM and WM reflect separate constructs. This study attempts to determine whether visuospatial STM and WM reflect separate constructs, by using latent-variable approach. Six visuospatial memory tasks were administered to 113 young adults (19 - 35 years-old; mean = 24.38; SD= 2.97). Three tasks were classified a priori as STM tasks, and three other as WM tasks. To provide a clear test of the hypothesis, we fit separate one-factor and two-factor confirmatory factor analysis (CFA) to the six visuospatial tasks. Similar CFA were also conducted on two sub samples, which were created on the basis of the performance in the six visuospatial tasks (High- vs. low-span). Overall, results support the hypothesis that the six visuospatial tasks reflect the same latent variable. The distinction between visuospatial STM and WM was not found.

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Working Memory I - 17:30-19:30

(1136)**Inhibitory Control in Verbal Working Memory Across the Lifespan** - *Christelle ROBERT, Delphine FAGOT, Thierry LECERF, Anik DE RIBAUPIERRE*

According to Hasher and colleagues (1999), three inhibitory functions regulate the contents of working memory (i.e., access, deletion, restraint). This study aimed at specifying to what extent these functions develop across the lifespan by examining the performance of children (M = 11.0), young (M = 21.1) and older adults (M = 69.0) in a computerized reading span test. Efficiency in inhibitory control was assessed through the analysis of three different types of errors, each assessing one of the three inhibitory functions. Results showed that older adults made more intrusions from earlier trials compared to both

children and young adults, suggesting a decrease in the efficiency of the deletion function in late adulthood. In contrast, children produced more invention errors (i.e., words that had not been presented) compared to both young and older adults, suggesting that the restraint function develops later in childhood. The theoretical implications of these results are discussed.

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Working Memory I - 17:30-19:30

(1137)**How Does Emotional Stimuli Affect Working Memory Performance?** - *Michal OLSZANOWSKI, Robert BALAS*

Common results of memory research are that emotional/negative information is better remembered than neutral. This might be caused by differences in processing both kinds of information in Working Memory. According to Cowan model of WM we could expect that emotional stimuli would have higher activation and preferentially enter the focus of attention. To examine the effect of emotional content on WM performance, we asked participants to perform Sternberg task using faces with emotional/neutral display as a stimuli. With respect to hypothesis presented above higher activation of emotional content should result in higher accuracy and faster recognition for emotional faces. The presented results support a general conclusion that emotional (especially negative) stimuli affect not only accuracy and RT for target stimuli but also impair accuracy for the stimuli that appear right after the emotional one. Consequences for memorizing real life events are discussed.

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Working Memory I - 17:30-19:30

(1138)**Working Musical Memory: Influence of the Musical Expertise and Specificities of the Auditory and Visually Information Processes.** - *Sophie DONNADIEU, Jean-Luc ROULIN, Nathalie FOURNET*

Berz (1995) propose to add a slave system to the Baddeley's (1990) working memory model to account for musical information. We conducted an experiment were musicians and non musicians have to judge if two auditory or visually presented melodies were identical or different. Performances for three interference tasks conditions (articulatory, non articulatory and visuo-spatial tasks) during the 2 second retention interval were compared to a non interference task condition. Musicians presented better performances than non musicians in the two modalities. For musicians, worse performances were observed in the non articulatory condition for the two modalities. Moreover, this condition has no effect in the retention of verbal information. Non musicians showed worse performances in the non articulatory and the visuo-spatial conditions for the auditory and visual modalities respectively. These results suggest the existence of a specific process involve in musical working memory which the efficiency seems dependant of the musical expertise.

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Working Memory I - 17:30-19:30

(1139)**How do You Juggle Numbers? Individual Differences in Mental Arithmetic** - *Annalisa LUCIDI, Jo-Anne LEFEVRE, Vincenzo CESTARI, Clelia ROSSI-ARNAUD*

The aim of the present experiment was to study individual differences in mental arithmetic by examining the solution strategies used by adults to mentally solve 2- plus 2-digit addition problems (e.g., 35 + 47) of varying complexity presented visually and auditorily. Participants could be grouped according to whether they were "flexible" (i.e. employed a larger variety of strategies such as decomposition, transformation, standard algorithm) or "stable" in that they used one of these strategies throughout the experiment. Results suggest that the type of strategy solution affects the time it takes to solve the operations rather than accuracy. In general response times are longer with auditory presentation, but with this presentation modality, flexible strategists were faster to solve problems than stable strategists. Results are discussed in terms of a contribution from working memory to the encoding and maintenance of operands and intermediate products during mental arithmetic

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Working Memory I - 17:30-19:30

(1140)**"Choking Under Pressure": Some Arguments Against the Cognitive-Load Hypothesis.** - *David GIMMIG, Pascal HUGUET, Jean-Paul CAVERNI, Pierre BARROUILLET, Raphaëlle LEPINE*

Beilock and Carr (2005) found that the individuals most likely to choke under performance pressure (on the most difficult part of an arithmetical task) were those who, in the absence of pressure, had the highest potential for success (as indexed by their higher Working Memory Capacity or WMC). According to these authors, pressure-induced anxiety hindered high-WMC subjects (HWMs) by consuming the WMC they used in low-pressure circumstances to devise more complex (i.e. resource-demanding) strategies and produce superior performances. Recent findings (Gimmig, Huguet, Caverni & Cury, 2006; Gimmig, Huguet, Caverni, Barrouillet & Lépine, under review), however, call into question this "cognitive load" approach. Although Gimmig et al (2006) showed that choking applied to fluid intelligence (Raven matrices), they observed that only HWMs reported increased anxiety under pressure. Here, we show that pressure in fact does not reduce HWMs capacity to control attention per se, but instead interacts with processing demand to influence the monitoring and decision making processes.

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Applied Cognitive Psychology II - 17:30-19:30

(2001)**Cognitive Processes in Implicit Attitude Measures: Testing the Validity of the Quad Model** - *Lena NADAREVIC*

Despite the fact that implicit attitude measures have become very popular in various areas of psychology, little is known about the cognitive processes they involve. Conrey et al. (2005) addressed this issue by developing the Quad Model, a multinomial processing tree model that separates four cognitive processes presumably underlying implicit attitude measures. The purpose of the present study was to test the validity of the Quad Model. The results revealed a good fit between the model and data of the Implicit Association Test (IAT, Greenwald et al., 1998), whereas misfit was observed for the closely related Go/No-go Association Task (GNAT, Nosek & Banaji, 2001). This finding indicates that even though the IAT and the GNAT are almost identical on a surface level, they differ in regard to the cognitive processes they involve.

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Applied Cognitive Psychology II - 17:30-19:30

(2002)**Memory Processes in Huntington's Disease.** - *John MCDOWALL, Kristy BOLTER*

The present study was designed to investigate the conceptual versus perceptual processing distinction across both implicit and explicit memory measures in patients with Huntington's Disease (HD). It was hypothesised that the HD Group would demonstrate unimpaired priming on both perceptual and conceptual implicit memory measures. However, given that HD patients appear to have deficits on some explicit memory measures, it was hypothesised that HD patients would demonstrate mild impairments on the explicit memory tasks regardless of their processing requirements. The overall results (with 19 patients) indicated that the dissociations found in the memory tasks appear to be predominantly driven by an explicit-implicit distinction rather than by a perceptual-conceptual processing distinction.

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Applied Cognitive Psychology II - 17:30-19:30

(2003)**Improving Rhythmic Performance With the Aid of Visual Feedback** - *Renee TIMMERS, Alex BRANDMEYER, Peter DESAIN*

Visual feedback often helps to improve performance on a task that demands fine motor control. Music performance is one such task. The Practice Space project aims to develop an application for the automatic evaluation of performance and the generation of visual feedback. An implementation has been realized for the practicing of drum rhythms in different styles. Student performances are analyzed and compared to target performances. Analytic feedback is provided, which shows the details of the performance, or holistic feedback, which shows the success of the performance. Success is assessed using the probability that a performance belongs to the target style. In an experiment, the usefulness of the feedback is tested in comparison to a no-feedback condition. The results show an advantage of holistic feedback, although participants preferred the analytic feedback. Promising directions for further research concern the elaboration of our Baysian approach to performance analysis and the use of abstract visualizations.

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Applied Cognitive Psychology II - 17:30-19:30

(2004)**Attentional Networks Performance, Social Behaviour and Specific Habilities in Young Football Players.** - *Florentino HUERTAS, Consuelo MORATAL, Jose PORTOLES,Juan Luis DELGADO, Javier ZAHONERO, Juan LUPIAÑEZ*

The present study examined the relationship between atentional networks performance (attentional orientating, executive control and alertness) and anxiety in young football players. Correlation between attentional variables and specific motor (technical, tactical, physical,…) and social football habilities were analyzed. Young soccer players (n = 79, age = 10,7 + 1,5) completed the State-Trait Anxiety Inventory for Children (STAIC) and a custom made sociogram, before performing at rest the ANTI (Callejas, Lupiáñez and Tudela, 2004) to evaluate the functioning of the attentional networks. Our results replicated the principal effects of cueing, interference and alertness, and the interactions alertness x orienting, orienting x congruence and alertness x congruence, in children. The most important finding was related to the correlation between different types of player social interactions and executive control network. Conflictive players shows lower levels of control than players who were seen more positively by their partners. These data might indicate that cognitive control is not only related to motor control, but it could also modulate general information processing, even socio-affective behaviour, thus being critical in social interactions.

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Applied Cognitive Psychology II - 17:30-19:30

(2005)**Two Patterns of Heroin Induced Craving : a fMRI Study** - *Arian BEHZADI, Hamed EKHTIARI, Azarakhsh MOKRI,Mohammad Ali OGHABIAN*

Introduction: In our previous study we designed a Cue Induce Craving Task (CICT) with heroin related images. In response to these cues, addicts demonstrate different patterns of physiological and subjective responses. This study was undertaken to determine these varieties by means of BOLD fMRI . Methods: 30 male heroin IV abusers fulfilled the DSMIV addiction criteria were compared with 15 normal subjects. CICT was presented before and during the imaging. Data analysis was carried out using FEAT (FMRI Expert Analysis Tool) part of FSL (FMRIB's Software Library) Results: Anterior Cingulate Gyrus, Rectus Gyrus, Superior Medial Frontal Gyrus , Nucleus Accumbens , and Cingulum were activated in the cue responders(17/30) whilst there is no activation in these areas in the non cue responders(13/30). Conclusion: CICT is a valid/reliable manner to estimate craving. fMRI results of the nonresponders represent no activation in the craving related brain regions (limbic/paralimbic-pleasure/inhibition ,Dopaminergic D_2 system)

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Applied Cognitive Psychology II - 17:30-19:30

(2006)**Visual Information Processing in Operators Working on Military Navigation Bridge** - *Magali ALBERT, Janine HARDOUIN, Martine PELLEN-BLIN, Rémy DUFLOS-FRICHOT, Mickael VANDERBUECKEN, Thierry RIPOLL*

This study takes place in the prospective human-centered approach adopted by French navy to design the future naval platforms. In order to reply to crew reduction on board without altering security and performance, new systems and automations are developed to support operators' activity and to maintain reasonable workload. In this context, our aim is to evaluate a new collective interface that displays visual information on bridge. So, we study how the operators process visual information provided by this interface. We use an original method based on highly realistic bridge simulator that allows emergence of natural individual and collective behaviors of operators working in the simulated navigation situation. Several objective measures (operational performance) and subjective measures (self-assessment of workload, for example) are collected. This set of data is completed with behavioural measures realised by an ethological approach. The results will bring better understanding of visual information processing at collective and individual level on the navigation bridge and, more generally, in real activity condition.

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Applied Cognitive Psychology II - 17:30-19:30

(2007)**Elderly Drivers' Performance in a Lane-Change Task is Vulnerable to Increased Secondary Task Complexity.** - *Ellen S. WILSCHUT, Gerhard RINKENAUER*

More and more driver assistance systems are being introduced into cars. However, it is unclear if the secondary tasks introduced by these systems affect the driving performance and if they cause safety risks to the driver and road traffic. Especially vulnerable could be elderly drivers, who are known to have decreased perceptual, motoric and cognitive functioning

due to normal ageing. In this study we evaluate the effect of secondary task complexity on driving performance using different complexity manipulations of a visual search task. The Lane-Change Task (Mattes, 2003) was used as the primary task to simulate driving. Results showed that participants (n=24) were unable to maintain their driving performance at baseline level when the secondary task had to be attended and reacted to by button press. The performance of elderly participants (50-70 years) was slower overall and showed severe and stronger dual task decrements with increasing visual search complexity. Mattes, S. (2003). The Lane-Change-Task as a Tool for Driver Distraction Evaluation. In: Strasser, H.; Kluth, K.; Rausch, H.; Bubb, H. (Eds.): Quality of Work and Products in Enterprises of the Future (pp. 57-60). Stuttgart: Ergonomia Verlag, 2003

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Attention II - 17:30-19:30

(2008)**Temporal Preparation Improves Pitch Discrimination** - *Karin M. BAUSENHART, Bettina ROLKE, Rolf ULRICH*

Recent studies show that temporal preparation improves discrimination performance within the visual modality. We conducted two experiments to examine if such a perceptual facilitation can also be observed for the auditory modality. In two experiments, temporal preparation was manipulated by varying the time interval between a warning signal and the subsequent target stimulus (i.e., foreperiod duration). Pitch discrimination performance for each foreperiod condition was assessed employing an adaptive single-stimulus presentation procedure. In Experiment I, pitch discrimination was improved following short foreperiods, which are known to enable good temporal preparation. Experiment II replicated this effect and ruled out an alternative explanation, according to which the improved performance following short foreperiods was due to more stable short term memory representations. Thus, the present results show that the perceptual facilitation by temporal preparation is not restricted to vision, but can also be observed within the auditory modality.

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Attention II - 17:30-19:30

(2009)**Two Mechanisms Underlying Inhibition of Return** - *Ana B. CHICA, Tracy L. TAYLOR, Juan LUPIAÑEZ, Raymond M. KLEIN*

Inhibition of Return (IOR) refers to slower reaction times to targets presented at previously stimulated or inspected locations (Klein, 2000). Taylor (1999; Taylor & Klein, 2000) showed that IOR can affect both input and output processing, depending on whether the oculomotor system was in a quiescent or in a prepared state, respectively. If the motoric flavour of IOR is truly non-perceptual and non-attentional, no IOR should be observed when the responses to these targets are not spatial. We found that when the eyes move to the peripheral cue and back to the centre before the target appears (to emphasize the motoric component), IOR is generated in a detection task (in which motor preparation is important) but not in a colour discrimination task. The same colour discrimination task showed IOR when eye movements to the cue were prevented (and thus the motoric component of IOR was not activated).

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Attention II - 17:30-19:30

(2010)**Behavioral and Electrophysiological Effects of Distraction Obtained in a Multi-Deviant Auditory Distraction Paradigm** - *Sabine GRIMM, Erich SCHRÖGER, Alexandra BENDIXEN, Pamela BÄß, Anja ROYE, Leon DEOUELL*

We investigated processes of involuntary attention by means of a new multi-deviant auditory distraction paradigm. Subjects performed a phonological discrimination task on lateralized consonant-vowel syllables. Infrequently, syllables contained a deviation on a task-irrelevant dimension. Behavioral performance and event-related potentials (ERPs) were measured within sequences containing three types of deviants (frequency, location, and duration deviants, 11 % probability each) and traditional single deviant sequences (frequency deviants only, 11 % probability). Syllables featuring a deviation were accompanied by a prolongation in reaction time for the phonological discrimination task and elicited ERP components that indicate the detection of and orienting towards the task-irrelevant changes (MMN and P3a). Deviance-related effects obtained in the multi-deviant and the single-deviant conditions were similar. That is, despite an increase in the overall probability of deviants, behavioral and electrophysiological effects of distraction are undiminished within the multi-deviant approach. Both theoretical and application-oriented implications of the findings are discussed. In brief, the multi-deviant distraction paradigm seems suitable for efficiently assessing processes of involuntary attention in a fraction of the time needed with traditional single-deviant paradigms.

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Attention II - 17:30-19:30

(2011)**Which Processes Underlie Attentional Capture by a Familiarity Singleton?** - *Celine CHIARAMONTE, Stephane ROUSSET*

The study aims at evidencing that a distinctive item on familiarity dimension (“singleton in familiarity” : novel stimulus among familiar ones, familiar stimulus among novel ones) can attract attention. Two different processes may underlie such selection : a) a top down selection originating in differences of activation between stored representations and favoring either familiar or unfamiliar stimuli ; b) a bottom up saliency based selection. Although top down based selection predicts asymmetric effects between familiar and unfamiliar singletons, saliency based selection predicts symmetric effects. A spatial pre cuing procedure is used; the spatial congruency between the familiarity singleton in a first display and a target in the subsequent display is manipulated. The symmetry of capture effects observed at short SOA (100-150 ms) suggests a selection based on differences of saliency. This early saliency could be based on differences of perceptual fluency between familiar and unfamiliar stimuli.

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Attention II - 17:30-19:30

(2012)**Attentional Enhancement is Absent During the Blink: Evidence From Electrophysiology and Behaviour** - *Srivas CHENNU, Patrick CRASTON, Brad WYBLE, Howard BOWMAN*

The Attentional Blink (AB) phenomenon outlines the temporal limits of conscious perception. There has been considerable recent interest in the identification of neural correlates of the AB, and the development of computationally explicit neural models. We report results from an experiment employing a dual stream AB paradigm to record electrophysiological (EEG) activity, with the aim of connecting key ERP (event related potential) components observed therein to patterns of simulated neural activation from models. The results show a clear correspondence between the N2pc and P3 ERP components, and the behavioural data for targets presented inside and outside the AB window. Specifically, the correlations suggest that the attentional enhancement reflected by the N2pc is necessary but not sufficient to ensure successful working memory encoding reflected by the P3. Connecting these ERP components to model dynamics enables us to theorize about their neural sources and comparatively evaluate competing theories of the AB.

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Attention II - 17:30-19:30

(2013)**Task-Dependent Strategic Modulation of Inhibition of Return** - *David HENDERICKX, Kathleen MAETENS, Eric SOETENS*

Subjects are faster at detecting a visual target when its position is known in advance than when they are misinformed about the target’s location. These cost-benefit patterns are observed for exogenous bottom-up and endogenous top-down guided attentional orienting. However, after exogenous cueing, a reverse cost-benefit pattern is observed when the cue-target interval (CTI) exceeds approximately 250ms (Inhibition of Return, IOR). Because IOR does not occur after endogenous orienting, we expect IOR also to be susceptible to strategic control. In the present study, we manipulated temporal target-onset predictability in both detection and identification cueing

tasks. When target-onset becomes temporally predictable, strategic control of attentional orienting may be possible. Preliminary results indicate that IOR does occur in detection tasks after fixed CTI's of 375ms and 500ms, but not in identification tasks with fixed CTI. Results are explained in terms of different cognitive processes needed to fulfil both types of tasks.

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Attention II - 17:30-19:30

(2014)**Spotlight Failure Effect With Task-Irrelevant Features** - *Serena CARNI, Alessandro COUYOUMDJIAN*

The aim of this study was to show that validity effect obtained in spatial cuing paradigms might be due to a priming process between an anticipated and a perceptual representation of the target display. More specifically, it is hypothesized that spatial cue brings subject to form a complete representation of the display that includes both task-relevant (target location) and irrelevant (background) features. To test this hypothesis we followed Klein and Hansen's methodology to highlight the spotlight failure effect (Klein & Hansen, 1990) in which validity effect was evident only with likely targets. We ran a series of spatial cuing experiments in which a Mondrian-like background might changed (30%) or not shortly before target presentation. Even if participants were not aware of this change, validity effect was significantly smaller in changed than in normal condition. This result is consistent with a representational account of validity effect in endogenous spatial cuing paradigms.

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Attention II - 17:30-19:30

(2015)**Inhibitory Control in Visual Search Depends on Central Attentional Resources** - *Damien FERNANDEZ, Stéphanie PHILIPPE, Camille FRECHET, George A. MICHAEL*

Inhibitory control appears to be a major process of visual selective attention, resistance to attentional capture (AC) presumably relying on it. Inhibition is assumed to depend on central attentional resources. AC should therefore increase with progressive depletion of these resources. Three experiments of visual search tested this hypothesis. Irrelevant onset distractors appeared in some trials, which participants were explicitely asked to ignore. A secondary task aimed at depleting resources : participants had to detect, in an auditory list concurrently presented, either nothing (simple task), or 1, 2 or 3 digits (dual-tasks). The results showed that depletion of resources induced increases in both RTs and costs of RT, this latter reflecting an increase of AC. This supports the resource-dependance hypothesis of inhibitory control. It also extends the relevance of inhibition to the domain of AC, as recently suggested and, furthermore, provides an operational index of this process of inhibition.

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Attention II - 17:30-19:30

(2016)**Implied Directionality Redefines Sidedness Effect** - *Alessia TESSARI, Giovanni OTTOBONI, Valentina BAZZARIN*

In this study we investigated whether implied motion in static photograph of hands may convey information about intended actions and whether this interacts with their automatic coding in generating the Sidedness effect (Ottoboni et al., 2005). A modified Simon task was used showing a hand with a colored circle in the centre. In the first experiment we replicated the Sidedness effect. In the second experiment, hands were rotated along their vertical axes in order to give the sense of motion and to test whether the direction of the implied action might interact with the sidedness effect. Both non-athletes and volleyball players were tested. Results showed a normal Sidedness effect for the back views in both groups. A Sidedness effect emerged in non athletes, but directionality contrasted the sidedness effect only in the volleyball players for the back views. Thus, action directionality seems to be coded only under special expertise requirement.

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Attention II - 17:30-19:30

(2017)**The Double Attention Paradigm: Dissociating Systems of Visual Selective Attention** - *Eran CHAJUT, Asi SCHUPAK, Avner CASPI, Daniel ALGOM*

Do different operational definitions of visual attention tap the same underlying process? To address this question, we developed a new paradigm that entailed various combinations of the flanker, Stroop, and Posner's orientation of attention tasks. In particular, the basic Posnerian design was combined with Stroop stimuli in Experiments 1-2, and with flanker stimuli Experiments 3-4. The routine result obtained with the orientation of attention task: Performance was poorer at unexpected than at expected location with both endogenous and exogenous means of orientation. The main question then focused on the flanker and Stroop effects at expected and unexpected locations. The flanker effects differed but the Stroop effects did not and were comparable under both conditions. We conclude that spatial attention (gauged by the orientation and the flanker tasks) and dimensional attention (gauged by Stroop task) tap separate processes of visual selection both of which are needed in normal attention processing.

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Attention II - 17:30-19:30

(2018)**The Negative Effect of Task Monotony and Sensation Seeking on Sustained Attention** - *Rebecca MICHAEL, Dr Renata MEUTER*

Vigilance tasks are by their very nature monotonous, yet the effect of monotony is typically not explored in isolation. Often, task monotony is confounded with fatigue, and monotony of task and environment are not distinguished. We examined the differential effect of task monotony - independent of fatigue - on sustained attention using a short (<5min) vigilance task, and explored the role of sensation seeking tendencies, degree of extraversion and the propensity towards cognitive failures in moderating performance. Task monotony, and therefore also task demand, was manipulated by varying target stimulus probability (p(monotonous) = 0.11 vs, p(non-monotonous) = 0.50). Continuous responses were required to all but the target stimuli. Performance was significantly worse in the monotonous task. Importantly, high sensation seekers performed far worse on vigilance tasks characterised by low task demand. These findings have implications for real world tasks involving sustained attention, with task monotony affecting performance independently of fatigue.

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Attention II - 17:30-19:30

(2019)**Stroop Faster Than Garner: Event-Related Potentials of Perceptual Interference in Visual Perception** - *Lars T. BOENKE, Frank W. OHL, Andrey R. NIKOLAEV, Thomas LACHMANN, Cees VAN LEEUWEN*

We studied perceptual organization in closed geometrical shapes. One part of the contour contained a target, another part the nontarget feature, thus creating perceptual overlap between the attended and unattended stimulus dimension. We observed Stroop interference (nontarget incongruence) and Garner interference (nontarget variation) on behavioral measures and event-related potential (ERPs). Additional experiments were designed to rule out the effects of potential confounding factors. Response times and error rates show reliable effects of Stroop and Garner interference. The ERPs show effects of Stroop interference on of the N1- and N2-component, and effects of Garner interference on mean activity of the P3-component. Furthermore we found the Stroop and Garner interference affecting the P3 peak latency. Taken together these results dissociate mechanisms underlying Stroop and Garner interference. Mechanisms associated with Stroop interference are demonstrated to involve early target discrimination; those associated with Garner interference involve later processes and reflect response uncertainty.

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Bilingualism II - 17:30-19:30

(2020)**Retrieval Induced Forgetting in Second Language Learners and Bilinguals -** *Patricia ROMAN, Maria Teresa BAJO*

Attemps to retrieve a word in a second language (L2) might involve processes that are similar to those involved in retrieval induced forgetting situations (Levy, McVeigh, Marful and Anderson, 2007). When trying to retrieve a word in L2, the dominant L1 word would compete for selection, and inhibitory processes could be recruited to stop retrieval of the non-intended L1 word. In our experiments, two group of native Spanish speakers varying in L2 (English) prociency named visual objects in English. The objects were presented one or five times. An independent proble lexical test was was used to capture inhibition. In addition, ERPs were recorded during repeated naming and the final test. Results indicated that repeated naming in English reduced the accessibility of the corresponding Spanish word, but this diminished accessibility depended of the language prociency. Results are discussed in the context of model that proposes inhibition as the mechanism involved in language selection in bilinguals.

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Bilingualism II - 17:30-19:30

(2021)**Direction of Translation Reverses the Cognate Effect in Proficient Bilinguals -** *Marina HRISTOVA, Armina JANYAN*

Our study aimed to investigate the influence of concreteness and cognate status of a word on the direction of translation effect. Bulgarian-English proficient bilinguals translated single words from and into their native language. Concreteness did not have an effect on reaction times. Noncognate words were translated faster from English into Bulgarian - the commonly established direction of translation facilitation effect. However, the opposite pattern was observed for cognates. Since cognates are assumed to be processed mainly at word-form level, this effect is attributed to differences in the orthographic transparency of the two languages - Bulgarian is a highly orthographically transparent language while English orthography is relatively opaque. High level of transparency facilitates phonological activation, thus speeding up recognition and translation of cognates. This finding points to an additional variable that can influence the cognate processing.

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Bilingualism II - 17:30-19:30

(2022)**Lexical Access in Bilingual Speech Production: ERP Correlates From Language Switching in Highly Proficient Bilinguals and L2 Learners.** - *Kristof STRIJKERS, Albert COSTA, Mikel SANTESTEBAN, Robert HARTSUIKER, Carles ESCERA*

The aim of the present study was to investigate lexical access and language control in highly proficient bilinguals and L2 learners. Three ERP experiments using the language switching paradigm, with special interest for the “inhibitory” N2 component, are conducted: In experiment 1 Spanish-Catalan highly proficient bilinguals performed the task in L1 and L2, in experiment 2 Spanish-Catalan bilinguals switched between L1 and L3 (English) and in experiment 3 Spanish learners of Catalan performed the task in L1 and L2. Behavioural results replicate those found in previous language switching experiments, with an asymmetrical switch cost for the learners and symmetrical switch costs for the highly proficient bilinguals. The ERP results show no modulation of the N2 between switch and no switch trials for the bilingual groups. In contrast for the L2 learners a clear N2 modulation between switch and no switch trials is present. The present study provides electrophysiological evidence that highly proficient bilinguals do not rely on inhibitory processes for lexical selection.

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Bilingualism II - 17:30-19:30

(2023)**Spelling Strategies of Good and Poor Biliterate Spellers in Their Second Acquired Language** - *Sonja UGEN, Sylvie BODE, Jacqueline LEYBAERT*

The study examines how good and poor spellers in German acquire literacy skills in French in grade 3. Research questions were whether a) their spelling of French words was influenced by their previous knowledge of phoneme-to-grapheme correspondences in German, b) the influence of the first written language knowledge is dependent on skill level in written German and c) the two groups of spellers also contrast on an implicit task of orthographic judgment. Results showed that after one year of practicing written French, a) influence from German phoneme to grapheme conversions were observed in unfamiliar words on an explicit orthographic task, b) this influence was larger for poor spellers and c) on an implicit orthographic judgment task however, children were able to differentiate between the two languages and there were no group differences. Although children recognize orthotactic language differences, spelling production is influenced by previous acquired orthographic knowledge.

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Bilingualism II - 17:30-19:30

(2024)**Is There a Bilingual Advantage in Cognitive Control? Evidence From Metalinguistic Awareness and Executive Functioning Tasks -** *Sandra INURRITEGUI, Géry D'YDEWALLE*

Current research provides evidence in favour of a bilingual superiority in processing control in both linguistic and non-linguistic domain. It is assumed that bilingualism promotes the development of the executive functions that contribute to managing two activated languages, namely selective attention, inhibition, and switching. In the present study, the expected bilingual advantage was tested by assessing Dutch-speaking monolingual and bilingual children using a grammaticality judgment task and 3 executive functioning tasks (inhibition, switching, and updating). Results provided support to the claim that bilingualism facilitates linguistic processing control; ignoring distracting meaning in order to judge grammaticality was a greater challenge to monolingual than to bilingual children. Although bilinguals responded more accurately in the inhibition task and showed less switch cost, there was no concluding evidence for a beneficial effect of bilingualism in the development of executive functioning. Factors affecting the relationship between bilingualism and cognitive control will be discussed.

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Bilingualism II - 17:30-19:30

(2025)**The Influence of Task Demand on Second Language Performance by Gallician Children** - *Isabel GÓMEZ VEIGA, José M. SUÁREZ RIVEIRO*

This study explores the effects of task cognitive load on oral performance by children who speak Spanish as their first language (L1) and Galician as second language (L2). Third grade students were asked to perform three different tasks in both languages: a direction-giving task, a narrative task and a decision-making task. According to Skehan & Foster (1999), task performance was analyzed in terms of fluency, accuracy and complexity in oral production. Results showed that the direction-giving task promotes fluency and a greater degree of accuracy, without achieving much complexity; the decision-making task produces the highest level of complexity; and the narration task sets an intermediate level of accuracy and complexity. Processing constraints were found in L2 fluency and accuracy areas in relation to lower linguistic processes (lexical access and word-order construction). Authors discuss the implications in terms of task-based instruction approach for second language acquisition.

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Bilingualism II - 17:30-19:30

(2026)**Grammatical Gender Processing in Italian-Spanish Bilinguals** - *Daniela PAOLIERI, Roberto CUBELLI, Pedro MACIZO, Teresa BAJO, Lorella LOTTO, Remo JOB*

In this study we explored whether the grammatical gender of the native language (L1) affects the production of words in a second language (L2). Previous investigations using a picture naming task have shown contrasting results (Costa, Kovacic, Frank & Caramazza, 2003; Bordag & Pechmann, in press). In our study,

Italian-Spanish bilinguals were instructed to name a set of pictures in L2. Half of the nouns had the same gender in the two languages, the other half had different gender. We found faster naming times in the gender congruent condition. No effect was observed with Spanish monolingual controls. We propose that for bilingual speakers the target picture activates the lemma representation of the corresponding nouns in both languages, thus facilitating the naming latency when the two lexical representations share the grammatical gender information.

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Cognitive Aging II - 17:30-19:30

(2027)**Interference in the Color Stroop Test: Age Differences as a Function of Item and Blocked Versions** - *Catherine LUDWIG, Erika BORELLA, Anik DE RIBAUPIERRE*

Studies on interference effects in younger and older adults in the Color Stroop task show divergent results. The aim of the study was to compare age-related effects in interference in two versions of the Color Stroop. Younger and older adults were provided either with a standard paper-and-pencil version (Blocked) or a with trial-by-trial randomized computerized version (Item) of the task. Both version contained incongruent and patch color naming items, and reading color names ones. Results from ANOVAs conducted on responses times revealed that in each version of the task, older adults showed larger interference effects than younger ones. However, analyses conducted using interference indices (relative ratios) controlling for baseline speed performance revealed that significant age-related differences in interference remained only in the Blocked version. Findings are discussed in terms task-characteristics susceptible to create different interference effects in young and older adults.

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Cognitive Aging II - 17:30-19:30

(2028)**Do the Elders Blame Memory Slips and Controlled Processes Through Their Memory Complaint?** - *Estelle GUERDOUX, Sophie MARTIN, Deborah DRESSAIRE, Denis BROUILLET*

The aim of this study was to explore the discrepancy observed between objective performances and subjective memory complaint in the elderly, by investigating the influence of controlled processes. Several methodological precautions were taken in order to control neuropsychological and psychopathological criterion. We used the habit paradigm developed by Hay and Jacoby (1996; 1999) to create a "memory slips" task. As assumed, equations from the Process-Dissociation Procedure of Jacoby (1991) showed that the 25 elderly people were impaired in their abilities to engage in recollection, compared to the 24 young adults. Surprisingly, young and older persons did not differ in term of memory complaint. However, as expected, correlationnal and post-hoc analysis evoked that the highest memory–complained participants were also the most controlled processes-impaired subjects. These data are in line with Jaboby's view that there were no process pure memory tasks. Our results are discussed in term of clinical implications.

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Cognitive Aging II - 17:30-19:30

(2029)**Visual Recognition of French Words in Young and Older Adults: a Regression Analysis Study** - *Delphine DOROT, Stéphanie MATHEY, Christelle ROBERT*

The aim of this study is to investigate age-related performance of visual word recognition concerning objective lexical factors collected from French lexical databases (objective frequency, concreteness and polysemy) and subjective lexical indicators computed with separate estimates for young and older adults (subjective frequency and age-of-acquisition). Other factors were controlled (orthographic neighbourhood, number of letters and syllables). In total, 220 words were presented in a lexical decision task to 47 young and 42 older participants. The regression analysis indicated that subjective frequency and age-of-acquisition were the best predictors of the young and older participants' latencies. In addition, the data showed that subjective estimates carried out by the old participants did not make it possible to predict in an optimal way the RTs of the young participants and conversely. This underlies the need for taking into account the estimates corresponding to the age of the participants for the subjective variables.

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Cognitive Aging II - 17:30-19:30

(2030)**Negative Priming and Aging: Episodic Retrieval or Inhibition?** - *Séverine LESTREMAU, Virginie POSTAL, Paméla LALIETTE*

The negative priming effect has been shown as more greater with young than with older adults. The inhibition and episodic retrieval hypotheses have been proposed to explain that the negative priming is influenced by age. The purpose of this experiment was to test these hypotheses by varying the repetition of both distractors and semantic categories. Forty participants (21 young adults, 19 old adults) performed an identity semantic priming task. The conditions of repetition of the distractors were varied: they were identical or different from the semantic network of the target. According to the episodic retrieval deficit hypothesis, a difference between young and older adults is expected with the manipulations of semantic relationships between targets and distractors. If no such difference is observed, the age-associated deficit in negative priming should be explained with the inhibition's deficit hypothesis. The data are more consistent with the inhibition deficit hypothesis than with the episodic retrieval one.

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Cognitive Aging II - 17:30-19:30

(2031)**Theory of Mind in Normal Aging** - *Sara BOTTIROLI, Elena CAVALLINI, Serena LECCE, Paola PALLADINO*

Theory of Mind (ToM) is defined as the ability to infer others' mental states. Studies on ToM have largely focussed on preschoolers with much less attention paid to the later life. The aim of this study was to explore ToM in a adult sample, controlling for both fluid and crystallized abilities. To this end, 48 young adults (aged 20-30 years), 27 young-old (aged 59-70 years) and 29 old-old age groups (aged 71-82 years) were compared on their understanding of ToM and control stories. Results showed that the young group performed significantly better than both the young-old and old-old group on the ToM stories but not on control stories. This pattern of results remained significant after controlling for cognitive abilities. Overall, these results indicate age-related deficit in referring to mental states in order to understand others' behaviour. Interestingly, this decline seems to be independent of changes in fluid and crystallized abilities.

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Dyslexia I - 17:30-19:30

(2032)**Frequency Effects of Morphological Units in Derived and Pseudoderived Words in French Dyslexics** - *Pauline QUEMART, Severine CASALIS*

We aimed at examining the effects of base frequency, cumulative frequency and family size of derived and pseudoderived words in dyslexic children, age-matched and reading-matched French readers. Children were asked to perform a lexical decision task in which the base frequency (high vs.low), the size of the family (large vs. small) and the cumulative frequency (high vs. low) of bases and pseudobases were manipulated. Results showed that dyslexics were sensitive to base frequency, family size and cumulative frequency of derived words contrary to reading-level matched readers who were only sensitive to the family size of derived words and of age-matched readers who showed no frequency effects. None of the readers were significantly sensitive to frequencies of morphological units in pseudoderived words. Thus, dyslexic children benefit from morphological units during reading, especially when these units are embedded in derived words.

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Dyslexia I - 17:30-19:30

(2033)**Training Two Types of Impaired Cognitive Skills in Developmental Dyslexia** - *Melanie JUCLA, Yves CHAIX, Stephanie IANNUZZI, Jean-Luc NESPOULOUS, Jean-François DEMONET*

This study evaluated the effects of two training programs consisting of auditory phonological and visual orthographic exercises in 28 dyslexic children (mean age, 125 months +/- 10). We classified dyslexic participants into three subgroups: phonological (9), surface (7) and mixed (12) dyslexics. During a 4 month period, children received the two types of training on a daily basis, each type of training lasting 8 weeks. The order of training type was counterbalanced across participants. Three neuropsychological assessments were administered, one before, and one after each training period. Children improved in reading, spelling, phonemic awareness and short term memory after the whole program. A training-specific effect was observed in that phonological training improved performances in phonemic awareness. Furthermore, visual verbal skills of the surface group increased specifically after the visual training compared to the other groups. This study provides empirical motivation for tailored remediation depending on each child's cognitive profile.

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Dyslexia I - 17:30-19:30

(2034)**Visual Attention Span Deficit in Developmental Dyslexia: a Simultaneous Processing Disorder.** - *Delphine LASSUS-SANGOSSE, Sylviane VALDOIS*

A number of studies holds that people with dyslexia have a deficit in processing sequential visual information. The disorder attributed to sluggish attentional shifting then extends to auditory processing and co-occurs with phonological problems. Other data rather suggest that dyslexia results from a simultaneous processing disorder due to a visual attention span reduction. This disorder more typically occurs in the absence of phonological problems. These two contrasted assumptions of developmental dyslexia were assessed using two groups of dyslexic children with or without phonological problems and a group of matched control children. The participants were engaged in two tasks requiring the oral report of series of simultaneously or serially displayed letters. The dyslexic participants were found to exhibit a simultaneous processing disorder in the absence of serial processing impairment. The deficit was stronger in the non phonological group. These results support the visual attention span deficit hypothesis of developmental dyslexia.

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Dyslexia I - 17:30-19:30

(2035)**A Case Study of Phonological Dyslexia: Evidence for an Amodal Attentionnal Deficit in the Perception of Rapid Stimuli Sequences.** - *Marie LALLIER, Sophie DONNADIEU, Sylviane VALDOIS*

The attentional blink (AB) refers to a decrease in accuracy that occurs when observers are required to detect the second of two rapidly-sequential (visual or auditory) targets. The AB is typically attributed to an inability to rapidly reallocate attentional resources from the first to the second target. Hari et al. (1999) showed that dyslexic adults exhibit a prolonged visual AB as compared to normal readers. This study aimed at assessing whether the AB deficit is amodal as postulated by Hari & Renvall (2001). Similar rapid sequential visual and auditory presentation tasks were given to a group of normal readers and a young adult with developmental phonological dyslexia. The control readers demonstrated an AB in both modalities. The dyslexic participant exhibited a prolonged visual AB and a greater magnitude in auditory AB. These results will be discussed in light of the Sluggish Attentionnal Shifting theory of dyslexia (Hari & Renvall, 2001).

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Dyslexia I - 17:30-19:30

(2036)**Eye Movements in Reading Aloud and Visual Search in Developmental Dyslexia: Impact of the Visual Attention Span** - *Chloé PRADO, Sylviane VALDOIS*

According to the visual attention (VA) span hypothesis, (Bosse et al., in press), dyslexia might result from a reduction of the VA span, i.e. of the number of distinct visual elements which can be processed simultaneously in a multi-element array. The eye movements of 14 dyslexic children having a VA span reduction and 14 normal readers were compared in two tasks of visual search and text reading. The dyslexic participants made a higher number of rightward fixations in reading only. They simultaneously processed the same low number of letters in both tasks whereas normal readers processed far more letters in reading. Importantly, the children's VA span abilities related to the number of letters simultaneously processed in reading. The atypical eye movements of some dyslexic readers in reading thus appear to reflect difficulties to increase their VA span according to the task request.

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Dyslexia I - 17:30-19:30

(2037)**Fractionating the Multi-Element Visual Processing Deficit in Developmental Dyslexia** - *Matthieu DUBOIS, Chloé PRADO, Sylviane VALDOIS, Søren KYLLINGSBÆK*

Multi-element visual processing deficit was investigated in young developmental dyslexic patients by means of report tasks within a multiple-case approach. A computational model of the attentional involvement in multi-object recognition [Bundesen, C. (1990). A Theory of Visual Attention. Psychological Review, 97(4), 523-547.] was further used to fractionate individual performance into different theoretical components and to describe the cognitive impairments at the source of this multi-element processing deficit. By combining psychophysical measurements and computational modeling, we demonstrated that multi-element processing deficit in dyslexia stem from at least two distinct cognitive sources: a limitation of the maximal number of elements extracted from a brief visual display and stored in visual short term memory, and a reduction of the rate of information uptake.

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Emotion II - 17:30-19:30

(2038)**Mesio-Temporal Lateralization of Musical Emotion Processing** - *Stéphanie KHALFA, Isabelle PERETZ, Maxime GUYE, Patrick CHAUVEL, Catherine LIEGEOIS-CHAUVEL*

The right and left anteromedial temporal lobes have been shown to participate in emotion processing in humans. The aim of the study was to further address their role in musical emotions recognition. Twenty-six epileptic patients with right or left anterior mesio-temporal resection (including the amygdala), and sixty control subjects had to listen to musical selections conveying either happiness or sadness, and to recognize the intended emotion. Right and left temporal resections were found to both impair sadness recognition, whereas happiness recognition was altered solely following the left resection. For the first time, the mesio-temporal structures were demonstrated to be asymmetrically involved in the recognition of positively-valenced musical emotion.

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Emotion II - 17:30-19:30

(2039)**Alexithymia and the Automatic Processing of Affective Information** - *Karolina CZERNECKA, Michal WIERZCHON, Dariusz ASANOWICZ*

Alexithymia can be defined as multifaceted personality construct characterized by a specific pattern of cognitive deficits concerning representing and processing of affective-emotional information. As empirical data regarding automatic processing of affect-loaded stimuli by alexithymics is scarce, two studies addressing this issue were carried out. In study 1 the classic affective priming paradigm was used. Masked emotional primes were shown for a brief duration, after which participants made a

preferential judgment about neutral target stimuli. Alexithymia level did not modify priming effectiveness, although the primes influenced the speed of judgment formation in alexithymic subjects. This result might suggest that alexithymia does not impair processing of affective stimuli on automatic level. To rule out alternative explanations and replicate the findings, study 2 was conducted. The priming procedure was partially modified with reference to judgment type and stimuli used. Additionally, dot-probe task was employed. The data is currently being analyzed.

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Emotion II - 17:30-19:30

(2040)**Effects of Negative Emotion State on Driver's Attentional Behaviour During a Simulated Driving Task** - *Christelle PECHER, Céline LEMERCIER, Jean-Marie CELLIER, Céline DELGAS*

The present original study investigated the impact of negative emotional state (induced by a preliminary combined imagery-music procedure and/or by music extracts presented during the task) on drivers' attentional behaviour. Firstly, either negative emotion (experimental group) or neutral emotion (control group) was induced in participants. Secondly, participants performed a simulated driving task during which negative and neutral music extracts were presented. According to the literature, negative emotion was expected to deteriorate attentional behaviour. Results confirmed that negative induction deteriorated longitudinal controls although lateral controls remained identical. This effect was reinforced when negative induction was followed by negative music presentation. The implication of these findings for theories about the impact of emotion on cognition and driving behaviour will be discussed.

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Emotion II - 17:30-19:30

(2041)**Defining Approach and Avoidance in Terms of Action Effects** - *Saskia VAN DANTZIG, Inge BOOT, Diane PECHER*

Several studies have shown that positive and negative stimuli can trigger approach and avoidance behavior. These studies, however, are inconsistent in their definitions of approach and avoidance reactions. Some researchers define arm flexion as approach and arm extension as avoidance, whereas others use the opposite mapping. The current study aims to solve this ambiguity. Based on the Theory of Event Coding, we propose that approach and avoidance actions are represented in terms of their perceivable effects. In two experiments, intrinsically neutral responses (left- and right-handed key presses) were consistently followed by moving the stimulus either toward or away from the participant. Responses to positive words were faster when followed by a toward movement, whereas responses to negative words were faster when followed by an away movement. This suggests that approach and avoidance reactions are defined in terms of their distal effects rather than in terms of their physical properties.

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Emotion II - 17:30-19:30

(2042)**Is "How You Said It" Dependent on "What You Said"?** - *Moon-Gee CHOI, Kichun NAM*

The present paper focuses on the interaction between lexical-semantic information and affective prosody. The previous studies showed that the influence of lexical-semantic information on the affective evaluation of the prosody was relatively clear, but the influence of emotional prosody on the word evaluation remains still ambiguous. In the present, we explore whether affective prosody influence on the evaluation of affective meaning of a word and vice versa, using more ecological stimulus (sentences) than simple words. We asked participants to evaluate the emotional valence of the sentences which were recorded with affective prosody (negative, neutral, and positive) in Experiment 1 and the emotional valence of their prosodies in Experiment 2. The results showed that the emotional valence of prosody can influence on the emotional evaluation of sentences and vice versa. Interestingly, the positive prosody is likely to be more responsible to this interaction.

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Emotion II - 17:30-19:30

(2043)**Dynamics of Emotions** - *Lorene DELCOR, Thibaut BROUILLET, Denis BROUILLET*

The recent researches on emotion tried to account for links between emotion and cognition. Two propositions are opposed: the first suggests that emotion is an intrinsic property of objects of the world which is instantiated in memory, the second suggests that emotion emerges in the "here and now" since the multiple and complex interactions, of the past and present (Salvador, 1993; 2005). The development of times series analysis of psychological data allows us to ask this question. Indeed, this analysis shows the temporal dependencies between successive behaviors of cognitive system. In others words, it allows us to bring out the dynamic of changes of cognition (here, changes of valences attributed to items) according to the environmental dynamic (i.e. the sequence of the items are built either by an organization rule or by a random rule). Results are discussed within the framework of emotion theory and dynamical complex system theory.

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Episodic Memory II - 17:30-19:30

(2044)**Signal Detection Versus Threshold Models of Source Memory** - *Julia SCHÜTZ, Arndt BRÖDER*

Conventional measures of source memory often confound memory processes and response biases. To solve this empirical problem, multinomial models have been proposed. These assume finite sets of latent states and hence imply a threshold concept. Critics have suggested signal detection models (SDT) with normally distributed probability densities on a familiarity continuum as a viable alternative. ROC analyses based on confidence ratings typically yield curvilinear ROCs which apparently support SDT. However, our reanalyses and simulations demonstrated that threshold models using ratings can also produce curved ROCs. To achieve a better discrimination between models classes, the experiment reported here manipulated response bias by varying rates of Source A vs. B items in test. Both models were at least equally capable of describing the data. From a pragmatic point of view several advantages support the use of multinomial models because they approximate signal detection models, and furthermore, they are flexible and conceptually simple.

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Episodic Memory II - 17:30-19:30

(2045)**The Roles of Encoding and Retrieval Processes in False Memory** - *Emma BOULD, Stephen DEWHURST*

Two experiments used the DRM and category repetition procedures to investigate whether false memories are created at encoding or retrieval. Experiment 1 investigated the role of associations at study by manipulating the organisation of the items. Participants studied DRM or categorised lists presented in either blocked or random order. The number of false R and K responses for both lists were not affected by presentation order. In Experiment 2 participants were tested by part-set cueing. After studying 10-item DRM or categorised lists they received one of three tests conditions. They were either instructed to recall the words without any cues, given five intra-list (studied words) or five extra-list (non-studied words) cues to help them remember the items. Both lists showed no significant difference between the three test conditions. These findings support the view that false memories caused by both procedures are the result of processes that occur at encoding.

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Episodic Memory II - 17:30-19:30

(2046)**Directed Forgetting of Pictures and Images** - *Yuh-Shiow LEE, Yu-Han HUANG*

This study used the item-method directed forgetting procedure to investigate the intentional forgetting of pictures and images. Experiment 1 compared directed forgetting effect among words, words with imagery instructions, pictures, abstract words, and abstract dot patterns. Participants were tested for both free recall

and recognition. Experiment 2 used a paired association learning paradigm and a cued-recall test. Participants encoded word-pairs in three ways: rote rehearsal, meaning association, and interactive imagery. Encoding using imagery or associative link reduced directed forgetting costs and directed forgetting benefits were found only in a free recall test, and not in a recognition test or a cued-recall test. These findings suggest that directed forgetting costs were reduced in more effective encoding conditions and directed forgetting benefits were affected by the output order. Results are discussed in terms of the mechanisms that produce item-method directed forgetting and implications for picture memory.

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Episodic Memory II - 17:30-19:30

(2047)**Veridicality, Consistency, and Confidence in Memory for Surprising and Unsurprising Events** - *Emanuele COLUCCIA, Carmela BIANCO, Maria A. BRANDIMONTE*

Although research appears to converge on the idea that surprise is not essential to form a "Flashbulb Memory" (FBM), no study has explicitly shown that a FBM that develops from an unexpected event has the same structure as a FBM that develops from an expected event. In the present research, we explored whether there is any substantial difference in memory for surprising and expected events in terms of veridicality, consistency and confidence, by contrasting the pattern of results of two studies. Two groups of participants were tested for their memories of a surprising event (Study I) or an expected event (Study II). All participants were then re-tested after 6 months and again after one year from the first interview. The same patterns of veridicality, consistency, and confidence were found for both events. Consistent with the "Narrative and Rehearsal" hypothesis, our results emphasize the role of post-encoding factors in the formation of FBMs.

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Episodic Memory II - 17:30-19:30

(2048)**Memory for Scenes: Refixations Reflect Retrieval** - *Linus HOLM, Timo MÄNTYLÄ*

Most conceptions of episodic memory hold that reinstatement of encoding operations is essential for retrieval success, but the specific mechanisms of retrieval reinstatement are not well understood. In three experiments, we used saccadic eye movements as a window for examining reinstatement in scene recognition. In Experiment 1, participants viewed complex scenes, while number of study fixations was controlled by using a gaze-contingent paradigm. In Experiment 2, effects of stimulus saliency were minimized by directing participants' eye movements during study. At test, participants made remember/know judgments for each recognized stimulus scene. Both experiments showed that remember responses were associated with more consistent study-test fixations than false rejections (Experiments 1 and 2) and know responses (Experiment 2). In Experiment 3, we examined the causal role of gaze consistency on retrieval by manipulating participants' expectations during recognition. After studying name and scene pairs, each test scene was preceded by the same or different name as during study. Participants made more consistent eye movements following a matching, rather than mismatching, scene name. Taken together, these findings suggest that explicit recollection is a function of perceptual reconstruction and that event memory influences gaze control in this active reconstruction process.

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Executive Control I - 17:30-19:30

(2049)**Working Memory and Fluid Intelligence: Examining the Relationship Between Several Working Memory Tasks and the Coloured Progressive Matrices.** - *Carmen BELACCHI, Barbara CARRETTI, Cesare CORNOLDI*

There is some evidence that working memory is related to the performance in fluid intelligence tasks such as Raven's Tests. In the case of Raven's Advanced Progressive Matrices, for example, Unsworth and Engle (2005) demonstrated that this relationship is not mediated by factors such as item difficulty, memory load, and rule type and highligthed the importance of attention control as a possible link between working memory capacity and fluid abilities. To deeply analyse this issue in this study we presented to participants (varying in age between 4 and 11 years) the Raven's Coloured Progressive Matrices.and a battery of tasks in which the request of attentional control was manipulated. Our results clearly confirmed that the request of attentional control is the key aspect in explaining the role of working memory in fluid intelligence performance. The results are examined with the hypothesis of the vertical continuum of Cornoldi and Vecchi (2003) assuming that the relationship between working memory and fluid intelligence increases in correspondence with increases of the control required by the working memory task.

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Executive Control I - 17:30-19:30

(2050)**Executive Control of Retrieval in Noun and Verb Production** - *Cristiano CRESCENTINI, Fabio DEL MISSIER, Tim SHALLICE*

Existing studies on verb generation do not offer a clear picture of the interaction between executive control and associative retrieval. We conducted an experiment requiring young participants to produce nouns or verbs in response to noun stimuli. The results highlighted the importance of S-R association strength and showed that task-irrelevant noun responses interfere with verb generation. In a previous study older participants were slower and less accurate when they had to retrieve weakly-associated verb responses while Parkinson's Disease patients failed dramatically in this same condition. A computational model, grounded in ACT-R retrieval equations and assuming a set of control operations (attentional resource allocation during retrieval, response checking and inhibition) was able to reproduce the whole pattern of data. The reduction of attentional resources explains the profile of the older participants, while the failure to inhibit task-irrelevant responses and a difficulty in reallocating reduced attentional resources explains the PD patients' behavior.

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Executive Control I - 17:30-19:30

(2051)**Transfer of Task-Switching Training: Results From a Lifespan Study** - *Julia KARBACH, Jutta KRAY*

The aim of this study was to investigate lifespan changes in the transfer of task-switching training. We examined near transfer to structurally similar switching tasks and far transfer to structurally dissimilar executive tasks, such as working-memory tasks and fluid intelligence measures. In addition, we assessed the effects of variable task-switching training (i.e., different tasks in each training session) and the use of verbal self-instructions on the amount of training transfer. We investigated three age groups (7-8; 20-27; 65-75 years of age) by means of an internally cued switching paradigm in a pretest-training-posttest design. Results revealed near transfer of switching training in all age groups, especially for children and older adults. Near transfer was enhanced in young and older adults, but not in children, when training was variable. Noteworthy is that we also found far transfer of task-switching training to other executive tasks and fluid intelligence in all age groups.

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Executive Control I - 17:30-19:30

(2052)**The Control of Distraction by New Environmental Sounds in Children and Adults** - *Nicole WETZEL, Andreas WIDMANN, Erich SCHRÖGER*

The study focused on the control of involuntary distraction by environmental sounds (novels) in two groups of children (7-8 years, 10-12 years) and adults. Novels were presented occasionally in a sequence of standard sounds. The predictability of the type of sound (standard or novel) by preceding visual cues was varied. Subjects performed a sound-related task and were instructed to attend predictive cues in order to avoid distraction. Although the type of sound was not task-relevant, novels caused an involuntary switch of attention

(reflected by P3a in the event-related potential) and prolonged reaction times. Adults were able to reduce P3a-amplitudes and reaction time prolongations if valid predictive information about the appearance of a novel was present. This indicates that adults but not children can control involuntary distraction by novel sounds, which cannot be evaluated in advance. Results suggest immature control of distraction at least until the age of 10-12 years.

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Executive Control I - 17:30-19:30

(2053)**Differential Impairment of Inhibitory Functions in Parkinson's Disease** - *Alessia GRANA, Nadia GAMBOZ, Emanuele BIASUTTI, Carlo SEMENZA*

Executive dysfunction has long been implicated in Parkinson's Disease (PD) and involves, among others problems, a decline in inhibitory abilities. Given the increasing amount of evidence highlighting the nonunitary nature of the inhibitory processes, the present investigation aimed to assess whether PD determines a generalized inhibitory breakdown or whether it selectively affects only some inhibitory processes. To this purpose twenty non-demented PD patients were compared to twenty healthy controls on different experimental tasks assumed to measure three different inhibitory-related functions, namely prepotent response inhibition, resistance to distractor interference, and resistance to proactive interference. Results revealed that PD selectively affected prepotent response inhibition, as indicated by patients' longer times to inhibit an ongoing response compared to controls. This deficit was independent of general slowing and cognitive impairment. The other inhibitory-related functions resulted equivalents in the two groups. These findings complement the evidence of the nonunitary nature of inhibitory functions and suggest that PD mainly affects the inhibition processes subserved, at least in part, by basal ganglia.

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Executive Control I - 17:30-19:30

(2054)**Backward Correspondence Effects Are Modulated by Task Grouping** - *Ravid ELLENBOGEN, Nachshon MEIRAN*

When performing two temporally overlapping tasks, Task 1 performance is sometimes affected by Task 2 response activation. Two boundary conditions were proposed to this Backward Correspondence Effect (BCE). According to Hommel (1998), BCEs depend on the temporal overlap between the tasks. Logan and Gordon (2001) suggested that BCEs are limited to situations in which the two tasks have the same task set. However, BCEs are sometimes absent with maximal temporal overlap (Logan & Gordon, 2001) and observed with different task sets (Hommel, 1998). We suggest an alternative hypothesis according to which BCEs depend on the subjective grouping of the two tasks. This hypothesis was confirmed in two experiments in which task grouping, according to the Gestalt principles of Proximity and Common Region (Palmer, Brooks & Nelson, 2003), dictated the size of the BCE.

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Executive Control I - 17:30-19:30

(2055)**Conflict Adaptation Processes in a Simon-Go/Nogo-Paradigm** - *Roland NIGBUR, Birgit STÜRMER*

In an electrophysiological study we investigated whether different types of cognitive conflicts trigger distinct adaptation processes in the upcoming trial. Therefore, a Simon task was combined with NoGos. Overall RTs were prolonged in trials following NoGos and errors. Moreover, the preceding trial type affected the Simon effect: The 75-ms Simon effect after a compatible Go was reduced to 29-ms after an incompatible Go. Errors and NoGo predecessors reduced the Simon effect with 46 ms and 50 ms, respectively, to a much lesser degree. NoGo trials elicited a fronto-central negativity peaking between 228 - 240 ms post-stimulus (N2c) independent of the predecessor´s trial type. Incompatible Gos evoked an N2c only when preceded by a compatible trial, and its scalp distribution differed from the N2c to NoGos. We, hence, conclude that incompatible Simon trials trigger adaptation processes that differ from those after NoGo trials and errors.

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Executive Control I - 17:30-19:30

(2056)**Being Mindful About Mindlessness: Mindlessness as a Mind Set.** - *Hadas ER-EL, Nachshon MEIRAN*

We conducted 5 experiments to examine the hypothesis that mindlessness is a task set. The measure of mindlessness was the number of trials required to unveil an arbitrary response rule for letter digit combinations, and the major manipulation was whether rule finding was performed as a task switch (after rule application) or as a task repetition (after rule finding). A baseline group was included, the members of which were only required to find the test rule without going through either rule application or rule finding beforehand. The findings support the hypothesis and reveal that switching from rule application resulted in substantial increase in the number of trials required for rule finding, even after a single application trial (Experiment 4), and when rule finding was performed on a new set of stimuli (Experiment 5)

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Higher Mental Processes - 17:30-19:30

(2057)**Neurocognitive Correlates of High and Low Figural Creativity: Linking With Attention** - *Nina VOLF, Olga RAZUMNIKOVA, Irina TARASOVA, Michail ONISHENKO*

EEG power and coherence were studied in 40 high- (HCA) and low- (LCA) creative achievers mentally performing tasks from Torrance figural subtest. Participants also performed lateralized Stroop and oddball tasks to examine attention-creativity association. Differences in the theta1 and theta2 power between HCA and LHA were connected with participants' gender. In males, HCA demonstrated task induced theta2 desynchronization in contrast to synchronization in LCA. In LCA, gender differences manifest themselves as task induced theta1 desynchronization in the right fronto-temporal area in females in difference to synchronization in males and generalized increase of theta2 power in males in contrast to it's decrease in females. HCA in comparison with LCA demonstrated higher coherence values. Reduced abilities in the right hemisphere novelty processing were found in all HCA and in selective attention in male HCA. These results suggest that there are gender specific associations between EEG-activation and creativity and between creativity and attention.

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Higher Mental Processes - 17:30-19:30

(2058)**Motivation Related Hemispheric Interaction Changes During Creative Thinking** - *Olga RAZUMNIKOVA, Nina VOLF, Irina TARASOVA*

Effect of extrinsic motivation on cortex activity during verbal and figural creativity testing has been studied using EEG mapping in 53 university students (27 males). Explicit instruction "to create the most original solution" (INS2) as compared to implicit solving of creative problem (INS1) induced both an increase of creativity indices and changes of the alpha1,2, and beta2 rhythms. Both power in posterior cortex and coherence in anterior cortex were increased during resting condition after INS2 vs. INS1 for the alpha1,2 bands. Task-related desynchronization of the alpha1,2 rhythms was higher and beta2 synchronization was lower after INS2 vs. INS1. Motivation associated patterns of the alpha2 and beta2 coherence were different in anterior and posterior regions depending on sex and task type. So, explicit instruction "to be creative" affects pretest alertness and task induced patterns of hemispheric activation and functional integration among neuronal assemblies evolving in the alpha and beta frequency ranges.

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Higher Mental Processes - 17:30-19:30

(2059)**The Act-R Cognitive Model Predicts Human Performance in a Problem Solving Task** - *Francesco S. MARUCCI, Lucio INGUSCIO, Sara VALERI*

Soar and Act-R Cognitive models suggest that behavioural moderators as emotion, experienced during problem solving, affect human performance (Belavkin, 1999). The aim of this study is to implement the ACT-R cognitive model and to re-use a code ACT-R cognitive architecture overlay proposed by Jones, Ritter and Wood (2000) in order to predict human performance during a problem solving task. The subjects tried to solve a 8-puzzle problem in a "free time" condition and in a "under time pressure" condition. We compared the human performance data to those of the ACT-R model: as predicted, results confirm the ACT-R model goodness and the code overlay capacity to account the role of time pressure.

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Higher Mental Processes - 17:30-19:30

(2060)**Embodied Cognition: Multi-Modal Imagery Generation Activates Pre-Motor Areas** - *Massimiliano PALMIERO, Marta OLIVETTI BELARDINELLI, Carlo SESTIERI, Alessandro LONDEI, Alessandro D'ausilio D'AUSILIO, Rosalia DI MATTEO*

In this fMRI study, we verified the embodied cognition perspective, according to which conceptual knowledge is grounded in sensory-motor systems, by means of auditory presentation of imagery sentences (twelve for each sensory modality plus twelve for both motor and somatic imagery, each type contrasted with twelve abstract concepts). For the most of imagery modality considered significant activations were observed in the corresponding modality-specific systems, as well as in other sensory areas. The left Inferior Temporal Gyrus (BA 37), the left Inferior Parietal Lobule (BA 40), and the left Premotor Cortex (BA 6) showed an heterogeneous pattern of activation across imagery modalities. Overall, consistently with the embodied cognition perspective, these patterns of activity seem to imply, apart from sensory specific activations, also a concept-driven motor involvement when mental imagery (in different modalities) is performed in response to spoken concrete sentences.

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Higher Mental Processes - 17:30-19:30

(2061)**Subliminal Priming of General and Specific Working Models of Attachment** - *Catarina GONZALEZ, Francisco ESTEVES, Isabel SOARES*

Internal working models of attachment (IWMs) are presumed to be largely unconscious representations of childhood attachment experiences, organized in a complex network of interconnected models. However, the structure of general and relationship-specific IWMs is still unclear (Collins et al., 2004). This study investigated the effects of subliminal priming activation of general and relationship-specific IWMs using the Subliminal Sentence Priming Method (Maier et al., 2004). Thirty-eight participants reported their attachment style on the Relationships Questionnaire (RQ; Bartholomew & Horowitz; 1991). The accessibility to general and relationship-specific IWMs was measured in a lexical decision task, manipulating word's emotional content. Prior to the lexical decision task, positive-, negative- and neutral-sentence primes were presented using the Subliminal Sentence Priming Method. The results showed that prime led to a general facilitation to emotional words, compared with neutral words, independently of attachment style.

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Implicit Learning II - 17:30-19:30

(2062)**Implicit Learning of Sequences and Language Impairment** - *Agnes LUKACS, Attila KRAJCSI, Dezso NEMETH, Ferenc KEMENY*

We examined the relationship between implicit learning abilities and language acquisition by testing children diagnosed with language impairment (N=20; mean age: 10.4; LI)) and typically developing children matched on chronological age (N=20; mean age: 10.2; AC)) on different versions the SRT task in different modalities. Our aim was to test the Procedural Deficit Hypothesis of SLI (PDH, Ullman and Pierpont, 2005), claiming that developmental disorders of the system should result in deficits in procedural learning, such as implicit learning of sequences within both the linguistic and nonlinguistic domains. On the classical version of the SRT task, the LI group showed the same amount of learning as the control group. This finding is not compatible with the PDH. We also tested modality effects with a design with alternating repeating and random sequences, which showed no learning in either LI or AC children (adults did learn). These results inspire further investigation.

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Implicit Learning II - 17:30-19:30

(2063)**Probabilistic Category Learning in Children and Adults: Sunshine or Chocholate?** - *Ferenc KEMENY, Agnes LUKACS*

In the Probabilistic Category Learning (PCL) paradigms learning is based on mechanisms and categorization takes place through the abstraction of probabilistic correlational attributes. By examining various forms of implicit knowledge we are seeking a paradigm suitable for testing PCL in children. For this reason we compared the classic Weather Prediction task with the structurally identical newer Ice-cream task. We compared performance of both children and adults on the two tasks. If the abstraction of statistical information is a domain general process, we could expect that the PCL task should be independent of both stimuli attributes and modalities. Our research is based on the first part of the statement, but our results do not support this hypothesis. Our further plan is to develop a version of the original PCL task that would be able to measure the performance of children.

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Implicit Learning II - 17:30-19:30

(2064)**Isoproblems in the Tower of London Puzzle: a Means to Assess Implicit Memory?** - *Amory FABER, Fatma SÜRER, Andreas M. HINZ, Kai BÖTZEL, Adrian DANEK*

Shallice´s Tower of London is popular to assess problem solving. We implemented a set of isoproblems: they require identical moves, but the colours of the balls are permuted. Thus, difficulty is the same even if the tasks look different. We wanted to analyse the impact of isoproblems, yet little studied, and hypothesized that there may be a learning effect specific to them ("Iso-Effect"). Problem solving by 14 patients with idiopathic Parkinson´s disease (IPD), mean age 66 years, was compared to that of matched healthy controls (59 years). In general, the patients needed more time and more moves to solve the problems, and their solutions were less efficient. Although both groups dedicated the same amount of their overall solution time to planning, controls found significantly better solutions. In particular, they showed specific learning over the isoproblems, an effect apart from a general learning effect. In contrast, patients with IPD did not improve their isoproblem performance. We thus confirmed an "Iso-Effect" in healthy subjects and suggest that it may be related to implicit memory which is thought affected by IPD.

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Implicit Learning II - 17:30-19:30

(2065)**Auditory Similarity Vs. Auditory Identity: Effects on Implicit Memory in Word-Stem Completion Tasks** - *Stefanie SCHIFFER*

Several experiments show that implicit memory is impaired if modality changes between presentation and recall. According to the theory of transfer-appropriate processing (Morris et al., 1977), this finding results from modality-specific differences in processing between learning and recall. It remains unclear whether intra-modal cue changes have any effect on implicit memory. The aim of the study was to examine if cues during recall in a word-stem completion task have to be absolutely identical or whether similar cues within the same modality increase implicit memory in the same way. Thus, we used two types of auditory presented word-stems: 50 % cut from sound files presented during the learning phase ("identical") and 50% cut from newly recorded sound files by the same speaker ("similar"). The results indicate that only identical word-stems improve implicit memory while intra-modal cue changes in similar word-stems have a significantly negative effect on implicit memory.

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Implicit Learning II - 17:30-19:30

(2066)**Working Memory and Explicit Knowledge in the Serial Reaction Time Task** - *Francisco Javier GUZMAN MUÑOZ, Addie JOHNSON*

Single-task (ST) and dual-task (DT) groups were compared in three different experiments of implicit sequence learning with a serial reaction time task. The sequences used were of the hybrid type (Cohen, Ivry & Keele, 1990) which contains positions that can be predicted from their immediate predecessor (unique associations) and positions that cannot be predicted unless two previous positions are considered (ambiguous associations). The aggregate data from the three experiments showed a positive correlation between learning of ambiguous associations and working memory span in the ST group. No correlation was found between working memory span and learning in the DT group. Furthermore, data from free generation tests showed consistently an advantage for the ST group in the explicit knowledge of ambiguous associations. Results show the involvement of explicit processing in sequence learning and its interaction with sequence structure.

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Language Acquisition - 17:30-19:30

(2067)**Lemma-Frequency and Past-Participle-Frequency Effects in a Spelling-To-Dictation Task in French** - *Isabelle BONNOTTE, Isabelle NEGRO, Michel FAYOL, Bernard LETE*

The study explored if statistical learning could explain the spelling of past-participle inflections produced by French children and adults. Participants wrote sentences read aloud by the experimenter. All sentences followed the <subject> (always male singular) <verb> (has + past participle) <object> (always singular) syntactic structure. The lemma frequency of the verb and the past-participle-inflection frequency were orthogonally manipulated with reference to grade-level-based frequency norms. The results showed a crossed interaction between lemma and past-participle frequencies in the 2nd and 3rd grade: whereas the spelling of a frequent inflection ("é") was easier with rare verbs, the spelling of a rare inflection ("i", "is", "it") was easier with frequent ones. In the 5th grade and in adults, the spelling depended only on the past-participle frequency, with more difficulties on rare inflections. Results are discussed according to statistical compared to rule-governed learning.

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Language Acquisition - 17:30-19:30

(2068)**Exploring Literacy Development in Children With Specific Language Impairment (SLI): a Longitudinal Study in French.** - *Filio ZOUROU, Jean ECALLE, Annie MAGNAN, Monique SANCHEZ*

Stackhouse and Wells (1997) argue that impaired speech perception in children with SLI interferes with the development of phonological representations, which in turn affects literacy skills. In a longitudinal design, language and literacy skills of 20 French-speaking SLI children (mean age 5;05 at T1 – October 2004) were evaluated on standardized measures. We used a K-means clustering analysis to identify homogeneous subgroups on language and literacy development. At T2 (March 2006) none of the children of our sample showed deviant scores on phonological tasks, yet their literacy abilities were significantly below average compared to normally developing children. Patterns of language comprehension, production impairment and literacy development cut across the typology, proving the heterogeneity of the disorder (Simkin & Conti-Ramsden, 2006). Particularly marked deficits were found in the majority of our sample on spelling, due to the high level of sound-to-letter inconsistency of French.

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Language Acquisition - 17:30-19:30

(2069)**Elaboration of Orthographic Representations: Role of Positionnal Coding in Children Reading Beginners** - *Marion JANIOT, Séverine CASALIS*

The aim of the present account was to analyse the keenness of orthographic coding in normal readers children with a different level in spelling (Low vs. High). Children have taken lexical decision task with quick mask priming (SOA=65 ms). The material is composed of pairs of four letters items (prime/target). The primes have always been pseudowords and the targets for half pseudowords and the other half words . Half of primes and targets has been orthographically relied with a change of letter in only one position (20 items for each position) and other half of pairs hasn't been relied. Orthographic and phonologic neighborhoods have been controlled. The results have revealed an effect of positional coding which distinguishes weak and strong children in spelling.

The results showed that there is a difference in orthographic representations relating to level of spelling.

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Language Acquisition - 17:30-19:30

(2070)**The Influence of Age and Linguistic Markers on Spontaneous Completions of Conditional Sentences** - *Sara VERBRUGGE*

This study investigates the types of conditionals adults and children produce in an elicitation task (If John is tired, then …). Content conditionals express relations between events in reality (… he must go to bed early), whereas epistemic conditionals express relations between states of thinking (… he has been working hard today). The experiment showed that children give many more conditionals that are a direct reflection of the course of events in reality (content conditionals). Adults express more variety. In many cases they complete the conditionals to content conditionals, but they produce nearly twice as many epistemic consequents as the children. Moreover, the number of completions to epistemic conditionals can be manipulated along all age groups by suggesting particular linguistic markers to be used in the consequent of the conditional. We will discuss these findings in the light of the linguistic skills required to understand different types of conditional relations.

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Language Acquisition - 17:30-19:30

(2071)**Age of Acquisition or Frequency Trajectory Effect in Biological and Artificial Neural Systems?** - *Martial MERMILLOD, Patrick BONIN, Sébastien ROUX, Ludovic FERRAND, Alain MEOT*

Words acquired early and more frequently in life are processed faster and more accurately than words acquired later and less frequently (for a review Johnston & Barry, 2006). Connectionist models have recently explored the influence of the AoA and frequency of the items (Zevin & Seidenberg, 2002, Lambon Ralph & Ehsan, 2006). AoA effects have been explored with the use of frequency trajectory (FT) – which refers to changes in frequency of the words over long period of ages – instead of the classical AoA adult estimations because FT is thought to better index age limited learning effects (Bonin, Barry, Méot & Chalard, 2004). The influence of FT varies as a function of the kind of mappings between input and output units (picture naming Vs word reading) in an artificial neural network. We explored this phenomenon in a connectionist model (Lambon Ralph & Ehsan, 2006) and in close connection with empirical data.

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Language Acquisition - 17:30-19:30

(2072)**Decoding Speech to Extract the Rules of Language** - *Ruth DE DIEGO BALAGUER, Mathilde ANDRE, Antoni RODRIGUEZ FORNELLS, Anne-Catherine BACHOUD-LEVI*

Learners of a new language are faced with the task of extracting words as well as the rules structuring them from speech. In previous studies in which participants have been exposed to artificial languages, word extraction has received greater interest than rule extraction. Learners are endowed with the capacity to extract statistical regularities from their environment. This capacity allows, applied to language, to extract words from speech in the absence of other cues. However, recently it has been proposed that natural languages have an intrinsic cue: the presence of pauses inducing prosodic information. This cue seems to trigger the application of different computational resources that allows the extraction of rules. In the present study we have investigated how the presence of these pauses induces

changes in the computations applied to the speech signal. In an event-related potentials (ERPs) experiment participants were confronted with artificial languages with words structured so that the first syllable would predict the syllable at the end irrespective of the syllable in the middle (AXC: puliku, pusaku, pubeku) and unstructured random syllable sequences. In half of the languages subtle pauses (25 ms) were introduced between words or trisyllabic sequences (for random streams). The behavioural results replicated a previous study showing that the presence of cues induces rule-learning (Peña et al., 2002). However the greatest improvement in performance, when pauses were introduced, was observed for word extraction. The results showed that the presence of pauses modulated the N1 component, previously proposed as a speech segmentation index. In structured language streams this modulation was followed by an increase in the P2 component. While the N1 modulation was clearly associated to the presence of pauses, this later P2 component was related to the rule extraction process. This data suggests that the presence of cues facilitates rule extraction by helping word segmentation, indicating the rule-learning per se seems to rely more on the interaction between bottom-up cues and top-down attentional mechanisms.

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Language Acquisition - 17:30-19:30

(2073)**Learning as Evolution in Populations of Exemplars; Syntax and Motor Control** - *Dave COCHRAN*

Darwinised Data-Oriented Parsing is an unsupervised Data-Oriented Parsing (DOP; Bod 1998) algorithm that takes advantage of the fact that, when DOP is allowed to construct its own training corpus online, subtrees (arbitrary-depth tree-fragments) become replicators and may be made subject to selection pressures. The present paper examines how different types of selection pressure facilitate different types of cognitive task: a Natural Language Processing task (parsing), where the pressure is towards replicability, and a Motor Control task (locomotion; a new application for DOP), where the pressure is towards sub-sequences of motor gestures that produce directional bodily motion. In both cases, the acquisition of a functional training corpus is bootstrapped by initial random productions, which are then refined by evolutionary processes. Bod, R., (1998), Beyond Grammar; An Experience-Based Theory of Language, Stanford, California: Centre for the Study of Language and Information.

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Language Comprehension II - 17:30-19:30

(2074)**The Influence of Spatial Dimension on the Construction of a Coherent Mental Textual Representation** - *Céline RENAU OP'T'HOOG, Isabelle TAPIERO*

To maintain the coherence of the representation, readers are assumed to inhibit or suppress irrelevant or inappropriate information (see Gernsbacher, 1990, 1997; Kintsch, 1988, 1998) and several empirical data supported this assumption. Thus, it is now well accepted that building a coherent representation requires activating several dimensions based on text information (Zwaan, Langston & Graesser, 1995). The participants were instructed to read texts that contained two types of spatial information, one relevant to the text topic and one irrelevant. We then tested whether the irrelevant information was first inhibited and re-integrated into the memory representation or definitely suppressed. Our main results firstly confirmed that irrelevant information can be retrieved from the memory representation and, secondly brought into the fore the importance of the reader's visual-spatial working memory capacity for building a coherent mental representation. This study also showed that inhibition and suppression are two relevant steps involved in this construction.

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Language Comprehension II - 17:30-19:30

(2075)**The Role of Finiteness Information in Recognizing Italian Verbs** - *Maria DE MARTINO, Francesca POSTIGLIONE, Alessandro LAUDANNA*

The study addresses the issue of lexical representation of inflected Finite (F) and Non-Finite (NF) Italian verbal forms. Linguistic and experimental data suggest the existence of differences in lexical processing between F and NF verbs depending on syntactic and morphological factors. We aimed at verifying whether lexical organisation of verbs in the mental lexicon could be affected by categorial properties of verbs (Finiteness, Tense and Person inflection) and by the regularity and the productivity of the Inflectional Class the verb belongs to. Three unmasked priming lexical decision experiments were carried out with three different SOAs. Prime-target pairs composed of two F and NF forms were compared with prime-target pairs composed of F-NF and NF-F pairs. A number of control conditions were also included. Results show a difference of processing between F and NF verbs; a priming effect of Finiteness and an interaction between Finiteness and Inflectional class.

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Language Comprehension II - 17:30-19:30

(2076)**Dynamic of Language Comprehension and Extension of the Revelation Effect** - *Maïté TAFFIN, Denis BROUILLET*

This work dealt with the dynamic aspect of the comprehension process (situation model updating). We explored whether the coherence of this situation model that was supposed to be achieved at the end of the reading process could evolve in response to the comprehension questions. We assumed that what we know about the situation model depends on the comprehension questions people have to answer. In our experiment, after reading several texts, participants had to answer comprehension questions. We handled the coherence of sentences, the context at the time of comprehension questions and we used anagrams (to obtain revelation effect). The main results showed that the situation model could evolve in response to the comprehension questions. Moreover, some results found in studies on memory can, to a certain extent, be found again in studies on text comprehension and can contribute to better understand the language comprehension process.

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Language Comprehension II - 17:30-19:30

(2077)**Comprehension of Sentences Implying Actions: Relevance of the Effector and of the Goal** - *Claudia SCOROLLI, Anna BORGHI*

Two experiments demonstrate that sentence comprehension activates a specific simulation, that is a simulation which is sensitive to the effector involved in the action expressed by the sentence and to the effector used for responding. The task consisted in evaluating the sensibility of sentences regarding hand, mouth and foot actions. In Experiment 1 participants responded by pressing two keys. We found a facilitation of sensible over non sensible sentences in right hand responses to hand and mouth sentences. This facilitation wasn't found in foot sentences. In Experiment 2 participants responded by using a pedal or a microphone. Mouth sentences produced faster RTs with the microphone, foot sentences with the pedal, even if the task didn't require an effector specific activation. The results suggest that sentence comprehension activates a simulation. This simulation is specific, as it is sensitive both to the involved effector and to the goal expressed by the sentence.

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Language Comprehension II - 17:30-19:30

(2078)**Cognitive Reconstruction of Reversed Speech in Normal and Dyslexic Adults** – *Claire GRATALOUP, Michel HOEN, Fanny MEUNIER, François PELLEGRINO, Evelyne VEUILLET, Lionel COLLET*

In this study, we explored the implication of high and low level mechanisms in degraded (time-reversed) speech comprehension in dyslexic adults and controls. In experiment 1 we compared the loss of intelligibility due to the increasing size of reversion windows in both words and pseudowords. Results showed that words are generally reconstructed better than pseudowords in both groups, suggesting the existence of a lexical benefit in degraded speech restoration. Overall the normal group

performed better than dyslexic group in particular, performances of dyslexics did not show any word-property effect. In the normal group only, there was greater variability between individuals when reconstructing pseudowords than words. In experiment 2, we tested the functionality of the auditory system of all participants. Auditory measurements on dyslexics are still in progress. First results suggest the existence of multiple higher-level strategies that can compensate on-line for the lack of information caused by speech degradation.

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Language Comprehension II - 17:30-19:30

(2079)**Rules of Irregularity - a Short Notice on Words and Rules in Hungarian** - *Rozalia IVADY, Csaba PLEH*

Pinker in his dual-route model proved that only regular words prime each other, whereas irregulars do not. Hungarian language is rather peculiar and different from English in this aspect as some of its nouns come in two flavours: one affix takes an irregular form (usually the accusative and the plural) whereas other affixes leave the stem unaltered and are regular. Not only does it seem, that irregulars do prime their stem - contrary to findings in English - but also irregular forms prime regular forms (of the same noun) to the same amount as two regulars prime each other, suggesting some form of regularity in irregulars. The conclusion is that a language like Hungarian, relying heavily on rich morphology, makes more use of finding regularities amond irregulars, that is a characteristic of connectionist models, rather than words and rules models.

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Language Comprehension II - 17:30-19:30

(2080)**Noun Animacy and ERP Components Modulation** - *Alberto DI DOMENICO, Rosalia DI MATTEO, Bernardo PERFETTI, Francesca DEFEUDIS, Marco ONOFRJ*

During sentences processing different kind of syntactic and semantic information are available to arrive at a correct interpretation. Noun animacy, in particular, may affect early sentence interpretation as an animate noun appears to be a better sentence subject (or agent) than an inanimate noun. Several ERP components related to the detection of a syntactic ambiguity and to the subsequent reanalysis are modulated by noun animacy. This study investigated the role of subject animacy on the processing of semantic anomalies, using 60 couples of sentences containing a semantic subject-verb incongruence. Half of correct and incorrect sentences contained an animated subject, while the remaining sentences contained an unanimated subject. Results showed ERP effects associated with semantic integration in all anomalous sentences; nevertheless, the waveforms were modulated by animacy suggesting an early influence of this factor on semantic integration in sentence interpretation.

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Language Production I - 17:30-19:30

(2081)**Phonological Memory, Intelligence, and Vocabulary Knowledge in a Group of Children and Adolescents** - *Célia OLIVEIRA, Alexandra CUNHA, Pedro ALBUQUERQUE*

Several studies state the importance of the phonological component of working memory to the development of vocabulary in the maternal language or in a secondary one (e.g. Baddeley, Gathercole & Papagno, 1998; Gathercole, Hitch, Service, & Martin, 1997; Solé, 1999). Moreover, the development of language has been related to the cognitive development (Baddeley, 2003). Taking these data together, the present study analyses the relationship between vocabulary knowledge and two other variables: phonological memory and IQ. Participants were 40 children between 7 and 16 years old, with no history of learning disabilities or language disturbances. We tried to understand how these variables interact in an advanced stage of language development, considering the three scales of the IQ separately (verbal, performance and global), in contrast to some studies that focused only on general measures of non-verbal intelligence. Indeed, preliminary results indicate significant correlations between phonological memory and the remain variables in study.

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Language Production I - 17:30-19:30

(2082)**Capacity Demands of Word Production** - *Amy COOK, Antje MEYER*

Most theories assume that only conceptualisation, but not lexical retrieval requires capacity (Levelt, 1989). However, using a dual-task paradigm (picture-word interference task and a tone discrimination task) Ferreira and Pashler (2002) showed that lexical selection but not phonological encoding required capacity: Semantic relatedness between target and distracter delayed the naming and tone latencies, but phonological relatedness only affected the naming latencies. In Experiment 1, we replicated these results. In Experiment 2, the distracters were presented for 1500 ms instead of 200 ms. This yielded phonological facilitation for the naming latencies and interference for the tone latencies. In Experiment 3, masked distracters were presented for 50 ms. This yielded phonological facilitation for the naming and tone latencies. We argue that there was no phonological facilitation effect on the tone latencies in Experiment 1 and 2 because the distracters were clearly visible, which had opposing effects on phonological encoding and self-monitoring processes.

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Language Production I - 17:30-19:30

(2083)**Conceptual Coherence Affects Phonological Activation of Context Objects During Object Naming** - *Frank OPPERMANN, Jörg D. JESCHENIAK, Herbert SCHRIEFERS*

Whether the not-to-be-named context object is processed up to a phonological level during speech planning is a question of continuing debate. While some studies presented evidence in favour of such a view (e.g., Morsella & Miozzo, 2002; Navarrete & Costa, 2005; Meyer & Damian, in press), other studies failed to do so (e.g., Bloem & La Heij, 2003; Bloem et al., 2004; Jescheniak et al., 2007). In a series of four picture word interference experiments containing a target and a context object, we demonstrate that phonological activation of context objects is reliably observed if target and context object are embedded in a conceptually coherent scene and that this activation disappears if both objects are presented in arrays of arbitrary objects. This pattern suggests that details of the visual input, in particular its conceptual coherence, have important consequences for the lexical processing of not-to-be named context objects.

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Language Production I - 17:30-19:30

(2084)**The Effects of the Target and the Distractor Frequency on Lexical Access in a Picture-Naming Task** - *Min-Mo KOO, Kichun NAM*

Two experiments were conducted to identify the locus of the frequency effect in speech production. In Experiment 1, an argument was assessed postulating that the word frequency effect is related to the stage of lemma selection. Because a number of speech production models assume that the semantic inhibition effect is derived from the stage where the lemmas are stored, it was examined whether two variables – target and distractor frequency – interact with the semantic relatedness in a picture-word interference paradigm. In fact, a significant interaction between the semantic relatedness and the distractor frequency was found. A marginally significant interaction between the distractor and target frequency was also obtained. In Experiment 2, the interaction between the phonological relatedness and the distractor frequency was examined in terms of the frequency of target. Current models of lexical access assume that the phonological facilitation effect lies in the lexeme level. If the word frequency effect arises from the lexeme level, the interaction between two variables should have been significant. However, no significant interaction effect was found. From these results it can be concluded that the exact locus of the word frequency effect exists in the stage where the lemmas corresponding to the lexical concepts are selected.

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Language Production I - 17:30-19:30

(2085)**Semantic Interference in a Delayed Naming Task: Evidence for the Response Exclusion Hypothesis** - *Niels JANSSEN, Walter SCHIRM, Bradford MAHON, Alfonso CARAMAZZA*

In two experiments participants named pictures of common objects with superimposed distractor words. In one naming condition, the pictures and words were presented simultaneously on every trial, and participants produced the target response immediately. In the other naming condition, the presentation of the picture preceded the presentation of the distractor by 1000 ms, and participants delayed production of their naming response until distractor word presentation. Within each naming condition, the distractor words were either semantic category coordinates of the target pictures or unrelated. Orthogonal to this manipulation of semantic relatedness, the frequency of the pictures'names was manipulated. We observed semantic interference effects in both the immediate and delayed naming conditions, but a frequency effect only in the immediate naming condition. In the context of other findings from the picture-word interference paradigm, these data support the view that the semantic interference effect arises at a post-lexical level of processing.

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Language Production I - 17:30-19:30

(2086)**The Monitoring of Taboo Spoonerisms in Speech Production.** - *Ine JANSSENS, Els SEVERENS, Rob HARTSUIKER*

Many speech errors are corrected very quickly, suggesting the operation of an internal self-monitoring system that safeguards the quality of speech. Some authors have even suggested that speech errors can be repaired before they are spoken aloud. The only experimental evidence supporting this covert repair is a study by Motley, Camden, and Baars (1981). They observed more neutral phoneme transpositions (tool carts => cool tarts) than taboo spoonerisms (tool kits => cool tits), suggesting covert repair. This study examines whether this covert repair is also reflected by brain responses. We hypothesize that in many correct productions of taboo-inducing stimuli, a taboo spoonerism will be produced internally (and covertly corrected), leading to emotional responses. Emotion-related ERP-responses (like larger amplitudes of the P2 or P3 potentials) in correct productions would therefore support covert repair.

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Language Production I - 17:30-19:30

(2087)**Managing Two Phonologies: Picture and Word Naming in Bidialectal Speakers of Spanish** - *Chip GERFEN, Carolina YUDES, Teresa BAJO*

Educated Andalusian Spanish speakers must manage and control two dialects, standard peninsular Spanish (SPS) and Andalusian Spanish (AS), which are largely distinguished by salient differences along a number of phonological dimensions. The primary goal of this study was to assess the differential effects of presentation (orthographic versus picture) on speech production in a speeded naming task. Since Spanish orthography closely reflects the phonological noms of SPS, we predicted that orthographically presented forms would be more likely than pictures to induce production in the standard phonology. Initial results for 15 speakers confirm this hypothesis. In addition, we find significant effects for word frequency and attitude as assessed by a survey after the naming task. High frequency words are more likely to be produced in AS phonology; speakers with more positive feelings towards AS are also more likely to produce more AS phonology than speakers with negative attitudes towards the dialect.

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Language Production I - 17:30-19:30

(2088)**Processing the English Past Tense: Regular Vs. Irregular or Easy Vs. Hard?** - *Vanja VUCETIC, Gert WESTERMANN, Kim PLUNKETT*

In the English past tense, dual mechanism accounts assume two separate mechanisms for processing regular and irregular verbs (rule application vs. retrieval from the mental lexicon) to account for observed processing dissociations. Approaches based on a single mechanism explain dissociations as arising from statistical characteristics of verbs that make them easier or harder to process (e.g. frequency, age of acquisition, number of similar verbs with the same of different inflection). Here, we directly compared both approaches by creating a set of regular and irregular verbs that were either easy or hard. 10-11 year old children and adults participated in an elicitation task cued by auditory presentation of a verb stem. Reaction times to produce the past tense showed main effects for easiness but not for regularity, as well as developmental changes in the processing of irregulars. We argue that these results support single mechanism accounts of processing.

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Language Production I - 17:30-19:30

(2089)**Syllable Sequence Production – an fMRI Repetition Priming Study.** - *Maya G. PEEVA, Frank GUENTHER, Jean-Luc ANTON, Bruno NAZARIAN, F.-Xavier ALARIO*

This functional magnetic resonance imaging (fMRI) study attempts to elucidate the processes underlying syllable production from neural perspective. Stimuli were bi-syllabic pseudowords produced in four block types: (1) repetition of the same pseudoword (e.g., FUBLO, FUBLO), (2) repeated reordering of syllables (e.g., ZE/KLO, KLO/ZE), (3) repeated resyllabification with the same set of phonemes (LI/MUF, MU/FLI), and (4) unrelated (GUPRI, DRAVO)The results suggest that (i) the supplementary motor area (SMA) gates on execution of the motor program for the current syllable, (ii) left PreSMA and left inferior frontal sulcus (IFS) are involved in the construction of upcoming syllables, (iii) left PreSMA, left IFS, and left frontal operculum (FO) are sensitive to the phonemic content of produced syllables, and (iv) FO is relatively insensitive to syllable frame structure. These results indicate that different frontal cortical regions are involved in different aspects of syllable sequence production.

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Memory II - 17:30-19:30

(2090)**Production of Memory Illusions in 6 to 11 Years-Old Children** - *Pedro ALBUQUERQUE, Sofia GOUVEIA, Teresa FREIRE*

The DRM paradigm is one of the most studied procedures to analyse the production of false memories. In our study, two groups of 6/7 and 10/11 years-old children were involved in the DRM paradigm using word lists specifically produced by children. Results showed an increase retrieval words ability according to age, associated with an increase in false memory production (retrieval of the critical non presented lures). In the recognition task the older group showed a better performance although the magnitude of the results was lower than the one of the recall task. We can conclude that, in comparison with studies that implemented the procedure with adult word norms that the phenomenon of false memories starts earlier than it is stated in the literature.

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Memory II - 17:30-19:30

(2091)**The Role of Different Visual Modes Within the Modality Principle of Multimedia Learning** - *Mencarelli CHIARA, Luigi DI MAURO, Nicola MAMMARELLA,Cesare CORNOLDI*

In this study participants took an 8 min. computer lesson from an e-learning course in economics. Participants either simultaneously saw on-screen text and an animated picture of the teacher narrating the lesson, simultaneously saw on-screen text and listened to the teacher's narration, or only watched the animated picture of the teacher narrating the lesson. Learning was measured as recall, matching and transfer test scores. Results support the usefulness of introducing different visual modes within the multimedia learning modality principle. In fact, participants' recall particularly decreased when they only watched the teacher narrating the lesson. Moreover, differences across learning tasks also arise. Overall, our data suggests a benefit deriving from multiple visual modes that rely on different types of visual processing.

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Memory II - 17:30-19:30

(2092)**Effects of Attention in Recollection and Familiarity Processes in Remember/Know and Process Dissociation Procedure Paradigms** - *María ESPINOSA, Mª Teresa BAJO, Pío TUDELA*

In two experiments we explored the extent to which familiarity and recollection processes are affected by attentional manipulations in the study phase. For this purpose, in both experiments, series of faces and lists of words were presented; half of these stimuli were presented in a divided attention condition and the other half were presented in a full attention condition. To study recollection and familiarity processes we used the Remember/Know paradigm (Tulving, 1985) in experiment one, and the Process Dissociation Procedure (Jacoby, 1991) in experiment two. The results showed that, while recollection is affected by attentional manipulation in both experiments, familiarity is affected by attention only when we used Remember/Know paradigm not the Process Dissociation Procedure to assess both processes. These results will be discussed in terms of the equivalences between these two forms of assessing recollection and familiarity in recognition memory.

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Memory II - 17:30-19:30

(2093)**Larger Word Order Difference Results in Better Recall in Translation** - *Ya-Shyuan JIN, Robert H. LOGIE, Martin CORLEY*

Although Mandarin Chinese and English are both considered SVO languages, the word orders of modifiers and adverbial complements differ reliably when texts are translated between these languages. But do word order differences between versions of a text influence the quality with which they are translated? Following the results of a simultaneous interpreting study (Mizuno, 2004), we predicted that texts with more ordering differences between source and target languages would result in poorer recall, and hence less accurate translation. We asked native Chinese-speaking speakers who were proficient in English (IELTS between 6.5 and 8.5) to translate a series of short passages. Participants recalled more idea units when translation resulted in large order differences, performance was better from Chinese into English than the vice versa, and these variables interacted. Our findings suggest that greater cognitive demand leads to deeper levels of processing, and hence better recall (Lambert, 1988; Darò and Fabbro, 1994).

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Memory II - 17:30-19:30

(2094)**Attentional Load and Word-Fragment Completion: a Failure to Find a Dissociation Between Explicit and Implicit Memory** - *Pietro SPATARO, Jessica MARI, Clelia ROSSI-ARNAUD*

A variant of the memory-load paradigm was used to investigate the effects of reduced attention on a word-fragment completion (WFC) task. During encoding, study words and strings of letters and digits (0, 4 or 6 elements) were presented jointly for 5 sec. Participants in the implicit and explicit conditions had to recall the strings and repeat the words aloud. Subjects in the selective attention condition should only remember the strings. Next, the WFC was given: fragments had unique or multiple solutions. More target words were recalled in the explicit than in the selective condition, and priming in implicit memory was significantly greater than zero. However, attentional load did not reduce implicit or explicit performance, and this was unaffected by the number of fragment solutions. Data support findings by Mulligan & Hartman (1996), Mulligan (1998) and Clarys, Isingrini & Haerty (2000) in showing a resiliency of WFC to attentional manipulations.

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Memory II - 17:30-19:30

(2095)**Deactivations in Elderly Subjects During a Cross-Modal Olfactory Memory Task** - *Barbara CERF-DUCASTEL, Claire MURPHY*

Deactivations observed during fMRI experiments have recently elicited new interest (Hutchinson et al. 1999). The current study investigated deactivations elicited by a cross-modal olfactory task in elderly subjects. Ten old subjects were presented with 16 familiar odors immediately before entering the scanner (3T). In the scanner, subjects viewed words on a screen and indicated by a button press whether words were targets i.e. represented odors previously presented or foils, i.e. new odors. Activations were found in left and right lingual gyrus, culmen, declive and left parahippocampal gyrus. Deactivations were observed in the left and right claustrum, putamen, caudate tail, cingulate cortex cortex, left middle frontal gyrus and right precentral gyrus. Results are discussed on the basis of attentional and task demands and reorganization of functional networks with aging. Supported by NIH grant AG04085 to CM.

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Numerical Cognition II - 17:30-19:30

(2096)**Fractional Values Can Be Represented as Such in Long-Term Memory** - *Arava KALLAI, Joseph TZELGOV*

Following a series of experiments that showed a strong influence of the components of fractions on their processing, we report an experiment in which participants practiced mapping seven arbitrary figures to fractions, and afterward were tested in intentional and automatic processing of the numerical features of these figures. In a critical task, pairs of figures differing in their physical and numerical size were presented and the participants performed physical size comparisons. A size congruity effect was obtained, and increased as a function of intrapair distance. These results indicate that fractional values are able to be represented as such in long-term memory.

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Numerical Cognition II - 17:30-19:30

(2097)**The Memory Representation of Multiplication and Division Facts.** - *Jolien DE BRAUWER, Wim FIAS*

The performance on simple multiplication facts has been studied extensively and there is a broad consensus that they are represented in memory. But for the reverse operation, simple division, a lot of questions remain unanswered: Are simple division problems represented in memory and activated automatically? And if so, are they solved by making use of the memory network for multiplications? Or do we have a separate memory representation for division facts? Two studies will be described that address these questions. First, the number-matching paradigm is used to show that simple division problems are indeed automatically activated in memory. Second, evidence for between-operation transfer from a training paradigm is presented. Results converge to a close association between both operations.

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Numerical Cognition II - 17:30-19:30

(2098)**Number Comparison in Context: the Effect of Magnitude Bias** - *Pedro MACIZO, Amparo HERRERA, Antonio IBAÑEZ*

We study how prior knowledge determines number comparison in real life. Participants read sentences presented word by word in the middle of the screen while brain-waves associated to the last word were recorded. After reading, they verified whether the sentence was true or false. The regular congruity effect (N400 component) was examined comparing true vs. false sentences (i.e., Mary paid twenty-two euros for the toast and twenty-eight euros for a dough, so she spent more money buying the dough -true- vs. the toast -false). Additionally, a magnitude bias was used to explore the effect of prior knowledge. We compared true-biased sentences vs. false-biased sentences (Mary paid twenty-two euros for the toast and twenty-eight euros for the lobster, so she spent more money buying the lobster –true vs. the toast –false). The magnitude-bias should increase the congruence effect. We explain and discuss how brain-waves were modulated by the congruity and the bias.

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Numerical Cognition II - 17:30-19:30

(2099)**Is Phonological Working Memory Involved in Comparison Tasks?** - *Amparo HERRERA, Pedro MACIZO, María José CABRERA*

We explore the role of phonological Working-Memory subsystem (the articulatory loop, AL, Baddeley, 2000) when

performing numerical tasks. It has been suggested that verbal codes may determine two-digit number comparison tasks. This work examines the role of AL when processing Arabic and written numbers in numerical tasks using a dual task paradigm. Single comparison tasks were compared to the performance of secondary tasks that required AL working memory component. Experiments 1 & 2 were intended to examine AL processing functions. In the dual task condition, participants compared two-digit numbers while they had to simultaneously produce the syllable "bla" (articulatory processing, Murray, 1965). The aim of Experiments 3 & 4 was to investigate AL storing capacities. In the dual condition participants maintained phonological information when performing the two digit comparison task (Herrera et al., submitted). The pattern of results let us clarify the relation between number processing and phonological working memory.

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Numerical Cognition II - 17:30-19:30

(2100)**To Identify 2- What Counts?** - *Sharon NAPARSTEK, Avishai HENIK*

Introduction: In the classic Stroop task, the irrelevant dimension interferes with the relevant one, suggesting an automatic activation of semantic representation even when irrelevant to the task. Similarly, numerical variations of the task suggest automatic activation of digit identity. Objective: To explore the opposite effect, namely, whether numerosity modulates digit identity. Method: In a Stroop-like paradigm, participants were asked to report the identity of a presented digit while ignoring the number of displayed digits. Identity could be congruent (e.g., 2 2) or incongruent (e.g., 2 2 2) with numerosity. Results: RTs in congruent trials were faster than RTs in incongruent trials. This effect was modulated by the arithmetic distance between the two dimensions. Conclusion: These results suggest that the representation of numerosity is activated automatically. Moreover, it confirms that the distance effect is not limited to comparative judgment tasks.

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Numerical Cognition II - 17:30-19:30

(2101)**SNARC Effect is Not Connected to Analogue Magnitude System** - *Attila KRAJCSI, Karolina JANACSEK, János IGACS*

According to the classical view, when the parity of a number is processed the magnitude representation is automatically activated. To study the activation of the two representations we examined the appearance of SNARC, numerical distance and numerical Stroop effects in comparison and parity tasks. In magnitude comparison task we found distance and Stroop effect but no SNARC effect. In parity judgment task, we did not found numerical Stroop effect and distance effect. These results are consistent with two different representations of magnitude and parity that are not activated simultaneously.

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Perception And Action II - 17:30-19:30

(2102)**The Locus of the Accessory Stimulus Effect: a Diffusion Model Account** - *Marieke JEPMA, Eric-Jan WAGENMAKERS, Sander NIEUWENHUIS*

It has been shown repeatedly that responses in a choice reaction time task are faster when an irrelevant "accessory" stimulus accompanies the imperative stimulus (e.g. Bernstein et al., 1970), which is presumably due to a brief increase in arousal. The locus of this effect is not fully clear yet. We addressed this issue by applying the diffusion model (Ratcliff, 1978) to the data from an accessory stimulus experiment (N=21). The accessory stimulus effect could be explained almost completely by a shortening of the nondecision time, which includes stimulus encoding and response execution. The decision process itself, on the other hand, was found to be unaffected. In contrast to previous studies (Hackley & Valle-Inclán, 1998, 1999), our results suggest that immediate arousal does not facilitate decision making, but instead speeds up early perceptual and/or late motoric processes.

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Perception And Action II - 17:30-19:30

(2103)**Previous Event With Spatial Compatibility Influences Time Perception** - *Akio NISHIMURA, Atsunori ARIGA, Fuminori ONO, Kazuhiko YOKOSAWA*

We investigated the effect of response events with spatial compatibility on later temporal perception. A trial consisted of a visual Simon task and a time production task. In the visual Simon task, participants made a speeded discrimination response based on color of a stimulus whose position was compatible/incompatible with the to-be-responded key position. In the time production task, the same stimulus reappeared. Here, the participants indicated the pre-defined stimulus duration with the key press. The elapsed time from the stimulus onset to the key press was significantly longer for the stimuli with incompatible response in a preceding Simon task than for the stimuli with compatible response. Subsequent experiments revealed that this difference could not be attributed to the spatial stimulus-response correspondence in Simon task alone or in time production task alone. We concluded that the previous response event with compatibility affects time perception when one encounters the same stimulus.

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Perception And Action II - 17:30-19:30

(2104)**Action Intention Compatibility: Interactions Between Observation and Execution of Goal-Directed Actions** - *Giovanna GIRARDI, Oliver LINDEMANN, Harold BEKKERING*

Three experiments investigated response priming effects following the observation of objects and hand postures. Participants had to indicate the semantic category of objects by means of reach-to-grasp movements. Experiment 1 showed that object affordance effects were only present if the observed hand was congruent with the object size (power grip for large objects). Experiment 2 ruled out that the impact of hand posture reflects merely a perceptual effect, because the reaction times were unaffected when participants executed finger pointing movements. Experiment 3 revealed that when object and hand were presented visually far apart, two independent stimulus-response compatibility effects were found, i.e., grasping movements were initiated faster to the object affording a consistent grip and to the consistent hand posture. Together, the results stress an action intention compatibility effect and support the notion of overlapping representations between actions observed and the representations needed to initiate and execute an intended motor action.

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Perception And Action II - 17:30-19:30

(2105)**Actions Speak Louder Than Words: Comparing Automatic Imitation and Verbal Command** - *Helge GILLMEISTER, Arnaud BADETS, Cecilia HEYES*

Automatic imitation – copying observed actions without intention – is known to occur, not only in neurological patients and those with developmental disorders, but also in healthy, typically-developing adults and children. Previous research has shown that a variety of actions are automatically imitated, and that automatic imitation promotes social affiliation and rapport. We assessed the power of automatic imitation by comparing it with the strength of the tendency to obey verbal commands. In a Stroop interference paradigm, the stimuli were compatible, incompatible and neutral compounds of hand postures and verbal commands. When imitative responses were required, the impact of irrelevant action images on responding to words was greater than the effect of irrelevant words on responding to actions. Control group performance showed that this asymmetry was not due to modality effects or differential salience of action and word stimuli. These results indicate that automatic imitation was more powerful than verbal command.

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Perception And Action II - 17:30-19:30

(2106)**Tick of the Clock: Information Process Sequencing and Behavior Regulation** - *Jacek BUCZNY, Radoslaw STERCZYNSKI*

Studies show how cognitive and affective processing work. We indicate that the difference between these two types of processing is based on temporal mechanism: "clock" found in the brain (Crick, 1997; Nosal, 2004). In the cognitive way information is being processed in regular 30 millisecond rhythm. In the affective way there is no regularity in the process. Cognitive - Experimental Self - Theory (Epstein, 1990) indicates that levels of behavior regulation transform cognitive and affective processing. On the direct level one's behavior depend on changes in environment. A person is concentrated on the sensitive and affective fillings, and programs of action based on them. On the mediated level, the action programming goes with using elaborative structures. A person action depends on goals especially. The expected main effect of the way of processing in sequencing is built on data collected in the group of people located on the direct level of behavior regulation.

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Perception And Action II - 17:30-19:30

(2107)**Attention Modulates Motor Cortex Activation During Action Observation: an EEG Mu Rhythm Study** - *Stefanie SCHUCH, Andrew P. BAYLISS, Steven P. TIPPER*

It is known that the human motor system is activated by perceiving another individual's actions. It is not known, however, whether this effect is modulated by attention. We measured the mu rhythm (oscillatory activity in the 8-13 Hz band over motor cortex) while participants watched videos of grasping movements. In one of two conditions, they had to attend to the grasping actions and estimate how many times there was a precision or power grip. In the other condition, they had to attend to a colour change, which occurred at the same time as the grasp. Results show mu rhythm attenuation in both conditions, suggesting that the mirror system is activated even when the perceived action is not relevant to the task. However, the effect was larger when participants made judgments about the grasp, suggesting that the mirror system is more strongly activated when the observed action is relevant.

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Perception And Action II - 17:30-19:30

(2108)**Linking Task Requirements to Human Gamma Band Activity** - *Kathrin OHLA, Thomas GRUBER, Matthias M. MÜLLER*

Gamma-band activity in human EEG has been suggested to play a crucial role in integrating distributed neural responses and is, moreover, thought to be a neural marker of a cortical object representation. This interpretation is supported by a large number of investigations. However, several studies reported diverging results, which might be due to differences in the experimental design. Thus, an outstanding question on the role of induced gamma activity focuses on the extent to which its elicitation is task-dependent. So far, there is a lack of direct comparisons of the influence of task requirements on gamma responses in the literature. We present here a systematic comparison of different experimental paradigms with varying task requirements and the corresponding finding concerning induced gamma band activity. Our findings show that the topographical distribution as well as the latency of these responses varies considerably with task requirements. This is of high significance, because the findings indicate that gamma band responses are not merely elicited by the presence of a visual stimulus. Instead, representational gamma band activity is also modulated by top-down influences (i.e. task demands).

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Priming I - 17:30-19:30

(2109)**The Time-Course of Subliminal Semantic Priming Effects** - *Eva VAN DEN BUSSCHE, Bert REYNVOET, Wim VAN DEN NOORTGATE*

Today, there seems to be no doubt that subliminal stimuli have an effect. However, it is still unclear how long primes should be minimally presented for priming to occur and how long primes can be maximally presented while still guaranteeing their unconscious nature.

The goal of this study is twofold: first, we want to sketch the time-course of subliminal semantic priming effects, which allows us to determine the onset and process of these priming effects. Second, we want to sketch the time-course of the visibility of the primes, which allows us to determine until when priming effects can be considered "unconscious". The results show that the development of priming effects occurs in a rather linear way. Within the time-courses of priming and visibility significant differences can be observed between word and number stimuli and between novel and repeated primes. These discrepancies are also expressed by observed differences in slopes. This study provides new insights in the development of subliminal semantic priming and sheds new light on theoretical and methodological issues regarding subliminal semantic priming.

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Priming I - 17:30-19:30

(2110)**Does Priming With Awareness Reflect Voluntary Retrieval Strategies in Implicit Memory Paradigms?** - *Séverine FAY, Michel ISINGRINI, Laurence TACONNAT, Viviane POUTHAS*

The purpose of this study was to determine whether priming with awareness in a word-stem completion task reflects explicit contamination (e.g. voluntary retrieval). Two groups of 16 participants carried out either the explicit or the implicit version of the task. Depth of processing during encoding was manipulated using two encoding tasks (lexical and semantic). Subjective awareness after implicit testing was measured on an item-by-item basis. As voluntary retrieval strategies are known to be time consuming, the time taken to complete each stem was registered. In the explicit task, semantically studied words were associated with higher levels of recall and faster response times than lexically studied words. By contrast, in the implicit task, these effects failed to reach significance, although deep encoding made the contents of memory more accessible to awareness. As expected, performance was slower in the explicit than in the implicit task. Furthermore, in the latter condition, times to produce old words with and without awareness were comparable, and both of these responses were produced more quickly than control words. These results suggest that although participants may become aware in implicit paradigms, they do not adopt voluntary retrieval strategies.

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Priming I - 17:30-19:30

(2111)**Semantic Priming for Natural and Artifactual Categories: Basic Effects and a Moderation by Sex** - *Christina BERMEITINGER, Christian FRINGS, Dirk WENTURA*

There is abundant evidence from behavioural and neurophysiological studies, that the distinction between natural and artifactual categories becomes manifest in cognition. Additionally, women's performance typically increases with natural categories whereas men's increases for artifactual categories. In cognitive psychology, the preferred method to study the representational structure and retrieval processes regarding categories is the semantic priming paradigm. However, so far the differentiation between natural and artifactual categories was largely ignored in this research. Here, we used category labels as primes and exemplars as targets and found larger priming effects for natural categories. Moreover, the pattern was moderated by participants' sex: females showed positive priming effects for natural categories and even negative effects for artifactual categories whereas males showed small positive priming effects for both categories. This difference may tap gender-specific retrieval processes, possibly showing that women focus on shared properties of primes and targets whereas men possibly focus on functional overlap.

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Priming I - 17:30-19:30

(2112)**Effect of Level-Of-Processing and Type of Memory Task on Creation of False Memories in DRM Paradigm** - *Eduarda PIMENTEL, Pedro ALBUQUERQUE*

False memories have been widely studied using the experimental procedure called DRM paradigm (Deese/Roediger/McDermott) which consists on the presentation of associated word lists to a key word not presented, called critical item, followed by recall and/or recognition tasks. This paradigm has been adapted to implicit memory tasks to study the unconscious production of false memories. Our study's aim was to know if the implicit retrieval of the critical item would be due to unconscious recollection or merely due to explicit strategies. To do so we manipulated the levels-of-processing. Our empirical results reveal the unconscious production of false memories in DRM paradigm since stem completion for associated words was not better with a deep task than with a shallow task. Besides that priming for associated words and critical items reach significance comparing with data of base line for each type of item.

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Priming I - 17:30-19:30

(2113)**Can We Be Told What to See? Grouping and Face Perception Modulated by Semantic Primes: an ERP Study** - *Georgiana JURAVLE, Anna SCHUBÖ*

We investigated whether simple geometric patterns could be modulated by semantic primes. A three-step design was used with: (1) baseline presentation of geometric patterns composed of one line and two dots, (2) semantic priming where words related to either faces or geometry were presented and (3) a control task with 'neutral' stimuli that allowed observers to group them as faces or as geometric forms (repeated discrimination task: Palmer and Beck, 2002). To measure efficiency of priming on grouping processes, response times and event-related potentials were recorded. We replicated Palmer and Beck's results showing 'grouping by common region' for both priming conditions. Additionally, increased N170 amplitudes at posterior electrodes were observed for stimuli presented after face-related priming only. N170 was found to be larger in face perception as compared to other objects (e.g., Bentin et al., 2002). Results indicate that grouping in the control task was also influenced by the primes, showing flexibility in grouping processes.

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Priming I - 17:30-19:30

(2114)**Intact Subliminal Processing and Delayed Conscious Access in Multiple Sclerosis** - *Françoise REUTER, Antoine DEL CUL, Bertrand AUDOIN, Irina MALIKOVA, Lionel NACCACHE, Jean Philippe RANJEVA*

White matter damage affecting large bundles connecting distant cortical areas may constitute the main neuronal mechanism for the deficit of controlled information processing observed in early multiple sclerosis (MS). Visual backward masking has been demonstrated to affect late stages of conscious perception involving long-range interactions between visual perceptual areas and higher level integrative. We therefore hypothesized that patients with early MS would have an elevated masking threshold, because of an impairment of conscious perception. 22 patients with early MS and 22 normal controls performed a backward-masking experiment. We quantified the visibility of the masked stimuli, thus obtaining accurate estimates of the threshold duration for access to consciousness. The threshold for access to consciousness was elevated in MS patients compared to controls. These findings suggest that conscious access depends on the integrity of large-scale cortical integrative processes, shown to be impaired in early MS due to diffuse demyelinating injury.

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Short-Term Memory - 17:30-19:30

(2115)**Word Length and Similarity Effect: What do They Tell Us About a Phonological Memory Deficit in Children?** - *Marcella FERRARI, Paola PALLADINO*

According to Baddeley & Hitch's model, phonological component of working memory seems to be critical for language learning (Baddeley et al., 1998) and significant associations have been found between short-term memory and foreign language learning (Service, 1992, Masoura & Gathercole, 1999). In this study, the effects of phonological similarity and word length in an immediate words serial recall task were investigated. Participants were a group of 7th and 8th grades Italian students with foreign language learning difficulties (FLLD) compared to a control group matched for age and non-verbal intelligence. Comparisons between groups showed a reduced memory span in FLLD than in controls. FLLD group showed a less marked phonological similarity effect and no sensitivity to word length effect, despite their employment of subvocal-rehearsal mechanism, as emerged by the analysis of serial position curves and articulation rate. The absence of phonological word length and similarity effects in FLLD group may indicate their use of alternative nonphonological strategies.

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Short-Term Memory - 17:30-19:30

(2116)**Effect of the Recall Constraint on the Processes Involved in Sternberg's Memory Scanning Task** - *Lucie CORBIN, Josette MARQUER*

In a previous experiment, with a new procedure based upon the analysis of individual processes we showed that the nature of the strategies implemented in Sternberg's memory scanning task (1966) differ according to the presence or the absence of the recall constraint: the Sternberg's scanning task seems to be a memory task only when participants have to recall the digit sequence. Nevertheless, this constraint, present in Sternberg's publications, is not used in most memory studies using this paradigm. To go further in the study of the inter- and intra-individual variability of the strategies, our participants performed again the Sternberg task but in the other experimental condition than the first time ("with recall" becoming "without recall" and conversely). The results should provide a new light on the cognitive processes actually implemented in this task and should help to improve the interpretation of the data collected in many applied studies.

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Short-Term Memory - 17:30-19:30

(2117)**Word Pleasantness Effects on Verbal Short-Term Memory in Children** - *Catherine MONNIER, Arielle SYSSAU*

In adults, the role of long-term knowledge in serial recall no longer needs to be demonstrated. In contrast, only a few studies have investigated the influence of semantic knowledge on serial recall in children. Recently, Monnier and Syssau (2006) identified a new semantic factor, pleasantness, having an impact on verbal short-term memory (STM) performance. In the present study, we explored whether the pleasantness effect could be replicated in children by comparing memory span for pleasant and non-pleasant words in 5-, 7- and 9-year-old children. Pleasantness was found to have an equivalent facilitation effect on memory span in 7- and 9-year-olds. In contrast, recall performance was insensitive to word pleasantness in 5-year-old children. This study supplies some new supporting arguments in favor of a semantic contribution to verbal short-term memory performance in children. The pleasantness effects are discussed in the redintegration perspective (e.g., Nairne, 2002; Schweickert, 1993).

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Short-Term Memory - 17:30-19:30

(2118)**Visual Short-Term Memory: is Capacity Dependent on Stimulus Complexity?** - *Thomas ALRIK SØRENSEN*

Several recent studies have explored the nature and limits of visual short-term memory (VSTM) (e.g. Luck & Vogel, 1997). A VSTM capacity limit of about 3 to 4 letters has been found,

thus confirming results from earlier studies (e.g. Sperling, 1960). However, Alvarez and Cavanagh (2004) have argued that VSTM capacity is dependent on visual complexity rather than the number of objects. We hypothesise that VSTM capacity is dependent on both the objective and the subjective complexity of visual stimuli. Contrary to Alvarez and Cavanagh, who argue for objective complexity, it seems that subjective complexity - which is dependent on the familiarity of a given stimulus - plays a more important role than the objective visual complexity of the objects stored. In several studies, we explored how familiarity influences the capacity of VSTM and our results indicate that VSTM capacity for familiar items is larger irrespective of visual complexity.

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Short-Term Memory - 17:30-19:30

(2119)- **Effect of Timbral Similarity in Short Term Memory as a Function of Retention Interval** - *Nathalie FOURNET, Sophie DONNADIEU*

This study investigated the possibility to observe a similarity effect for non verbal auditory information in short-term memory, equivalent to the classical phonological similarity effect. Participants had to detect a sound in a comparison list of sounds, which was not presented in a reference one, by indicating the position of the novel sound (order recognition task). The recognition occurred either after a 2, 8 or 24 seconds delay and the list was either similar or dissimilar. For the similar list, timbres shared a common value on one of the psychoacoustical timbre dimension. The results showed a “timbral similarity effect” for the 2 s retention interval, which disappeared for the 8 s delay. No “beneficial timbral similarity effect” was observed for the 24 seconds delay. These results are discussed in the light of Nairne’s (1990) feature model and extend to non verbal auditory information, the role of item-specific and inter-item processes.

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Spatial Cognition II - 17:30-19:30

(2120)**Cognitive Determinants of Efficiency of Pilot's Behavior in Conditions of Spatial Disorientation** - *Hanna BEDNAREK*

This study examined efficiency of pilots' behavior in conditions of spatial disorientation. It has been assumed that visual illusion of false horizon tends to produce spatial disorientation. Efficiency of execution of flight’s profile in conditions of spatial disorientation was analyzed in context of dependent vs independent style of perception. Additionally, efficiency of attention and working memory were analyzed. 29 pilots participated in the experiment (air-raid 1021.2; hours +/- 18.4). Efficiency of execution of flight profile has been defined on simulator YAPETUS based on indicators of course (high, velocity). Cognitive processes were researched by means of computer tasks. It appears that false horizon illusion influence the efficiency of pilot's behavior. In conditions of cognitive conflict: visual field - navigational instruments, pilots dependent on field were most strongly exposed to disorientation (lower efficiency of selective and divided attention, less resistance to distraction, weak mechanism of inhibition and higher susceptible to interference).

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Spatial Cognition II - 17:30-19:30

(2121)**The Effects of Congenital and Late Visual Impairments on Mental Representations** - *Zaira CATTANEO, Tomaso VECCHI, Maura MONEGATO, Alfredo PECE, Cesare CORNOLDI*

Previous studies suggest that congenitally visually impaired people perform closer to sighted than to blind individuals when required to generate visuo-spatial mental representations corresponding to tactile stimuli. This research indicates that this is not the case when late - and not congenitally visually impaired individuals - are tested. The experiment required to memorise the location of a number of targets presented either on tactile or visual matrices. The capacity to simultaneously maintain multiple information in memory, to integrate different inputs into a single representation and to deal with three-dimensional stimuli was measured. Late visually impaired people showed less efficient visuo-spatial processes compared to congenitally visually impaired individuals, suggesting that the compensatory mechanisms associated to the sensory loss are modulated by the timing of the deficit-onset. The same pattern emerged both with tactile and visual stimuli. Differences between late and congenitally visually impaired participants were of a quantitative nature only, indicating common cognitive mechanisms that can be clearly differentiated from those of congenitally blind people

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Spatial Cognition II - 17:30-19:30

(2122)**Mental Rotation of Mirrored Letters: Evidence From Event-Related Brain Potentials** - *María Isabel NÚÑEZ-PEÑA, José Antonio AZNAR-CASANOVA*

ERPs were recorded while participants were presented with mirrored and normal letters at different orientations and were asked to make mirror-normal letter discriminations. Our main aim was to test whether the mental rotation of normal letters differs from the mental rotation of mirrored letters. The results showed the well-known orientation effect on both the response time and the amplitude of the rotation-related negativity. However, the version of the letter also had an impact on the ERP pattern. The orientation effect on the amplitude of the rotation-related negativity was more evident for normal than for mirrored letters. Mirrored letters in the upright position showed a negative-going waveform over the right hemisphere in the 400-500 ms window. This negativity was also present in mirrored letters at 30º and 60º, but in these cases was not lateralized. These results indicate that mental rotation of mirrored letters differs from that of normal letters, and suggest that an extra rotation out of the plane may be involved in the processing of mirrored letters.

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Spatial Cognition II - 17:30-19:30

(2123)**Similarity is Closeness: a Perceptual Task.** - *Inge BOOT, Diane PECHER*

The conceptual metaphor theory implies that image schemas, conceptual structures formed by our sensorimotor experience, of concrete concepts are mapped onto abstract concepts (Johnson, 1987; Lakoff and Johnson, 1980, 1999; Gibbs, 1994). In the present study we examined the metaphor SIMILARITY IS CLOSENESS in a perceptual paradigm not used before in this research field. Participants had to decide whether two colors presented in squares in the middle of a screen were similar or dissimilar. These squares were presented horizontally near or far from each other. We found an interaction effect for similarity and distance. Participants responded faster and more accurate to similar colors that were near each other compared to far from each other, whereas we found the opposite for dissimilar colors. This is evidence that the NEAR-FAR image schema is active during comprehension of the abstract concept SIMALARITY, and thus supports the conceptual metaphor theory.

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Spatial Cognition II - 17:30-19:30

(2124)**Constructing a Spatial Model With a Verbal Description or a Virtual Environment: the Role of Working Memory Components.** - *Luciana PICUCCI, Valerie GYSELINCK, Virginie LEFEVRE, Serge NICOLAS, Pascale PIOLINO*

Two experiments have been conducted to investigate how people create spatial models of the environment as a function of the source through which spatial knowledge is acquired. Routes in a city within a virtual environment and verbal descriptions of the same routes were used. In the first experiment, results suggest that the way information has been encoded plays a role in the construction of the mental model, as asserted by results on a verification task and sketch maps, but it seems that the representations built have a functional equivalence. In a second experiment, a dual-task procedure was used to examine the involvement of the visuo-spatial working memory and the verbal working memory in the construction of the spatial model.

The two components of working memory are expected to be differentially involved as a function of the source for spatial information.

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Spatial Cognition II - 17:30-19:30

(2125)**On the Relationship Between Categorical/Coordinate and Egocentric/Allocentric Spatial Representations** - *Rosamaria SEPE, Luigi TROJANO, Giorgia COMMITTERI, Dario GROSSI, Gian Luca ROMANI, Gaspare GALATI*

We investigated interactions between categorical/coordinate and egocentric/allocentric spatial representations in a behavioural study and in a block-design fMRI experiment. The coordinate task required judging which of two dots was closer to either the body midline (egocentric frame) or the midpoint of a circle (allocentric frame); the categorical task required to judge whether two dots were in the same spatial quadrant, centred on either the body midline or the circle. The behavioural study (38 subjects) revealed a significant interaction between the two kinds of representation, with worse performance and slower responses in the categorical/egocentric combination. Functional MRI (14 subjects), however, only showed significant main effects: the coordinate task strongly activated medial frontal, parietal, and right temporo-parietal regions, while the categorical task activated right frontal and parietal regions, and left temporo-occipital areas; moreover, strong bilateral fronto-parietal activation was associated to the egocentric frame, while medial occipito-temporal activation to the allocentric frame.

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Task Switching I - 17:30-19:30

(2126)**Cue-Independence of Task Inhibition** - *Miriam GADE, Iring KOCH*

As empirical marker of task inhibition in task switching, n-2 task-repetition costs can be measured by comparing performance in trial n-2 repetitions (i.e., ABA) with that in n-2 switches (i.e., CBA). Given the recent discussion of the role of cue-related processing for the performance of task sequences, we designed two 2:1 cue-to-task mapping experiments to further investigate the role of cue processing in the occurrence of task inhibition. We found significant n-2 repetition costs both with n-2 cue repetitions and n-2 cue switches. These costs were about equal (Experiment 1), and this data pattern was found for both short and long cuing intervals (Experiment 2). Thus, we conclude that cue-related processing (i.e., priming from cue-repetitions) cannot account for the observation of n-2 repetition costs. Furthermore, the data also provide further evidence that the target for task inhibition is the task set and not the cue representation. (146 words)

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Task Switching I - 17:30-19:30

(2127)**Explicit and Implicit Cues in the Task Switching Paradigm** - *Kamila SMIGASIEWICZ, Michal WIERZCHON*

The studies were aimed at investigating the influence of explicit and implicit cues on performance in the task switching paradigm. The cue, presented before the target, provides an information which of the two task have to be performed in the next trial. It was assumed that the stronger the association between explicit cue and the task set the better task performance and lower switch costs, as indicated by RTs. This effect should be greater in the long response-stimulus interval (RSI) condition. Secondly, it was expected that implicit cues will also be used to improve task performance, but not to reduce switch costs. The results confirmed predictions concerning explicit cues: switch costs were reduced in strong task/cue as compared to weak task/cue association condition. Additionally, the influence of the former cue type on task performance was stronger in long RSI condition. However, the results concerning implicit cues are not clear and more studies are needed.

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Task Switching I - 17:30-19:30

(2128)**Sequential Effects in Task-Cuing With Explicit and Transition Cues.** - *Björn VAN LOY, Baptist LIEFOOGHE, André VANDIERENDONCK*

The present study investigated to what extent task-cues that are uniquely related (e.g., explicit cues: “color”) and task-cues that are non-uniquely related to a particular task (e.g., transition cues: “repeat”) elicit differences in the actual reconfiguration of task-sets. To this end, transition cueing was compared with transparent (Experiment 1) and non-transparent (Experiment 2) explicit cueing by using a yoked design. Initial results indicated larger switch costs and longer latencies for transition cues compared to explicit cues. Additional analyses controlling for sequential effects and distortions due to scaling, suggest that this effect was solely caused by a stronger facilitative task-repetition benefit for transition cues. There were no differences between both types of cues on task-switch trials. These results converge towards the idea that the difference between uniquely and non-uniquely related cues is not situated in the reconfiguration of task-sets, but can probably be attributed to differences in the interpretation/ translation of these cues.

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Task Switching I - 17:30-19:30

(2129)**The Role of Response Repetition in Task Switching** - *Stephen COOPER, Paloma MARI-BEFFA*

When switching between tasks, transitions of response can be confounded with the task switch. Five experiments examined transitions of response within a linear four-finger arrangement. A random baseline condition was compared with the cuing of specific response subsets, grouped by hand or by finger equivalence, and these subsets were examined in both single task and task switching designs. Results showed that part of the task switch cost is associated with switching between response sets. Furthermore, when task switching and repetition trials are mixed, a bias towards switching the response and/or hand is found in task repetition trials. It is surmised that an anti-perseveration mechanism promotes flexibility and so hinders response repetition when a task switch is expected, even for those trials when a switch of task does not occur. The results demonstrate that executive processes involved in task set configuration closely depend on the structural aspects of the response set.

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Task Switching I - 17:30-19:30

(2130)**Stimulus-Modality Switching** - *Sarah LUKAS, Andrea M. PHILIPP, Iring KOCH*

In a series of experiments, we investigated switching between stimulus modalities in a task-switching paradigm. In each experiment, two stimuli in different modalities (visual and auditory) were presented simultaneously. A cue indicated to which stimulus modality subjects should react to with a spatial decision. Thus, in two consecutive trials, subjects could respond to the same stimulus modality (stimulus-modality repetition) or to different stimulus modalities (stimulus-modality switch). We found substantial stimulus-modality-switch costs in all experiments. That is, subjects responded faster in a stimulus-modality repetition as compared to a stimulus-modality switch. A long cue-stimulus interval reduced this stimulus-modality switch costs. Additionally, we observed an interaction between cue modality and stimulus modality. We discuss the results of the experiments with respect to cue encoding and selective cross-modal attention.

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Task Switching I - 17:30-19:30

(2131)**Influence of an Extra Response Selection Stage in a Task-Switching Paradigm** - *Stéphanie LALLEMAND, Virginie POSTAL, Magdaléna WAWRZYNIAK, André CHARLES*

Executive processes allow a supple shifting between the several tasks which constitute actions of our every day life. However, through the use of the task-switching paradigm, experimental

studies of these situations show the existence of a cost related to the switching between tasks (Allport, Styles & Hsieh, 1994; Rogers & Monsell, 1995). When these tasks share the same response-set, response repetition decreases reaction times (RT) in repetition trials, but increases RT in switching trials (Rogers & Monsell, 1995; Meiran, Chorev & Sapir, 2000). We assume that the response selection process generates a short-term trace temporarily stored in working memory. This trace may persist until the next trial and have differential effects according to the similarity between the two trials. Consequently, if the response selection process is responsible for this trace production, we can presume that any further response selection would replace the trace previously generated. In a task-switching experiment, we manipulate the selection of an additional intra-task implicit response. This extra response selection stage deals with the choice of one of two possible stimuli. As expected, the results show the dissipation of the effect of the previously selected response in the extra response condition. A switching-cost is still observed but it is identical whether the response is the same or different. This result confirms that the trace of the preceding response is temporary and that it is related to the response selection process. Thus, this trace binds the response representation and the relevant task-set. Therefore it may be considered as an episodic trace which may be stored temporarily in working memory. Implications for the episodic buffer, recently proposed as a new structure of the working memory model (Baddeley, 2000), will be discussed.

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Task Switching I - 17:30-19:30

(2132)**Task Switching Performances in Adhd Adults** - *Magdaléna WAWRZYNIAK, Colette FABRIGOULE, Manuel BOUVARD, Stéphanie LALLEMAND*

Attention Deficit Hyperactivity Disorder (ADHD) is increasingly recognized in adults. Cepeda & al. (2000) showed in ADHD children a deficit in executive control through a task switching paradigm. We examined control processes involved in task switching, such as inhibition of the previous task and preparation of a new task, in adults with ADHD. The switch cost, usually observed, can be reduced by increasing tasks preparation and/or dissipation times. We expected that contrary to controls, ADHD adults doesn't benefit from these increased intervals. 10 off medication adults ADHD and 10 matched controls performed a variant of the task switching paradigm, so called the cueing paradigm. In this experiment, participants alternated between two simple tasks allowing us to measure reaction times for repeated or switched trials. For both type of trials, we manipulated durations (short vs long) of the preparation and dissipation intervals as well as the similarity of the responses. ADHD group didn't differ from the control group on mean reaction times and on mean switching costs. However, they didn't take advantage as much as controls of a long preparation time. Furthermore, ADHD obtained a greater switching cost when the dissipation time was increased contrary to controls who showed the reverse – classical - pattern of result. In ADHD patients, the necessity to repeat a response was associated with a cost in switched trials and with a benefit for repeated ones at short and long preparation intervals. The same effect was observed for controls only at short interval. Nevertheless, in switched trials and at short dissipation and/or preparation intervals, ADHD were faster than controls. Results show that ADHD adults were impaired in task-switching situations, especially when intervals – usually employed in order to prepare a new task or deal with interferences steaming for previous trials – are increased.

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Task Switching I - 17:30-19:30

(2133)**Influence of the Frequency of Incongruent and Congruent Stimuli on Task-Set Control** - *Camille BONNIN, Cédric BOUQUET*

When performing a Stroop-like task with Congruent (C) and Incongruent (I) stimuli, incongruent stimuli are processed faster when they are frequent (high I/C ratio) than when they are rare (low I/C ratio) (Logan and Zbrodoff, 1979). De Pisapia and Braver (2006) have suggested that high I/C ratio would induce a proactive control preventing interference prior to stimulus onset. Alternatively, performances obtained in the low I/C ratio condition would reflect the efficiency of reactive control suppressing irrelevant information after stimulus onset. The present study tested whether this implicit handling of control induced by I/C ratio could influence the performance in an unpredictable task-switching paradigm. The performance on task-repeat trials was affected by I/C ratio manipulation, while performance on switch-trials was unaffected. This indicates sustained task-set control processes carried out in task-repeat trials distinct from transient control processes carried out in task-switch trials.

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Word And Letter Processing II - 17:30-19:30

(2134)**Structural and Positional Features of Chinese Charater Radicals** - *Anna Wing-Yee LEE,*

Chinese orthography is made up of characters. Each character is composed of radicals, which are important processing units. Previous research mainly focused on two-radical characters. Little is known about three-radical characters. This study investigates the properties of radicals in three-radical characters by using a radical-completion task where one of the radicals is missing in three-radical characters. Native Chinese participants from Hong Kong choose from three choices the correct missing radical. Results showed that response times were significantly faster and accuracy was significantly higher when the given radicals had a small type frequency and when the missing radical was in the bottom position. The propositions of a small type frequency that helps limit the choice and the Chinese character writing sequence which rendered filling in the lower position faster were tested across several conditions. The same robust results were found. Implications of this on mental lexical memory and organization were discussed.

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Word And Letter Processing II - 17:30-19:30

(2135)**Morphological Priming in Children's Visual Word Recognition : a Developmental Study From Grade 2 to Grade 4.** - *Severine CASALIS, Pascale COLE, Stéphanie DUCROT, Sophie BOUTON, Marion DUSAUTOIR*

Recent studies have pointed the importance of morphemic units in reading acquisition. The morphological structure was evidenced to assist word reading in English while it helped French or Italian Children to decode pseudowords. The aim of the study was to track the morphological processing while reading in developing children and to disentangle its effect from this of orthographic and/or semantic information. Children, from grade 2 to 4 performed a lexical decision task, with four priming conditions : morphological, orthographic, semantic and unrelated. Two SOAs were considered : 80 ms and 250 ms. Results clearly evidenced a morphological priming at both SOAs, with a spreading activation course different from that of both orthographic (evidenced for the shortest SOA only) and semantic (not evidenced at these SOAs) priming. These priming effects evolved from 2 to 4 grade. Morphological information is thus available early in reading acquisition.

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Word And Letter Processing II - 17:30-19:30

(2136)**Using Transposed-Letter Confusability Effects to Investigate Lexical Precision** - *Kristi PAUL, Sally ANDREWS*

The lexical quality hypothesis proposes that skilled readers rely on high quality lexical representations that code orthographic and phonological information precisely and redundantly. Such representations allow automatic lexical retrieval without depleting attentional resources required for comprehension. This research used transposed-letter confusability effects to investigate individual differences in the precision of skilled readers' lexical representations. Two experiments investigated the effects of adjacent and non-adjacent letter transpositions (e.g. confusing misucal or mucisal for musical) in a masked

priming lexical decision paradigm across groups categorized on reading and spelling ability. Overall, consonant transpositions were more disruptive than vowel transpositions in both adjacent and non-adjacent positions. Individuals with higher quality lexical representations (indexed by above average reading and spelling performance) were better able to resolve discrepancies and more sensitive to consonant and vowel differences. The results have implications for understanding how letter order and consonant-vowel status are coded in models of visual word recognition.

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Word And Letter Processing II - 17:30-19:30

(2137)**Mixing Fast Nonwords and Slow Nonwords Does Not Homogenize RTs: a Challenge to the Time Criterion Account** - *Francesca PERESSOTTI, Claudio MULATTI, Remo JOB*

The time criterion account (Lupker, Brown, & Colombo, 1997) posits that the moment in time in which a response is released might change as a function of the list composition: fast items are responded to slower when mixed with slow items, whereas slow items are responded to faster when mixed with fast items. We put this account on the test by comparing short and long nonwords in pure and mixed list. Experiment 1 compared 5 vs. 6 letter nonwords. Experiment 2 contol for an attentional bias found in Experiment 1. Experiment 3 compared 3 vs. 7 letter nonwords to control for a possible lack of statistical power of Experiment 1 and 2. In none of the experiment we found an omogeneization of the reaction times, thus contradicting the time criterion account predictions.

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Word And Letter Processing II - 17:30-19:30

(2138)**Early Recognition of Irregular Words: Evidence From Morphological Priming in English** - *Davide CREPALDI, Max COLTHEART, Lyndsey NICKELS*

Forster et al. (1987) and Meunier et al. (2004) investigated irregular morphological priming with short SOA; they both report equal facilitation when a stem is primed by itself (or a regular inflected word) and by an irregular related word. However, both these studies used only one set of control words, making impossible a perfect prime-control matching in both repetition/regular and irregular conditions. We replicated these lexical decision studies using similar SOA (40ms) and two different control word sets, each of which was matched for length, frequency, number of orthographic neighbours and orthographic overlap with either the repetition or the irregular prime list. The results show that there is a repetition priming effect, there is a borderline irregular priming effect, and this latter is smaller than the repetition effect, contrary to the previous findings. The consequence of these results for the models of complex word recognition will be discussed.

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Word And Letter Processing II - 17:30-19:30

(2139)**The Time Course of the Cerebral Activations Associated With Resolving the Lexical Ambiguity: an Meg Study** - *Gisoon YU, June Sic KIM, Chun Kee CHUNG, Kichun NAM*

Neuromagnetic fields were recorded from normal 10 subjects to study the time course of cerebral neural activation while they resolved a lexical ambiguity. All recordings were made using a whole-head 306-channel MEG (Elekta Neuromag Inc., VectorviewTM). The observed activity was described by sLORETA (standardized low resolution brain electromagnetic tomography) techniques implemented in CURRY software (Neuroscan). In the results, the occipito-temporal lobe was bilaterally activated at 170ms. At 250ms bilateral temporal lobe was associated with ambiguous condition, whereas the left parietal and temporal lobe was activated on unambiguous condition. The left frontal lobe and temporal lobe were activated at 350ms for all condition. At approximately 430ms, the right frontal and temporal lobe was activated when resolving ambiguity, whereas the left parietal lobe and the right temporal lobe were activated when preserving ambiguity.

In conclusion, the cerebral activations that are related to resolving lexical ambiguity were right frontal lobe and those related to maintaining ambiguity were left parietal lobe.

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Word And Letter Processing II - 17:30-19:30

(2140)**Assigning Stress to English Polysyllabic Words: to What Extent Can Orthography Help?** - *Nada SEVA, Padraic MONAGHAN, Joanne ARCIULI*

On reading a word, how does the speaker access the pattern of stress for the word? This may be accomplished through the application of rules related to morphology, or through direct association with the lexical item, or through the application of combined phonological, orthographic, and grammatical probabilistic cues (Kelly, 1992, 2004; Arciuli & Cupples, 2006, in press; Monaghan, Chater, & Christiansen, 2005). We constructed a series of simple feedforward models that learned to map the orthography of disyllabic words onto stress position, from English corpora of wordforms, word lemmas, and monomorphemic words. The models were trained on random samples of 90% of the corpus and tested on the remaining 10%. All models resulted in highly accurate classifications, with mean d-prime = 2.5, 1.6, and 1.1 for wordforms, lemmas, and monomorphemes, respectively. The simulations indicated that probabilistic orthographic cues alone provide extremely accurate information about stress position assignment in reading.

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Working Memory II - 17:30-19:30

(2141)**A Dissociation Between Local and Global Updating Processes in Working Memory** - *Yoav KESSLER, Nachshon MEIRAN*

In a series of 4 experiments, we show that updating working memory (WM) representations is carried out by the cooperative act of 2 dissociable processes. Participants had to keep track of 1-3 items (digits or Gibson figures). In each trial, the items were either similar to the previous trial, or different in any or all of the items. Experiments 1-2 established the existence of 2 independent reaction time components. The first, “global updating cost”, was sensitive to total number of items in WM (set-size), regardless of the number of items that were actually modified. The second, “local updating cost”, was sensitive to the number of modified items, regardless of the set-size. Experiment 3 used a same-different paradigm that eliminated the local updating process, but not the global process. Experiment 4 provided evidence for binding between all items in WM that is accomplished by the global updating process.

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Working Memory II - 17:30-19:30

(2142)**Sensitivity of the Time-Based Resource-Sharing Method to the Interaction of Digit Recall With Sentence Processing** - *Maaike LONCKE, Timothy DESMET, André VANDIERENDONCK, Rob HARTSUIKER*

We investigated the relation between syntactic processing and working memory resources using the Time-Based Resource-Sharing (TBRS) methodology (Barrouillet, Bernardin, & Camos, 2004). In line with this method we presented a series of digits, which had to be reproduced after an interval of a few seconds. During the interval either the grammatically simple or the grammatically complex version of a sentence had to be processed. We found an influence of sentence processing difficulty (simple vs. complex sentences) on the recall of the digits. We did however not find an effect of memory load (5 vs. 6 digits) on sentence processing. The asymmetry in sensitivity of the TBRS method to the trade-off between syntactic processing and working memory load mirrors the pattern of results of Liefooghe, Barrouillet, Vandierendonck and Camos (submitted), who found an effect of task switching on recall, but no influence of load on task switching with the TBRS paradigm. Barrouillet, P., Bernardin, S., & Camos, V. (2004). Time Constraints and Resource Sharing in Adults' Working Memory Spans. Journal of Experimental Psychology: General, 133(1), 83-100. Liefooghe, B., Barrouillet, P., Vandierendonck, A. &

Camos, V. (submitted). Working memory costs of task switching.

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Working Memory II - 17:30-19:30

(2143)**Processing and Storage in Visuo-Spatial Working Memory: a Time-Based Resource Sharing Account** - *Evie VERGAUWE, Pierre BARROUILLET, Valérie CAMOS*

Interference between processing and storage in visuo-spatial working memory was investigated in four experiments. Complex span tasks were used in which the cognitive load of the processing component was manipulated. This was done by varying the number of stimuli to be processed within a processing phase of fixed duration. Increasing the cognitive load of the processing component resulted in poorer recall performance within both the spatial (experiment 1) and the visual domains (experiment 2). Furthermore, the same effect of cognitive load on recall performance was found between visual processing and spatial maintenance (experiment 3) and between spatial processing and visual maintenance (experiment 4). Being at odds with both process- and domain-based fractionations within (visuo-spatial) working memory, these results are consistent with a time-based resource sharing account of working memory as proposed by Barrouillet, Bernardin and Camos (2004).

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Working Memory II - 17:30-19:30

(2144)**The Magnitude of the Path Complexity Effect in Visuo-Spatial Working Memory After Controlling for Other Factors** - *Virpi KALAKOSKI, Sebastian THERMAN, Anu LEHTINEN*

Path complexity, as measured by the number of path crossings in the to-be-remembered sequences, has been shown to affect recall accuracy in a Corsi-type spatial serial recall task (Parmentier, Elford, & Maybery, 2005). We studied the effect of path crossings after controlling for other factors, such as path length and angles, which have also been shown to affect serial spatial memory. A method similar to that used by Parmentier et. al. was applied in four experiments, where the task was to recall the order of seven dots that were presented in sequence. Our results showed that, after controlling for the path length and the angles, the effect of the number of path crossings was small, in contrast to what previous studies have assumed. Furthermore, our results indicated that the serial position of the first crossing in the sequence modulates the effect of path complexity. The mechanisms underlying the effect of path crossing was further studied by analyzing spatial and order errors in a condition where the recall was conducted on an empty screen without position cues.

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Working Memory II - 17:30-19:30

(2145)**Verbal Working Memory and Morphological Complexity** - *Dezso NEMETH, Rozália IVADY, Marton MIHALTZ, Donald PECKHAM, Attila KRAJCSI, Csaba PLEH*

The main purpose of this study is to explore the relationship between verbal short-term memory and the morphological complexity of words. Hungarian, as an agglutinative language, is of special interest for psycholinguistic inquiries in morphology. The authors present two word list recall experiments. The recall of the word list was measured by the classical span design. The item lists consisted of two-syllable stems (base words) and two-syllable morphologically complex words (stem + suffix). Within each list the words were of the same length, the same phonological structure (CVCVC), the same frequency and the same concreteness. The same experimental design was used with three-syllable words as well. Results indicated that morphological complexity has a significant effect on word span, and that memory was better for derived words (e.g., boy + hood) than inflected words (e.g., boy + s), and regular than irregular words.

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Attention III - 14:00-16:00

(3001)**Decisional Processes in Time Discrimination: a Dual-Task Analysis.** - *Anne-Claire RATTAT, Claudette FORTIN, Richard SCHWEICKERT*

The purpose of the present study was to distinguish between processing stages in a time discrimination task by examining dual-task interference in a psychological refractory period (PRP) paradigm. Participants performed two tasks: 1) classify the duration of a tone as being short or long, 2) classify a digit as being odd or even. Responses were speeded in both tasks. The stimulus-onset-asynchrony (SOA) was varied so that the digit classification task could be performed at various times during the tone presentation. Response times to the digit task varied significantly with the SOA, showing a sharp increase towards the end of tone presentation. These data are interpreted as distinguishing decisional and peripheral processes in temporal discrimination.

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Attention III - 14:00-16:00

(3002)**Spatial Attention Improves Temporal Resolution** - *Ana B. CHICA, John CHRISTIE*

Recent evidence suggests that spatial attention impairs temporal resolution (Hein, Rolke, & Ulrich, 2006; Rolke, Dinkelbach, Hein, & Ulrich, 2006; Yeshurun, 2004; Yeshurun & Levy, 2003). Here we study the effect of spatial attention in temporal resolution while constraining reaction time such that the response decision was made within comparable time windows in all conditions. The results revealed that, when speed stress was controlled, performance was still impaired for cued trials as compared with the neutral trials used in previous research, although it was actually improved for cued trials as compared to uncued trials. These results suggest that speed-accuracy trade-off effects may have played an important role in the previous studies, because when it was controlled, the results completely reversed, revealing that exogenous attention does improve performance on temporal resolution tasks.

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Attention III - 14:00-16:00

(3003)**Can Training Eyemovements Hinder Visual Search Performance?** - *Richard DEWHURST, David CRUNDALL*

There have long been assumptions about optimal visual strategies for specific tasks, arising from the differences noted between experts' and novices' eye movements in domains as diverse as reading, driving, rifle shooting, and cricket. However, because there remains a gulf between theoretical models of eye-movement control (e.g Findlay & Walker, 1999) and their use in applied contexts, simply training novices eye-movements to resemble those of experts may not lead to improvements in performance (Donovan, Manning, Phillips, Highman, & Crawford, 2005). It is plausible, based on Findlay & Walkers model of saccade generation, that only training people where to look actually hinders the ability to process foveated stimuli (via activation of the centre concerned with generating saccades and inhibition of the centre concerned with maintaining fixation). A series of experiments attempts to demonstrate this result, suggesting that optimal training for complex visual tasks should focus both on saccades and fixations.

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Attention III - 14:00-16:00

(3004)**Effects of Cue Luminance on Facilitation and Inhibition in a Spatial Cueing Paradigm** - *Yuanyuan ZHAO, Dietmar HEINKE, Glyn W. HUMPHREYS*

Two experiments investigated the influence of cue luminance on attention capture and inhibition of return (IOR) in a spatial cueing paradigm. Experiment 1 contrasted effects of small luminance increases with those of large increases. The magnitude of facilitation and inhibition did not change but the onset of IOR was delayed when there was only a small increase. In Experiment 2 decreases in cue luminance were examined and demonstrated similar effects as a function of the magnitude of the luminance decrease, though overall facilitation and inhibition occurred later in Experiment 2 than in Experiment 1. The results suggest that the change in luminance direction of the cue modulates the overall timing of attentional orienting, while the magnitude of the change specifically influences the timing of IOR.

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Attention III - 14:00-16:00

(3005)**Object-Based and Space-Based Hierarchical Focusing of Visual Attention** - *Menahem YEARI, Morris GOLDSMITH*

Is the focusing (as opposed to orienting) of visual attention object-based, space-based or both? We compared the identification of targets in hierarchical, compound-letter stimuli, orthogonally varying global size (large vs. small), and organizational complexity: 2-level structure (a global letter composed of local letters) versus 3-level structure (a global letter composed of squares composed of local letters). Participants successively identified the global and local letters in one of two orders: global-local (focusing) or local-global (defocusing, with attention initially fixated on the local elements). Longer overall response latencies were observed for both large versus small and 3-level versus 2-level stimuli, indicating that attentional focusing and defocusing are affected by both spatial and organizational factors. Control experiments ensured that these results do not stem from differences in target discriminability or attentional interference (distraction introduced by the intermediate-level squares). The results support a hierarchical object-based spatial model of attentional focusing.

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Attention III - 14:00-16:00

(3006)**Selection in Touch: Negative Priming With Tactile Stimuli** - *Christian FRINGS, Regine BADER*

Negative priming (NP) refers to the finding that in selection tasks (where targets are accompanied by distractors) the processing of stimuli previously ignored is usually impaired in terms of reaction times and error rates. This phenomenon has been widely analyzed to gain a better understanding of selection processes. However, so far only visual and auditory stimuli were used; here, we transferred the NP paradigm to the tactile modality. In two experiments ($N = 17$, $N = 20$) participants selected a vibro-tactile stimulus presented at one hand while simultaneously ignoring a distractor vibration on the other hand. When the distractor-stimulus was repeated as the following target, participants showed especially large NP effects (Cohen's $d > .90$). The results suggest that selecting targets against distractors in touch functions in the same way as in vision or in the auditory modality, hereby emphasizing that selection is a modality-free function of attention.

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Attention III - 14:00-16:00

(3007)**Dissociating Repetition-Dependent Congruency Modulations.** - *Peter ZEISCHKA, Kathleen MAETENS, Eric SOETENS*

In congruency tasks, repeating irrelevant information tends to decrease congruency effects. On trial-to-trial basis this has been observed in the Stroop-, Simon-, and flanker task, but only with short response-stimulus intervals (RSI). Also on block level, with continuous repetition of irrelevant information and long RSI's, congruency effects disappear. Both effects have been explained with a common mechanism: attention is attracted by changes in irrelevant information, abstracting processing resources from the relevant information. In two flanker experiments, one with colour stimuli and one with arrow stimuli, we show that the repetition effect on block level is present for both types of stimuli, whereas the repetition effect on trial level only occurs with arrow stimuli. This discrepancy suggests that the repetition dependent flanker congruency modulation can be caused by two at least partially different mechanisms: a low-level adaptation process based on residual activation, and a higher-level more strategic-like process.

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Attention III - 14:00-16:00

(3008)Alpha Band Activity and CNV Reflect the Evaluation of Target Probability - Waltraud STADLER, Karim N'DIAYE, Richard RAGOT, Wolfgang KLIMESCH, Catherine TALLON-BAUDRY, Viviane POUTHAS

During the presentation of stimulus sequences in oddball paradigms, participants tend to implicitly evaluate the conditional probability of target occurrence. In order to study the influence of probability evaluation on timing processes during anticipation and response preparation, EEG alpha power and CNV amplitude were analyzed with respect to subjective probability of target occurrence in sequences of auditory stimuli. Standard trials consisted of tone pairs. Target trials were characterized by the omission of the second stimulus in the pair. Behavioral reaction time was significantly shorter after highly probable targets. Both EEG indicators showed low activity preceding low probable targets and increased activity preceding high probable targets. Results suggest that preparation to respond to upcoming events is a ratio of costs and benefits. If target probability was low, it was judged as being too costly to trace the time course and to invest in the preparation of an accurate response.

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Attention III - 14:00-16:00

(3009)**Processing Fate of Pop-Out Stimuli in a Visual Search Task: an ERP Study** - *Anna SCHUBÖ, Angela DINKELBACH, Elkan AKYUREK*

Detection of pop-out stimuli is considered to be fast and relatively effortless. Further processing, however, is considered to depend on the availability of cognitive resources. To what extent does processing of simple orientation pop-outs depend on their relevance for further processing stages? To what extent do task instructions affect 'early' selection processes? Observers had to perform a memory task while searching through a search display. Some pop-out targets required further processing, others did not. We hypothesized that differences in pop-out selection modulate early ERP components, while late components are modulated by differences in working-memory encoding. Results showed similar N1 and N2pc for all pop-out stimuli but larger P3 amplitudes for those pop-outs that had to be processed further. This P3 modulation was strongest in participants performing well in the memory task. Results support an initial common selection stage for all pop-out stimuli and separate further processing dependent on working-memory involvement.

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Attention III - 14:00-16:00

(3010)Attention Orienting Follows a Progressive Mode, Related to Salience and Relevance - Damien FERNANDEZ, Sophie GARCIA, George *A. MICHAEL*

Visual selective attention is thought to be allocated from the most to the least salient items, until a target is found. This implies a progressive mode of attention orienting, which still has to be assessed. In a visual search task, participants had to discriminate a target among three items of different sizes (big, intermediate and small), and thus of different saliences. The probability for items to be the target was either equal for all the items (a), or favoured the big (b) or the small one (c). Thus, the role of task relevance could also be evaluated. In (a), RTs continuously decreased with increasing salience. This pattern was accentuated in (b), whereas it reversed in (c). The progressive mode of attention orienting was directly supported by these results, and shown to depend on a combination of salience and relevance. As salience, relevance appeared to function on the basis of a gradient, from high to low relevance.

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Attention III - 14:00-16:00

(3011)**Dissociating Attention Shifting and Expectation Through Electroencephalographic Dynamics** - *Diego COSMELLI, Vladimir LOPEZ, Javier LOPEZ-CALDERON, Bernard RENAULT, Jacques MARTINERIE, Francisco ABOITIZ*

Electroencephalographic recordings were used to study human cortical dynamics specifically engaged by covert attentional orienting. To this end, a visuospatial cueing paradigm that included a central (no-shift) task to control for expectation was used. Early and late cue-evoked potentials distinguished shift from no-shift conditions. Oscillatory induced alpha-band activity was differentially modulated in upper and lower sub-bands during the task. When attention was shifted, upper alpha-band activity was sustained above control level over parietal regions contralateral to the ignored visual hemifield. Occipital decrease in overall alpha power was observed upon orienting, but did not differ from the no-shift condition. Our results suggest that facilitatory processes during visuospatial attentional shifts, as indexed by posterior alpha suppression, might be more related to expectation of upcoming stimuli than to the actual displacement of the attentional focus. The latter seems dependent on selective, dynamically complex, enhancement of parietal alpha oscillations contralateral to the ignored hemifield.

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Attention III - 14:00-16:00

(3012)**Individual Differences in Working Memory Predict Attentional Shifting** - *Lubna AHMED, Jan DE FOCKERT, Tomas CHAMORRO-PREMUZIC*

Individual differences in working memory capacity (WMC) have been shown to predict efficiency of selective attention processes (e.g. Kane et al 2001; Conway et al 2000), it is not however known if a similar relationship exists for the ability to shift attention. In the current study the Posner cueing paradigm, in which participants are cued to shift their attention to a given target location was used to assess WMC related differences in attentional shifting. The results demonstrated a reliable difference in the cue validity effect between high and low WMC individuals; the high group showed the expected effect of cue validity whereas the low group demonstrated an absence of the effect, indicating a differentiation in the ability to shift attention in response to a cue between these groups. The results provide support for the relationship between WMC and attentional processes extending beyond the domain of selective attention alone.

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Attention III - 14:00-16:00

(3013)**The Joint-Effect of Feature-Based and Space-Based Attention in a Visual Memory Storage Task** - *Mohamed Aymen BEN ABBES, Thierry RIPOLL*

In a previous study, we found that visual memory storage is highly sensitive to the spatial configuration of targets. Indeed, targets were better memorized when they appeared in separate locations. We investigated the joint-effect of selections that are based upon spatial properties and selections that are based upon elementary local property (i.e. color) on a visual short term memory task. This task was to memorize four objects embedded among four previewed distractors. The spatial variable was manipulated by using four different configurations, the first of which had completely contiguous targets, the next two of which had partially contiguous targets, and the last of which had completely non-contiguous targets. The local property was manipulated through differences in color salience between targets and distractors. The main result was that accuracy remarkably increased with inter-target separation, which indicate that subjects continue taking advantage of the spatial information although the salient difference between targets and distractors. This spacing effect are consistent with the recent reformulation of the "biased competition model" that suggests a degradation of perceptual performance when two or more neighboring objects must compete for attentional resources (McCarley, Mounts & Kramer, 2006).

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Auditory Perception - 14:00-16:00

(3014)**Breaking the Rule: Mismatch Negativity is Affected by Top-Down Predictive Information** - *Andreas WIDMANN, Erich SCHRÖGER*

The mismatch negativity component (MMN) of the human event related brain potential reflects neural processes related to the detection of irregularities in acoustic stimulation. MMN was supposed to be unaffected by top-down predictive information as it is also elicited when participants have full knowledge about an upcoming deviation, e.g. when it was predicted by an attended visual cue. Here, however, we show that top-down predictive information can affect the processes underlying MMN generation. MMN amplitude was found to be smaller in response to self-generated expected deviants compared to unexpected deviants and deviants where no top-down predictive information was available. It is argued that the processes underlying MMN generation, in particular the generation of the memory trace serving for the memory comparison, are accessible to top-down predictive information and not restricted to bottom-up driven regularity violations.

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Auditory Perception - 14:00-16:00

(3015)**Phonology-To-Spelling Consistency Effects in Visual and Auditory Word Recognition** - *Ana PETROVA, Johannes ZIEGLER, Ludovic FERRAND*

Two experiments investigated the role of phonology-to-spelling consistency in the visual and auditory lexical decision tasks in French and English. Experiment 1, done in French, showed strong phonology-to-spelling consistency effects in the auditory modality but no such effects in the visual modality despite the fact that the same items were used in both modalities and that consistency was manipulated at different units (onsets and rimes). In Experiment 2, exactly the same pattern of results was found in English showing that the previous finding is not limited to French. Moreover, in this experiment, bidirectional phonology-to-spelling and spelling-to-phonology consistency was manipulated to test whether there is evidence for feedback loops in either modality. No bidirectional effects were found in either modality. The most parsimonious interpretation of these results is that people activate phonology when they read (visual modality) and that they activate orthography when they listen (auditory modality) but that neither information feeds back to alter the incoming information.

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Auditory Perception - 14:00-16:00

(3016)**Neural Correlates in the Processing of Auditory Spatial Cues and Stimuli Direction.** - *Marco SPERDUTI, Ralf VEIT, Andrea CARIA, Paolo BELARDINELLI, Niels BIRBAUMER, Marta OLIVETTI BELARDINELLI*

A sound source position in the horizontal plane is mainly computed by the central nervous system using binaural cues: interaural level difference (ILD) and interaural time difference (ITD). None of previous neuroimaging studies evidencing that the auditory system is divided in two streams devoted to sound recognition and localization respectively, has directly addressed the question if cortical activity is modulated by different stimuli features. The aim of this study is to investigate neural correlates for the processing of incoming sounds direction and different binaural cues. By means of fMRI we measured brain activity of 12 healthy subjects listening to stimuli differing in spatial location and spatial cues: ILD, ITD or Head Related Transfer Functions (HRTF). Our findings suggest that brain activity changes according to stimuli direction but not to spatial cues type. In particular, stimuli delivered from central position elicit bilateral activations, while lateralized stimuli activate only contralateral cortex.

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Auditory Perception - 14:00-16:00

(3017)**The Effects of Sound Familiarity on the Electrophysiological Components of Pre-Attentive Auditory Processing** - *Ursula KIRMSE, Erich SCHRÖGER, Thomas JACOBSEN*

This study addressed the effects of sound familiarity and familiarity of the sound context on the event-related brain potentials (ERPs) of pre-attentive auditory processing. Therefore, a familiar sound (a sheep) and an acoustically matched unfamiliar sound were presented in different conditions. An enhanced positivity for the familiar sound was observed in the time range of 230 ms in all conditions. When presented with 100 % probability (thus further creating an either familiar or unfamiliar context), the familiar sound additionally elicited an enhanced P2 (154-174 ms) and a negativity in the time range of 300 to 400 ms. On the other hand, a posterior enhancement of the N1 for the familiar sound was observed for conditions implying stimulus changes (50% probability each and location deviants presented within 100% familiar or 100% unfamiliar sounds). These results identify first electrophysiological markers of sound recognition. The effects will be further investigated using variable sound material.

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Auditory Perception - 14:00-16:00

(3018)**Sound Localization and Auditory Capture in a Spatial Cuing Paradigm** - *Marieke VAN DER HOEVEN, Adelbert BRONKHORST, Jan VERHAVE*

This study examined how an auditory non-informative spatial cue influences detection and localization of auditory targets. In a go-no go task subjects attended a centrally placed loudspeaker surrounded by 6 other loudspeakers and were asked to respond only to centre targets. The cue came from one of the loudspeakers and preceded the target tone with an SOA of 100 or 400 ms. A baseline condition with a spatially diffuse cue was included, using out-of-phase presentation through two loudspeakers. Results show that, compared to the baseline, cues shortened reaction times at small cue-target angles (up to 7º) and increased them at larger angles. At the shortest SOA, the reaction time difference was up to 80 ms. Furthermore, cuing seems to have no effect on sound localization: false alarms were normally distributed around the hits. These findings demonstrate that strong auditory capture effects occur that depend on cue-target distance.

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Auditory Perception - 14:00-16:00

(3019)**Cognitive Priming in Melody Perception** - *Frédéric MARMEL, Barbara TILLMANN, Charles DELBE*

The musical priming paradigm has shown facilitated processing for tonally related, expected targets over less-related targets. Our goal was to show that cognitive components (based on listeners' knowledge about the Western tonal system) are sufficient to elicit priming in tonal melodies, with sensory components (e.g., acoustic overlap) being controlled. The tonal relatedness of target tones was manipulated by changing only one tone in the melodies, thus keeping sensory differences minimal between related and less-related contexts. The musical priming effect was observed for melodies played by piano tones (Experiment 1) and pure tones (Experiment 2). Simulations with a model of the peripheral auditory system suggest that data for piano tones can be explained in terms of sensory components, while the model fails to explain the effect for pure tones. The priming effect for pure tones (Experiment 2) thus provides evidence for the influence of listeners' tonal knowledge on music processing.

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Auditory Perception - 14:00-16:00

(3020)**Role of Stimulus Length, Intensity, and Offset-Onset Interaction in Audiovisual Temporal Order Judgement** - *Lars T. BOENKE, Matthias DELIANO, Frank W. OHL*

We investigated the influence of different stimulus parameters on the perception in an temporal order judgment task (TOJ). Recent studies have revealed various confounds in classical work on intermodal TOJs, in that, e.g. eccentricity, response

dimension or relative stimulus location have an influence on the time order threshold. In the present study we asked the question whether systematic variation of the temporal interval between onset of a stimulus and offset of the preceding stimulus, the length of the stimuli, and the subjective intensity of clearly suprathreshold audio-visual stimuli (such as white noise tone bursts and white light pulses) have influence on the perceived temporal order judgment. Our preliminary results indicate a dissociation of these parameters on perceived temporal order. Final results will be reported and discussed in the light of masking effects and stimulus offset-onset interactions.

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Bilingualism III - 14:00-16:00

(3021)**Influence of Dutch Gender on Discourse Processing in English: Evidence From Eyetracking** - *Kathy CONKLIN, Ton DIJKSTRA, Walter VAN HEUVEN*

Two eyetracking studies with Dutch-English bilinguals were conducted to determine whether Dutch gender information influences English pronoun resolution while listening to sentences in an English discourse. Dutch-English bilinguals listened to an English discourse while viewing a corresponding visual scene containing a cartoon character and an inanimate object. Interpretation of pronouns was investigated following the presentation of inanimate nouns which have gender in Dutch, but not in English (i.e., tractor is masculine in Dutch but has no gender in English). To refer to a previously mentioned tractor in Dutch, the masculine singular pronoun HIJ is used. Upon hearing the pronoun HE bilinguals had increased looks and fixation durations to inanimate objects for cognates (e.g., tractor) but not noncognates (kite/vlieger). Results show that information about Dutch gender is active while processing spoken discourse in English. These findings will be discussed in terms of the BIA+ model.

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Bilingualism III - 14:00-16:00

(3022)**Event-Related Alpha and Beta Band Oscillations in Word Translation** - *Ivo POPIVANOV, Armina JANYAN*

The study explores sensitivity of event-synchronization (ERS) and desynchronization (ERD) electrophysiological measures to lexical (frequency) and semantic (concreteness) word properties in a translation task. Generally, ERD is associated with active information processing and ERS - with deactivation, or idle state. ERS and ERD were analyzed in two stimulus onset time windows (early, from 200 to 500ms and late, from 500 to 800ms) and in two frequency bands (alpha (8-12Hz) and beta (12-24Hz)). In general, the analyses revealed high ERD in early time window for abstract words and for both low and high frequent words and high ERS for the concrete words and reduced ERS/ERD in the late time window. Analyses in the beta band showed stronger ERD in early time window and stronger ERS - in the late one for all word conditions. The results suggest high sensitivity of ERS/ERD measures to lexical and semantic word properties in translation processing.

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Bilingualism III - 14:00-16:00

(3023)**Semantic Processing in Oral Translation: an Electrophysiological Study** - *Armina JANYAN, Ivo POPIVANOV, Elena ANDONOVA*

Words, representing concrete concepts are processed faster than words representing abstract concepts. The aim of the study was to examine the concreteness effect in translation of single words that are either cognates (a similar form and meaning across languages) or noncognates (different word forms with a similar meaning). Concrete words elicited more negative event-related potentials (ERPs) than abstract words between 360 and 660 ms after stimulus onset. This effect was wide-spread across the scalp. However, noncognate words elicited the concreteness effect more in frontal ERPs, and cognate words - more in the right posterior ERPs. In addition, noncognates elicited more negative ERPs than the cognates. This effect was more frontally distributed. Taken together, these results are in agreement with neuroimaging findings suggesting that translation processing is associated with the frontal lobes. In addition, the study provides evidence that cognate processing involves semantic activation.

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Bilingualism III - 14:00-16:00

(3024)**ERP Correlates of Switching Languages in the Context of Receptive Conversation** - *Choong-Myung KIM, Jiyoun CHOI, Je Young JUNG, Kichun NAM*

The aim of the present study is to verify the time course and neural correlate of switching response languages using ERPs. Several studies of switching language have reported but there was no report on the switching tasks based on the question and answer (QA) patterns to date. Switching between decisions on the appropriateness of the answer for the written question in different languages requires a receptive switch in both given question-language (Korean) and response-language (Korean/English). The ERP data revealed that incongruency conditions showed more N400 over fronto-central and right frontal activation in one-language and different-language contexts respectively in view of congruency between QA irrespective of response-languages. Particularly, centro-parietal P600 was newly observed only for the one-language condition. In the other view of response-languages only in incongruency condition, different-language contexts (Korean-English pair) showed more N400 peak amplitudes and delayed latencies by 100ms than one-language. In sum, contextual congruency between QA elicited semantic incongruency index regardless of response-language types. Furthermore the bounded QA pattern in one-language conditions centered on typicality or expectancy of QA is likely to be recognized as other forms of structural matching tasks only in first habitual language differently from the different-language contexts.

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Bilingualism III - 14:00-16:00

(3025)**"Are Common Syllables Shared in French-Spanish Bilingual Production?"** - *Violaine MICHEL, F.-Xavier ALARIO, Jeremy GOSLIN, Cynthia CASTELLANO, Marina LAGANARO*

A central question in the study of phonological encoding in bilinguals is whether common phonological representations are shared between the two languages. In this study on French-Spanish bilinguals, we investigated whether "common" syllables are shared or not. Since syllable frequency effects have been reported in both languages we analysed which frequency (French, Spanish or both) affects production in bilinguals. We selected common phonological syllables from French and Spanish lexical databases, covering the entire syllable frequency distribution in each language. 200 non-words were created with these common syllables. Participants had to read these non-words in each language during two separate sessions. Preliminary results on 20 bilinguals showed that RT only correlated with syllable frequency of the tested language. That is, within a given language, the highest the syllable frequency, the fastest the production latency. These preliminary results seem to indicate separate syllabic stores for the two languages in bilingual speakers.

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Cognitive Development II - 14:00-16:00

(3026)**Mental Processing From 6 to 12 Years of Age** - *Antigoni MOUYI*

This study examined the structural relations between the basic dimensions of processing efficiency (processing speed, perceptual and conceptual control, information integration), working memory and reasoning (inductive and deductive), and their developmental interplay. An array of electronically administered tasks was addressed to 140 elementary schoolchildren. Structural equation modeling revealed that the processes are interrelated in a cascade fashion. More complex processes encompass fundamental processes. Processing speed lies at the lower end of the hierarchy and it is involved in all higher processes ordered hierarchically as follows: perceptual control, conceptual control, working memory and reasoning.

Analyzing the change patterns of the processes as a function of age revealed that they all change exponentially. Rapid changes occur during the period between 7-10 years, with speed being the prime contributor to it. The implications of these findings for theories of cognitive development are discussed.

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Cognitive Development II - 14:00-16:00

(3027)**A Comparison of the Use of Multi-Media Software and Traditional Books to Support Reading Acquisition** - *Arjette KAREMAKER, Nicola PITCHFORD, Claire O'MALLEY*

We investigated if a multi-media software package 'Clicker' accelerated early reading acquisition relative to traditional teaching methods using books. Two groups of children (total N = 27), aged 5-6 years that were reading at a typical level for their age, were drawn from two classes within the same school. Each group received instruction with each of two books from the Oxford Reading Tree scheme, using either 'Clicker' or traditional printed texts. Instruction was delivered to each group over five one-hour sessions over the course of a week. The order of presentation of instruction and books was counterbalanced across groups. Performance on tests of oral word reading, written word recognition, and phonological awareness, was measured pre and post each week of instruction. Results showed significant gains in oral reading skill after both methods of instruction. However, only after instruction with 'Clicker' were significant gains in word recognition and phonological awareness observed.

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Cognitive Development II - 14:00-16:00

(3028)**What Does "Chance" Mean? Children and Adults' Conceptions and Misconceptions About Chance.** - *Giorgio GRONCHI, Francesca CHIESI, Caterina PRIMI*

This study sought to determine children and adult's understanding of "chance". In spite of a large number of researches on this topic that focused only on children understanding of the concept (Falk & Wilkening, 1998; Green, 1982; Lecoutre, 1992; Williams & Amir, 1995), little effort has been made to determine the age-related trend of what one believes "chance" to mean. Children and adult's understanding of chance, belief and intuitions were explored. Interviews were conducted with 9 and 10 year-old children and college students, eliciting examples of random events and focusing on the language of chance. They were observed age related differences of understanding of the meaning of "chance". Mistakes and misconceptions were examined in terms of use of approaches commonly applied by adults and children.

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Cognitive Development II - 14:00-16:00

(3029)**Schooling Versus Aging: the Development of Number Processing** - *Tamar DEKALO, Andrea BERGER, Henik AVISHAI*

Number processing is a developmental ability seen in early stages of life. Automaticity of number processing is attributed to higher levels of numeric knowledge. The current study was designed to investigate possible effects of aging and schooling on development of automaticity in number processing by examining the size congruity effect. Participants were asked to decide which digit was larger numerically or physically (e.g., 2 3)—the size congruity paradigm. Schooling effect was measured at three different stages—pre-school, and middle and end of 1st grade. The aging factor was based on the date of birth of participants within each group. In addition to examining automaticity in relation to schooling and aging, mathematical ability was tested. These scores allowed us to determine the relationship between the development of automaticity in number processing and arithmetic competence.

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Cognitive Development II - 14:00-16:00

(3030)**Is There a Developmental Difference in Recognizing the Harm Through Actions and Inactions?** - *Hajimu HAYASHI*

The purpose of this study is to examine whether there is a developmental difference in recognizing the harm caused by actions and equivalent inactions. Sixty-five young children aged 4 to 6 years participated. The tasks were composed of two act types (action and inaction). The mental state questions and the moral judgment questions were asked in each task. The 5- and 6-year-olds gave a higher percentage of correct answers to the mental state questions than the 4-year-olds. In contrast, the 5- and 6-year-olds did not give a higher percentage of correct answers to the moral questions than the 4-year-olds. The two questions tended to be correlated. Act types did not differ under any conditions. These results indicate that young children make moral judgments based on the understanding of mental states, but that there is not a developmental difference in recognizing the harm through actions and equivalent inactions.

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Decision Making - 14:00-16:00

(3031)**Motivation Towards Closure and Individual Differences** - *Malgorzata KOSSOWSKA*

The purpose of the study was to explore possible cognitive antecedents of the need for cognitive closure. This construct has been described by Kruglanski (1989) as a dimension of individual differences in the striving for clear and certain knowledge, aimed at reducing the sense of cognitive uncertainty. During the last twenty years the nature of the need for closure and its influence on the way and scope of both cognitive and social functioning was extensively researched. However, the sources of this motivation remain unknown. In this paper the possible cognitive mechanisms contributing to the need for cognitive closure are explored. Based on considerations to be outlined shortly, it is assumed that the need for closure may go hand in hand with certain cognitive deficits, related to ability to cognitive resources management. It is additionally hypothesized that these cognitive limitations may mediates the relationship between need for closure and the range of information processing. Successful identification of the cognitive resources management as a mediator is interpreted as an evidence for the hypothesis that resource management, not motivation towards closure, is responsible for individual differences in target task performance.

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Decision Making - 14:00-16:00

(3032)**Does Unconscious Thought Improve Complex Decision Making?** - *Arnaud REY, Pierre PERRUCHET*

In a recent study, Dijksterhuis, Bos, Nordgren and van Baaren (Science, 2006) reported that participants were better at solving complex decisions after a period of unconscious thought relative to a period of conscious thought. This result concerns decisions such as buying a car or choosing among various professional options, but it might also be applied to decisions taken by judges, company managers, or army officers. Evaluating its empirical validity is therefore of major importance. In the present report, using a similar design, we also observed an advantage of the "unconscious" condition compared to the "conscious" one. However, a control condition and additional analyses revealed that the seeming advantage of unconscious thought is misleading. It is concluded that the benefit of unconscious thought in complex decision making is still a controversial issue that should be considered cautiously.

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Decision Making - 14:00-16:00

(3033)**Thinking Style and the Accuracy/Efficiency Tradeoff** - *Laurel EVANS, Marc BUEHNER*

Thinking styles Actively Open-minded Thinking (AOT), Need for Cognition (NFC), and Maximization are all characterized in part by the tendency to perform an extensive search for the "correct" or "best" answer. We tested whether such a focus on accuracy would be maintained even in a problem setting in which efficiency is also valued. Modelled after Fiedler & Kareev (2006), participants were given a choice task in which they were asked to sample judgments (positive or negative) of two candidates from a very large (but finite) set of judges. They decided when to terminate sampling, and then indicated which

candidate was superior or withheld choice. Accuracy and efficiency were given equal emphasis in the instructions and, accordingly, scores were based on an equal weighting of each. Halfway through the experiment, participants received instructions asking them to focus more on either accuracy or efficiency. Participants' initial balance between accuracy and efficiency, as well as their ability to respond to corrective instructions were compared against the three Thinking Styles, as well as g. Implications of the accuracy-efficiency tradeoff for AOT, NFC, and Maximazation will be discussed.

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Decision Making - 14:00-16:00

(3034)**Matching Between the Answers Simulated by the Brain and the Answers Required by a Task Explains the Response Times. –** *Thibault BROUILLET, Arielle SYSSAU, Michel LAUNAY, Denis BROUILLET*

This study has two goals. On the one hand, we support that all cognition, including high-level conceptual processes, relies heavily on such grounding in either the modality or the body (Wilson, 2002). On the other hand, we want to show that the latency time of the responses, in a lexical decision task, is linked to the matching between the answers simulated by the brain and the answers required by the task. Three experiments contribute to our goals. The first demonstrates that evaluation of a string of letters (word vs non-word) is directly influenced by verbal responses (yes/no) required by the task. The second show that the discrimination between "yes" or "no" words is influenced by motor behaviour (pushing/pulling a lever). In a last experiment, we showed that verbal and motor responses related to each other at the time of the effective response (coordination dynamic). All this findings argued in favour of embodiment theories.

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Decision Making - 14:00-16:00

(3035)**Effect of Punishment Frequency on Risky Decision-Making Strategy** - *Hamed EKHTIARI, Ahmad EKHTIARI, Ali JANNTI, Arian BEHZADI, Azarakhsh MOKRI*

Background: The amount of reward or punishment, times of gain or loss, degree of delay and the probability of reward or punishment are the main determining factors in risky decision making. Methods: In this study, 117 male subjects underwent the Persian version of Gambling in different phases and settings. Results: Analysis of the results from the two phases of the study indicates a propensity of individuals to card decks B and D (Fewer times of loss with great amount) in comparison with card decks A and C (More times of loss with little amount) Discussion: The results of this study show a higher importance of times of loss compared to the amount of loss. Therefore, individuals in our study do not discriminate significantly between the cards with the same times but different amounts of loss.. Different aspects of this concept are discussed under the section of "amount versus frequency".

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Decision Making - 14:00-16:00

(3036)**Intentional Preparation and Sequential Modulations in the Simon Task** - *Gamze ALPAY, Birgit STUERMER*

In the Simon task, reaction times are typically slower when the response location does not match the stimulus position although the latter one is task-irrelevant. This so-called Simon effect appears after preceding compatible trials while it vanishes after incompatible ones. We investigated to what extent these sequential effects can be modulated by intentional preparation. Therefore, we have presented precues of different validity within a Simon task and recorded the electroencephalogram. Cues referred either to the task-irrelevant stimulus position or to compatibility (assumed to enable intentional preparation). Compatibility cues accelerated responses to compatible trials, especially in case of absolute validity. The Simon effect was absent with preceding incompatible trials. Corresponding to these findings, the Contingent Negative Variation was larger in trials with compatible antecessors and valid cuing. The N2 amplitude was enhanced for incomplete valid cueing. Consequently, sequential modulations in the Simon task seem not to be affected by intentional preparation.

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Dyslexia II - 14:00-16:00

(3037)**The Irrelevant Sound Effect on Dyslexic Adult's Serial Memory: a Perceptual Organization-Based Account.** - *Emma MCDONALD, William MACKEN*

Serial short-term memory (STM) is impaired if task-irrelevant background sound is presented during the task, due to obligatory processing of order information in the irrelevant material interfering with the deliberate processing of order in the serial recall task. Dyslexics show impaired STM, including serial recall, which is often attributed to central executive and phonological loop impairments. This study examines whether the pattern of interference from irrelevant sound in dyslexic participants is the same as for controls. Participants performed auditory-verbal and visual-verbal serial recall under quiet, steady-state, and changing-state sound conditions. Apart from overall impairment in performance in the dyslexic group, there were no between-group interactions. Since the pattern of interference by irrelevant sound is the same for both groups, this suggests that obligatory processing of order information in the auditory domain is intact in dyslexia and that such obligatory processing interferes with deliberate order processing in the usual way.

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Dyslexia II - 14:00-16:00

(3038)**Crowding Effect and Developmental Dyslexia: a Preliminary Study on a French Group** - *Stéphanie BELLOCCHI, Mireille BASTIEN-TONIAZZO*

Crowding is the negative effect of surrounding visual elements on the processing of a central target. We explored the hypothesis that the crowding effect (CrE) may influence RTs on words (W), pseudowords (PW), nonwords (NW) and symbols (S) in an identification task. For this purpose we studied twenty-two French children with dyslexia (D), twenty-two reading-level matched children (RA) and twenty-two chronological-age matched children (CA). Results showed a main stimulus effect (RTs S>NW>PW>W) and a main CrE (RTs on the crowding condition are slower than those on the isolated condition) for all groups. More in-depth analyses showed a larger CrE especially for symbols in D compared to CA, despite dyslexics' RTs on symbols being generally faster. This has been explained as an advantage for D in processing non-verbal stimuli, which, however, turns out to be highly influenced by the crowding condition. Thus, crowding is hypothesized to be a critical factor in modulating dyslexics' performance.

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Dyslexia II - 14:00-16:00

(3039)**Reading in French-Speaking Adult Dyslexics.** - *Jennifer MARTIN, Pascale COLE, Christel LEUWERS, Liliane SPRENGER-CHAROLLES, Séverine CASALIS, Ulrich FRAUENFELDER*

This study investigates the reading procedures of adults with a childhood diagnosis of developmental dyslexia. The reading performance of 12 French-speaking dyslexic students was compared to that of chronological age and reading level matched controls. Sublexical and lexical procedures were tested through reading aloud of pseudowords, frequent and irregular words. Dyslexic students were slower than both control groups on pseudowords, revealing a deficient use of the sublexical procedure. In contrast, dyslexic students were not slower than reading level controls on both frequent and irregular words, suggesting a relatively preserved use of the lexical procedure. These results differ from those of previous studies in English where the use of both procedures was found to be deficient in dyslexic students. Grapheme-phoneme consistency, a factor known to differ between French and English and to have an impact on reading skills, may in part be responsible for this difference.

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Dyslexia II - 14:00-16:00

(3040)**Does Global Report Performance in Dyslexic Children Reflect a Visual Attention Span Deficit?** - *Delphine LASSUS-SANGOSSE, Sylviane VALDOIS*

The poor performance of dyslexic children in global report (GR) tasks is typically interpreted as reflecting a visual attention span disorder. However, iconic memory or verbal short term memory problems might also result in a poor GR performance. In order to validate the former interpretation, 24 dyslexic children and 24 matched controls were assessed using three different versions of the GR task: 1) The usual GR task in which briefly displayed 5-letter strings have to be reported, 2) a GR task with mask, to suppress iconic memory and 3) a GR task with concurrent verbal rehearsal to prevent recoding in verbal short term memory. The dyslexic participants were found to be similarly impaired on all three conditions suggesting that their poor performance in GR did not reflect problems in either iconic memory or verbal short term memory. These findings provide evidence for a visual attention span disorder in developmental dyslexia.

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Dyslexia II - 14:00-16:00

(3041)**Brain Activation in Relation to Early Visual Word Processing in Korean** - *Hyojeong SOHN, Sugnbom PYUN, Jaebum JEONG, Yongmin CHANG, Hui-Jin SONG, Kichun NAM*

This present study was carried out to investigate the functional role of midfusiform gyrus known as "VWFA(visual word form area)" in visual word processing. The specific objects are to examine the characteristics of early visual word processing in alexic patients, and the cortical activation of ventral occipito-temporal region related Korean visual word processing according to word frequency and lexicality. In experiment 1, we conducted the neuropsychological test and an fMRI for two Korean dyslexic patients, one letter-by-letter reader and one global alexic. The results showed that letter-by-letter reading (in fact, syllable-by-syllable reading in Korean) patient has more activation of right fusiform gyrus than global alexic patient in word reading. In experiment 2, volunteers performed word and nonword reading during fMRI scanning. The results showed that the activation area of the left fusiform gyrus was modulated by lexicality and word frequency, whereas the activation of the right fusiform gyrus varied by the word difficulty and nonword reading. In conclusion, the specialized area of the left fusiform gyrus manages the normal word reading, and in comparison, the corresponding right area is responsible for the compensatory syllable-by-syllable reading.

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Episodic Memory III - 14:00-16:00

(3042)**Script Knowledge of an Event Modulates Retrieval-Induced Forgetting** - *Malen MIGUELES, Elvira GARCIA-BAJOS*

This study analyses the effects of scripts on retrieval-induced forgetting (RIF) in eyewitness memory. Selective retrieval of specific information about an event could cause eyewitnesses to forget related contents. The event used in this study was a video sequence of a bank robbery. Based on a previous normative data study, high and low typicality actions of the event were selected. After watching the video, participants practiced retrieving half of the high or low typicality actions of the event, and a non practice control group was added. In the final recall task the three groups had to recall all the actions of the event. In both, immediate and long-term recall, conventional RIF was found for low typicality actions, but a comparable forgetting effect did not emerge in the high typicality actions. It is assumed that the organization and integration of the script actions make them resistant to inhibitory processes.

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Episodic Memory III - 14:00-16:00

(3043)**The Effects of Stereotype Knowledge on Retrieval-Induced Forgetting** - *Elvira GARCIA-BAJOS, Malen MIGUELES*

This study expands retrieval-induced forgetting research on the issue of stereotype inhibition. Based on previous normative data high- and low-typicality traits of two stereotypes were selected. First, the participants of the experiment studied ten high-, low- or neutral stereotype traits of two characters accompanied by the name of the stereotype (athlete, scientific) or the name of the target (Mikel, Jon). Then, they practiced retrieving half of the high-, low- or neutral typicality traits of one of the characters. Finally, immediate and one-week recall was assessed for all of the studied traits. The conventional retrieval-induced forgetting effect was found in the immediate and long-term recall for the low and neutral typicality traits, but a comparable forgetting effect did not emerge for the high-typicality traits when they were accompanied by the name of the stereotype. These findings suggest that stereotype knowledge affects retrieval processes.

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Episodic Memory III - 14:00-16:00

(3044)**Generation Effects on Item and Source Memory for Pictorial Material** - *Sandra D. ZILLIG*

The (positive) generation effect (GE) refers to the mnemonic advantage of self-generated compared to perceived items frequently found in recognition memory. Contradictory results have been reported for GEs on source memory. Mulligan (2004) hypothesizes that memory for source features is better for perceived compared to generated items (negative GE). In contrast, Riefer, Chien, & Reimer (in press) argue that negative GEs are limited to reality-monitoring paradigms whereas positive GEs emerge in external source monitoring. We tested these hypotheses by asking participants to remember pictures, their colour (external source monitoring), and their level of fragmentation at study (reality monitoring). Results obtained using a two-dimensional source monitoring multinomial model do not support any of the two hypotheses: Source memory was worst for items at an intermediate level of fragmentation and better for both complete and highly fragmented items. A cognitive effort heuristic of source memory is proposed to account for these results.

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Episodic Memory III - 14:00-16:00

(3045)**Evidence of Two Processes in Recognition Using a Measure of Accuracy** - *Sergio IGLESIAS-PARRO, Almudena ORTEGA*

Studies examining recognition have found evidences of two processes. Nevertheless, other works analyzing accuracy measures (e.g., Donaldson, 1996), have proposed that recognition can be modelled as a familiarity-based signal-detection process. In order to study the role of recollection in recognition memory an experiment was conducted. In this experiment, retrieval practice paradigm was used. To reduce the impact of familiarity an associative recognition, test with episodically related material was utilised. The results obtained show that, when the impact of familiarity on recognition is minimized, the recollection accuracy pattern (measured by d') differs significantly from the recognition accuracy pattern observed.

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Episodic Memory III - 14:00-16:00

(3046)**Retrieval Practice Impairs Recognition of Episodically Related Material: the Role of Feature Binding.** - *Bernhard SPITZER, Karl-Heinz BÄUML*

Retrieval practice on a subset of studied items can impair later memory performance for nonretrieved related material. Using semantically related words, such effects have been demonstrated in tests of implicit, semantic, and episodic memory, including recognition testing. In two experiments, we examined the effect of retrieval practice on recognition of semantically unrelated material that could be grouped by perceptual features. In Experiment 1, subjects studied items that were framed by colored bars. Following retrieval practice, an item recognition test based on confidence ratings and a subsequent color recall test were applied. In Experiment 2, study items were presented in different font colors against a neutral background and, after the retrieval-practice phase, a color recognition test was applied. The results of the two experiments demonstrate detrimental effects of retrieval practice in item recognition (Experiment 1)

and color recognition (Experiment 2), which suggests a strong binding between studied items and the episodic feature 'color'. Detailed ROC analysis of the recognition data suggests that the detrimental effect of retrieval is best characterized by a reduction in the nonretrieved items' general memory strength, as is proposed by current single-process accounts of recognition memory.

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Episodic Memory III - 14:00-16:00

(3047)**Implicit True and False Memory in Korsakoff Patients** - *Ilse VAN DAMME, Géry D'YDEWALLE*

Recent studies with the Deese/Roediger-McDermott (DRM) paradigm have revealed that not only impaired veridical memory, but also diminished false memory is characteristic of Korsakoff patients' amnesia. However, due to the typically used explicit retrieval instructions, this finding may reflect problems at encoding, recollection, or both. Therefore, the present experiments examined implicit as well as explicit false memory for nonstudied semantic associations, in Korsakoff patients and memory-intact controls. Implicit stem completion and explicit cued recall were tested either at the end of the experiment (Experiment 1) or immediately following each word list (Experiment 2). For the study words, various presentation durations were used. The results emphasize the importance of the distinction between automatic and intentional retrieval: Korsakoff patients' veridical and false memory scores were only significantly impaired when explicit recollection of the studied information was required. When tested implicitly, their performance was similar to controls'.

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Executive Control II - 14:00-16:00

(3048)**Is Conflict Adaptation Dependent on Task Set? Conflict Monitoring in the Task Switching Paradigm** - *Kamila SMIGASIEWICZ, Wim NOTEBAERT, Baptist LIEFOOGHE,Edward NECKA*

The studies were aimed at exploration of the conflict monitoring theory in the task switching paradigm. Two questions were posed: is the adequate task set activation a necessary condition for conflict adaptation to occur? Is conflict adaptation general (occurs across different tasks) or specific (occurs only for task in which conflict was detected)? Five studies were carried out in the task switching paradigm with predictable or unpredictable task sequence and with long or short response-stimulus interval (RSI). The conflict adaptation occurred in repetition as well as in alternation task condition but only if the task sequence was predictable or RSI was long. In case of unpredictable sequence or short RSI, the conflict adaptation occurred only in repetition condition. Thus, results indicate that the conflict adaptation process depends on information specified in the task set. If the appropriate task set can be established in advance the conflict adaptation is general, i.e. occurs across two different tasks.

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Executive Control II - 14:00-16:00

(3049)**Cognitive Basis of Hallucinations in Aging: Role of Metacognition and Controlled Processes (Jacoby, 1991)** - *Sophie MARTIN, Estelle GUERDOUX, Déborah DRESSAIRE, Jérôme MOLINIER, Denis BROUILLET*

This study investigated the vulnerability factors for hallucination proneness during aging. Our main prediction was that participants showing higher hallucination proneness would endorse a lack of cognitive confidence, negative beliefs about the uncontrollability of thoughts as well as a decrease of controlled processes as measured by the Processes Dissociation Procedure (Jacoby, 1991). In this purpose, we used a habit paradigm (Hay & Jacoby, 1996, 1999) and the Meta-Cognitions Questionnaire (Cartwright-Hatton & Wells, 1997). We compared performances of young (n=21) and older adults (n=22). Results showed that participants experiencing higher hallucination proneness also exhibited a higher level of negative thoughts, a lack of cognitive confidence and dysfunctional controlled processes. Although, older participants demonstrated fewer hallucinations than younger ones, our results are emphasized with aging. Implications of these findings are discussed regarding the importance of preserving one sense of control over life course events in order to reduce hallucination experiences during aging.

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Executive Control II - 14:00-16:00

(3050)**Sense of Agency Reflects Automaticity, Not Overcoming Conflict.** - *Dorit WENKE, Patrick HAGGARD*

Our actions usually produce events in the outside world. To assess the conditions that generate the experience of controlling these events, we compared perceived control when actions produced spatially compatible or incompatible effects. Subjects explored by pressing left or right keys to what extent their action choice controlled the colours of arrows that followed their actions. In addition, arrow direction, which was always irrelevant, was related to action choice in a spatially compatible, incompatible, or unpredictable manner. Agency was measured by (1) explicit ratings of perceived control over arrow colours, (2) an implicit measure that required subjects to judge a varying time interval between action and arrow onset. Subjects experienced more control in the spatially compatible than in the incompatible arrow condition, suggesting that agency is tied to automatic mastery, rather than to overcoming conflict. This research was supported by ESRC grant RES-000-23-1571.

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Executive Control II - 14:00-16:00

(3051)**Does Anterior Cingulate Cortex Monitor Response Conflict ?** – *Clémence ROGER, Franck VIDAL, Thierry HASBROUCQ, Boris BURLE*

Our ability to detect and correct errors is essential for our behavior to be adapted, implying control mechanisms. Recently, the conflict-loop theory has proposed that control mechanisms depend on the detection of response "conflict", defined as the co-activation of correct and incorrect responses. The neurophysiological correlate of conflict is an EEG wave, called "Error Negativity" (Ne) or "Error Related Negativity" (ERN), whose source is likely in the Anterior Cingulate Cortex (ACC). According to this model, the amplitude of the Ne depends on the amount of conflict. In simulation and experimental studies, we have estimated, on a single trial basis, the amount of conflict, and sorted the trials in increasing order of conflict. Although the simulation shows that the model predicts an increase of the Ne as conflict increases, empirically the Ne amplitude decreases, thereby demonstrating that ACC does not monitor conflict.

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Executive Control II - 14:00-16:00

(3052)**The Role of Shifting, Inhibition and Working Memory in Older Adults' Performance in the Wisconsin Card Sorting Test** - *Nadia GAMBOZ, Erika BORELLA, Maria Antonella BRANDIMONTE*

The Wisconsin Card Sorting Test (WCST) is considered a typical executive test. However, several interesting questions are still open as to the specific executive processes underlying this task. In the present study, we explored how shifting, inhibition and working memory, assessed through the Number-Letter, the Stop Signal and the Reading span tasks, relate to old adults' performance in the WCST. Results showed age-related differences in inhibition and working memory, while shifting resulted largely spared in aging. Results also showed that old adults' performance variability in the number of perseverative errors was predicted by shifting abilities. This study provides additional evidence for the prominent role of shifting in WCST performance. It also places a potential limitation on the use of old adults' performance in the WCST as an unequivocal index of frontal lobe deterioration, as age-related differences could generate from a decline in other cognitive processes involved in the WCST.

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Executive Control II - 14:00-16:00

(3053)**Blunted Right Inferior Frontal Cortex Activation During Motor Response Inhibition in Schizophrenia** - *Pascale MAZZOLA-POMIETTO, Régine JEANNINGROS, Jean-Michel AZORIN, Stephan GRIMAULT, Jean-Luc ANTON, Arthur KALADJIAN*

Schizophrenia has been associated with response inhibition impairments. However, the neural bases of these impairments are still poorly understood. The aim of this study was to assess the neural correlates of motor response inhibition in schizophrenic patients. We compared 21 medicated schizophrenic patients and 21 healthy subjects, group-matched for age, sex, and perfomance accuracy on a visual Go-NoGo task during event-related fMRI. Schizophrenic patients had significantly lower premorbid IQs and longer response times on correct Go trials than healthy subjects. Patients demonstrated significantly decreased activation in the right ventrolateral prefrontal cortex (VLPFC) during successful response inhibition as compared to healthy subjects, even when the between-group comparison was adjusted for differences in response times and IQs. We suggest that failure to engage the right VLPFC, a region known to play a key role in response inhibition, may help to explain the inhibitory control deficits observed in schizophrenia.

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Face Recognition - 14:00-16:00

(3054)**Rating Motion Parameters and Recognising Moving Faces** - *Natalie BUTCHER, Karen LANDER*

We investigate the effect of motion on familiar face recognition. Participants were asked to recognise famous faces, and rate the same faces for familiarity, how much motion was perceived, and how distinctive the facial motion was. Results show that faces rated as distinctive movers are recognised significantly better than those rated as more typical movers. In addition, faces rated as moving a lot were recognised significantly better than those rated as showing little motion. Significant correlations were found between correct recognition of identity, familiarity ratings, ratings of how much motion is shown and distinctiveness ratings. Results support the hypothesis that the recognition benefit of motion for familiar faces is due to characteristic motion patterns stored in memory and reveal that how much facial motion is perceived may contribute to perceptions of distinctiveness and correct recognition of identity.

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Face Recognition - 14:00-16:00

(3055)**Sparse Classifiers for Facial Perceptual Modelling** - *Nicholas COSTEN, Martin BROWN, Shigeru AKAMATSU*

A fundamental problem in computational vision is the specification of a representation vocabulary. In face classification, this involves the calculation of sets of parameters which robustly and uniquely describe facial differences. A Support Vector Machine (SVM) extracts the optimal hyperplane to separate a pair of classes, but with too many parameters. We use a 1-norm complexity function to generate sparser sets of features. Computational studies indicate that our sparse face-identification system will perform comparably with an SVM. Faces were rated for apparent gender and a 197-dimension model of the faces built. Rank correlations with the model's classifications peaked with 29 dimensions, significantly higher than the correlation with an SVM-based model. Individual faces can be manipulated parallel or normal to the classifying hyperplane, altering apparent gender or age. Experiments show that the apparent gender change interacts with identity, suggesting that a sparse non-linear boundary is an appropriate model.

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Face Recognition - 14:00-16:00

(3056)**A Developmental Study of the Thatcher Illusion: Are the Eyes Enough?** - *Deborah RIBY, Leigh RIBY*

This paper presents evidence from a large scale developmental study of the traditional Thatcher face illusion task. One hundred and fifteen participants between 6- and 67-years of age completed a face matching task whereby detection of a Thatcherised face was crucial for matching pictures. Where faces had been changed they had either been manipulated in line with the traditional Thatcher illusion (eyes and mouth rotated) or only the eyes or mouth had been manipulated. Half the face matching trials were presented in the upright orientation whilst half were inverted. Participants across the developmental spectrum were affected by inversion, with accuracy for upright trials completed significantly faster and more accurately than inverted trials. Important for consideration of the relative salience of face features, eye manipulations were detected more readily than mouth manipulations. In fact, detection of eye manipulations was as accurate as detection the traditional Thatcher manipulation of eyes plus mouth. The results indicate that the Thatcher illusion can be detected using information from the eye region alone and that the level of configural processing required to detect the illusion is robust by 6-years of age.

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Face Recognition - 14:00-16:00

(3057)**The Bilateral Advantage for Famous Faces: Interhemispheric Communication or Competition?** - *Lyndsay BAIRD, A. Mike BURTON*

The present studies used a redundant target procedure to investigate the bilateral advantage for the perception of famous faces. In Experiment 1 we compared simultaneous presentation of stimuli (a) bilaterally and (b) one above the other in the central field. Results showed a redundancy advantage, but only when faces were presented bilaterally. This result lends support to the notion of interhemispheric communication using cross-hemisphere representations. Experiment 2 examined the nature of such communication by comparing bilateral presentation of identical face images, with bilateral presentation of different images of the same person. When asked to make a familiar/unfamiliar face judgement, participants showed evidence for a redundancy advantage under both bilateral conditions. This suggests that the nature of the information shared in interhemispheric communication is abstract, rather than being tied to superficial stimulus properties.

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Face Recognition - 14:00-16:00

(3058)**Gender Differences in the Associative Memory for Faces and Verbal Information** - *Johanna STERN, Clelia ROSSI-ARNAUD, Nicole FIORI*

A serial model for the processing of face-name associations has been proposed in which personal-related semantics play a mediating role (e.g. Craigie & Hanley, 1993). In the present study, participants saw an unfamiliar face, a common name and an occupation title, and were later tested a) either with 2 photographs and a name (or occupation title) and asked to recognize the correct face; or b) with 2 names (or 2 occupation titles) and one photograph and asked to recognize the correct verbal information. Women outperform men in recognition accuracy and reaction time in the retrieval of face-occupation associations, but show only faster reaction times with face-name associations. Men show a better recognition accuracy than women only for names associated with male faces. We also find a face gender x condition type x type of verbal information interaction. Results are discussed in terms of possible gender differences in the retrieval strategies.

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Language Comprehension III - 14:00-16:00

(3059)**Influence of Multidimensional Contextual Constraints on Predictive Inferences' Generation** - *Sonia GALLETTI, Isabelle TAPIERO*

In two experiments, we explored the impact of multidimensional contextual information on the strength of predictive inferences generation. The generation of predictive inferences was evaluated during and at the end of the reading of texts describing a causal event either high or low in sufficiency. Causal or emotional contextual information preceded the presentation of this focal event. Each subject was assigned to only one

contextual version. The integration of inferences was tested by measuring reading times of two critical sentences; Predictive inferences' activation was evaluated by collecting response times to critical questions that either were presented during reading and at the end of each text or ended the story only. The same procedure as in experiment 1 was used in experiment 2, the only difference was that in the latter, we reinforced the strength of contextual information. The main results indicated that contextual emotional information weakens the sufficiency strength.

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Language Comprehension III - 14:00-16:00

(3060)**Semantic Priming and Reading Comprehension in Children** - *Sophie DONNADIEU, Carole BERGER*

This study investigated the linkage between semantic knowledge's organization and reading comprehension in children aged 10-11. A priming paradigm was used, in which participants (with low versus high level of reading comprehension) had to perform a lexical decision task. Our results revealed a priming effect for related (i.e., thematic, taxonomic, slot-filler) conditions, when compared with a non related control condition (no semantic relation between primes and target words). Importantly, this effect was higher in children characterized with a low (versus high) level of reading comprehension. These findings suggest that the semantic knowledge associated with the prime stimulus would induce a pre-activation of the target's representation. This process would assist recognition especially in children encountering reading comprehension difficulties (it also depended on prime/target delays in these participants). Relations between activation constraints in the semantic network and individual strategies (associated with reading comprehension capabilities) were discussed.

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Language Comprehension III - 14:00-16:00

(3061)**Frequency and Type Numerosity of the Morphological Family: a Study on Italian Verbal Forms** - *Giulia BRACCO, Alessandro LAUDANNA*

Previous studies on Dutch (Schreuder & Baayen 1997, Baayen, Lieber, & Schreuder, 1997) found that the number of word types within the morphological derivational family is a good predictor of the written word recognition latencies. The frequency of morphological family, instead, does not seem to affect recognition. The present study investigates the role of the same two variables on verbal forms of Italian. In two visual lexical decision experiments both the frequency and the type numerosity of the morphological family were manipulated. The results on Italian i) confirm the type numerosity effect and the crucial role played by the semantic transparency of the derived words with respect to its base (Bertram, Baayen & Schreuder, 2000), and ii) extend the previous data by providing a distributional function of the effect over families of different size.

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Language Comprehension III - 14:00-16:00

(3062)**The Influence of Stimulus Preview on Phonological Competition: Evidence From Synonyms** - *Alissa MELINGER, Andrea WEBER*

In visual-world experiments, stimulus pictures and names are sometimes introduced in preview sessions. To determine whether preview influences subsequent phonological competition, we paired, in a German study, target pictures (glider, 'Segelflugzeug') with competitor pictures with two synonymous names (pirate, 'Pirat' and 'Seeräuber') and two unrelated distractor pictures. Preview either introduced pictures and their subordinate names or just pictures. If subordinate names ('Seeräuber') of competitor pictures are automatically activated during spoken-word recognition, we predicted more looks to competitor than to distractor pictures due to phonological similarity with the target, even when subordinate names were not previewed. If, however, preview modulates the availability of subordinate names, either by inhibiting dominant names or by priming subordinate names, the magnitude of the competition should vary with preview. In two experiments, we found that subordinate names competed with target names even without preview, although previewing subordinate names modulated the magnitude of the competition.

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Language Comprehension III - 14:00-16:00

(3063)**Phonology Matters: Brain Regions Involved in Phonological Processing in Silent Reading** - *Mario BRAUN, Florian HUTZLER, Thomas MÜNTE,Rotte MICHAEL, Arthur JACOBS*

Previous research investigating phonological processing in visual word recognition using fMRI shows a rather heterogeneous pattern. Several regions are proposed to account for phonological processing (e.g., inferior frontal gyrus, IFG/BA44,45, superior frontal gyrus, STG/BA22, supplementary motor area, SMA/BA6, angular gyrus, AG/BA39 and supramarginal gyrus, SMG/BA40). By using the lexical decision task and the well known pseudohomophone effect, we found that AG and SMG reflect differences between pseudohomophones (e.g., ROZE) and spelling controls (e.g., ROFE). Since pseudohomophones and spelling controls differ only in phonology and under the assumption that pseudohomophones activate whole word representations, we propose that this activity reflects activation at the lexical level. And furthermore, that the AG and SMG (BA39, BA40) are the brain regions which are engaged in the processing of phonological information or at least reflect the interaction of orthographic and phonological information at the lexical level.

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Language Comprehension III - 14:00-16:00

(3064)**Shadowing Requires More Effort Than Listening?: Electroencephalographic Evaluation** - *Yoshihiro HIRATA, Yoko HIRATA*

Shadowing has become widely used as one of the most effective techniques to improve students' English listening abilities at Japanese secondary and tertiary institutions (Tamai, 2005). Unlike listening, this simultaneous action of repeating exactly what students hear, in fact, makes them feel stressed and fatigued in the early stages of training. However, not much psychophysiological research has been done on what kinds of factors affect their sense of fatigue and weariness. The purpose of this study is to examine how the amplitude of the alpha band of Japanese students changes while they are performing listening and shadowing tasks. The alpha band of one student showed almost the same monotonic decrease in both tasks. The other showed the same tendency, although the values were rather large in the shadowing tasks. Although the students verbally reported more stress in shadowing tasks, the activities of shadowing are as complex as those of listening.

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Language Comprehension III - 14:00-16:00

(3065)**Different Effects of the Orthographic and Phonological Neighborhood Density on Korean Visual Word Recognition** - *You-An KWON, Kichun NAM*

The purpose was to examine the different role of the orthography and the phonology-syllable in Korean visual word recognition. To accomplish the purpose, we manipulated phonological and orthographic syllable neighborhood density. In Experiment 1 using a lexical decision task, the results showed that as the number of the phonological syllable neighbors increases, lexical decision latencies became longer, and as the number of orthographic syllable neighbors increases, words are recognized faster. In Experiment 2, we used the same procedure as Experiment 1, but we impressed the accuracy of response rather than response speed. In Experiment 3, the naming task was. The result of Experiment 2 and 3 showed the similar pattern as that of Experiment 1. It can be said safely that the phonological syllable neighbor density effect comes from the multiple lexical-activation and lexical competition, whereas the

orthography syllable effect is due to the sub-lexical unit overlapping and orthographic redundancy.

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Language Comprehension III - 14:00-16:00

(3066)**Event-Related Brain Correlates of Structural Syntactic Expectation** - *Elisabeth FONTENEAU*

The current study used event-related brain potentials (ERP) to investigate how and when argument structure information is used when processing a sentence with a filler-gap dependency. We hypothesise that one specific property - animacy (living vs. object) - is used by the parser during the building of the syntactic structure. Participants heard sentences that were off-line rated as having an expected noun (Who did Jack race the boat with?) or non-expected noun (Who did Jack race the man with?) based on their animacy properties. ERPs from the noun in the non-expected condition (boat) elicited a typical ELAN/P600 complex compared to the noun in the expected condition (nurse). Firstly, these results demonstrate that the ELAN reflects not only grammatical category violation but also animacy property manipulation in filler-gap dependency. Secondly, our data suggest that the parser uses argument structure information on-line to build up the syntactic structure of the sentence.

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Language Production II - 14:00-16:00

(3067)**Written Spelling to Dictation: Sound-To-Spelling Regularity Affects Both Writing Latencies, Durations and Attentionnal Components** - *Marie DELATTRE, Patrick BONIN*

The effect of sound-to-spelling regularity was examined on written spelling latencies and writing durations in a dictation task in which participants had to write each target word three times in succession. We found that irregular words (i.e., those containing low-probability phoneme-to-grapheme mappings) were slower both to initially produce and to execute in writing than regular words. The regularity effect was found both when could and could not see their writing (Experiments 1 and 2) and was larger for low- than for high-frequency words (Experiment 3). These results suggest that central processing of the conflict generated by lexically-specific and assembled spelling information for irregular words is not entirely resolved when the more peripheral processes controlling handwriting begin. In Experiment 4, we observed that the attentional cost of the regularity effect.

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Language Production II - 14:00-16:00

(3068)**The Production of Italian Past Participle Forms: a Study With a Recurrent Neural Network** - *Manuela CARASTRO, Alessandro LAUDANNA*

A recurrent neural network has been used in order to investigate the production of regular and sub-regular past participle forms of Italian verbs of the second conjugation. Sub-regular morphological processes of inflectional affixation in Italian verbal forms are often predictable, both phonologically and orthographically. Our starting hypothesis was that the acquisition of the past participle is based on concurrent schemata which represent both regular and sub-regular paradigms. A recurrent neural network has been set up which had to learn to transform either the infinitive form of a verb into the past participle form, or the past participle into the infinitive. The output of the simulations confirmed the existence of emergent generalizations based on cluster of verbs belonging to the same regularity and sub-regularity types: the conclusion is that concurrent schemata can provide the basis for learning to produce both regular and sub-regular forms of the second conjugation.

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Language Production II - 14:00-16:00

(3069)**Multiple Object Naming and Drawing Inferences About Planning in Spoken Production** - *Markus F. DAMIAN, Nicolas DUMAY*

Recent investigations of how far speakers plan ahead have capitalised on multiple object naming paradigms, in which not only latencies but also eye movements are recorded. In our experiments, speakers had to name two objects which were semantically related (face-leg), phonologically related (cat-cake) or unrelated. Semantic facilitation but no phonological effect was obtained when the objects were presented side-by-side and named using the grammatical frame "the X and the Y". In contrast, when one object moved towards the other, utterances of the type "the X bumps the Y" induced semantic interference but no phonological effect, whereas intriguingly, utterances of the type "the X attracts the Y" produced phonological facilitation but no semantic effect. Such variations in the pattern of priming effects likely reflect discrepancies in spatial separability of the objects, ensuing differences in lexical activation of the picture names. Hence, drawing inferences about speech planning from such tasks seems problematic.

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Language Production II - 14:00-16:00

(3070)**Neighborhood Stress Effects in Spanish** - *Nicolas GUTIERREZ-PALMA, Julio SANTIAGO DE TORRES*

This study investigates lexical stress assignment in Spanish. Word naming and lexical decision tasks were used to compare list of words having many or few stress friends (i.e., syllabic neighbors with the same stress as the target). Results showed that words with many stress friends had shorter naming latencies. However, differences were significant only for words with final or antepenultimate stress. In lexical decision, lower error rates were found for words with many stress friends, but only for words with antepenultimate stress. Despite differences were significant only by subjects, hierarchical regression analyses showed that stress neighborhood predicted reaction times in both tasks. However, this result was obtained only when words with penultimate stress (i.e., the most common stress in Spanish) were excluded from the analyses. Taken together, these data suggest that frequent stress patterns may be weakly represented in the lexicon as they can be generated by a simple rule.

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Language Production II - 14:00-16:00

(3071)**Category-Related Effects of Conditional Picture Naming. an Electrophysiological Analysis of a Dual Task During Speech Production** - *Sabrina ARISTEI, Remo JOB, Markus KIEFER*

In the Job and Tenconi study (2002), a dual task, conditional naming, does not produce behavioural costs compared to free naming. In the present study we investigated whether mechanisms underlying conditional picture naming (composed by identification and categorization) differ from those of the two simple tasks composing it. EEG was recorded during participants' performance. Preliminary results show that free naming and categorization elicit a larger P1 than conditional naming. Livings categorization produces a larger N1 than identification, whereas free and conditional naming show equivalent waveforms. An increased N1 during conditional naming compared to free naming is elicited by non living objects. The differential modulation of the N1 component, reflecting visual object categorization, reveals that categorization processes during conditional naming vary as a function of category. Conditional naming of livings does not impose enhanced visual processing compared to free naming, whereas non-living things require increased visual categorization demands during conditional naming.

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Learning - 14:00-16:00

(3072)**Sources of Metacognition in Skill Learning** - *Maciej SWIEZY*

The presented study is an attempt to identify and examine the most important sources of metacognitive knowledge about skill learning. Literature stemming from metacognitive framework proposed by Nelson and Narrens concentrates on intrinsic, formal explanations of mechanisms that allow to form metacognitive judgments. According to the author, a wider spectrum of metacognitive knowledge sources should be considered, with respect to both procedural and declarative

memory. In order to achieve this goal, Sources of Knowledge Inventory – a questionnaire tapping availability of different kinds of feedback – was developed and used to examine formation of metacognitive judgment of expertise while the subjects were learning a complex skill in naturalistic context. Achieved results allowed to analyze the relative importance of social, behavioral and self-related sources of knowledge. Measuring performance allowed to examine the validity of judgments based on respective sources, as well as their comparative value in the learning process. Practical implications are considered.

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Learning - 14:00-16:00

(3073)**Discourse Comprehension by Oral Deaf Individuals: the Role of Spontaneous Gestures Accompanying Discourse** - *Mara VENDRAME, Ilaria CUTICA, Monica BUCCIARELLI*

We assume that spontaneous non-symbolic gestures produced by an actor while proffering an oral discourse favor deep comprehension and learning from discourse in the partner because they favor the construction of an articulated mental model of the discourse. Indeed, we assume that co-speech gestures, which are cast in a non-discrete format, favor the construction of mental models, which are non-discrete mental representations in nature. There follow the predictions that the partner who sees the gestures of the actor, as compared with the partner who does not, will recollect more conceptual information, will draw more on-line inferences, and will recover less easily information at a verbatim level. In a previous study we confirmed these predictions for hearing partners. In the present study we confirm the predictions for oral-deaf partners who access the discourse information through lip-reading.

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Learning - 14:00-16:00

(3074)**Flexibility of Routines** - *Magdalena ROSS, Tomasz SMOLEN, Zbigniew STETTNER, Piotr WASILEWSKI*

The present study is a part of larger project concerning flexibility of routines. Routine is defined as a complex sequence of actions (production rules), acquired voluntarily but not necessarily consciously accessible. In this context, routine flexibility is defined as an ability to acquire the new routine after the old one is already established and automatized and/or as a switching between them depending on situational requirements. The experiment presented here has an exploratory character: its aim is to examine the influence of the level of automatization on the flexibility of routines. In order to explore that issue the Target The Two game was used. It is a complex card task, proposed by Cohen and Bacdayan (1994) and modified by Egidi (1995) in the context of economy, demanding application of one of two possible sequence of actions (routines). The data from the experiment is currently being analyzed.

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Learning - 14:00-16:00

(3075)**Serial Learning Induces Spatially-Organized Mental Representation** - *Luisa GIRELLI, Paola PREVITALI, Maria Dolores DE HEVIA*

One of the most exploited effect in number processing research is the SNARC effect, which indicates a systematic association between numerical magnitude and lateralized response. This effect is considered to reflect the spatial nature of the number representation where numbers are organized from left to right with increasing magnitude. Recently, response-side effects were reported with non-numerical ordinal sequences (i.e., months and letters) challenging the assumption that the SNARC effect reflects the access to magnitude information (Gevers et al, 2003). This study further investigates the hypothesis that a left-to-right mental representation may be invoked in over-learned sequences which preserve their ordinal information. To this aim, two learning experiments were carried out where an arbitrary ordered list of words was subject to repeated training across different sessions. In both experiments, we found an association between ordinal position and spatial response preference, supporting the hypothesis that newly acquired ordered information is spatially represented. This study suggests that exploiting visuo-spatial resources is a general strategy which applies not only to numerical representation.

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Learning - 14:00-16:00

(3076)**Influence of the Scheduling of Repetitions in the Learning of a Fictitious Language Vocabulary** - *Emilie GERBIER, Olivier KOENIG*

The massed versus spaced practice effect is well known, but few studies have used more than 2 repetitions of items. We investigated which one of 3 schedules of repetitions would result in the best memory performance. Participants had to learn French word/non-word pairs on 7 consecutive days. Some pairs were repeated 4 times in one of the 3 following conditions, in which the mean lag between repetitions was equal : i) 1st-3rd-5th-7th day. ii) 1st-2nd-3rd-7th day. iii) 1st-5th-6th-7th day. The test occurred on the 9th day and consisted on giving the word in response to the non-word. The ii condition (narrow then spaced) led to a significantly better score than the other two. These results are one among the first evidences of the efficiency of the so-called expanding schedule in the learning of new materials. Applications in educational settings are promising.

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Learning - 14:00-16:00

(3077)**Is Learning by Observation Capacity Obvious in Humans? The Crucial Role of Social Comparison and Related Ability Inferences.** - *Lënda BOUNOUA, Pascal HUGUET, François CURY*

Observational learning allows us to acquire new behaviors faster than if we had to learn them by trials and errors. Although this fundamental capacity makes little doubts in humans, much remains to be done regarding its boundary conditions, at least on cognitive tasks. Here, we offer first evidence that observational learning (associative learning task) is strongly disrupted in normal adults when they simply can infer very superior ability in their model. As expected, relative to the participants in the control (exposure to the model with no comparison information) and slightly upward comparison condition (where the model was supposedly slightly superior to the self), those in trial and error condition (no model) or faced with a strongly superior model achieved the success criterion much slower, produced more maintenance and perseverative errors, and responded slower on correct associations. These results have strong theoretical and practical implications, especially for educational practices. Key-words: observational learning, related ability inferences, social comparison.

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Memory III - 14:00-16:00

(3078)**Memory Conformity and Suggestibility** - *Craig THORLEY, Steve DEWHURST*

Memory conformity studies have found that misinformation introduced by a confederate during collaborative remembering is later falsely recalled and recognised by participants on individual testing (e.g. Meade & Roediger, 2002; Reysen, in press). In the present experiment, individual participants and a confederate studied DRM lists and during turn taking collaborative recognition the confederate falsely recognised several critical non-studied words prior to the participant responding. As in the past research, it was found that on later individual testing participants falsely recognised the critical non-studied words suggested by the confederate. The participants' levels of suggestibility were then measured using Gudjonsson's Suggestibility Scale (GSS 2, 1987). It was found that there was a positive correlation between levels of suggestibility and false recognition of words suggested by the confederate. It is therefore argued that susceptibility to memory conformity is influenced by a person's suggestibility levels.

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Memory III - 14:00-16:00

(3079)**Cognitive Representations of Faces Specify Lateral Orientation** - *David WHITE, Mike BURTON*

It has been claimed that our memory representations of familiar faces are invariant to mirror reversal (Brooks, Rosielle & Cooper, 2002). This finding is in contradiction to previous research demonstrating sensitivity to the mirror reversal of familiar faces (Rhodes, 1986), and to the mirror reversal of recently learned unfamiliar faces (McKelvie, 1983). Using a classic recognition paradigm, we tested whether recall performance is effected by lateral reversal of test images. We found that when the same images were used at learning and test the lateral orientation of the stimulus had no effect on recall performance. However, when different images (taken using different cameras under slightly different lighting conditions) of the to-be-remembered individuals were used at learning and test, reversal led to significantly poorer recall. In a second experiment, we tested whether recognition of famous faces was affected by mirror reversal of the test stimuli. Whilst celebrities were identified just as accurately when the image was presented in its non-veridical orientation, response latencies in this condition were longer. In combination, these results confirm that the abstract representations necessary for successful face recognition are sensitive to the left-right orientation of the perceived face.

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Memory III - 14:00-16:00

(3080)**Fatigue or Warm-Up? How the Cognitive Load Influences Implicit and Explicit Memory** - *Malwina SZPITALAK, Michal WIERZCHON*

The cognitive load is believed to cause mental fatigue, moreover recent studies suggest that it could also results in better performance of the following task. The purpose of two presented studies was to examine the cognitive load influence on controlled (C) and automatic (U) influences of memory in word-stem completion task. After memorization of words list participants were asked to complete stems under process dissociation procedure conditions. To examine the time effects of cognitive load participants performed the arithmetic task for 5, 10, 15 or 30 min before word-stem completion task. The results of the experiments indicate that the cognitive load for 10 – 15 min results in more accurate completion in C influence, whereas the U influence stays intact. The conclusions about the fatigue and warm-up effects on implicit and explicit memory were presented. The results are also analyzed regarding the implicit explicit memory dissotiation.

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Memory III - 14:00-16:00

(3081)**Creating Fiction Around Non-Existing Reality** - *Justyna OLSZEWSKA,*

The aim of the study was to investigate how: 1) individuals, when asked about something that is not explicitly stated in the text, in fact create fictional reality 2) imaginative or non-imaginative strategies of encoding information affect memory of the given text. 3 experiments were conducted, each for two different ways of retrieving information: recall and recognition. In Experiment 1 the author tested whether imaginative conditions of encoding information enhance the application of prior knowledge to memory tests after time delay. In Experiment 2 the author used the same procedure, however, in immediate memory tests. According to boundary extension phenomenon, Experiment 3 tested whether photographs may indeed enhance the distortions of memory caused by using prior knowledge. The results have shown the influence of a reading strategy (imaginative and non –imaginative) on memory of current information. Moreover, differences between the recall and the recognition are discussed.

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Memory III - 14:00-16:00

(3082)**False Memory for Pictures Tested Directly and Indirectly** - *Yana WEINSTEIN, David SHANKS*

We have developed a new paradigm in which false memories for rich pictorial stimuli are accessed directly and indirectly. Participants label pictures in a study phase, imagine other pictures in response to words in an imagery phase, and then perform a recognition (direct) and/or perceptual identification (indirect) test on old/imagined/new pictures in the final phase. In the direct test, we found substantially higher false recognition rates for imagined than new pictures. The indirect test yielded priming for imagined items, measured by a decrease in time taken to identify pictures compared to the new item baseline. We discuss the implication that the false memories produced in the current paradigm contain perceptual details.

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Memory III - 14:00-16:00

(3083)**Memory for Emotional and Neutral Video Sequences** - *Francesco S. MARUCCI, Sara VALERI, Lucio INGUSCIO, Serena MASTROBERARDINO*

The aim of this study is to examine the hypothesis of memory advantage for emotional events compared to neutral ones. In particular, we compared memory performance for neutral and emotional video sequences, as rated by participants on a Likert scale. Participants viewed the two videos and than answer to some questions, some of which misleading, immediately and after two weeks delay. Results showed that participants had a better recall for the emotional video event in the immediate questioning, but this advantage disappeared in the delayed questioning. Moreover the effect of misleading questions become stronger in delayed condition for both emotional and neutral event, showing no difference in participants performance between the two. These results suggest that the emotional video sequence induced an arousal that influenced immediate performance while the effect of misleading questions is activated by time course and influence long term memory performance.

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Memory III - 14:00-16:00

(3084)**Dynamic of Knowledge Emergence: Activation and Integration of Sensory Components in a Short-Term Priming Paradigm** - *Elodie LABEYE, Rémy VERSACE*

Involvement of the sensory areas in the emergence of knowledge now seems to constitute a strong argument in favour of a multisensory conception of memory traces. The aim of the present research was to study the processes and the components involved in trace (knowledge) emergence and to highlight its temporal dynamic. We used a short-term priming paradigm, in which the participants had to categorize geometrical figures according to their orientation. Each figure was preceded by a colored point, which were associated during a training phase with one form and/or one orientation. Thus, the prime was either congruent or not with the target according to its orientation and/or its form. The SOA between prime and target was either 100 ms or 500 ms. Preliminary results with a short SOA showed that sensory components are activated independently (additive effects of form and orientation congruency). For long SOA, we predict an interaction between form and orientation congruency that would be due to an integration of the two prime's components.

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Memory III - 14:00-16:00

(3085)**Distribution of Practice in Retrieval Induced Forgetting** - *Almudena ORTEGA, Carlos J. GOMEZ-ARIZA, Teresa BAJO*

Retrieval-induced forgetting (RIF) refers to a reduced access to specific memories traces due to repeated retrieval of related information. Typically retrieval practice (RP) is done massively within a single RP phase. The purpose of these studies was to explore if changes on the temporal distribution of RP changes the magnitude of RIF. Recently, MacLeod & Macrae (2001) showed that RIF is sensitive to changes in temporal parameters:

the effect was present after a 24 h. delay between study and RP, but it was absent when this interval was introduced between RP and the final memory test. Thus, we further investigated this issue by manipulating the spacing of the RP trials. Thus, the standard RIF procedure was compared to conditions in which the RP phase was delayed by an hour and conditions where RP was distributed along this interval. Results indicated that the presence and magnitude of RIF depended on the interval between study and RP and on the distribution of this practice.

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Memory III - 14:00-16:00

(3086)**The Effects of Social Interaction and Task Demand on a Pro-Social Event-Based Prospective Memory Task.** - *Guido D'ANGELO, Andrea BOSCO, Maria A. BRANDIMONTE*

We explored whether social interaction and attentional demand affect pro-social prospective memory (remembering to do something for others). Participants performed an even/odd digit decision task (ongoing task). At the same time, they had to remember to press the space-bar on appearance of four target digits (background task). For each correct PM response, they could earn 50 cent. The money earned by all participants would eventually be given to homeless people. Task demand (High vs. Low) and type of Social Interaction (Collaborative vs. Neutral vs. Competitive) were manipulated. As regards accuracy, for both background and ongoing tasks, performance in competitive situations was higher under Low-demanding than under High-demanding conditions. However, in collaborative situations, performance was higher under High-demanding conditions. Under low demanding conditions, no effect emerged on the RTs in the ongoing task. However, under High demanding conditions a dampening effect was found. Implications for models of prospective memory are discussed.

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Numerical Cognition III - 14:00-16:00

(3087)**Working Memory for 2-Digit Numbers** - *Dana GANOR-STERN, Yoav KESSLER, Joseph TZELGOV*

We employed Luck and Vogel's (1997) working memory (WM) paradigm to explore whether two-digit (2D) numbers are represented holistically or by their components. If holistically, then WM capacity for 2D numbers should be similar to that of 1D numbers and therefore be restricted by the quantity of 2D numbers in the display. If components-based, then it should be restricted by the overall number of digits in the display. Participants were briefly presented with a probe display containing a variable number of one-digit or 2D numbers, followed by a test, either identical to the probe or different from it by one digit in one of the numbers. Participants had to make a same - different decision. The results show that WM capacity for 2D numbers is restricted by the number of overall digits rather than the number of whole numbers. This supports a components representation of 2D numbers.

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Numerical Cognition III - 14:00-16:00

(3088)**Numbers Follow Where Arrows Point: Spatial Symbolic Cues During Number Processing** - *Amparo HERRERA, Pedro MACIZO*

A general accepted view suggests that numerical magnitude is coded along a mental number line. This number line incorporates spatial-numerical associations by which small-numbers are related to the left and large-numbers to the right. Research has showed that these spatial features are able to prime responses and attentional shifts. This work explores the spatial component of the numerical magnitude representation by introducing symbolic spatial cues during a parity judgment task. Right before the target number, an arrow (pointing to left or to right) was presented. In Experiment 1 subjects used two response keys. In Experiment 2, there was only a response key, in one block participants responded to odd and in the other block they responded to even. The results showed the usual association small/left and large/right between symbolic spatial cues and numbers. It indicates an early activation of the spatial numerical features produced independently of response requirements.

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Numerical Cognition III - 14:00-16:00

(3089)**Conceptually Mediate Route for Two-Digit Naming: Evidence From a Blocking Paradigm** - *Pedro MACIZO, Amparo HERRERA, María Pilar PEREZ-RIVAS*

A major question in number naming is whether digits can be named without conceptual mediation as number words are read. Some researchers hold the semantic processing of digit naming (e.g., the semantic route in the dual-route model of Arabic digit naming, Fias, Geypens, Brysbaert, & d'Ydewalle, 1996), while others defend that digit naming is achieved like word naming without semantic processing (e.g., Roelofs, 2006). To explore these opposing views we asked participants to name single digits (Experiment 1) and number words (Experiment 2) while we introduced a semantic manipulation by blocking the numerical distance of seven consecutive naming trials. Compared to non-blocking trials, numerically close digits were named faster. However, the semantic blocking had no effect when reading number words. The pattern of results strongly indicates that digit naming can be conceptually mediated while number words are read bypassing semantic processing.

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Numerical Cognition III - 14:00-16:00

(3090)**Development of 7 to 12 Year Olds' Exact and Approximate Calculation Abilities** - *Julie NYS, Jacqueline LEYBAERT*

Dehaene & Cohen's triple code model (Dehaene & Cohen, 1995) suggests that numerical activities involve different types of representations, among which verbal and non-verbal. Counting and retrieval of arithmetic facts activate verbal representations. Number comparison and approximate calculations imply analogical representations of quantity, which seem to be language-independent. However, studies supporting the view that exact and approximate calculation abilities are independent, mostly included preschool children, adults or non-occidental populations. Our study focuses on the development of these two types of numerical representations and abilities, by assessing occidental 7 to 12 year old children. Participants (N = 120) were submitted to tasks involving exact calculations, comparison of symbolic and non-symbolic quantities, approximate calculations and vocabulary knowledge. Results of the normally developing children have been collected and will be presented at the conference. The overall research project aims at comparing normally developing children with children suffering of specific language impairment.

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Numerical Cognition III - 14:00-16:00

(3091)**Multiplication Priming and the Role of the Equals Sign** – *Jesus DAMAS-LOPEZ*

Recent studies have shown that unconsciously presented single-digit multiplications influence the naming of Arabic numbers. The present experiment explores the relevance of the equal sign on this multiplication priming effect. In the context of simple arithmetical problems like multiplications the equals sign could be seen as the symbol that should trigger the solving of the multiplication problem (e.g., Seo & Ginsburg, 2003). Numbers and single-digit multiplications were presented as masked primes with a SOA of 48 ms. Participants were presented with Arabic numbers as targets, and Arabic numbers or multiplications as primes. Primes could be congruent or incongruent with the target. Presence/absence of the equal sign was also manipulated in the multiplication priming conditions. Data analyses showed that the size of the multiplication priming effect was similar irrespective of the presence of the equal sign, suggesting that the equal sign is not important for the automatic activation of simple multiplication.

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Perception And Action III - 14:00-16:00

(3092)**Spatial Representations of Time: Evidence for the Spatial-Temporal Association of Response Codes** - *Masami ISHIHARA, Peter KELLER, Yves ROSSETTI, Wolfgang PRINZ*

Numeric stimuli have spatial characteristics and responses to such stimuli are biased by the mental representation of their magnitude [e.g., spatial-numerical association of response codes (SNARC) effect]. This supports the existence of a spatial component in the cognitive representation of magnitude. We investigated the spatial representation of 'time' using responses to the onset timing (early vs. late) of a probe stimulus following periodic auditory stimuli. The results showed that left-side responses to early onset timing were faster than those to late onset timing, whereas right-side responses to late onsets were faster than those to early onsets when the response keys were aligned horizontally. Such a congruity effect was not observed with vertically arrayed responses. These results suggest that time is represented along the horizontal, rather than vertical, axis in space. The existence of a 'mental time line' and the spatial-temporal association of response codes (STEARC) effect are discussed.

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Perception And Action III - 14:00-16:00

(3093)**The Influence of Another's Actions on One's Own Synchronization With Music.** - *Lena NOWICKI, Peter KELLER, Wolfgang PRINZ*

How is one's own music performance affected by the presence of a co-performer? The present study provides a first step into the investigation of this question. Pairs of musically trained participants were asked to tap the beat of two types of auditory sequences (a musical piece and a metronome), either on their own (solo) or alternating with another participant (joint). Tapping either produced no audible effects (Experiment 1) or percussive sounds (Experiments 2). Results showed higher synchronization accuracy and lower timing variability when tapping produced auditory effects, which may be because temporal information is processed more rapidly when auditory feedback is given in addition to tactile feedback. This feedback benefit was stronger for metronomic than for musical sequences. Further, variability was higher in joint than in solo conditions. Correlation analyses revealed interdependencies between participants' tapping, suggesting that mutual error correction may have inflated variability in joint conditions.

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Perception And Action III - 14:00-16:00

(3094)**Visual Enhancement of Touch and the Bodily Self** - *Matthew LONGO, Sean CARDOZO, Patrick HAGGARD*

Seeing the hand increases tactile acuity on the hand, compared to seeing a non-hand object. While several studies have demonstrated this visual enhancement of touch (VET) effect, its relation to the 'bodily self', or mental representation of one's own body remains unclear. We examined whether VET is an effect of seeing a hand, or of seeing my hand, using the rubber hand illusion. In this illusion, a prosthetic hand which is brushed synchronously – but not asynchronously – with one's own hand is felt to actually be one's hand. Thus, we manipulated whether or not participants felt like they were looking directly at their hand, while holding the actual stimulus they viewed constant. Tactile acuity was measured by having participants judge the orientation of square-wave gratings. Two characteristic effects of VET were observed: (1) cross-modal enhancement from seeing the hand was inversely related to overall tactile acuity, and (2) participants near sensory threshold showed significant improvement following synchronous stroking, compared to asynchronous stroking or no stroking at all. These results demonstrate a clear functional relation the bodily self and primary tactile perception.

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Perception And Action III - 14:00-16:00

(3095)**Motion and Action in Animate and Inanimate Objects.** - *Annalisa SETTI, Anna BORGHI, Alessia TESSARI*

We investigated the activation of action information elicited by inanimate and animate entities. We hypothesized a stronger activation of action information with inanimate objects, and a stronger activation of motion information with animate entities. Target words (animate and inanimate object concepts) were preceded by 4 primes: a moving downward arm with hand in grasping position ('action and motion'), or with hand closed as fist ('motion only'), a static arm with hand in grasping position ('action only'), and a catch trial. Participants decided whether the target could move by itself or not. Results showed slower RTs for inanimate objects in the 'action and motion' condition relative to the inanimate in 'motion only' condition and both inanimate and animate entities in 'action only' conditions. An interference between the action afforded by inanimate entities and that displayed in the prime was found, while no such an effect was registered for animate entities.

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Perception And Action III - 14:00-16:00

(3096)**Language Modulation of the Motor System: a Study on Weight Perception** - *Arthur GLENBERG, Claudia SCOROLLI, Anna BORGHI, Annalisa SETTI*

Does comprehending sentences about lifting a weight interfere with judgments of weights lifted by others? Observers read a sentence describing the lifting of a Heavy or Light Weight. Then they were shown a video depicting the lifting of a Large or Small Box, and the observers estimated the box's weight. In Experiment 2, practice lifting the boxes preceded observation of the videos and led to a dramatic increase in the correlations between judged and observed weight. For Light Videos, Light Sentences produced the lowest correlations, for Heavy Videos the Heavy Sentences reduced the correlation. A modification of the MOSAIC model explains these results: Reading about the lifting of a light/heavy object occupies a module that would otherwise be used in making a weight judgment. Previous work has demonstrated effects of action systems on comprehension; these results demonstrate a reciprocal effect of comprehension on use of motor system to make judgments.

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Perception And Action III - 14:00-16:00

(3097)**Spatial Demonstratives and Perceptual Space** - *Berenice VALDES-CONROY, Kenny COVENTRY, Pedro GUIJARRO-FUENTES, Alejandro CASTILLO*

Locative demonstratives (e.g., this/that) are linguistic pointing devices that play a crucial role when indicating object locations in space. Some neuropsychological evidence suggests that these proximal and distal linguistic descriptors do not correspond with the near and far visual representation of space (Kemmerer, 1999). In a series of experiments in which participants had to communicate the locations of objects in front of them using language and pointing (this/that red square) we manipulated a range of perceptual variables, including the distance between participants and objects, whether participants used an arm extension to point, and whether participants placed the object prior to description. Our results show that the use of this and that is sensitive to physical parameters of peri-personal perceptual distance, and more interestingly, that English demonstratives are highly sensitive to direct interaction with objects. The relationship between spatial demonstratives and perceptual accessibility to objects is discussed.

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Perception And Action III - 14:00-16:00

(3098)**Assessing Multisensory Integration in Reaching Space** - *Claudio BROZZOLI, Francesco PAVANI, Lucilla CARDINALI, Christian URQUIZAR, Alessandro FARNE*

Does voluntary action affect visuo-tactile (VT) coding of peripersonal space (PS)? Healthy subjects discriminated tactile stimulations on right hand (up-index/down-thumb) while

grasping an object (embedded with visual distractors) with the stimulated right or, as a control, left hand. Before the movement, VT interference (VTI) was larger when the object's orientation was spatially compatible with the index/thumb's orientation. Crucially, right-hand grasping modulated the VTI that increased at movement onset and during action. This on-line multisensory effect was only present for object's orientations that were incompatible with respect to the right-hand posture before action initiation. No effect of action on VTI was found in the control condition. In conclusion, action affects the multisensory coding of the PS. This is the first experimental evidence that action-dependent modulations are selective for body-parts involved in action, suggesting that multisensory integration in action space can dynamically vary according to the different phases of an ongoing action.

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Priming II - 14:00-16:00

(3099)**Consequences of Ignoring Category-Items on Subsequent Correct and False Recall** - *John E. MARSH, François VACHON, Robert W. HUGHES, Dylan M. JONES*

Is it more difficult to recall category-items if those, or categorically-related, items have been previously presented as to-be-ignored material? Participants were presented with visual lists—comprising items drawn from single semantic-categories—for free recall. In some trials, the to-be-remembered items were either identical or drawn from either the same, or different, semantic-category as items auditorily presented as irrelevant words on the previous trial. Correct recall was facilitated when the identity of the to-be-remembered items matched that of the previously presented irrelevant items. However, when the to-be-remembered and previous to-be-ignored items were non-identical but drawn from the same category, the level of correct recall was reduced and false recall of the category-related items previously presented as to-be-ignored material was increased. The findings are discussed in terms of semantic activation/inhibition theories.

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Priming II - 14:00-16:00

(3100)**Differences Between Conscious and Unconscious Priming When Automatic or Controlled Processes Are Solicited.** - *Ljubisa PLACE*

Four experiments where conducted : two with subliminal priming (17ms presentation) and two with supraliminal priming (80 ms); two experiments dealt with semantic (involving controlled processes) and morphological priming (automatic processes), the two others dealt with phonological priming (automatic processes). Results indicate that subliminal priming soliciting automatic processes may influence conscious tasks involving automatic or controlled processes, but there is no facilitation effect when subliminal priming solicits controlled processes. Besides, supraliminal priming soliciting automatic processes is without effect on a conscious task also involving automatic processes, whereas an effect is obtained when the task involves controlled processes, regardless of priming soliciting automatic or controlled processes. These results enable a distinction between conscious versus non conscious processes and controlled versus automatic processes : a controlled process can only be activated consciously, whereas an automatic process, normally activated unconsciously may also be activated consciously, but it generates a cost in performance.

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Priming II - 14:00-16:00

(3101)**No Feature Integration for Unconscious Stimuli** - *Carsten POHL, Andrea KIESEL, Wilfried KUNDE, Michael P. BERNER, Joachim HOFFMANN*

Previously, we observed that chess experts but not novices revealed unconscious priming effects with a check detection task. Participants had to decide whether a rook or knight was giving check to a king. To resolve this task the features identity and location of the attacking piece have to be considered. The present experiment investigates whether chess experts integrate features of unconsciously presented stimuli or whether their priming effects are due to acquired templates of possible chess configurations. Therefore we modified the chess detection task to an explicitly instructed XOR task: A rook or knight was depicted on either white or black squares of a chessboard. The same response was required for a rook on white squares and a knight on black squares and vice versa. Experts showed no reliable priming effects for this arbitrary conjunction. We therefore assume that acquired templates are responsible for complex visual processing without awareness.

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Priming II - 14:00-16:00

(3102)**Finiteness Information and Homographs Competition in the Processing of Italian Verbal Forms** - *Francesca POSTIGLIONE, Alessandro LAUDANNA*

The study investigates the lexical representation of verbal forms in Italian. Previous studies showed that different mechanisms are involved in processing finite (e.g., impiega (he/she employes)) vs. non-finite (e.g., impiegato (employed, past participle)) verbal forms. A further difference is that the latter forms are often syntactically ambiguous: they may also appear as nouns and/or adjectives. Two visual lexical decision tasks exploiting the priming paradigm were performed. In Experiment 1 past participle targets were preceded by a finite form of the same verb. In Experiment 2 the prime-target relationship was reversed. The critical stimuli were past participle forms having a higher frequency either as nouns (e.g., impiegato, clerk/employed), or as verbs (e.g., condannato, condemned/convict). In both experiments we observed stronger priming effects on forms with higher nominal frequencies. The results are interpreted by assuming that non-finite forms have distinct lexical representations, according to the number of syntactic roles they can play.

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Priming II - 14:00-16:00

(3103)**Is There Semantic Priming With Verbs? Evidence From Word Naming in Italian** - *Davide CREPALDI, Lisa Saskia ARDUINO, Claudio LUZZATTI*

The effect of grammatical class on semantic priming has been poorly investigated so far. In a first experiment we used primes and probes belonging to different grammatical classes (e.g., food-eat) and no facilitation emerged. This result may be explained either semantically (structurally different semantic representations - i.e. functional vs visual, relational vs denotative- do not facilitate each other) or syntactically (i.e., no priming across grammatical classes). In a second experiment, we used strongly related noun-verb pairs in which prime and probe denote very close concepts (idea-think): again, no priming emerged, suggesting that the semantic hypothesis is not correct. In a third experiment, we tested noun-noun and verb-verb pairs (dog-cat; eat-drink): semantic priming emerged with nouns (as usual), but not with verbs . Altogether, the experiments indicate that the mere presence of a verb in a prime-probe pair prevents semantic priming from emerging.

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Priming II - 14:00-16:00

(3104)**Electrophysiological Correlates of Orthographic Masked Priming** - *Frédérique FAÏTA-AÏNSEBA, Stéphanie MATHEY, Sarah BOUAFFRE*

Prior studies using the masked priming procedure have shown an inhibitory effect of orthographic priming in lexical decision experiments. In the present study, we recorded ERPs (Event-Related Potentials) in a primed lexical decision task to observe electrophysiological correlates of orthographic priming. Participants performed a lexical decision task on target words preceded either by their highest frequency orthographic neighbour (e.g., poing-COING) or by a control prime (e.g., lueur-COING). Target frequency (high vs low) was also manipulated. Behavioural results comforted that lexical decision latencies were delayed for targets preceded by orthographic neighbours, and showed faster decisions for high-frequency

targets. ERPs displayed two waveform differences: 1) an early effect (180-270 ms) showing a larger positivity for targets primed by a neighbour and 2) a later classical N400 frequency effect with a larger negativity for low-frequency targets. Results are discussed in terms of ERP contribution regarding to the time-course of lexical access.

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Priming II - 14:00-16:00

(3105)**Associative Priming of Concrete and Abstract Words: Electrophysiological Evidence for Distinct Context Effects** - *Oliver MUELLER, Alberto AVILES, Jon Andoni DUÑABEITIA, Manuel CARREIRAS*

Concrete and abstract words have shown processing differences in many studies. One of the prevailing assumptions is that abstract words depend more on context to access meaning than concrete words do. Accordingly, a context manipulation like semantic priming should differentially affect abstract and concrete words. However, in a study using event-related brain potentials (ERPs), Swaab, Baynes, and Knight (2002), found no interaction between semantic priming and concreteness of words. One possible caveat is that the SOA was quite large, namely 1200 ms, and that stimuli were presented auditorily. The present ERP study used visual presentation and a masked associative priming paradigm, with an SOA of 50 ms. The ERP analysis showed that the relatedness effect had a different topography for concrete and abstract words. This is evidence that context as provided by an associative prime influences concrete and abstract words in a distinct way, even without conscious identification.

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Spatial Cognition III - 14:00-16:00

(3106)**Building a Mental Model From Text and Animation** - *Emmanuel SCHNEIDER, Jean-Michel BOUCHEIX*

The aim of this study was to analyze the role of a text explaining the mechanical complex system comprehension with an animation. Two hundred and forty-one participants were tested. The task was to understand a complex pulleys system with an animation and an explanative text or with an animation only. During the study phase, we recorded eye movements with an eye tracking system before comprehension measures. Results showed that an animation and a text did not improve the comprehension performances compared to an animation only, despite of a more important study time. The eye tracking data showed that the numbers of fixations in specific areas of the animations and the numbers of transitions between these areas were less important when participants studied an animation with text than an animation only. Text is an referential media, for learners, as they look at it more, but it does not improve comprehension performances

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Spatial Cognition III - 14:00-16:00

(3107)**Rehabilitation of Visuo-Spatial Neglect by Prism Adaptation** - *Signe VANGKILDE, Thomas HABEKOST, Claus BUNDESEN*

Over the last decade, several studies have found that visuo-motor adaptation to rightward deviating prismatic goggles (prism adaptation, PA) can alleviate the symptoms of left visuo-spatial neglect after brain damage. Recently, however, both the long-term effect of PA and the clinical relevance of this rehabilitation approach have been questioned. In the present study, 6 patients with left neglect were given 20 sessions of PA over a two-week period. Patients were tested alongside a matched control group of neglect patients (n = 5) using a variety of attentional effect measures at baseline, after training, and after a period of five weeks. Significant long-term improvements due to PA were found on clinical tests of neglect, lateral bias of eye movements, and on measures of everyday functioning. These diverse positive effects support the efficacy of PA and speak in favour of integrating this approach with the general neuropsychological rehabilitation of neglect.

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Spatial Cognition III - 14:00-16:00

(3108)**A New Methodology for Hemispheric Difference's Studies** - *Benjamin PUTOIS, Olivier KOENIG*

Baciu et al. (1999) observed a decrease in the involvement of the right angular gyrus and concomitant increase in the involvement of the left angular gyrus for processing coordinate spatial relations. We predict that this reversal in functional lateralization is a function of dynamic interhemispheric inhibition. We used a bilateral stimulus presentation paradigm. We varied the congruence of the stimuli simultaneously presented in the right and in the left visual field. This paradigm enabled us to control the participation of both hemispheres in processing and allowed for testing different levels of interhemispheric cooperation. When identical stimuli were presented bilaterally, we observed a left visual field advantage and an absence of right visual field practice effect. In contrast, when bilateral inputs were different, we observed a right visual field advantage along with a left visual field practice effect. This interaction shows that functional asymmetries depend on hemispheric collaboration. These results highlight the importance of taking into account both hemispheres when measuring hemispheric performance.

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Spatial Cognition III - 14:00-16:00

(3109)**Gender Differences in a Visuospatial Planning Task: an Investigation of Cognitive Strategies** - *Valentina CAZZATO, Simone CUTINI, Demis BASSO, Patrizia Silvia BISIACCHI*

Many gender studies report a male advantage in several visuospatial abilities, that has been confirmed also in visuospatial planning tasks. This study is aimed at exploring whether gender may affect the choice of cognitive strategies in a visuospatial planning task. A computerized task based on the Traveling Salesman problem (TSP) has been used to investigate visuospatial planning: participants have to optimize time and space of a path travelling among a number of subgoals in a spatially constrained environment. Results confirmed significant differences in planning behaviour: men showed a shorter execution time and a better path length optimization than women. Moreover, a more proficient use of strategies was observed in men, while women often used a strategy based on a single heuristic. Accordingly, the more successful performance of the male sample may be due to their higher ability to properly coordinate the heuristics during the task.

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Task Switching II - 14:00-16:00

(3110)**Specific Characteristics of Tool-Associated Transformation Rules : a Tool-Switching Paradigm** - *Miriam LEPPER, Cristina MASSEN, Wolfgang PRINZ*

In tool-use, we have to realize the tool-specific transformation rule that transforms our bodily movement into the desired action effect. Thus, switching between tools also means switching between transformation rules. For mechanical tools, the transformation rule is embodied in the tool structure. We developed a tool-switching paradigm to elucidate how tool-associated transformation rules are applied. Regarding the interaction between response repetition/switch and rule repetition/switch, we found evidence that the application of transformation rules with a compatible action-effect relation could benefit from natural action-effect bindings, whereas for incompatible transformation rules, the required action-effect binding had to be computed anew in each trial. In a rule-switching paradigm, in which the rules were not embodied in the stimulus structure but had to be learned explicitly, action-effect bindings – compatible or incompatible – always had to be computed anew. There was further evidence that tool-associated transformation rules and explicit task rules differ in important aspects.

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Task Switching II - 14:00-16:00

(3111)**On the Costs of Alternately Performing Two Tasks** - *Job LINDSEN, Ritske DE JONG*

Two types of performance costs can be distinguished in the task switch paradigm: mixing costs and switch costs. The Failure-to-Engage theory of residual switch costs posits that these costs arise because people, although able to perform equally well at switch trials as at repetition trials, occasionally fail to engage in advance preparation. We investigated whether such a competence-performance distinction applies to the mixing costs as well; are mixing costs the result of occasional failures to maintain the task set in memory throughout the preparation interval? In line with our prediction, we found that the fastest responses in the task-switch condition were as quick as the fastest responses in the single-task condition. Our data further show that both the number of failures to prepare for a task switch and the number of failures to maintain the task set appear to decrease as the trial-to-trial probability that a task switch occurs decreases.

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Task Switching II - 14:00-16:00

(3112)**Response Effects in Voluntary Task Switching** - *Jelle DEMANET, Baptist LIEFOOGHE, André VANDIERENDONCK, Frederick VERBRUGGEN*

In the voluntary task switching paradigm participants are free to select which task they want to perform, as long as they perform both tasks an approximate equal number of times and do not follow a predictable pattern of alternation. Previous research demonstrated a moderate and inconsistent influence of relevant and irrelevant sequences of stimuli on this pattern of alternation. In analogy, we investigated the role of response sequences by evaluating the influence of response correspondence and response repetition effects of the task executions on the selection of upcoming tasks. A series of three experiments, demonstrated that the speed of task selection was clearly influenced by these response effects, while the task selection probabilities and the randomness of the pattern of alternation remained unaffected. These results converge on the idea that while response effects influence task-level processes, they do not come into play in higher-order functions such as the random generation of task sequences.

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Task Switching II - 14:00-16:00

(3113)**Task Set Control and Mixing Cost: Influence of the Probability of a Task Switch** - *Camille BONNIN, Cédric BOUQUET*

The mixing cost (MC) denotes the poorer performance in task repetition trials within blocks of mixed task relative to task repetition within blocks of single task. The present study examined whether MC varied with switch probability. When this probability is high, subjects would tend to overpredict task changes and prepare for a different task (Monsell & Mizon, 2006). This may thus affect task repetition trials in mixed blocks. Two groups of participants were tested on a task-switching paradigm with single and mixed task blocks. In mixed blocks, the switch probability was 0.5 for the High probability (HP) group and 0.25 for the Low Probability (LP) group. Analyses of RTs and error rate indicate a smaller MC in the LP group, suggesting that MC is related to strategic processes (Steinhauser & Hübner, 2005). An analysis of RT recovery after a switch further indicates that task-set inertia also contributes to MC.

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Task Switching II - 14:00-16:00

(3114)**Response-Repetition Effects in Task Switching With and Without Response Execution** - *Stefanie SCHUCH, Iring KOCH*

Repeating the same response in a different task context is associated with costs. In a change-signal paradigm, we investigated whether such response-repetition costs occur even when the first of the two responses was not overtly executed. Two stimuli occurred one after the other, the second stimulus indicating to stop the response to the first stimulus and only respond to the second. Stimulus-onset asynchrony was varied adaptively so that the first response could only be successfully stopped in half of the trials. In Experiment 1, different tasks had to be performed on the first and second stimulus; in Experiment 2, the same task had to be performed twice. Response-repetition costs were obtained in Experiment 1, but not in Experiment 2. Importantly, the response-repetition costs were obtained even when the first of the two responses was successfully stopped, supporting the idea that response-repetition costs are due to interference of abstract response codes.

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Task Switching II - 14:00-16:00

(3115)**The Effect of Response Inhibition on Switch Cost Under High and Low Interference Conditions** - *Zoltan KONDE, Iren BARKASZI, Istvan CZIGLER*

By the response selection account of task switching switch cost is thought to arise from slowed response selection through interference of competing stimulus-response bindings. Exploring its predictions in 5 experiments a non-random task switching paradigm combined with a stop signal paradigm was used and the level of interference related to response selection processes was manipulated. Under high interference a same set of responses were used and the same stimulus were presented for both relevant and irrelevant tasks (bivalent responses and stimuli). In low interference conditions a separate set of stimuli and responses were used and by a moderate level of interference the stimuli or response sets were univalent. Again response-stimulus interval was manipulated in all experiments. In dim contrast with the response selection account response inhibition before predictable switching resulted in decrease of switch cost only in low interference condition with long preparation interval

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Task Switching II - 14:00-16:00

(3116)**Task-Set Shifting Selectively Modulates Activity of Extrastriate Task-Related Regions** - *Stefano SDOIA, Sabrina PITZALIS, Gaspare GALATI*

Two fMRI experiments test the hypothesis that task-set reconfiguration occurs through the modulation of neural activity of task-related regions. We employed a task-cueing paradigm requiring random switches between motion-, face- and body part- discrimination tasks, afforded by the same stimulus. In separate runs, motion-, face- and body part-selective extrastriate regions (V5/MT, FFA, EBA, respectively) were individually mapped using standard procedures. Higher activity for switch compared to repeat trials was found in several regions of the prefrontal and parietal cortex, irrespective of the task-relevant visual dimension. Importantly, in the analyses restricted to functionally identified extrastriate regions, we found dimension-selective switch-related modulations: V5/MT was more activated for switch-to-motion than for motion-repeat trials; FFA was more activated for switch-to-face than face-repeat trials; EBA was more activated for switch-to-body part than repeat-body part trials. These results reveal that task-set reconfiguration during task switching is mediated by the modulation of activity of extrastriate task-related regions.

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Task Switching II - 14:00-16:00

(3117)**Perception of Emotionally Relevant Stimuli Interact With Control Processes in Task-Switching** - *Roberta TRINCAS, Alessandro COUYOUMDJIAN*

Aim of the study is to investigate whether visual stimuli with positive and negative emotional valence affect control processes involved in task-switching, although they are irrelevant to the task at hand. Consistently with the notion of cognitive flexibility, it is hypothesized that pictures with positive valence facilitate switching from an automatic to less-learned task; on the contrary, pictures with negative valence facilitate switching from a less-learned to an automatic task. Participants were asked to switch randomly between two tasks: a) arrow-direction categorization (automatic task), and b) geometric-shape categorization (less-learned task). On each trial, the background

consisted of emotionally positive (block 1 and 2) or negative pictures (block 3 and 4) selected from IAPS. Results show that switch costs toward the automatic task are grater with negative than with positive pictures. Therefore positive and negative valence of pictures seem to have different effects on control processes.

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Visual Perception II - 14:00-16:00

(3118)**Symmetry and Size Estimation** - *Pom CHARRAS, Juan LUPIANEZ*

Visual perception follows the law according to which « The whole is more than the sum of its parts » (Wertheimer, 1923; Kohler, 1920). We investigated this assumption with bisected lines. Our data first confirmed that a whole line is reported to be longer than the sum of two lines, even if the total length is equal. Moreover, the results provided evidence the sum of different-size parts of lines is longer than the sum of same-size parts (Charras & Lupianez, in preparation). We will report a series of experiments aiming at exploring to what extend this new rule of perception can be generalized as a law of size and quantity estimation. Symbolic and no symbolic stimuli were manipulated. We conclude that when estimating the overall size of different parts, the sum of two different-size parts is perceived as bigger than the sum of two equal-size parts.

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Visual Perception II - 14:00-16:00

(3119)**Priming of Natural Pictures of Object by Normal, Low-Passed, and Band-Passed Versions in a Natural/Artificial Categorisation Task** - *Sandrine DELORD, Pierre BORDABERRY*

This study aimed at determining the facilitatory effect of the global shape or the contour of an object on semantic categorisation using a visual priming task. Four primes were used : 1/ the complete object, 2/ a band–passed filtering isolating the object contour, 3/ a low-passed filtering, isolating the global shape, strong enough to prevent recognition, and 4/ the iFFT of the randomized spectra as control. The 128 targets were the original non-filtered pictures. Prime duration varied : 30 or 70 ms (Experiment 1) and 150 or 400 ms (Experiment 2). Results showed an equal priming for low-pass and band-pass versions in Experiment 1 and a stronger priming for the complete prime. Experiment 2 replicated the results, but priming effects were stronger for band-passed than for low-passed primes. Both the global shape and the contour could help the semantic categorization, as soon as 30 ms of processing, but recognizable primes become more efficient when processing time increases.

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Visual Perception II - 14:00-16:00

(3120)**Lateral Interaction Between Noise and Pattern in the Visual System** - *Sohei WAKISAKA, Yukio GUNJI, Ohta HIROYUKI*

The fact that ongoing activity is “oriented” has been one of the hottest topics in the last decade. Then, the question arises: what is the relation between ongoing activities and those induced by oriented stimulus? If the former is highly patterned, is there any interaction between the latter? We report a new visual phenomenon which actually can be explained as a result of such interaction between them in the early visual process. Several implications of the phenomena will be discussed, from the aspects of psychophysical methods and the theory of computation.

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Visual Perception II - 14:00-16:00

(3121)**Exposure Time and ISI: Effects on Right (RH) and Left (LH) Hemisphere Processing of Saliency and Semantic Relevance** – *Sara SPOTORNO, Mylène MEYER, Sylvane FAURE*

A one-shot divided visual field task investigated the effects of scene exposure (50, 100, 180 ms) and ISI (100, 400 ms) on processing physical and semantic properties and on the modulation of hemispheric involvement in change detection. Three experiments revealed that accuracy and speed improved as exposure duration increased, and that detection was faster for long than for short ISI at the shortest exposure. Whereas long ISI facilitates detection in high more than in low relevance condition, long exposure improved performance for high but not for low saliency changes. Hemispheres were differentially influenced by change properties: RH showed relevance facilitation earlier than LH and saliency effects independent of relevance level, while for LH saliency improved detection only for highly relevant changes. At short ISI and high saliency/low relevance changes RTs were shorter in left than in right visual field, suggesting a functional asymmetry modulated by stimuli characteristics and time parameters.

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Visual Perception II - 14:00-16:00

(3122)**Allocation of Endogenous Visual Attention Affects Perceptual Grouping** - *Magali ALBERT, Thierry RIPOLL*

In previous studies, we have shown that recent visual knowledge affected perceptual grouping even for very simple stimuli such as 2*2 matrices of simple elements organized horizontally or vertically by colour or shape similarity. We attributed this effect to the expectative allocation of visual attention induced by knowledge about future organization. In the present experiment, we evaluate an alternative account in term of perceptual priming effect. In previous studies, knowledge was provided explicitly by source stimulus showed for 500 ms before target stimulus onset. In the present study, we manipulate perceptual status of source (subliminal vs. supraliminal), probability of source-target compatibility (80% vs. 50%) and design of source presentation (mixed vs. blocked). Perceptual priming effect cannot explain the obtained results. Our findings are consistent with an implication of a flexible form of endogenous attention in perceptual grouping.

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Word And Letter Processing III - 14:00-16:00

(3123)**Serial Position Effects in the Identification of Letters, Digits, and Symbols** - *Ilse TYDGAT, Jonathan GRAINGER*

The form of serial position functions was investigated for two-alternative forced-choice accuracy in the identification of letters, digits, and symbols presented in strings. The results replicate findings obtained with the target search paradigm, showing an interaction between the effects of serial position and the type of stimulus, with symbols generating a distinct serial position function compared with letters and digits. In the present study this interaction was driven almost exclusively by performance on the first position in the string, with letters and digits showing higher levels of accuracy than symbols at this specific position. These results provide further support for the existence of a specialized mechanism designed to optimize processing of strings of alphanumeric stimuli.

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Word And Letter Processing III - 14:00-16:00

(3124)**The Syllable Congruency Effect With the Masked Priming Procedure Re-Examined in French** - *Fabienne CHETAIL, Stéphanie MATHEY*

This study aimed to investigate the role of syllables in lexical decision and naming tasks with the masked priming procedure in French. Pairs of target words sharing the first three letters but not the first syllable were constructed (BA.LANCE/BAL.CON). Each target word was preceded by a nonword prime sharing the first three letters that either corresponded to the syllable in the congruent condition (ba.lieux-BA.LANCE, bal.nat-BAL.CON), or did not in the incongruent condition (bal.veux-BA.LANCE, ba.lave-BAL.CON). Similar results were found in both lexical decision (Experiment 1) and naming tasks (Experiment 2). Targets such as BA.LANCE were recognized more rapidly in the congruent condition than in the incongruent and control conditions while targets such as BAL.CON were recognized more rapidly in the congruent and incongruent conditions than in the control condition. This suggests that syllables are functional units of lexical access in French. The results are discussed in an interactive-activation model with syllables.

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Word And Letter Processing III - 14:00-16:00

(3125)**Ambiguity Advantage in Word Recognition** - *Pierre THEROUANNE, Maude LAS DIT PEISSON, Jessica ROTH*

Several studies have provided evidence that ambiguous words are recognized faster than unambiguous words when presented in isolation. However, recent results have shown a disadvantage for homonyms, which have unrelated meanings, and an advantage for polysemic words, which have related senses (e.g., Beretta et al., 2005; Rodd et al., 2002). Three lexical decision experiments were conducted to study ambiguity effect for French homonyms in visual and spoken word recognition. The results showed that homonyms were responded faster than matched unambiguous words. This ambiguity advantage was larger when pseudohomophones were used as foils in the visual lexical decision task than when illegal nonwords were used. These findings can be interpreted in terms of feedback activation from multiple unrelated meanings to the lexical representation of the ambiguous word. Thus, ambiguity advantage still challenges models assuming a competition between meanings at the semantic level.

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Word And Letter Processing III - 14:00-16:00

(3126)Effects of Intervocalic Cluster Reduction and Sonority Within Syllabic Boundary in French Adult Readers - Norbert MAÏONCHI-PINO, Bruno DE CARA, Annie MAGNAN, Jean ECALLE

The present study investigated how sonority (i.e., sonorant vs. obstruent), phonotactics and consonant deletion (i.e., coda vs. onset) within the syllabic boundary influenced syllabification and resyllabification strategies in French adult readers. We also used an audio-visual recognition task. Participants had to decide whether a simultaneously audio-visual presented pseudoword (e.g., TOLPUDE) was identical or not to a test-pseudoword. In non-identical condition, coda (e.g., TOPUDE) or onset (e.g., TOLUDE) was deleted. Experimental evidence suggested a phonological processing based on syllabic units which was constrained by linguistic principles; adults faster responded in identical condition when the syllabic contact between syllables was optimal (i.e., sonorant coda-obstruent onset). Yet, coda deletion (especially sonorant coda deletion) improved response times what highlighted sensitivity to preserved syllabification, to optimal syllabic structure (i.e., CV) and to cohesion between syllables. Released data are in line with linguistic principles argued by Clements (1990) and are innovative in French reading.

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Word And Letter Processing III - 14:00-16:00

(3127)**A Holistic Code for Visual Words** - *Thomas HANNAGAN, Emmanuel DUPOUX, Anne CHRISTOPHE*

The question of how visual words are encoded in the brain –what has been termed the letter position coding scheme- has recently received considerable attention. Today four main approaches can be distinguished: Slot Coding (McClelland & Rumelhart, 1981), Wickelcoding (Seidenberg & McClelland, 1989), Open Bigrams (Grainger & Van Heuven, 2003; Whitney, 2001) and Spatial Coding (Davis, 1999). We present a simple neural code for visual words based on holistic representations (Kanerva, 1997), a distributed connectionist framework designed to account for combinatorial structures. We show that our model, which belongs to a positional approach such as slot-coding, can explain transposition priming results on which current models fail (Perea & Lupker, 2003; Davis & Bowers, 2006; Guerrera & Forster, submitted), while allowing for combinatorial information to be captured in a fixed-size, distributed and accessible code.

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Word And Letter Processing III - 14:00-16:00

(3128)**Letter-Name Knowledge Promotes Letter-Sound Learning in French-Speaking Prereaders** - *Blandine BOUCHIERE, Jean Noel FOULIN*

The present study was devoted to test that letter-name knowledge (LNK) facilitates the learning of letter sounds when letter names contain letter sounds (e.g. /be/, the letter name of B, contains the sound /b/). The issue was addressed in English and in Hebrew but never in French, to the best of our knowledge. How the type of letter name (e.g. consonant-vowel for B or vowel-consonant for F), and children's phonemic awareness level affected learning letter sounds was also investigated. Participants were French-speaking prereaders aged four to six and unaware of letter sounds. Some participants had high LNK level and other low LNK level. They were individually taught 12 letter sounds through a paired-associate learning procedure. Results revealed that learning letter sounds depended on children's LNK and on letter-name type and was associated with children's phonemic analysis level. These findings are discussed for their theoretical and pedagogical implications.

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Word And Letter Processing III - 14:00-16:00

(3129)**The Syllable Frequency Effect in Lexical Decision: Phonological or Orthographic Processing?** - *Markus CONRAD, Jonathan GRAINGER, Manuel CARREIRAS, Arthur JACOBS*

Several experiments are reported addressing the nature of the syllable frequency effect in the visual lexical decision task. Making use of the inconsistency regarding the orthographic representation of phonological syllables in French we obtained an inhibitory effect of syllable frequency on lexical access only when manipulating phonological syllable frequency while controlling for orthographic syllable frequency and not in the inverse case. In two experiments using bisyllabic Spanish words starting with a two letter CV syllable we manipulated a) initial syllable frequency controlling for the frequency of the initial letter cluster and b) initial bigram frequency controlling for initial syllable frequency. We obtained an inhibitory effect of syllable frequency but a facilitative effect of orthographic letter cluster frequency. Taken together, these results suggest that the syllable frequency effect in visual word recognition occurs independently of orthographic redundancy and is related to the processing of phonological syllables.

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Word And Letter Processing III - 14:00-16:00

(3130)**ERP Correlates of Inhibitory and Facilitative Effects of Compounds Constituent Frequency** - *Marta VERGARA, Jon Andoni DUÑABEITIA, Itziar LAKA, Manuel CARREIRAS*

Word-into-constituent decomposition of compounds has often been examined by orthogonally manipulating constituent frequency. Compounds with high frequency (HF) second constituents are recognised faster those with low frequency (LF) ones. However, the role of the first constituent remains unclear: facilitative effects were found in English while inhibitory effects were found in Spanish and Basque in lexical decision and eye movement measures. In this experiment, ERPs of participants were recorded while reading Basque compounds inserted in sentences. The P200 component showed first constituent frequency effects while the N400 component showed second constituent frequency effects. The effects in the P200 window might be related to an inhibitory effect of HF first constituent, whereas N400 amplitude attenuation might be associated with facilitative effects of HF second constituent. These results are discussed in terms of an activation-verification account, as an alternative to previous models that cannot account for the first constituent frequency inhibitory effect.

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Working Memory III - 14:00-16:00

(3131)**Inhibition-Related Functions Disrupt Maintenance in Working Memory** - *Sophie PORTRAT, Valérie CAMOS, Pierre BARROUILLET*

Recently, and in line with Time-Based Resouce-Sharing (TBRS) model (Barrouillet, & al., 2004), Barrouillet, Bernardin, Portrat, Vergauwe, & Camos (in press) showed that maintenance in working memory is disrupted by concurrent processes involving executive functions such as memory retrievals or response selection. In a series of experiments, we investigated the cognitive cost induced by inhibition-related functions through modified Stroop (Stroop, 1935) and Flanker (Eriksen & Eriksen, 1974) effects. In each experiment, participants maintained words or digits while performing a concurrent task in which the implication of the inhibition processes was manipulated. For example, a colour-naming task of colour words (involving prepotent response inhibition) was compared to a colour-naming task of adjectives. The results were congruent with the TBRS model, i.e., the maintenance of memory items was deteriorated when inhibition-related function was necessary to achieve the task.

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Working Memory III - 14:00-16:00

(3132)**Is the Focus of Attention in Working Memory Limited to a Single Element?** - *Svetlana BIALKOVA, Klaus OBERAUER*

Mental arithmetic was used to investigate whether the Focus of Attention (FoA) in Working Memory (WM) is limited to a single element, or its limit is more flexibly adapted to the task. The following hypotheses were tested: (1) the FoA is limited to a single element; (2) The focus can select both elements by: (a) chunking them into one element, or (b) holding them as separate elements; (3) The FoA has as many slots as it needs simultaneously to access all WM contents, assigning each element to a separate slot. The results showed switch costs for switches to a new element, but not for switches to an element that has been used in the other argument role before. These findings support the hypothesis that the FoA can select both elements, chunking them into one element.

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Working Memory III - 14:00-16:00

(3133)**Interactions Between Prospective Memory and Working Memory Loads?** - *Marcella FERRARI, Silvia ZOCCHI, Demis BASSO, Paola PALLADINO*

Several studies support the idea that prospective memory (PM) performance demands upon the interaction of preparatory attentional and working memory (WM) processes. The present study examines the effects of the WM and PM load in an event-based prospective memory task. The ongoing task consisted in an updating memory task, in which subjects had to detect whether the presented word was among the last 3 or 5 words presented (WM load conditions). The prospective task consisted in pressing a key when the item was among the list of words (composed by 1 or 3 event-cues: prospective load condition) presented in the beginning of the block. Results indicated the effects of both prospective and working memory load on the PM performance, while the ongoing task was influenced only by the WM load factor. These results may be used as a baseline for a subsequent TMS study aimed to elucidate the cerebral regions involved in the PM process.

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Working Memory III - 14:00-16:00

(3134)**Aging and the Effect of Inter-Dependent Self-Knowledge on Feature Binding** - *Nicola MAMMARELLA, Beth FAIRFIELD, Cinzia DEZULIAN, Rossana DE BENI*

This study was designed to test the influence of inter-dependent self-knowledge on reflective binding functions in older adults. Before engaging in the Mitchell et al.'s (2000) combination task, half of the participants read a brief paragraph that focused on the individual self (in-dependent self-knowledge), whereas the other half read a paragraph that focused on the relational self (inter-dependent self-knowledge). Results showed that older adults, who were primed with the inter-dependent self-knowledge passage, tended to be more successful in binding features together (e.g., object and location) compared to the group of participants who were primed with an in-dependent self-view. These findings are discussed in terms of the role of social factors in favouring reflective functions during source monitoring.

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Working Memory III - 14:00-16:00

(3135)**Attentional Resource Sharing Between Storage and Processing: an ERP Study** - *Kimberley VANDAMME, Arnaud SZMALEC, André VANDIERENDONCK, Pierre BARROUILLET*

The Time-Based Resource-Sharing (TBRS) model postulates that both processing and storage of information require attention, which is a limited resource that must be shared when two cognitive tasks are performed concurrently. This attention sharing is presumably achieved through frequently switching between processing and storage. The present ERP study investigated how memory storage affects the brain potentials of a processing task, using a standard TBRS design. Of particular interest was the N2 component which is used as an index of cognitive control. In a first experiment, we investigated how two processing tasks (a simple and a choice RT task) were affected by a concurrent memory load. In a second experiment we manipulated the cognitive demands of both the processing task and the memory load. Our results show that the N2 of the processing task is amplified under a concurrent memory load, suggesting that cognitive control is involved in sharing attentional resources.

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Working Memory III - 14:00-16:00

(3136)**Working Memory for Pitch, Timbre and Words** - *Katrin SCHULZE, Barbara TILLMANN*

Working Memory (WM) has been mainly investigated for verbal material and it remains an open question, whether verbal and non-verbal information are processed by the same WM system. Our study explores WM processes for three types of auditory stimuli (pitch, timbre, words). Nonmusicians listened to two consecutive sequences (of various length) of auditory stimuli separated by a short period of silence (3 s), and indicated whether the second sequence had the same or a different order compared to the first sequence. WM processes for maintenance and manipulation were investigated separately using a forward (requiring maintenance) and a backward (requiring manipulation) task. Furthermore, the influence of tonal structure on WM performance was investigated by using tonally structured sequences and atonal sequences in the pitch task. Data acquisition is currently in progress and findings will be discussed in link to different WM models and the potential influence of musical expertise.

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