2014

CSBBCS SCSCCC

CANADIAN SOCIETY FOR BRAIN, BEHAVIOUR, AND COGNITIVE SCIENCE

SOCIÉTÉ CANADIENNE DES SCIENCES DU CERVEAU, DU COMPORTEMENT, ET DE LA COGNITION

24TH ANNUAL MEETING

RYERSON UNIVERSITY TORONTO, ONTARIO

JULY 3RD – JULY 5TH 2014

RYERSON UNIVERSITY

OFFICE OF THE VICE-PRESIDENT, RESEARCH AND INNOVATION

Psychology
Faculty of Arts

TED ROGERS SCHOOL OF MANAGEMENT RYERSON UNIVERSITY

CORTECH SOLUTIONS

THE CHANG SCHOOL
RYERSON UNIVERSITY
CONTINUING EDUCATION

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CSBBCS 2014 A BASIC SURVIVAL GUIDE

IF YOU ARE ATTENDING CSBBCS2014:
The scientific program of CSBBCS 2014 will take place at the Ted Rogers School of Management, Ryerson University (55 Dundas West; see map). All locations are situated on the 7th (TRS1) and 8th (TRS2) floor of this building. You will need to ride two escalators before reaching the 7th floor (TRS1).

Located on the 7th floor (TRS1) are the Registration Desk, Student Lounge, Cara Commons, TRS1-073, TRS1-067, TRS1-147, and TRS1-149. Located on the 8th floor (TRS2) are TRS2-147, TRS2-149.

IF YOU ARE PRESENTING A PAPER:
You will have been allocated a specific 1 hour session within which your paper will be presented. **Please arrive at the lecture room 15 minutes before the start of the 1 hour session.** There will be someone on hand to help you set up. We would prefer it if you transferred a .ppt file onto the host computer. **If you use a laptop you are responsible for bringing the necessary connection cable (your connector must have 15-pin HD-15 Male VGA).** Your talk should be approximately 10 minutes, with 5 minutes for Q&A / change over.

IF YOU ARE PRESENTING A POSTER:
Please make a note of the poster session (A, B, C, D) and poster number to which you have been allocated. **There are three rooms in use for each poster session so note whether you are presenting in the Student Lounge, Cara Commons or TRS1-073.** Pin-up and take-down times are listed below:

	Pin-up time	*Take-down time*
Poster Session A	Thursday 3rd July 12pm	Thursday 3rd July 4pm
Poster Session B	Thursday 3rd July 6pm	Friday 4th July 10.30am
Poster Session C	Friday 4th July 12pm	Friday 4th July 6pm
Poster Session D	Saturday 5th July 10am	Saturday 5th July 2.30pm

IF YOU ARE ATTENDING THE THURSDAY NIGHT RECEPTION:
The Thursday night reception will take place from 6.30pm at the Arts and Letters Club (55 Elm Street; see map). This is a pre-ticketed event and your ticket will be in your registration pack.

IF YOU ARE ATTENDING THE CSBBCS 2014 BUSINESS MEETING:
The CSBBCS 2014 Business Meeting will take place from 4.45pm on Saturday 5th July in the 14th floor boardroom at Jorgenson Hall (380 Victoria Street; see map). Access to Jorgenson Hall should be made from the Gerrard St entrance and may not be open until close to the event time.

IF YOU ARE HUNGRY / THIRSTY:
The **Department of Psychology**, the **Faculty of Arts** and the **Vice President of Research and Innovation** are happy to sponsor the provision of **light refreshments for the Thursday poster session**. During the conference coffee breaks will be provided. A non-exhaustive list of restaurants is provided in the conference pack (but free feel to ask us about those out-of-the-way cocktail lounges too).

IF YOU ARE LOOKING FOR WI-FI AT THE CONFERENCE:
Connect to the **RYERSON** wireless network. When prompted for password, enter **EGGY1**
Open a browser and use the following to login; username: **RUguest2014**, password: **TRSconf34**

CSBBCS 2014 CONFERENCE COMMITTEE WELCOME

On behalf of all the members of the conference committee, I would like to extend an extremely warm welcome to all of you attending CSBBCS 2014. I sincerely hope you will find Ryerson University a great conference host this year and that you can take advantage of our fantastic facilities in the heart of downtown Toronto. Although I hope you'll be busy with CSBBCS 2014, you should also be thoroughly entertained by the city itself. Please feel free to ask a CSBBCS volunteer for advice about the conference, or, where to go and what to do.

CSBBSC 2014 Conference Organizer
Ben Dyson

CSBBSC 2014 Conference Organizing Committee Members
Paolo Ammirante, Bonnie Armstrong, Sara Gallant, Todd Girard, Naomi Koerner, Lingqian Li, Lucy McGarry, Syb Pongracic, Kristina Safar, Raj Sandhu, Nicole Sugden, Pete Wegier, Naresh Vempala, Jonathan Wilbiks, Brenda Wong, Lixia Yang

CSBBSC 2014 Conference Volunteers
Pierre Bouche, Sara Gallant, Andrea Kusec, Lingqian Li, Amy-Jane McAuley, Lucy McGarry, Raj Sandhu, Galilee Thompson, Linda Truong, Brenda Wong, Lixia Yang

Donald O. Hebb Graduate Student Award Committee Organizer
Todd Girard

CSBBSC 2014 Conference Website
Trudy Shore, MohSho Interactive Multimedia

CSBBSC 2014 Conference Photography
Stephen Want

CSBBSC 2014 Conference Logo Design
Dana Greenbaum, Ben Dyson

Thanks to
Marty Antony, Psychology Department, Ryerson University
Gerald Belanger, AV Services, Ryerson University
Jean-Paul Boudreau, Dean of Arts, Ryerson University
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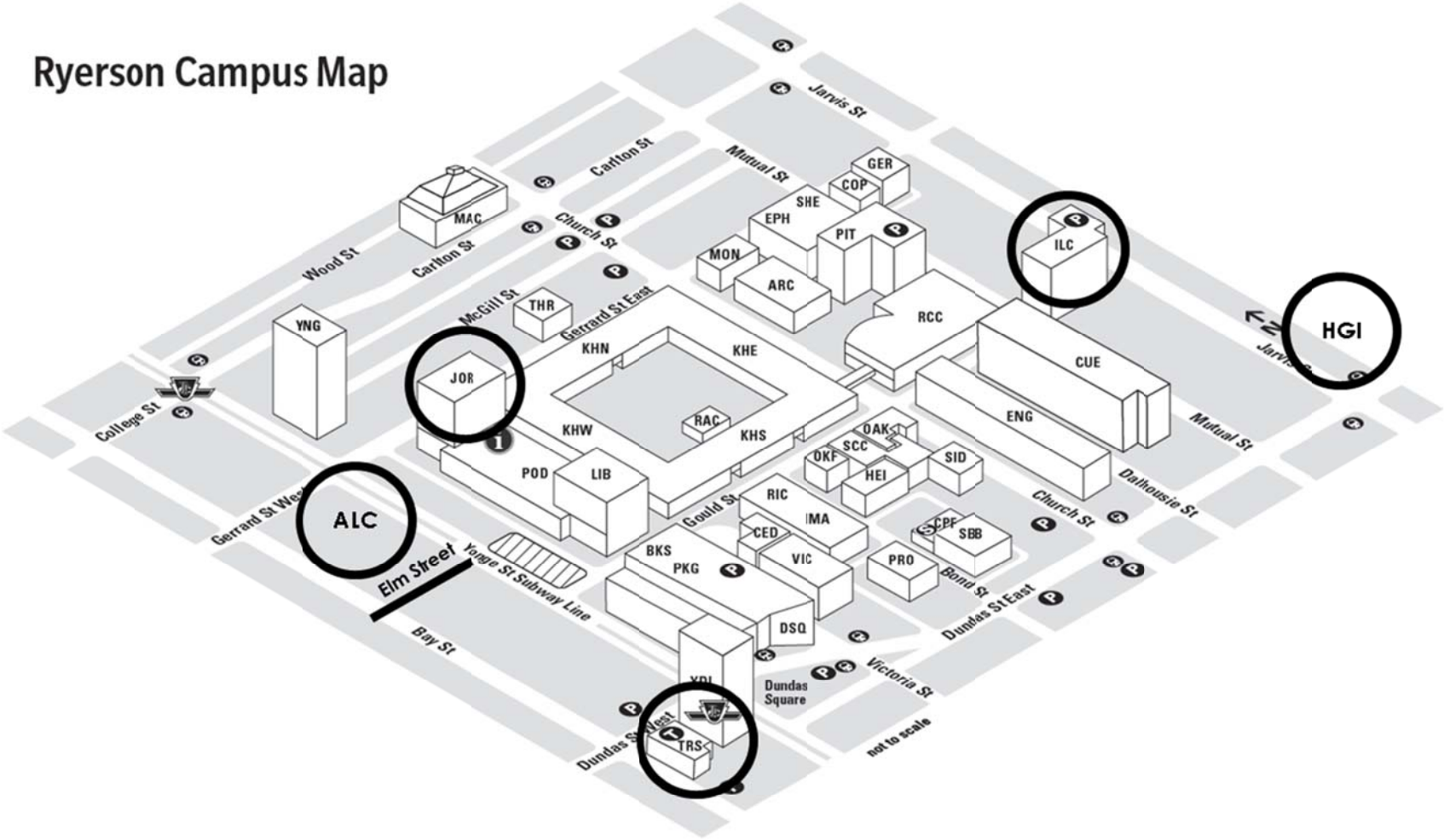
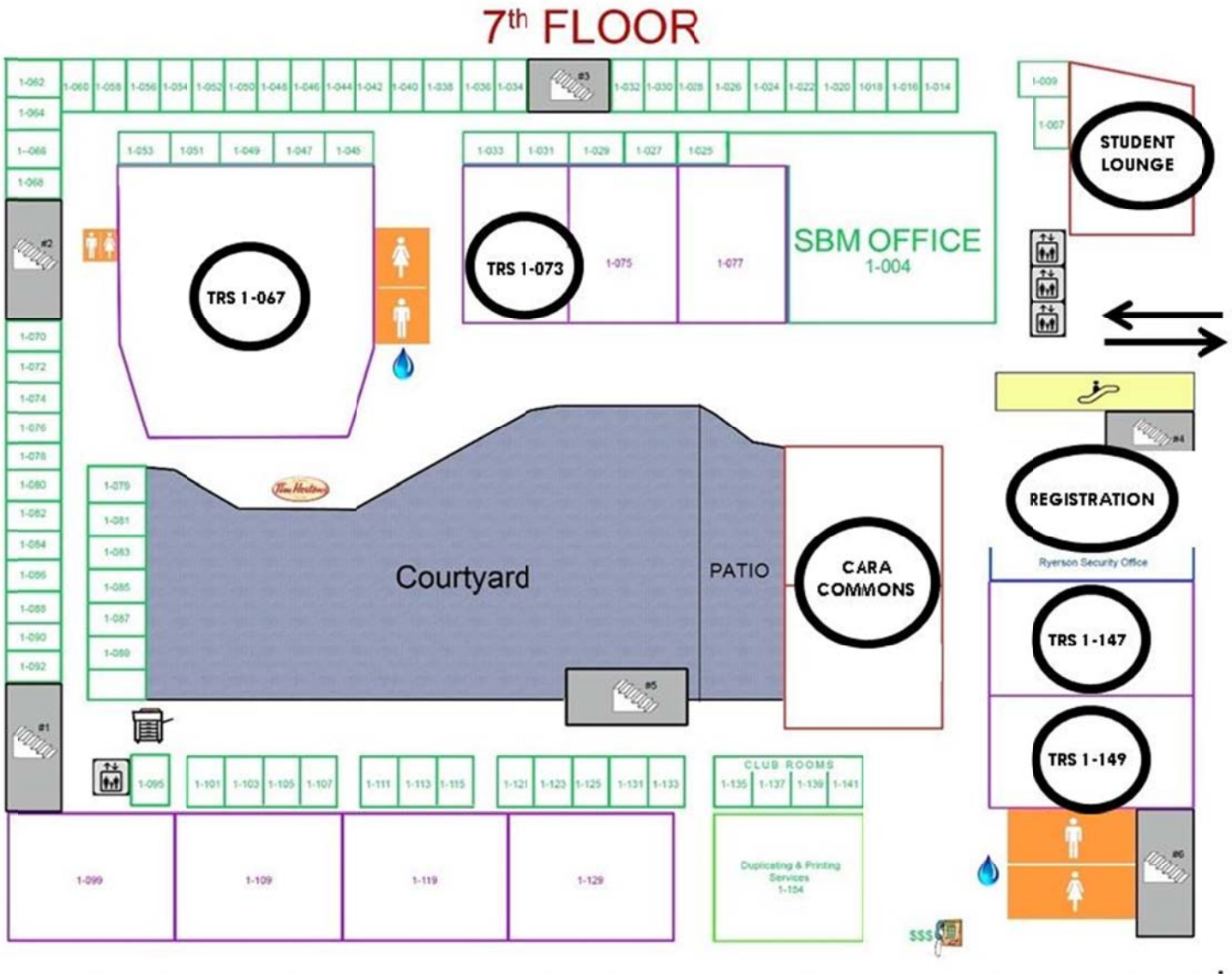
Susie Harrington, TRS Facilities and Special Events, Ryerson University
Agnes Leung, Conference Services, Ryerson University
Rita Lingner, TRS Facilities and Special Events, Ryerson University
Lloyd Smith, Cortech Solutions

Ryerson Campus Map

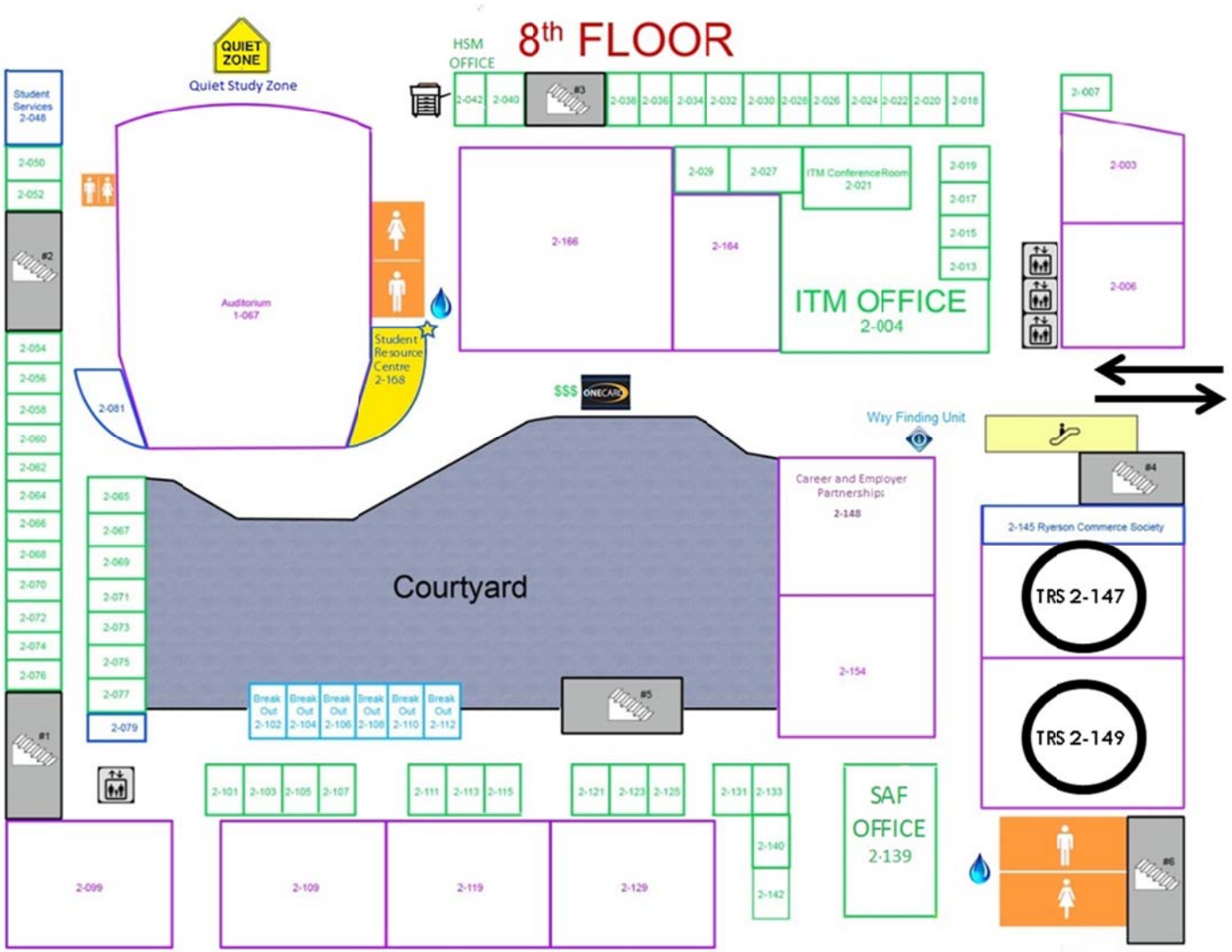


TRS	Ted Rogers School of Management	55 Dundas West	Main Conference Venue
ALC	Arts and Letters Club	14 Elm Street	Thursday Night Reception
ILC	International Living Learning Centre	240 Jarvis Street	Accommodation
HGI	Hilton Garden Inn	200 Dundas East	Accommodation
JOR	Jorgenson Hall	380 Victoria Street	CSBBCS Business Meeting

TRS 1 (7TH FLOOR) PLAN



TRS 2 (8TH FLOOR) PLAN



THURSDAY 3RD JULY

	TRS 1 Lobby	Student Lounge Cara Commons TRS1-073	TRS1-067	TRS1-147	TRS1-149	TRS2-147	TRS2-149
12.00 –	CSBBCS Registration						
2.30 – 4.00	CSBBCS Registration **Light Refreshments**	Poster Session A					
4.10. – 4.30	CSBBCS Registration		CSBBCS 2014 Welcome & Award Ceremony				
4.30 – 5.00	CSBBCS Registration		Early Career Award Talk				
5.00 – 6.00	CSBBCS Registration		Donald O. Hebb Award Talk				
6.30 –	Evening Reception at Arts and Letters Club (14 Elm Street) *TICKETED EVENT*						

FRIDAY 4TH JULY

	TRS 1 Lobby	Student Lounge Cara Commons TRS1-073	TRS1-067	TRS1-147	TRS1-149	TRS2-147	TRS2-149
8.30 – 10.00	CSBBCS Registration **Coffee / Pastries / Fruit**	Poster Session B					
10.00 – 12.00	CSBBCS Registration		Past President's Symposium				
12.00 – 1.00	LUNCH (not provided)						
1.00 – 2.00	CSBBCS Registration			*Symposium:* Conjoint Cognition	Perception I	Language & Reading I	Attention I
2.15 – 3.15	CSBBCS Registration			*Symposium:* Embodied Cognition	Perception II	Language & Reading II	Attention II
3.30 – 4.30	CSBBCS Registration			*Symposium:* Analytic Thinking	Development	Language & Reading III	Neuro-Psychology
4.30 – 6.00	CSBBCS Registration **Coffee Break**	Poster Session C					

SATURDAY 5TH JULY

	TRS 1 Lobby	Student Lounge Cara Commons TRS1-073	TRS1-067	TRS1-147	TRS1-149	TRS2-147	TRS2-149
8.30 – 9.30	CSBBCS Registration **Coffee / Pastries / Fruit**			*Symposium:* Mathematical Cognition	Reasoning	Memory I	Auditory Processes I
9.45 – 10.45	CSBBCS Registration			*Symposium:* How To Manipulate Attention	Aging	Memory II	Auditory Processes II
11.00 – 12.00	CSBBCS Registration			*Symposium:* Individual Differences & Performance	Cognitive Processes I	Memory III	Auditory Processes III
12.00 – 1.00	LUNCH (not provided)						
1.00 – 2.30		Poster Session D					
2.30 – 3.45				*Symposium:* Sharing Interpersonal Action	Cognitive Processes II	Memory IV	Animal Behaviour
3.30 – 4.30						NSERC Discovery Grant Meeting	
4.45 – 6.00	CSBBCS Business Meeting (14th floor boardroom, Jorgenson Hall; 380 Victoria Street)						

THURSDAY 3RD JULY 2.30 PM – 4.00 PM POSTER SESSION : COGNITIVE PROCESSES

STUDENT LOUNGE

A1	Leonard, Williams, Hann	Erroneous cognitions: key in the development of problem gambling?
A2	Dienes, Trick	Is search for Kanizsa illusory contour figures always inefficient?
A3	Reynolds, Heinze Kehoe, Bauer	The Spatial Resolution of Attention: What is the Contribution of Parafoveal Information During Visual Search?
A4	Reynolds, Ford	When is a "4" a "four": Evidence for task specific differences in script processing
A5	Fergusson, Graf	Timing Accuracy: The Effect of Feedback
A6	Harding, Tremblay, Chartier, Cousineau	What about non-standard architectures? An investigation on how an artificial neural network is detected by Systems Factorial Technology
A7	Newcombe, Duffels, Siakaluk, Pexman,	Effects of Emotional Experience and Valence in Lexical Decision
A8	Vokey, Allen	Repetition Blindness Isn't: Recall Following RSVP is Not Unbiased
A9	Banks, Vokey	Pitch Perception, Harmonic Range, and the Role of Musical Expertise
A10	Vo, Hiebert, Seergobin, Solcz, Partridge, MacDonald	Dopaminergic medication impairs learning but not decision making in Parkinson's disease
A11	Yang, Azevedo	Gender Differences and the Impact of Scaffolding on Learning with a Multi-Agent Intelligent System
A12	Patrick	Relaxation states change response strategy in the RAT creativity task
A13	Chen, Campbell	Generalization Effects in Canadian and Chinese Adults' Simple Addition
A14	Wright, Carriere, Cheyne, Smilek	Peak-end and recency effects in retrospective mind wandering judgments
A15	Matthews	Painters' Decline: Toward the Use of Art as a Screening Tool for Alzheimer's Disease
A16	Ferguson, Maloney, Fugelsang, Risko	Lost in space: Sense-of-direction and spatial anxiety in math anxious individuals

CARA COMMONS

A17	Lemire-Rodger, Spreng, Stevens, Turner	Dissociating the Neural Correlates of Executive Control
A18	Lorentz, Gould, Mickleborough, Ekstrand, Boyer, Cheesman, Borowsky	All in One Fell Stroop: Examining Consciousness Thresholds with a Multiple-Response-Paradigm
A19	Phillips, Varao Sousa, Olney, Kingstone, Risko	Everyday Attention: Digital Annotation's Influence on Lecture Performance
A20	Struk	A Self-Regulatory Approach to Understanding Boredom Proneness
A21	Doyle, Hourihan	Metacognitive Monitoring during Category Learning: How Success affects Future Behaviour

A22	Wong, Yang	Implicit Statistical Learning from Attended and Unattended Information: A Culturally Universal Phenomenon?
A23	Rabi, Minda	The Effects of Ego Depletion on Category Learning
A24	Millar, Pennycook, Fugelsang, Friedman	Cognitive Style Predicts Acceptance of Destructive Ownership Violations in Moral Dilemmas
A25	Aslam, Gozli, Pratt	Action-effect learning and flanker congruence
A26	Toxopeus, Trick	A look at driver and passenger gender effects in young drivers
A27	Siemens, Bolster	Mental rotation vs. Reorientation: Common or independent spatial processes?
A28	LaRosee, Cheema, Techentin	Gender Differences in Identifying Basic and Social Emotional Facial Expressions
A29	Chang, Zhao, Beesley, Gorzalka	Does analytic thinking suppress acceptance of rape myths?
A30	Ouslis, Pereira, Jeong, Spence	Attention and Visuospatial Working Memory in Mental Rotation
A31	MacKay	Digits vs. Words: Exploring Patterns of Eye Movements on Addition Problems Presented in Different Formats
A32	Kendall, Kingstone	The influence of social presence on looking behaviour to security videos
A33	Huebner, LeFevre	Use of Procedural Knowledge in Mental Subtraction: Evidence from Eye Movement Patterns
A34	Mettler, Marcil, Bao, Doobay, Bertone,	Gender-specific differences in autism spectrum cognitive profiles: Wechsler Intelligence Scales versus Raven's Progressive Matrices
A35	MacLellan, Dias, Shore, Milliken	I made you blink!
A36	Hozempa, Oriet	Do numerosity and perceptual averaging rely on a shared mechanism?
A37	Puckering, D'Souza, Wiseheart	Improving Task Switching Performance in Children through Music and Dance Training
A38	Dube, Al-Aidroos, Al-Aidroos	Monetary rewards speed conscious visual perception
A39	Ralph, Thomson, Eastwood, Smilek	Individual differences in media multitasking are associated with trait-level boredom
A40	Nielsen, Minda	The Coffee Shop Effect: Investigating the Relationship Between Ambient Noise and Cognitive Functioning
A41	Aelick, Bridekirk, Chamberland, Dickinson	The Impact of Eating Patterns and Attitudes on Cortical Responses to Facial Expressions
A42	Waclawik, Leow, Grahn	Music-Induced Mood Improves Retention in Sensorimotor Adaptation
A43	Langerak, Brown, Herdman	The Separability of Storage and Processing in Visuospatial Working Memory: Evidence from a Dual-Task Paradigm
A44	Morayko, Vokey	On Telling More Than We Can Know: Expanding on Nisbett & Wilson (1977)

TRS1-073

A45	Krishnamoorthy, Grundy, Shedden	Cognitive control as a function of trait mindfulness: An event-related potential study
A46	LeFevre	Processing of number sequences by adults: Serial search plus obligatory activation of familiar patterns
A47	McAuley, Moore, Ashcraft	It's All About the Timing: Investigating the Self-Report of Math Anxiety
A48	Pearson	What Older Adults' Perception of Emotional Faces During Binocular Suppression Reveals About Theories of Aging
A49	Murphy	Younger and Older Adults Demonstrate Similar Attention and Inhibition During Binocular Suppression
A50	Uttl, White, Hodgson, Stevens	GRE Verbal Reasoning Prep Books are not created equal
A51	Crease, Graf, Jamieson	A bird in the hand: Prospective memory cues disrupt encoding of surrounding stimuli
A52	Brochu, Schubert, Chamberland, Ferguson, Dickison	Does culture reduce the impact on cognition during schema violation?
A53	Kusec, Koerner	Cognitive Flexibility in Generalized Anxiety Disorder and its Impact on Interpretation Biases
A54	Walsh	The Effects of Feature Similarity on Same-Different Categorization of Letter-Based Stimuli
A55	Healy	The Effect of Music and Distraction on Spatial Ability
A56	BLANK	
A57	Rozario, Barr, Maloney, Risko, Fugelsang	The Numerical Distance Effect and Math Achievement: Assessing the validity of magnitude comparison paradigms
A58	Wong, Irvine, Tankel, Warren, Cadieux, Shore	Hear this, see that? Effects of audiovisual congruency on recognition memory
A59	Murray, Morgenstern	Human vision is attuned to the diffuseness of natural light
A60	BLANK	

THURSDAY 3RD JULY 4.10 PM – 6.00 PM CSBBCS 2014 WELCOME

TRS1-067 ***CSBBCS 2014 WELCOME***

4.10 – 4.30			CSBBCS 2014 Welcome and Awards
4.30 – 5.00	***1***	Rosenbaum	Understanding episodic amnesia: lessons from patient and neuroimaging studies
5.00 – 6.00	***2***	Whishaw	How touch becomes vision to control the hand

FRIDAY 4TH JULY 8.30 AM – 10.00 AM POSTER SESSION : ANIMAL / DEVELOPMENT / NEURO

STUDENT LOUNGE

B61	Lauby	The Effect of Sucrose Concentration in Feeding Behaviours of the Rat: An Omission Contingency Experiment
B62	Baetz-Dougan, Troje	How does variable response effort influence risk-sensitive decision making in pigeons?
B63	BLANK	
B64	Germé, Gossip, Mormina, Nease, Spevak, D'Cunha, Pfaus	Nucleus accumbens dopamine and the disinhibitory effect of alcohol on conditioned sexual inhibition in male rats: A microdialysis study
B65	Taylor, Simons, Lehmann	Overtraining in the Shock-Probe Conditioning Task Recruits More than the Hippocampus
B66	Athanassiou, Madularu, Catania, Gallant, Welch, Brake, Mumby	Behavioural consequences of prenatal exposure to dizocilpine in the adult rat
B67	Lee, Ho, Kotsopoulos,	The use of mathematical learning strategies by parents during play
B68	Fitzpatrick, Pelley, Hallett	Methods of division: What works best for fourth grade students?
B69	Morrissey, Bakhtiar, Hallett, Lenahan	A differential contribution of Math and Language-gender stereotype to adolescent's academic attitudes.
B70	Bogutska	Preschooler's Psychophysiological Status and Their Learning Performance
B71	BLANK	
B72	Wong Kee You, Adler	Differential Attentional Performance in Caesarean Delivered versus Vaginally Delivered Infants
B73	Thorpe, Hallett, Brown, Skinner, Quinlan,	Developmental Changes in Interval Time-Place Learning
B74	Chung-Fat-Yim, Friesen, Timmer, Bialystok	Electrophysiological Differences between Monolinguals and Bilinguals on the Flanker Task
B75	White, Berg, Itti, Munoz	Saliency coding in the superior colliculus during free-viewing of natural dynamic scenes
B76	Hatin, Sykes Tottenham	Painting a Picture of How Hemispheric Asymmetries are Related to Artwork

CARA COMMONS

B77	Fageera, Fortier, Grizenko, Choudhry, Sengupta, Joober	Response to placebo in children with ADHD: Multidimensional evaluation and exploration of its determinants
B78	Fageera, Choudhry, Sengupta, Grizenko, Joober	Association of catechol-O-methyltransferase (COMT) gene with the reverse placebo effect in children with ADHD
B79	Gould, Mickleborough, Anton, Ekstrand, Lorentz, Borowsky	Functional Neuroimaging of Word and Picture Identification: Modularity of Mind Revisited
B80	Le, Niemeier	Bimanual grasping without a corpus callosum
B81	Corriveau, Fortier-Gauthier, Jolicoeur,	Processing speed and the implication of visual short-term memory: Evidence from the sustained posterior contralateral negativity

B82	Stoettinger, Filipowicz, Valadao, Anderson, Danckert	Neural correlates of updating mental models in a picture morphing task
B83	Blackler, Beatty, Jobidon, Muller-Gass, Vartanian	The Effects of Memorization Technique, Fluid Intelligence, and Cognitive Load on Route Recognition: Behavioural and fMRI Evidence
B84	Mathias, Palmer, Tillmann	Auditory-motor learning modulates memory-based expectations during auditory perception
B85	Doidge, Wilkins, Milligan, Badali, Schmidt, Segalowitz	Mindfulness Treatment Decreases ERP Indices of Affect Intensity Following Negative Feedback in Adolescents with ADHD
B86	Smith, Cercignani, Duka	Altered white matter integrity in whole brain and segments of corpus callosum, in young social drinkers with binge drinking pattern
B87	BLANK	
B88	Paas, Halpern, Macdonald	Imagining and Perceiving Timbre: An EEG Study
B89	Carlin, Brown	Repetitive TMS to the premotor cortex and near-hand effects
B90	Keshavarz, Berti	Sensory integration precedes the perception of vection as mirrored by the N2 component of the human event-related brain potential
B91	Nespoli, Russo	Musicianship and Neural Synchronization at Multiple Timescales
B92	Losier, Lefebvre, Doro, Dell'Acqua, Jolicoeur	Working memory encoding in the attentional blink and its role in early attentional processing: Evidence from human electrophysiology
B93	Delleman, Fernandes	Individual differences in anxiety influence verbal long-term memory accuracy and confidence
B94	Meade, Fernandes	Interfering with episodic memory: Do semantically related words help or hinder?
B95	Isabella, Cheyne	Cortical oscillations in inhibitory control: evidence for a differential role of gamma and theta band activity in performance monitoring
B96	Frost, Niemeier	Mapping the Saccadic Suppression of Motion Perception
B97	Guo, Le, Wall, Niemeier	Prism Adaptation and Bimanual Grasping: Probing the Cross-talk between Sensorimotor Systems
B98	Dyson, Wilbiks	The capacity of audio-visual integration need not be limited to one item
B99	Jones, Rafiq	The feedback-related Negativity (FRN) and P300 as indices of violation of expectancy
B100	Elshiekh, Dyson, Moulson, Kusec, Koerner	Brain responses to semantic ambiguity in worry: An event-related potential (ERP) investigation
B101	O'Bertos, Sykes Tottenham, Thompson, Hatin	Emotion from a Different Angle: Facial Threat Signals Affect Female Spatial Processing
B102	Thompson, Sykes Tottenham, O'Bertos, Hatin	Sex Differences in Spatial Performance? Roles of Task Type, Stimulus Type, and Testosterone
B103	Adnan, Turner, Chen, Novakovic-Agopian, D'Esposito	Neural network modulation in older adults after executive control training
B104	Atluri, Wright-Beatty, Sculthorpe-Petley, Kissmann, Craig, Araujo, Keillor	In-flight Investigation of Stress and Workload with Subjective and Objective Metrics

TRS1-073

B105	Beben, Brown	Enhanced Visual Processing When Targets Presented Near the Hands
B106	Peck, Livingstone, Russo	The Effects of Facial Attractiveness on Spontaneous Facial Mimicry
B107	Leow, Grahn	Altering beat-based timing using transcranial direct current stimulation
B108	Boucher, Itier	Modulation of Facial Expression Perception in Body Context
B109	Stewart, Hoddinott	Social Anxiety Influences Performance Monitoring: An Electrophysiological Investigation
B110	BLANK	
B111	Wilkins, McCormick, Girard, McAndrews	Differential effects of semantic relatedness and repetition on hippocampal activation
B112	Mallya, Sutherland, Pongracic, Mainland, Ornstein	The manifestation of anxiety disorders after traumatic brain injury: A review
B113	Harms, Poon, Smith, Elias	Take Your Seats: Leftward Asymmetry in Classroom Seating Choice
B114	Mainland, Lawson, Ornstein	Impact of Psychological Comorbidity on Neurocognitive Functioning Following Traumatic Brain Injury
B115	Sagar, Mainland, Lawson, Ornstein	The Influence of Affective State and Time Since Injury on Test Effort in Patients with Mild Traumatic Brain Injury
B116	Deotto, Fuentes, Desrocher, Westmacott, deVeber	Working memory and arithmetic ability in pediatric arterial ischemic stroke
B117	Plumtree, Giroux, Techentin	Laterality of Basic and Social Emotions
B118	Bodnar, Amodio, Girard	Are neuropsychological tests sensitive to body position?
B119	Boshra, Satel, Sculthorpe-Petley, D'Arcy, Trappenberg	Single subject statistical analysis of ERP data for applications in brain injury
B120	BLANK	

FRIDAY 4TH JULY 10.00 AM – 12.00 PM PAST PRESIDENT'S SYMPOSIUM

TRS1-067 **PAST PRESIDENT'S SYMPOSIUM**
10.00 – 12.00 ***Chaired by Stephen Lupker*** ***Grounding Conceptual Knowledge: Embodiment and its Alternatives***

3	Masson	Toward a deeper understanding of embodiment
4	Glenberg	Few believe the world is flat
5	Mahon	What is embodied about cognition?

FRIDAY 4TH JULY 1.00 PM – 2.00 PM PAPER SESSIONS

TRS1-147		**SYMPOSIUM: CONJJOINT COGNITION**	
1.00 – 1.15	***6***	Palmer, Spidle, Koopmans, Schubert	Playing well together: Individual and joint timekeeping abilities underlie musical coordination
1.15 – 1.30	***7***	Kingstone	People, pinholes, and glassholes: The influence of real and implied social presence on human behaviour
1.30 – 1.45	***8***	Titone, Pivneva	Bilinguals speaking conjointly: How L2 experience and executive control modulate the temporal dynamics of conversational fluency and interactive alignment
1.45 – 2.00	***9***	Russo	Coordination of expressive movements with music: Underlying mechanisms and novel treatments for emotion processing disorders
TRS1-149		**PERCEPTION I**	
1.00 – 1.15	***10***	Courchene, Bub, Masson	Time Course of Evoked Action Representations
1.15 – 1.30	***11***	Kumar, Masson, Bub	Form follows Function: The Time Course of Hand Action Representations Evoked by Handled Objects
1.30 – 1.45	***12***	Ammirante, Russo	Modality effects in sensorimotor synchronization between individuals
1.45 – 2.00	***13***	Solman, Kingstone	Space and action
TRS2-147		**LANGUAGE AND READING I**	
1.00 – 1.15	***14***	Riven, de Almeida, Segalowitz	First and second language speakers use distinct processing strategies when (mis)interpreting implausible passive sentences
1.15 – 1.30	***15***	Pivneva, Free, Titone	Asymmetrical Switch Costs During Bilingual Production Relate to Asymmetrical Switch Costs in Domain-General Executive Control: Evidence from Eye Movements
1.30 – 1.45	***16***	Joanne Lee, Lina Fonnegra	Re-examining the early noun advantage in language acquisition: A bilingual approach
1.45 – 2.00	***17***	Blair Armstrong, Clara Martin, Manuel Carreiras, Ram Frost	Grapheme-phoneme mappings are not necessarily symmetrical: A cross-linguistic comparison
TRS2-149		**ATTENTION I**	
1.00 – 1.15	***18***	Ivanoff, Webb, Nemeth, Carroll	On the Mental Chronometry of Stimulus-Response Conflict: Response Time Distribution versus Speed-Accuracy Tradeoff Analyses of Simon and Stroop Effects
1.15 – 1.30	***19***	Rajsic, Pratt	Confirmation Bias in Visual Search
1.30 – 1.45	***20***	Lagroix, Spalek, Di Lollo	The efficiency of "pop-out" search is impaired during the attentional blink
1.45 – 2.00	***21***	Dixon	What happens when subjects are not ready for a task switch

FRIDAY 4TH JULY 2.15 PM – 3.15 PM PAPER SESSIONS

TRS1-147 **SYMPOSIUM: EMBODIED COGNITION**

2.15 – 2.30	***22***	Pexman, Sidhu	Beyond The Bouba/Kiki Effect: The Bob/Kirk Effect
2.30 – 2.45	***23***	Masson, Bub	Examining the Interface Between Hand Actions and Object Identification
2.45 – 3.00	***24***	Kingstone, Chisolm, Upmanu, Risko	Visible embodiment of remote actions
3.00 – 3.15	***25***	Risko, Dunn	Cognitive Offloading: The Importance of How We Think about Thinking with Our Body

TRS1-149 **PERCEPTION II**

2.15 – 2.30	***26***	Bauer	Better when loaded, on average
2.30 – 2.45	***27***	Patten, Lagroix, Spalek	The role of sudden onsets and offsets in escaping temporal-integration masking
2.45 – 3.00	***28***	Laurence, Zhou, Mondloch	They all look different to me: Examining factors that affect the ability to perceive identity in ambient images.
3.00 – 3.15	***29***	Kurowski	The neuro-integrative account of consciousness

TRS2-147 **LANGUAGE AND READING II**

2.15 – 2.30	***30***	Jouravlev, Lupker	Two syllables or one: An investigation of the syllabic length effect
2.30 – 2.45	***31***	Mohaghegh, Chambers	Compensation for Assimilation Is Affected by Phonological Context and Priming: Evidence from Two Eyetracking Experiments
2.45 – 3.00	***32***	Amd	Relative shifts in Frontal Alpha Asymmetry and the Transformation of Evaluative Functions
3.00 – 3.15	***33***	O'Malley, Brambati, Jolicoeur	The role of central attention in semantic processing across the lifespan

TRS2-149 **ATTENTION II**

2.15 – 2.30	***34***	Lin, MacLeod	Costs as well as benefits in colour-word contingency learning
2.30 – 2.45	***35***	Hayward, Ristic	Dissociating attentional effects of gaze and arrow cues using the cuing task
2.45 – 3.00	***36***	Giammarco, Paoletti, Guild, Al-Aidroos	Contingent attentional capture by stimuli that match long-term memory representations
3.00 – 3.15	***37***	Taylor, Chan, Bennett, Pratt	Attentional Cartography: Mapping the distribution of facilitation and inhibition across time, space, and objects

FRIDAY 4TH JULY 3.30 PM – 4.30 PM PAPER SESSIONS

TRS1-147		**SYMPOSIUM: ANALYTIC THINKING**	
3.30 – 3.45	***38***	Toplak, West, Stanovich	Assessing Rational Thinking Using an Expansion of the Cognitive Reflection Test
3.45 – 4.00	***39***	Pennycook, Fugelsang, Koehler	What makes us think? Conflict detection and cognitive decoupling as sources of analytic engagement
4.00 – 4.15	***40***	Markovits, Thompson, Brisson	Metacognition and Abstract Reasoning
4.15 – 4.30	***41***	Thompson, Gibb, Newman	Thinking fast and slow: Analytic beliefs and intuitive logic?
TRS1-149		**DEVELOPMENT**	
3.30 – 3.45	***42***	Maloney, Gunderson, Ramirez, Levine, Beilock	Parents' and Teachers' Math Anxiety Impacts Children's Math Achievement
3.45 – 4.00	***43***	Khalidi	Critical Questions about the Critical Period
4.00 – 4.15	***44***	Short, Mondloch	A Developmental Examination of Perceptual Tuning for Young versus Older Adult Faces
4.15 – 4.30	***45***	Karl, Whishaw	Haptic grasping configurations in early infancy reveal different developmental profiles for visual guidance of the Reach vs. the Grasp
TRS2-147		**LANGUAGE AND READING III**	
3.30 – 3.45	***46***	Medimorec, Schaffer, Pavlik Jr., Olney, Graesser, Risko	The Language of Lectures: Offsetting Challenging Words
3.45 – 4.00	***47***	Roncero, de Almeida	Alike or Different: Comparing the online processing of metaphors and similes
4.00 – 4.15	***48***	Redford, Chambers	The good, the bad, and the ugly: Incremental processing of evaluative adjectives
4.15 – 4.30	***49***	Besner, White, Coltheart	What the Neighbours Say about the Bayesian Reader
TRS2-149		**NEUROPSYCHOLOGY**	
3.30 – 3.45	***50***	Ramdeen, Heckemann, Hammers, Klein-Koerkamp, Moreaud, Keignart et al	Amygdalar Atrophy as a Predictor of Cognitive Decline in Mild Cognitive Impairment
3.45 – 4.00	***51***	Vezer, Livingstone, McGarry, Russo	Deficits in spontaneous facial mimicry in patients with Parkinson's disease
4.00 – 4.15	***52***	Mendizabal	Benign Epilepsy with CentroTemporal Spikes (BECTS) : still considered as a benign neurologic condition?
4.15 – 4.30	***53***	Pinnock, Heinrichs, Ammari, Hartman	Smoking status, cognition and neurobiology in schizophrenia

FRIDAY 4TH JULY 4.30 PM – 6.00 PM POSTER SESSION : ATTENTION / MEMORY

STUDENT LOUNGE

C121	Trick, Reed Jones	Item-individuation as measured by quantification and tracking performance in the blind field of an individual with cortical blindness
C122	Bharwani, Vinski, Watter, Andrews	It's All About Me: Stressor---Task Relatedness Influences Task Utility & Performance In Depression
C123	Maheux	Electrophysiological indexes pf spatial relation evaluation in visual working memory
C124	Dukewich, Klein	Inhibition of Return: A phenonmenon in search of a definition and a theoretical framework
C125	Laidlaw, Shin, Kingstone	Eye remember you! The importance of eye contact in recognizing faces
C126	Varao Sousa, Kingstone	A look back at the wandering mind during reading
C127	Liu, Rajsic, Pratt	Overt Retrospective Cues Elicit Location Specific Enhancement of Visual Working Memory
C128	White, Stolz, Besner	Where Have You Been, What Did You See, and How Did You Get Here: Effects of Prior Trial History in the Context of Spatial Cuing
C129	Farisello, Bauer, Johnson, Pfaus	Visibility of Sexual Features Influences Eye Movements in Women, but not in Men
C130	Rigby, Stoesz, Jakobson	Attention to Faces in Scenes in Adults with Autism Spectrum Disorders and Typical Adults
C131	Alcock, LaRosee, Berntson, Techentin,	Do the Eyes Follow the Ears? Eye Movements and Laterality Effects in a Focused Attention Dichotic Task
C132	Leclerc	The Sexual Image Stroop Task: Predicting Sexual Interest Based on the Pattern of Delays in the Processing of Sexual Content
C133	Thomson, Besner, Smilek	The Beneficial Effects of Perceptual Variability on Sustained Attention
C134	Sibalis	Mindfulness-Based Martial Arts Treatment Enhances Attention Orienting in Adolescents with ADHD
C135	Pereira, Liu, Castelhano	Inhibition of attention to irrelevant areas of a scene during visual search
C136	Lam, Taylor, Chasteen, Pratt	Self-Esteem as an Embodied Metaphor to Cue Attention

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C137	Seusan, Hayward, Ristic	Eye tricked you: The effects of a distractor face on visual search
C138	Nazar, Grundy, O'Malley, v. Mohrenschildt, Shedden	Does training with self-motion improve target tracking performance in a three-dimensional environment?
C139	Perry, Rahim, Ramchandani, Tahiri, Fallah	Feature Integration in the Dorsal Visual Pathway
C140	Harrison, Rajsic, Wilson	Object-substitution masking reveals the graded nature of conscious perception
C141	Wammes, Boucher, Smilek	Mind Wandering During Lectures: An Ecologically Valid Exploration

C142	Fehr	Attention Modulates Colour Perception across the Visual Field in Natural Scenes
C143	Forrin, Millar, Klinger, Seli, Smilek	Mind wandering and reading: Does difficulty matter?
C144	Chen, Wall, Niemeier	Electrophysiological Correlates of Distractor Removal and Pseudoneglect
C145	Ralph, Thomson, Besner, Smilek	Mind wandering and the attentional blink
C146	Brand, Bodur, Grohmann, Johnson	Perceptual averaging of three-dimensional shapes
C147	LaPointe, Gough, Shore	Detecting change in 3D: Assessing depth as a cue in visual attention
C148	Ritz	Attention enhances phase-locking in the frequency-following response
C149	Emrich, Schutten	Limitations on the Effectiveness of Bottom-Up and Top-Down Attention During Visual Working Memory Encoding
C150	Fernandes, Weston, Wiseheart	Contextual Variation is Not Always Detrimental to the Spacing Effect
C151	Quinlan, Neath, Surprenant	Error gradients in the Brown-Peterson Paradigm
C152	Haskell, Anderson	Re-examining the sequential-simultaneous paradigm: orientation judgements and iconic memory
C153	Lagacé, Guérard	Evidence for the role of motor affordances in object memory
C154	Rosner, Milliken	Context reinstatement and the desirable difficulty effect
C155	Rosner, López-Benítez, Milliken	Repetition can be costly: The non-intuitive effect of repeating items on remembering
C156	Maslany, Graf	The Bland and the Beautiful: The Effects of Emotion and Motivational Intensity on Memory
C157	Voronchikhina, Gorfine, Lukasik, Taler	Shared Feature Identification and Recognition in Mild Cognitive Impairment
C158	Pestonji	A Way with Words: Fluency of Processing in a Lexical Decision-Making Task
C159	Rowe, Guérard	Perceptual distinctiveness in object memory
C160	Belchev, Bodner	Effects of initial testing and previewing on recognition
C161	Li, Yang	The Own-Race Bias in Context Memory of Faces: A Cross-Culture Comparison
C162	Nicholson, Brown, Wade, Herdman	The Impact of Motion on Memory for Object Location and Form
C163	Cann, Perrault, Pratt	The Influence of Backward Associative Strength and Gist in the DRM Paradigm when Creating Stories at Recall
C164	Curtis, Jamieson	A Single-System Account of Intact Identification Priming in Memory Dysfunction

C165	Tanguay, Renoult, Beaudry, Tavakoli, Campbell, Davidson	Are personal semantics distinct from episodic and semantic memory? An electro-physiological study of memory for repeated events and autobiographical facts
C166	Shi, Wang, Li, Zhang, Tung, Wong, Bai, Sun	Viewpoint independence in implicit spatial learning: Evidence from contextual cueing paradigm
C167	Bellana, Liu, Anderson, Moscovitch, Grady	Left to recollect? Laterality effects in whole-brain functional connectivity of the angular gyrus during rest and recall.
C168	Churchill, Hourihan	Intentional Forgetting of Factual Information: A Comparison of Reliable and Unreliable Sources
C169	Ensor, Bancroft, Whaley, Hockley	Item-Based Directed Forgetting for Sound Effects and Spoken Words
C170	Wammes, Fernandes	The Residual Protective Effects of Enactment
C171	MacDonald, Cote	Impact of directed forgetting instructions on memory reconsolidation during sleep
C172	Taylor, Enns	The pen is mightier than the pixel: Note-taking technology and context in memory
C173	Fitzgerald, Oriet, Price	Lineup composition and lineup presentation influence eyewitness misidentifications
C174	Fitzgerald, Valentine	Effects of target distinctiveness and test format on face recognition
C175	Uttl, White, Morin	Students don't like numbers: Sex and discipline effects
C176	Uttl, White, Mathison, Grant, Vandergaag, Wilson	Prospective Memory, Big Five, and Symptoms of Psychopathology
C177	Byun, Lanthier, Zhu, Jarick, Kingstone	Stare to Remember: Prolonged mutual gaze, verbal memory, and gender
C178	Liu, Moscovitch	Prior knowledge enhances both familiarity and recollection type of associative memory
C179	Wang, Li, Wong, Bai, Sun	Relocated targets in repeated contexts could be learned again in contextual cueing paradigm
C180	Li, Wang, Wong, Bai, Sun	Intrinsic Reference Direction can facilitate Implicit Spatial Learning: Evidence from Contextual Cueing Paradigm

SATURDAY 5TH JULY 8.30AM – 9.30AM PAPER SESSIONS

TRS1-147 **SYMPOSIUM: MATHEMATICAL COGNITION**

8.30 – 8.45	***54***	Campbell, Dufour	Retrieval-Induced Forgetting of Arithmetic Facts and Identity Rule
8.45 – 9.00	***55***	Sowinski	The relations between quantitative skills and adults' mental arithmetic skill
9.00 – 9.15	***56***	Penner-Wilger, Anderson	Functional Diversity of the Intraparietal Sulcus: Evidence Against a Domain-Specific Number Module
9.15 – 9.30	***57***	Moore, McAuley, Ashcraft	Investigating the factors of math anxiety: Timing of self-report matters

TRS1-149 **REASONING**

8.30 – 8.45	***58***	BLANK	
8.45 – 9.00	***59***	Mehta, Thomasdóttir	Roles of Numeracy, Cognitive Reflection, and Information Processing Styles in Heuristics and Biases
9.00 – 9.15	***60***	Wegier, Spaniol	To switch or not to switch: Age differences in information search and decision quality in experience-based judgments
9.15 – 9.30	***61***	BLANK	

TRS2-147 **MEMORY I**

8.30 – 8.45	***62***	Rosner, Davies, Lai, Milliken	Encoding difficulty and recognition: A context effect
8.45 – 9.00	***63***	De Vito, Ferrey, Fenske	The Affective Devaluation of Inhibited Stimuli within Memory
9.00 – 9.15	***64***	Bodner, Taikh, Lambert	What produces the production effect? Tests of a distinctiveness-based strategy
9.15 – 9.30	***65***	Jamieson	Implicit learning is path dependent

TRS2-149 **AUDITORY PROCESSES I**

8.30 – 8.45	***66***	Scheerer, Jones	An Examination of Motor and Perceptual Thresholds using Vocal, Behavioural, and Event-Related Responses to Frequency-Altered Feedback
8.45 – 9.00	***67***	Tumber, Scheerer, Jones	Compensations to Pitch-Shifted Auditory Feedback during Visual Attentional Load
9.00 – 9.15	***68***	Scheerer, Jones	The Predictability of the Magnitude of Auditory Feedback Perturbations influences Vocal and Event-Related Responses
9.15 – 9.30	***69***	DeMarco, Scheerer, Jones	Investigating the role of repeated exposure to alterations of vocal auditory feedback

SATURDAY 5TH JULY 9.45AM – 10.45AM PAPER SESSIONS

TRS1-147 **SYMPOSIUM: HOW TO MANIPULATE ATTENTION**

9.45 – 10.00	***70***	Lefebvre, Losier, Audevar, Jolicoeur	Attention might move rather than spread on a curve
10.00 – 10.15	***71***	Fortier-Gauthier	Relative spatial location of distractors modulate attentional deployment delay
10.15 – 10.30	***72***	Drisdelle, Jolicoeur	The effect of spatial distance and physical similarity between a target and a salient distractor on attentional selection: Evidence from the N2pc component
10.30 – 10.45	***73***	Jolicoeur	Components in the machine: Dynamics of attention and sensory memory revealed by electroencephalography

TRS1-149 **AGING**

9.45 – 10.00	***74***	Truong, Yang	How Does Mood Affect Cognitive Control in Younger and Older Adults?
10.00 – 10.15	***75***	Rondina II, Olsen, Riggs, Meltzer, Ryan	Age-related differences in neural oscillations during a visuospatial working memory task
10.15 – 10.30	***76***	Ahmad, Fernandes, Hockley	Improving Associative Memory in Older Adults with Unitization
10.30 – 10.45	***77***	D'Angelo, Smith, Zhang, Kacollja, Barense, Ryan	Aging and Unitization: Unitization Supports Relational Learning in Healthy Older Adults but not those At-Risk for MCI

TRS2-147 **MEMORY II**

9.45 – 10.00	***78***	Service, Chapman, Deschamps	Working memory load varies during sentence processing
10.00 – 10.15	***79***	Hannah	Word frequency sequency effects support criterion-calibration rule
10.15 – 10.30	***80***	Schoenherr, Thomson, Lacroix	Categorical and Sub-categorical Properties in Immediate Recall for Mixed-Lists
10.30 – 10.45	***81***	Stevanovski, Doyle	Central Attentional Resource Requirements for Encoding Sequential Versus Simultaneous Displays in Visual Short-Term Memory

TRS2-149 **AUDITORY PROCESSES II**

9.45 – 10.00	***82***	Slavin-Stewart	The Physiological Underpinnings of Why We Love to Groove
10.00 – 10.15	***83***	Feinberg	A unified approach to studying vocal attractiveness
10.15 – 10.30	***84***	Vempala, Russo	Computationally Modeling Musical Emotion Appraisals Using Audio and Physiological Features
10.30 – 10.45	***85***	Russo	Coordination of expressive movements with music: Underlying mechanisms and novel treatments for emotion processing disorders

SATURDAY 5TH JULY 11.00AM – 12.00PM PAPER SESSIONS

TRS1-147 **SYMPOSIUM: INDIVIDUAL DIFFERENCES AND PERFORMANCE IN COGNITIVE TASKS**

11.00 – 11.15	***86***	Schoenherr, Lacroix	Overconfidence in Nonlinearly Separable Category Structures as Evidence for Dissociable Category Learning Systems
11.15 – 11.30	***87***	Mackenzie, Logan	Psychopathic Characteristics and Facial Expression Recognition in a Face-word Stroop Task
11.30 – 11.45	***88***	Faddoul	Language Laterality as a Predictor for Autistic-Like Traits
11.45 – 12.00	***89***	Boucher, Lacroix	Individual Differences Influence the Degree of Source Expertise Bias in Syllogistic Reasoning

TRS1-149 **COGNITIVE PROCESSES I**

11.00 – 11.15	***90***	Dubé, McEwen	Do gestures matter? The implications of learning mathematics on a tablet computer
11.15 – 11.30	***91***	Bedore, Lehmann, Brown	Beyond the Lab: Visuomotor Tasks on a Portable Tablet
11.30 – 11.45	***92***	Jarick, Jensen, Simpson, Dixon, Harrigan	Negative Slot Machine Sounds Make Losses More Memorable
11.45 – 12.00	***93***	Cheng, Scheerer, Jones	Event-related responses to feedback regarding decisions made using relevant and irrelevant information

TRS2-147 **MEMORY III**

11.00 – 11.15	***94***	Girard, Amodio, Peers, Bodnar	Body position induces an "incongruency effect" on memory (you might want to read this lying down)
11.15 – 11.30	***95***	Hourihan, Smith	I just met you, and memory's hazy: Producing your name will help recall, maybe?
11.30 – 11.45	***96***	O'Connor	Facial characteristics influence recall accuracy for romantic reputations
11.45 – 12.00	***97***	Scoboria	Truth and Accuracy Appraisals in Autobiographical Remembering

TRS2-149 **AUDITORY PROCESSES III**

11.00 – 11.15	***98***	Pan, Cohen	Music training enhances implicit imitation of timing in both music and language domains
11.15 – 11.30	***99***	Thompson, Cohen	Effects of complexity and music training in a rhythm discrimination task in younger and older adults
11.30 – 11.45	***100***	Zamm, Wellman, Palmer	Role of endogenous rhythms and motor familiarity in timing of duet music performance
11.45 – 12.00	***101***	Demos, Palmer, Wanderley, Dixon	Auditory Feedback Perturbations Affect Duet Music Performance

SATURDAY 5TH JULY 1.00 PM – 2.30 PM POSTER SESSION : LANGUAGE / PERCEPTION

STUDENT LOUNGE

D181	Nisbet, Gagne, Spalding	Processing of (pseudo)constituents in English opaque and pseudo-compounds: Effects of morphemic structure
D182	Webb, Conrad	Semantic representations of words in memory affect reading and spelling in children
D183	Ekstrand, Gould, Mickleborough, Lorentz, Borowsky	Spatial-attentional and orthographic-lexical interactivity during reading processes
D184	Noonan, Archibald	Verbal Implicit Statistical Learning: Evidence for Dual-Task Interference
D185	Bridekirk, Chamberland, Whissell, Dickinson	The Assignment of Smooth and Jagged Words: An ERP Investigation of Sound-Symbolism
D186	Choi, Fitneva	Effects of varying initial accuracy of word-referent associations on word learning
D187	Danguecan, Buchanan	The influence of concreteness and SND on explicit semantic tasks
D188	Dudar, Thomas, Chamberland, Ferguson, Dickinson	Visual Verbs Versus Visual Verbs: A Study of Within-List Variability
D189	Jackson, Buchanan	Individual Differences in Repetition Blindness
D190	Hong, Ferretti, Craven, Hepburn, Hall, ,	The role of perspective-taking in event imagination
D191	Bourassa, Anderson	An Analysis of Spelling Knowledge in First Graders
D192	Plamondon, Roy-Charland, Lalande	The missing-symbol effect: Examination of properties of the attentional beam in reading
D193	Lempert, Park	Song and musical training can enhance learning novel words
D194	Romano, Chambers	Multimodal Processing of Speech: The Relationship between Beat Gesture Synchrony and Speech Comprehension
D195	Tsantali, Altani, Georgiou	Studying the relationship between RAN and orthographic processing
D196	Taylor, Molson, Schoenherr, Logan	Personality variables and Non-Native Phoneme Learning

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D197	Ramlakhan	On the Nature of Morality: Why Empathy is Not Necessary For Moral Judgment
D198	Barlas	Cultural background influences implicit but not explicit sense of agency for the production of musical tones
D199	Leonard, Williams	So that's what good poker players are made of!
D200	Zhu, Lanthier, Byun, Jarick, Kingstone	Eye don't remember: Excessive eye contact impedes memory
D201	Humeny	The aftermath of a romantic relationship with a psychopath: The effect of personality sub-factors

D202	Slobodenyuk, Jraissati, Kanso, Ghanem, El Hajj	Cross-modal associations between color and haptics
D203	Voyer, Thibodeau, Delong	Context, Contrast, and Tone of Voice in Auditory Sarcasm Perception
D204	Richard, Andres, Thompson, Johnson, Hansen	The effects of trans-cranial Direct Current Stimulation (tDCS) on the Contrast Sensitivity Function (CSF)
D205	Marcil, Guy, Mottron, Bertone	Evaluating Gender Differences in Perceptual Profiles of Individuals with Autism Spectrum Disorder
D206	Hartle, Wilcox	Depth magnitude from stereopsis: Assessment techniques and the role of experience
D207	Sun, Guo, Arathoon, Cant	Attentional scope reveals different mechanisms underlying face and body inversion effects
D208	Patel, Reed	Global and Local Processing Of Multistable Stimuli: Effects of Aging
D209	Desmarais, Payne	Visuo-haptic identification: Effects of object similarity and congruency
D210	Miyata, Desmarais	The Impact of Sensory Dominance and Congruency Effects on Multisensory Integration
D211	Jabar, Anderson	Modelling Probability Effects as Differences in Neuron Tuning
D212	Heenan, Baetz-Dougan, Tao, Troje	Effects of anxiety on the perception of depth-ambiguous biological motion stimuli are mediated by inhibitory ability
D213	Morrisey, Rutherford	Attention capture and faces: An eye tracking study
D214	Patel, Yousuf, Cant	The role of size and rotation changes in the visual perception of whole human bodies and individual body parts
D215	Lowe, Cant	Revealing a global-processing bias for texture in scene perception
D216	Zaki-Azat, Jones	The Influence of Vocal Training on Vocal Responses to Altered Auditory Feedback
D217	Lucyk, Purchase, Humphrey	Colour and Emotion in Drawings
D218	Mueller, Timney	Perception of acceleration and deceleration as a function of pattern complexity and direction
D219	Valtchanov, Ellard	The influence of low level visual properties on scene preference, recognition and eye-movements
D220	Weatherhead	The role of talker identity in perceptual learning
D221	Grundy, Nazar, O'Malley, Chung, Mohrenschildt, Shedden	Functional motion threshold: The role of practice when discriminating direction in a turbulent motion simulator
D222	Morrill, Anderson	Can Visual Beat Perception be Improved?
D223	Mondloch, Nelson	Looking for emotion cues: Allocation of attention varies with age, emotion, and whether stimuli are static or dynamic
D224	Squires, Macdonald, Quinlan, Paccioco, Culham, Snow	Do Real Tools Prime Hand Actions More Than Photographs of Tools?

D225	Stalker, Austen	Enhancing motor performance using motor imagery and visual feedback
D226	Townsend, Staples, Herdman	Inconsistent Visual Information Disrupts Perception of Vestibular Motion
D227	Dunn, Risko	Image vs. Reference Frame Rotation in Rotated Word Identification: New Evidence from Multi-item Displays
D228	Howell, Brown, Herdman	Using Display Backlight Strobing to Decrease Perceived Motion Blur
D229	Cutone, Wilcox, Allison	Retinal Motion and Stereoacuity Revisited
D230	Dyson, McLean, Want	Appreciating art through action? Evaluating the contribution of visuo-motor similarity, sound and expertise
D231	Guterman, Allison	Head orientation influences the perceived tilt of global motion
D232	Agako, Kusec, Marcos, Pawluk, Koerner	An Examination of Intolerance of Uncertainty as a Mediator of Paranoia and Interpretation Bias in People with High and Low Worry
D233	Goren, Elder	Visual distortions induced by simple and complex shapes
D234	Ramkhalawansingh	How Aging affects Multisensory Integration and Driving Performance
D235	Pritchett, Murray	Classification Image Analysis Reveals Decision Strategies in 2AFC Tasks
D236	Sager, Spalek	Turning in Front of Motorcycles: The effect of lane position on motion-camouflage
D237	Doyle, Voyer	Mental Rotation Accuracy and Response Time on Occluded and Nonoccluded Blocks and Bodies
D238	Chubala, Jamieson	The emergence of distributed representation in group learning
D239	BLANK	
D240	BLANK	

SATURDAY 5TH JULY 2.30PM – 3.45PM PAPER SESSIONS

TRS1-147 **SYMPOSIUM: SHARING AND DISTINGUISHING INTERPERSONAL ACTIONS**

2.30 – 2.45	***102***	Tashchereau-Dumouchel, Hétu, Massicotte, Chagon, Jackson	BDNF Val^{66}Met polymorphism configures sensorimotor resonance in the human mirror system
2.45 – 3.00	***103***	Hogeveen, Obhi, Banissy, Santiesteban, Catmur, Press, Bird	Elucidating and enhancing the brain's imitation control network
3.00 – 3.15	***104***	Welsh	On the processes underlying the action prediction in individual and social contexts
3.15 – 3.30	***105***	Loehr	Monitoring shared goals in joint action

TRS1-149 **COGNITIVE PROCESSES II**

2.30 – 2.45	***106***	Whitman	Frontal and posterior networks underlying probabilistic reasoning follow distinct timecourses: a multimodal MEG/fMRI study
2.45 – 3.00	***107***	McGarry, Russo, Cross	The role of the mirror system in processing emotional action in visual and auditory modalities
3.00 – 3.15	***108***	Oddson	The nearly null cognitive effects of relaxation
3.15 – 3.30	***109***	Isacescu, Struk, Merrifield, Danckert	Boredom, Aggression, and Mind-Wandering
3.30 – 3.45	***110***	Besner, Reynolds	Visual Word Identification: Is Semantic Processing Capacity Free?

TRS2-147 **MEMORY IV**

2.30 – 2.45	***111***	Selvamenan, Service	Serial Order Coding: Shared Mechanism in Verbal and Visuospatial STM
2.45 – 3.00	***112***	Saint-Aubin, Guerard, Fiset	Is it possible to learn more than one sequence with the Hebb repetition paradigm?
3.00 – 3.15	***113***	Dunn, Risko	Cognitive Offloading in a Perceptual Task: The Role of Working Memory Demand

TRS2-149 **ANIMAL BEHAVIOUR**

2.30 – 2.45	***114***	Marsh, Vining, Roberts	Rudimentary metacognitive control? Information-seeking Behaviour in Old and New World Monkeys
2.45 – 3.00	***115***	McMillan, Sturdy, Spetch	Midsession Reversals of Go/No-Go Task Contingencies in Chickadees and Pigeons
3.00 – 3.15	***116***	Macpherson, Roberts	Interval Timing in the Domestic Dog
3.15 – 3.30	***117***	Dwyer, Cole	Dog Deception Using Transparent Containers that were Obviously Baited or Non-Baited
3.30 – 3.45	***118***	Aujla, Nedjadrasul	Differential Actions of Low-Dose Nociceptin on Anxiety-Like Performance in Alcohol-Withdrawn vs. Control Rats

CSBBCS 2013 DONALD O. HEBB GRADUATE STUDENT AWARDS

For the individuals who, in the opinion of the awards committee, have been judged to have presented the best paper or poster at the 2013 CSBBCS meeting.

Best Paper: Victoria Holec, University of Lethbridge (#65, Holec & Euston)
Honorable Mention: David M. Sidhu, University of Calgary (#41, Sidhu & Pexman)

Best Poster: Sara N. Gallant, Ryerson University (#188, Gallant & Yang)
Honorable Mention: Jeffrey Wammes, University of Waterloo (#149, Wammes, Fernandes, & Hsiao)

CSBBCS 2014 RICHARD C. TEES DISTINGUISHED LEADERSHIP AWARD

DR. PETER GRAF UNIVERSITY OF BRITISH COLUMBIA

Dr. Peter Graf more than fulfills the criteria for the Richard Tees Distinguished Leadership Award.

Peter's dedication to CSBBCS is unquestionable. He has been a leader in the society for a very long time and has held the position of Secretary/Treasurer on the executive committee since 2005. In that position he has kept the continuity of the organization and mentored new executive officers in their positions. He has been instrumental in moving the society to take a more active role in advocacy by responding to research funding and other science-related issues that arise in Canada. All of that is not to mention the numerous behind-the-scenes duties of the Secretary/ Treasurer of a large national organization which he seems to handle with ease.

Peter has not limited his work with scholarly organizations to CSBBCS. Concurrent with his work on the executive of CSBBCS, he served on the board of directors for the Canadian Psychological Association and was elected president of that organization. He can be credited with the re-establishment of a seat on the CPA board for a member of CSBBCS and increasing the ties between the two organizations for the betterment of psychology in Canada as a whole. This rapprochement can only serve to strengthen all areas of psychology in Canada.

Peter is one of the most influential researchers in memory in the world. His career has been characterized by transformative ideas followed by very careful exploration of an area. He always seems to be in the forefront of his field. His work has had a tremendous impact on research and theory in memory. For example, his ground-breaking paper on implicit and explicit memory for new associations in normal and amnesic subjects (co-authored with Daniel Schacter) has been cited over 1,000 times. More recently, he has shown himself to be a leader in the study of prospective memory. From 1995 to 2013 his work has been cited, on average, over 500 times a year. His scholarly accomplishments have been recognized by his election as fellow of APA, APS, and CPA.

Although Peter's contributions to basic research in memory are widely known and admired, perhaps less known (at least for now, I think that will change soon) is his work applying his knowledge of memory and cognition to obsessive-compulsive disorder, cognitive training in older adults, and to solving usability problems of technology for older adults. This application of basic research to solving real problems in society demonstrates the generality of his research and the creativity of his thinking.

In summary, Peter is a remarkable leader, an exceptional researcher and, due to his extraordinary leadership and service to the BBCS community is most worthy of the Richard C. Tees Distinguished Leadership Award.

CSBBCS 2014 EARLY CAREER AWARD

DR. SHAYNA ROSENBAUM YORK UNIVERSITY

Dr. Rosenbaum received her PhD in Clinical Neuropsychology and Cognitive Neuroscience from the University of Toronto in 2003, and did a postdoctoral fellowship at the Rotman Research Institute before joining the faculty of York University. Her research examines how memory is represented in the brain, how cognitive functions are affected by brain damage, and how such deficits can be managed in patients. Her neuroimaging and patient studies have shown that, contrary to conventional views, the hippocampus is needed for supporting some aspects of remote spatial memory, and is also involved in future decision making and theory of mind.

Dr. Rosenbaum has published these and related findings in over 40 papers, including articles in Science, Nature Neuroscience, and the Journal of Neuroscience. Her work has gained diverse media attention in Canada (CBC News, CTV, Toronto Star, National Post, MacLean's) and in the USA (The New York Times, USA Today). Her past honors include the Ontario Ministry of Economic Development and Innovation Early Researcher Award, Baycrest Award of Research Excellence, CIHR New Investigator Award, York Faculty of Health Early Career Research Award, a Sloan Research Fellowship and the 2013 CAN-ACN Young Investigator Award.

CSBBCS 2014 DONALD O. HEBB AWARD

DR. IAN Q. WHISHAW UNIVERSITY OF LETHBRIDGE

When you consider the fields of behavioural neuroscience and neuropsychology the impact of Ian Q. Whishaw is unparalleled. He was elected to the Royal Society of Canada in 2000, was the first Board of Governors Research Chair at the University of Lethbridge, and has received honourary degrees from Thompson Rivers University and the University of Lethbridge.

Ian was born in South Africa but grew up in the Kootneys of British Columbia. He obtained his first two degrees at the University of Calgary and completed his PhD at the University of Western Ontario, working with Case Vanderwolf. Following his PhD Ian was hired in 1970 by the U of Lethbridge before there was an actual campus – it was housed in what was then called Lethbridge Junior College. There were about 600 students and no labs. The teaching load was 5 different semester courses, a load that did not get reduced to 4 until about 1980. In order to do research Ian left his family in Lethbridge for the summers of 1971 and 1972 to work at the University of Calgary with Warren Veale, which constituted a de facto postdoc. In 1972 the U of L moved to its new campus and Ian had a very small and ill-equipped lab. He had no colleagues in physiological psychology and none of his colleagues in Psychology actually did research at that time. His early work was an extension of his PhD work on EEG-behaviour correlations in freely moving rats. He did a sabbaticalwith Philip Teitlebaum in 1976-77, who was at the time one of the leaders in physiological psychology. This experience had a profound impact on Ian as he began to develop his observational skills of behaviour – a talent that would eventually lead to a Globe and Mail article in about 2005 in which he was called the "rat whisperer." There is today likely no behavioural neuroscientist with a better-honed skill in studying the behaviour of laboratory animals and human beings. By the time that the U of Lethbridge offered its first MSc, Ian had over 200 publications with an unbelievable number of different collaborators across North America and Europe.

Perhaps the one thing that characterizes Ian's research career is its breadth of topics and its ingenuity. It is this breadth that makes it difficult to point to what Ian actually studies! He has studied EEG, hypothalamic organization, feeding and drinking, the effects of complete decortication, the effect of intracerebral grafts, the evolution of grasping in rodents, spinal cord organization, timing, hippocampal functioning, dead reckoning, development of finger movements in children, dance therapy in Parkinson's, learning disabilities, schizophrenia, and many other topics. Perhaps the two that he is best known for are the analysis of skilled forelimb movements in mammals and the analysis of spatial navigation. He has dozens of papers on each of these topics.

In addition to his amazing research record, he is also the co-author of two successful textbooks. The best known, Fundamentals of Human Neuropsychology, is now going into its seventh edition in English and has been translated into several languages. For most academics just having two successful books would be a career but for Ian, this has been a side project. He has now published over 400 papers and has over 25,000 citations.

CSBBCS 2014 EARLY CAREER AWARD

THURSDAY 3RD JULY	TRS1-067	4.30 – 5.00

1. Understanding episodic amnesia: lessons from patient and neuroimaging studies

Shayna Rosenbaum
York University shaynar@yorku.ca

Researchers have long studied memory for past autobiographical episodes, which help make up the fabric of everyday life and are vulnerable to age-related changes in brain function. Recently, scientists have turned to representations of other kinds of events, such as future events and the mental experiences of other people during theory of mind, partly in an effort to understand the root of autobiographical episodic memory impairment. In this talk, I will describe recent patient and neuroimaging studies that we have conducted to examine if, how, and to what extent autobiographical episodic memory is related to other forms of thinking and reasoning about current and future mental states belonging to the self and to other people. This work suggests that familiarity with people and events, and the vividness associated with constructing such events, play a crucial role, independent of past or future orientation or whether directed to the self or to others.

CSBBCS 2014 DONALD O. HEBB AWARD

THURSDAY 3RD JULY	TRS1-067	5.00 – 6.00

2. How touch becomes vision to control the hand

Ian Q. Whishaw
University of Lethbridge whishaw@uleth.ca

Human behaviour is a flow of complex and seamless action seemingly only explained by an appeal to an equally complex and seamless consciousness. But behaviour can be reduced to simpler actions - such as using a hand to eat. The movement of reaching is an everyday act that is completed in seconds and requires little motor attention other than the decision to move. For those who have suffered brain injury it is the behaviour that they would most like restored. According to The Dual Motor Cannel theory, reaching, in turn consists of submovements, including the Reach and the Grasp. The Reach and the Grasp use different spatial guidance, limb musculature and respond to different target cues. Using biometric, evolutionary, developmental research I will trace the origins of the Reach and the Grasp from their tactile antecedents and suggest how they are knitted together as a single act by specialized visuospinal pathways.

PAST PRESIDENT'S SYMPOSIUM		
FRIDAY 4TH JULY	**TRS1-067**	**10.00 – 12.00**

Grounding Conceptual Knowledge: Embodiment and its Alternatives
Chaired by Stephen Lupker

3. Toward a deeper understanding of embodiment

Michael Masson
University of Victoria mmasson@uvic.ca

Advances in our understanding of how embodied representations contribute to cognitive processing are no longer going to be made by straightforward demonstrations of modulatory effects. Theoretical accounts specifying the direction and temporal profiles of such effects as well as the relationships between them are needed. Consensus definitions of what qualifies as evidence for causal contributions of embodied knowledge to cognitive performance need to be constructed and potential limitations on these contributions must be explored.

4. Few believe the world is flat

Arthur Glenberg
Arizona State University Arthur.Glenberg@asu.edu

Science has changed many of our dearly held and commonsense beliefs. Few still believe the world is flat, and few still believe the sun orbits the earth. Few still believe humans are unrelated to the rest of the animal kingdom, and soon few will believe human thinking is computer-like. Instead, as with all animals, our thoughts are based on bodily experiences, and our thoughts and behaviours are controlled by bodily and neural systems of perception, action, and emotion interacting with the physical and social environments. We are embodied; nothing more. Thus, embodied cognition is about cognition formatted in sensorimotor experience, and sensorimotor systems make those thoughts dynamic. Even processes that seem abstract, such as language comprehension and object identification are embodied. Thus, embodied cognition is not limited to one type of thought or another: It is cognition. (Of course, I will discuss data supporting these claims.)

5. What is embodied about cognition?

Brad Mahon
University of Rochester mahon@rcbi.rochester.edu

The thesis of embodied cognition has developed as an alternative to the view that cognition is mediated, at least in part, by symbolic representations. A useful testing ground for the embodied cognition hypothesis is the representation of concepts. An embodied view of concept representation argues that concepts are represented in a modality-specific format. I argue that questions about representational format are tractable only in the context of explicit hypotheses about how information spreads among conceptual representations and sensory and motor systems. This means that the currently formulated versions of the embodied hypothesis are at best premature. Where constraining data are available, they indicate that concepts are more than just sensory and motor content. As such, the embodied/disembodied debate is either largely resolved, or at a point where the embodied and disembodied approaches are no longer coherently distinct theories. This situation merits a reconsideration of what the available evidence can tell us about the structure of the conceptual system. I suggest that it is the independence of thought from perception and action that makes human cognition special—and that independence is made possible by the representational distinction between concepts and sensorimotor representations.

FRIDAY 4TH JULY	TRS1-147	1.00 – 2.00

SYMPOSIUM: **CONJOINT COGNITION: HOW THE PRESENCE OF OTHERS AFFECTS COGNITION**
Chaired by Caroline Palmer

How do people perform cognitive tasks in the presence of other people? The majority of psychological theory is based on evidence from single minds interacting with computer-generated events that require little (often minimal) interaction. Additional variables, such as relative differences in memory, sensitivity to sensory information, motivation, and emotion may become amplified when people interact. We do not yet know how models of individual cognition scale up to real-world interactions among people. The following four talks address perception and cognition in the context of human interaction, focusing on variables that arise from interactions among individual minds.

	TRS1-147	1.00 – 1.15

6. Playing well together: Individual and joint timekeeping abilities underlie musical coordination

Caroline Palmer, Frances Spidle, Erik Koopmans, Peter Schubert
McGill University caroline.palmer@mcgill.ca

Joint music performance demonstrates naturally how a partner influences one's timekeeping abilities. We address vocalists' temporal synchronization in terms of entrainment of biological rhythms, and access to sensory information from oneself and from one's partner. Choral vocalists sang in duet performance conditions that presented altered auditory and visual feedback about their partner. Differences between the partners' solo rhythms, as well as differential sensitivity to self/partner feedback, influenced pairs' temporal synchronization. We address the treatment of pairs as the unit of analysis, calculating chance estimates of pair-variance. Timekeeping models should incorporate interactions among individuals to scale up to group behaviour.

	TRS1-147	1.15 – 1.30

7. People, pinholes, and glassholes: The influence of real and implied social presence on human behaviour

Alan Kingstone
UBC alan.kingstone@ubc.ca

Evolutionary theory suggests that the unique high-contrast morphology of the human eye evolved for rapid, silent communication between conspecifics. Using people, hidden pinhole cameras, sexy calendars, and eye trackers, my lab demonstrates that social presence has a profound effect on human behaviour. One focus of our work has been to understand how the presence of people affects where others look. Another focus investigates the influence of implied social presence on human behaviour. Together these studies are revealing that social attention between individuals is a two-way street, consistent with the idea that human eye morphology evolved to facilitate communication between conspecifics.

	TRS1-147	1.30 – 1.45

8. Bilinguals speaking conjointly: How L2 experience and executive control modulate the temporal dynamics of conversational fluency and interactive alignment

Debra Titone, Irina Pivneva
McGill University dtitone@psych.mcgill.ca

We examine temporal markers of conversational fluency and interactive alignment, as a function of second language (L2) experience and executive control capacity. 94 bilinguals conversed in their first language (L1) and L2 to describe map routes. From these conversations, we extracted measures of global fluency (turn duration where longer turns indicate greater fluency) and interactive alignment (switching pause duration where shorter pauses indicate greater alignment). There were three key results: greater L2 experience predicted longer L2 and shorter L1 turns; greater executive control predicted shorter switching pauses; temporal measures coincided with independent evaluations of speaker clarity, fluency, and interpersonal skill.

	TRS1-147	1.45 – 2.00

9. Coordination of expressive movements with music: Underlying mechanisms and novel treatments for emotion processing disorders

Frank Russo
Ryerson University russo@psych.ryerson.ca

Research in my lab has examined the role of mimicry in face-to-face communication. The mimicry is typically spontaneous involving subtle muscle activations that are detected using electromyography or facial motion capture. The extent of mimicry is correlated with emotional accuracy and trait empathy. Experimental manipulations that interfere with mimicry lead to decrements in emotional accuracy and slowed reaction times. I will argue that the rhythmic temporal arts provide scaffolding for the coordination of expressive movements. Progress will be described on new imitation therapies we have developed that use song to support the rehabilitation of spontaneous mimicry in clinical populations.

FRIDAY 4TH JULY	TRS1-149	1.00 – 2.00

PERCEPTION I

	TRS1-149	1.00 – 1.15

10. Time Course of Evoked Action Representations

Carrie Courchene, Daniel Bub, Michael Masson
University of Victoria carrie.courchene@gmail.com

Action representations are thought to contribute directly to our conceptual knowledge of manipulable objects. For many objects, functional grasps (applied when using an object) and volumetric grasps (applied when merely lifting an object) are distinct. We tracked the time course of the evocation of these two types of action representations by having participants make reach and grasp responses in the context of pictured objects. In contrast to the pattern of action priming effects previously obtained using object names, these results show a tight coupling in the temporal dynamics of functional and volumetric action representations elicited by object form.

	TRS1-149	1.15-1.30

11. Form follows Function: The Time Course of Hand Action Representations Evoked by Handled Objects

Ragav Kumar, Michael E. J. Masson, Daniel N. Bub
University of Victoria ragavk@uvic.ca

Subjects made vertically or horizontally oriented reach and grasp actions primed by images of handled objects that were depicted in upright or rotated orientations, at one of three possible SOAs: -250ms (where the action cue precedes the object prime), 0ms, and +250ms. Congruency effects between action and object orientation were driven by the object's canonical (upright) orientation at the 0ms SOA, but by its depicted orientation at the +250ms SOA. We conclude that subjects initially access a conceptual representation of the object, and that only after some time can the depicted form influence the elicited action representation.

	TRS1-149	1.30-1.45

12. Modality effects in sensorimotor synchronization between individuals

Paolo Ammirante, Frank A. Russo
Department of Psychology, Ryerson University paolo.ammirante@ryerson.ca

There is a well-established auditory advantage when an individual taps with a metronome. It is not known whether this advantage generalizes to synchronization between individuals. We had dyads tap a beat together under audio-alone (A), visual-alone (V), and audio-visual (AV) feedback conditions. Contrary to previous studies, synchronization was significantly more accurate for V than A, and AV was significantly more accurate than both. A follow-up addresses whether these effects are modality specific by providing dyads with continuous sonifications of each other's movements. Applied and theoretical implications are discussed.

	TRS1-149	1.45-2.00

13. Space and action

Grayden JF Solman, Alan Kingstone
University of British Columbia gsolman@gmail.com

The arrangement of objects in space has important influences on our decisions about which goals to pursue, and about how to go about achieving those goals. As a result of these influences, human behaviour can be understood as emerging from the interplay between an individual's deliberate intentions, and the opportunities present in the environment. Importantly, the arrangement of the environment is itself altered by behaviour. Using a novel task combining search, decision-making, and organization, we provide evidence that decisions arise from an interplay between convenient, familiar, and optimal behaviours, and further demonstrate how spontaneous organizational behaviours can support efficient action.

FRIDAY 4TH JULY	TRS2-147	1.00 – 2.00

LANGUAGE AND READING I

	TRS2-147	1.00 – 1.15

14. First and second language speakers use distinct processing strategies when (mis)interpreting implausible passive sentences

Levi Riven, Roberto G de Almeida, Norman S Segalowitz
Concordia University leviriven@gmail.com

When interpreting sentences like "The dog was bitten by the man," native speakers frequently invert semantic roles to accommodate plausible interpretations such as "The dog bit the man." We found that second-language (L2) speakers misinterpreted such sentences at the same rate as native speakers, but that interpretations were achieved using distinct processing routes. Whereas L2 speakers were significantly faster for incorrect compared with correct interpretations, native speakers responded at similar speeds for both types of responses. This suggests that when interpretations are wrong native speakers nevertheless compute a syntactic representation, whereas L2 speakers rely primarily on plausibility heuristics.

	TRS2-147	1.15-1.30

15. Asymmetrical Switch Costs During Bilingual Production Relate to Asymmetrical Switch Costs in Domain-General Executive Control: Evidence from Eye Movements

Irina Pivneva, Abigail Free, Debra Titone
McGill University irina.pivneva@mail.mcgill.ca

Switching into one's native language (L1) is often more difficult than switching into one's second language (L2) (asymmetrical switch costs; Meuter & Allport, 1999). We investigated whether intersentential switch-cost asymmetry relates to congruent vs. incongruent condition switch-costs in the Simon task. 48 young adult bilinguals named picture arrays in short sentences ("The hose and the stove are above the bridge"). They were cued by the background color to switch into a different language on the second picture or not. Greater switch-cost asymmetry on the Simon task related to greater language switch-cost asymmetry, suggesting that both share a common neurocognitive mechanism.

	TRS2-147	1.30-1.45

16. Re-examining the early noun advantage in language acquisition: A bilingual approach

Joanne Lee, Lina Fonnegra
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Evidence for the early noun advantage as a universal feature of human language has been mixed. Research has predominantly focused on cross-linguistic comparison and older children. This study re-examines the noun-verb asymmetry by analyzing longitudinally the early word composition of Cantonese-English and Spanish-English bilingual children aged 12-19 months from CHILDES. Our analysis reveals a distinct early noun advantage in English produced by these children. However, this was not the case in Cantonese (a verb-bias language) and even in Spanish (a noun-bias language). Thus, our findings suggest that language-specific features (noun omission, manner of verbs) influence language and conceptual development.

	TRS2-147	1.45-2.00

17. Grapheme-phoneme mappings are not necessarily symmetrical: A cross-linguistic comparison

Blair Armstrong, Clara Martin, Manuel Carreiras, Ram Frost
Basque Center on Cognition, Brain, and Language (BCBL) blair.c.armstrong@gmail.com

We investigated whether internal representations of grapheme-phoneme and phoneme-grapheme mappings reflect the actual mapping transparencies in different languages using an audio-visual matching task. Therein, 40 English, French, and Spanish participants signalled whether they saw and heard either the same word or different words. A control condition was contrasted against conditions with degraded audio, visual, or audio-visual stimuli. The results showed different effects of visual and audio degradation in the three languages as a function of the cross-linguistic differences in the complexity of mapping speech to print or print to speech. Implications for modeling word recognition are discussed.

FRIDAY 4TH JULY	TRS2-149	1.00 – 2.00

ATTENTION I

	TRS2-149	1.00 – 1.15

18. On the Mental Chronometry of Stimulus-Response Conflict: Response Time Distribution versus Speed-Accuracy Tradeoff Analyses of Simon and Stroop Effects

Jason Ivanoff, Nicole Webb, Evan Nemeth, Steven R. Carroll
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Distributional analyses of reaction times (RTs) in a Stroop task, vertically aligned stimuli in a Simon task, and horizontally aligned stimuli in a Simon task have shown contrasting time course properties: Stroop effects increase, vertical Simon effects remain unchanged (or increase), and horizontal Simon effects decrease with slower RTs. Here we use speed-accuracy trade-off methodology to assess the time course of these effects. While the time course of the two Simon tasks were similar, the Stroop effect had a unique pattern. The temporal mechanics of response conflict in Simon tasks are quite different from those in Stroop tasks.

	TRS2-149	1.15-1.30

19. Confirmation Bias in Visual Search

Jason Rajsic, Jay Pratt
University of Toronto jason.rajsic@mail.utoronto.ca

In a series of studies, we investigated whether confirmation bias occurs in visual search. Participants reported whether a proposition was true or false; e.g., whether the lone "d" in a display of other letters was red. By manipulating the proportion of non-target letters that shared the critical colour, we found that increasing the proportion of proposition-confirming stimuli slowed search. Importantly, this effect was attenuated with a colour preview display, indicating that participants adopted a non-confirmatory search strategy when given an opportunity to plan their search. Thus, confirmation bias does exist in visual search but is susceptible to top-down control.

	TRS2-149	1.30-1.45

20. The efficiency of "pop-out" search is not impaired during the attentional blink

Hayley E P Lagroix, Thomas M Spalek, Vincent Di Lollo
Simon Fraser University hlagroix@sfu.ca

Perception of the second of two rapidly-sequential targets (T1, T2) is impaired when presented soon after the first (attentional blink, AB). Using an oddball-search array as T2, Ghorashi et al. (2007) found search efficiency (RT slope over set size) to be invariant with inter-target lag. This conclusion is questionable because T2 was displayed until response, allowing observers to postpone search until attention was available, thereby negating the AB. By using brief T2 presentations, we forced the search to be performed during the AB, but nevertheless, search efficiency was found to be invariant with lag, suggesting that efficient search is "pre-attentive".

	TRS2-149	1.45-2.00

21. What happens when subjects are not ready for a task switch

Peter Dixon
University of Alberta peter.dixon@ualberta.ca

Subjects are typically slower when the task to be performed is different from that performed on the previous trial. This "switch cost" often persists even with ample time to prepare for the new task. In this research, I analyze the response time distribution across conditions that vary the form of the task-switch cue. The results suggest that the residual switch cost is due to a small proportion of trials on which subjects retrospectively review the cue and match it to the stimulus for that trial.

FRIDAY 4TH JULY	TRS1-147	2.15 – 3.15

SYMPOSIUM: **EMBODIED COGNITION**
Chaired by Evan Risko

Attention in cognitive science has recently turned to trying to provide a deeper understanding of the embodied nature of human cognition. While researchers have approached this problem from a variety of angles, at its core is a desire to understand how cognitive processes are shaped by the body and its interaction with the physical environment. This symposium will feature researchers at the cutting edge of this effort. Talks will cover research investigating embodied cognition across a number of traditional domains in cognitive psychology including object identification, language processing, attention, and visual perception.

	TRS1-147	2.15 – 2.30

22. Beyond The Bouba/Kiki Effect: The Bob/Kirk Effect

Penny Pexman, David Michael Sidhu
University of Calgary pexman@ucalgary.ca

In previous research we demonstrated that the Bouba/Kiki Effect (the tendency to associate nonwords like bouba with round shapes, and nonwords like kiki with sharp shapes) depends at least in part on the tactile experience of articulation. Here we tested an extension of the effect beyond nonwords, and show that individuals will pair names like Bob with a round silhouette and Kirk with a spiky silhouette. We also noted and investigated an overall tendency to associate males/females with spiky/round silhouettes, respectively. Finally we investigated whether this pattern would extend to personality traits that were metaphorically described as round or sharp.

	TRS1-147	2.30 – 2.45

23. Examining the Interface Between Hand Actions and Object Identification

Michael E.J. Masson, Daniel N. Bub
University of Victoria mmasson@uvic.ca

We examined the effect of preparing and executing a reach and grasp action on naming a handled object presented simultaneously with or shortly after the cue to act. We manipulated the congruency between the depicted object and the cued hand action with respect to two dimensions (left-right hand alignment and horizontal-vertical wrist orientation). Congruency effects on object naming time were negative at first for both dimensions, but alignment congruency later changed to a positive effect. These dynamic influences of congruency on object identification reflect changes in how hand alignment and wrist orientation are represented during movement planning and execution.

	TRS1-147	2.45 – 3.00

24. Visible embodiment of remote actions

Alan Kingstone, Joseph D. Chisolm, Chaitanya Upmanu, Evan F. Risko
UBC alan.kingstone@ubc.ca

If you've ever gone bowling, then you've probably witnessed someone leaning to one side or another trying to coax their ball in a particular direction. This spontaneous leaning behaviour is akin to a kind of mental 'teleoperation' representing a form of visible embodiment. I report a series of video game experiments establishing that this behaviour is tied to one's intentions and is sensitive to task demands. This work is then extended to children, typically developing and with autism, to explore if deficits in theory of mind might be mediated in part by a reduced tendency to spontaneously embody remote items.

	TRS1-147	3.00 – 3.15

25. Cognitive Offloading: The Importance of How We Think about Thinking with Our Body

Evan F. Risko, Timothy L. Dunn
University of Waterloo evan.f.risko@gmail.com

Understanding how individuals use their body to help them think represents an important goal in embodied cognition. A major part of this effort is to understand how individuals decide whether to rely solely on internal processes or to adopt an external/body-based strategy (i.e., cognitive offloading) in a cognitive task. We have explored this question using head tilting when reading rotated text. Experiments demonstrating a dissociation between what individuals think this behaviour accomplishes and what it actually accomplishes will be discussed. These results support the importance of considering an individual's metacognitive beliefs in understanding the decision processes governing cognitive offloading.

FRIDAY 4TH JULY	TRS1-149	2.15 – 3.15

PERCEPTION II

	TRS1-149	2.15 – 2.30

26. Better when loaded, on average

Ben Bauer
TrentU Oshawa benbauer@trentu.ca

Summary value extraction from visual displays has been shown in many labs and with many visual properties. Computational modeling of human vision (e.g., Freeman & Simoncelli, 2011), determination the summary values computed (e.g., means, variances, principal components), identification of interactions with other properties (e.g., crowding, display duration, masking), and specification of corresponding mathematic algorithms (e.g., RMS, Coefficient of Variation) require as much precision as possible in human behavioural results. A concurrent load of 4 to 7, digits or zeros affected perceptual averaging of line length for 9-item displays producing smaller thresholds and steeper slopes in fitted functions with greater load.

	TRS1-149	2.30 – 2.45

27. The role of sudden onsets and offsets in escaping temporal-integration masking

James William Patten, Hayley Lagroix, Thomas Spalek
Simon Fraiser University jwpatten@gmail.com

A brief target embedded in – and co-terminating with – a noise mask is identified easily when the duration of the mask is long but not when it is short (Di Lollo, 1980). Identification has been said to be mediated by the visible persistence of the target which outlasted that of the mask. We tested an alternative account based on neural transient-responses triggered by the onset and offset of the target, relative to those of the mask, without recourse to visible persistence. The results of three experiments questioned the role of visible persistence, supporting instead neural transient activity in mediating target identification.

	TRS1-149	2.45 – 3.00

28. They all look different to me: Examining factors that affect the ability to perceive identity in ambient images.

Sarah Laurence, Xiaomei Zhou, Catherine J. Mondloch
Brock University slaurence@brocku.ca

Recognizing unfamiliar faces across images that capture within-person variability is challenging (Jenkins et al., 2011). We used a sorting task in which participants were given 20 photos of each of two identities and asked to sort them so that all of the pictures of the same person were grouped together. Identity perception (number of piles created) was affected by whether the identities were own/other race (more piles for other race) and their perceived familiarity to the participant (fewer piles if faces perceived as familiar). Our findings have implications for eyewitness testimony and the validity of photo ID.

	TRS1-149	3.00 – 3.15

29. The neuro-integrative account of consciousness

Lukasz Kurowski
York University luxterek@yahoo.ca

The science of consciousness is divided as to where we should look for consciousness in the brain. I consider the role of the thalamo-cortical loops coupled with the integrative role performed by the thalamus as the neural substrates of consciousness. By focusing on how information is integrated in the brain we avoid stressing only specific brain parts or neural activities as key substrates of consciousness. Such accounts fail to show how the brain gives rise to a whole subject of experience. My account addresses local and global unity of consciousness, which are essential for understanding the holistic nature of consciousness.

FRIDAY 4TH JULY	TRS2-147	2.15 – 3.15

LANGUAGE AND READING II

	TRS2-147	2.15 – 2.30

30. Two syllables or one: An investigation of the syllabic length effect

Olessia Jouravlev, Stephen Lupker
University of Western Ontario ozhuravl@uwo.ca

In the present research, the role of the syllables in word recognition was examined. Variables investigated were syllabic length (Monosyllables vs. Disyllables) and vowel consistency (Consistent vs. Inconsistent with the number of syllables). Participants engaged in a go/no-go task (one vs. two syllables), while their ERPs were recorded. Monosyllables with one and disyllables with two vowels enjoyed a processing advantage over the other two word types in the behavioural data. This pattern was replicated in the ERP data for go-trials, but it was reversed for no-go-trials (i.e., increased negativity for monosyllables with one and disyllables with two vowels).

	TRS2-147	2.30 – 2.45

31. Compensation for Assimilation Is Affected by Phonological Context and Priming: Evidence from Two Eyetracking Experiments

Mercedeh Mohaghegh, Craig Chambers
University of Toronto mercedeh.mohaghegh@mail.utoronto.ca

Two visual world eyetracking experiments examined whether and how listeners overcome the effects of phonological assimilation during speech comprehension (e.g., 'phone box' is perceptually similar to 'foam box'), focusing on words ending in nasal ('phone box': /n/-->[m]) or stop consonants ('cat box': /t/-->[p]). Comprehension measures indicated listeners do not readily identify words that have undergone assimilation, instead interpreting them as ending in original [m]/[p]s. However, results for nasal consonants showed that hearing a previously-assimilated form subsequently facilitates processing in instances where listeners identified words accurately (priming), reflecting the idea that contextual factors influence perceptual processing differently for nasals and stops.

	TRS2-147	2.45 – 3.00

32. Relative shifts in Frontal Alpha Asymmetry and the Transformation of Evaluative Functions

Micah Amd
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Recent studies have demonstrated evaluative functions transform across relational networks along electrophysiological, self-reported and "implicit" measures of verbal behaviour. The current experiment expands on this work by presenting the subjects' own name(s) and face(s) as compounded member(s) within a seven-member comparative network, where X>happy A>happy B >happy OWN-NAME>happy D>happy E>happy Y. Following tests for mutual and combinatorial entailment, baseline vs. post-relational comparisons demonstrated that evaluations of formerly novel stimuli transformed significantly in the predicted directions. Specifically, stimulus A was consistently responded to as happier-than stimulus E relative to baseline across all levels of observation, as predicted by Relational Frame Theory.

	TRS2-147	3.00 – 3.15

33. The role of central attention in semantic processing across the lifespan

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Visual word processing has been characterized as an "automatic" process in the sense that it does not require attention. However, recent research suggests that VWP does require attention. Here we examined whether semantic processing, indexed with a category judgement task, requires attention in the context of the psychological refractory period (PRP) paradigm in young and older adults. The results suggest that in this context both young and older adults wait to begin processing Task 2 until Task 1 is complete. This is consistent with the claim that semantic processing requires central attention, and that this does not change with age.

FRIDAY 4TH JULY	TRS2-149	2.15 – 3.15

ATTENTION II

	TRS2-149	2.15 – 2.30

34. Costs as well as benefits in colour-word contingency learning

Olivia Y.H. Lin, Colin M. MacLeod
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People are very good at acquiring associations between two or more events, even when they are unaware of acquiring these associations. In the colour-word contingency paradigm (Schmidt et al., 2007), four words appeared in three colours with different probabilities. Three of the words appeared in one colour 83% of the time (High contingency) and in the other colours 17% of the time (Low contingency). The fourth word served as a baseline, appearing equally often in each of the three colours. Results showed a cost in processing the low contingency items in addition to the benefit for the high contingency items.

	TRS2-149	2.30 – 2.45

35. Dissociating attentional effects of gaze and arrow cues using the cuing task

Dana A Hayward, Jelena Ristic
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Despite proposals that social attention might be unique, no clear support has emerged for this hypothesis when social and nonsocial cues are contrasted within the cuing task. Here we show that this result reflects differential contributions of the cuing tasks' extraneous variables across cue types. When the task invokes spatial orienting only, social attention emerges quickly but is short-lived while nonsocial attention emerges slowly but is sustained. This supports the idea that social and nonsocial cues engage attention differently, and highlights the importance of estimating the contributions of the cuing task's extraneous variables in the observed attentional effects.

	TRS2-149	2.45 – 3.00

36. Contingent attentional capture by stimuli that match long-term memory representations

Maria Giammarco, Adriana Paoletti, Emma B. Guild, Naseem Al-Aidroos
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Object salience plays an important role in guiding visual attention, such as when attention is captured by flashing lights on an ambulance. Conventionally, salience is thought to be created by an object's low-level features (e.g., brightness). Here we examine the role higher-level representations play: Is attention drawn to objects that resemble items stored in long-term memory (LTM)? We show that, after memorizing 30 visual objects, those objects produce the signatures of capture: cueing effects and inhibition of return in a Posner cueing paradigm. These results suggest that, beyond low-level features, object salience is partially determined by internal representations in LTM.

	TRS2-149	3.00 – 3.15

37. Attentional Cartography: Mapping the distribution of facilitation and inhibition across time, space, and objects

Eric Taylor, David Chan, Patrick Bennett, Jay Pratt
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Attention exhibits facilitation then inhibition following peripheral cues. We lack a high-resolution spatiotemporal map of this pattern. Moreover, the effect of placeholders on this pattern is unknown, despite their popularity. Participants detected targets at 121 locations at 4 delays following cues with or without placeholders. With placeholders, the classic pattern of facilitation then inhibition was observed, anchored within placeholders. Without placeholders, inhibition manifested at all delays, upsetting the famously reliable facilitation effect. Moreover, inhibition spread from the cue. This study produced a high-resolution map of facilitation and inhibition following peripheral cues and describes the unexpected effect of placeholders on attention.

FRIDAY 4TH JULY	TRS1-147	3.30 – 4.30

SYMPOSIUM: **ANALYTIC THINKING**
Chaired by Valerie Thompson

Dual process theories of reasoning posit that judgments and decisions are often mediated by autonomous processes that give rise to responses based on heuristics, such as stereotypes and beliefs. A more analytic mode of thinking may sometimes be engaged to overturn the initial response. The goal of this symposium is to explore factors that mediate the probability of analytic engagement, including qualities of the reasoner, such as individual differences in motivation, cognitive capacity, and metacognitive skill, as well as item-specific triggers, such as response fluency and sensitivity to conflicting cues (e.g., logic versus belief).

	TRS1-147	3.30 – 3.45

38. Assessing Rational Thinking Using an Expansion of the Cognitive Reflection Test

Maggie Toplak, Richard F West, Keith E. Stanovich
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The Cognitive Reflection Test (CRT, Frederick, 2005) has become a popular measure for assessing cognitive miserly information processing. We expanded the original three-item version into a seven-item version. The seven-item version was a strong independent predictor of performance on rational thinking tasks after the variance accounted for by cognitive ability and thinking dispositions had been partialled out. The CRT is a useful measure to assess rational thinking, as it measures the tendency to accept a heuristic response in a performance context where people are searching for an accurate solution.

	TRS1-147	3.45 – 4.00

39. What makes us think? Conflict detection and cognitive decoupling as sources of analytic engagement

Gordon Pennycook, Jonathan A Fugelsang, Derek J Koehler
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We investigated two potential sources of analytic reasoning, conflict detection and cognitive decoupling, using a rapid-response base-rate task where stereotypes and base-rate probabilities were either congruent or incongruent. Participants took longer to respond to incongruent problems relative to congruent both when they responded according to the stereotype (conflict detection) or base-rate (cognitive decoupling). Relative to more biased participants, less biased participants had larger RT increases for stereotypical responses (more sensitive conflict detection) and smaller RT increases for base-rate responses (more effective decoupling). These data indicate that conflict detection and cognitive decoupling are differentially affected by individual differences.

	TRS1-147	4.00 – 4.15

40. Metacognition and Abstract Reasoning

Henry Markovits, Valerie A Thompson, Janie Brisson
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The question of whether people have some kind of metacognitive representation of abstract validity is an open one. In Study 1, participants were asked to make a series of (1) abstract conditional inferences, (2) concrete conditional inferences chosen to have a statistical structure isomorphic to conditional logic or (3) concrete problems with a statistical structure non-isomorphic to conditional logic. Participants were asked to give Confidence ratings after each inference. Results show that confidence ratings were positively correlated with logical performance on Abstract problems and concrete problems with an isomorphic structure, but not when these were not isomorphic. Study 2 used a generation of counterfactual alternatives task (Markovits & Lortie Forgues, 2011) to improve levels of logical performance with abstract problems. The resulting increase in logical performance was mirrored by increases in mean Confidence ratings. Results provide direct evidence for a metacognitive representation of abstract logical validity.

	TRS1-147	4.15 – 4.30

41. Thinking fast and slow: Analytic beliefs and intuitive logic?

Valerie Anne Thompson, Maia Gibb, Ian Newman
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According to Dual Process Theories, many reasoning biases occur because autonomous processes deliver answers based on belief that may not be overturned by slower analyses based on logic and probability. Data from two tasks (base rate neglect, N = 54) and conditional inference (N = 42), challenge this assumption. Participants made initial judgments of probability and logic under time restrictions and a second judgment under free time. As expected, initial judgments were sensitive to beliefs; unexpectedly, they also varied as a function of validity and probability. Both effects increased at time 2. A revised model is proposed to accommodate these findings.

FRIDAY 4TH JULY	TRS1-149	3.30 – 4.30

DEVELOPMENT

	TRS1-149	3.30 – 3.45

42. Parents' and Teachers' Math Anxiety Impacts Children's Math Achievement

Erin A Maloney, Elizabeth Gunderson, Gerardo Ramirez, Susan Levine, Sian Beilock
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Math skills are important in school and everyday life yet many people experience a great deal of anxiety when dealing with numbers – termed math anxiety. Here we examined the influence of teachers' and parents' anxiety about their own math abilities on the math achievement of their children. We demonstrate an interaction between teachers' and parents' math anxiety such that a teacher's math anxiety negatively affects her students if those children come from households with a low math anxious parent. The results are discussed in terms of possible mechanisms by which mentors' own math anxiety affects their children's math performance.

	TRS1-149	3.45 – 4.00

43. Critical Questions about the Critical Period

Muhammad Ali Khalidi
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Cognitive capacities are said to be subject to a critical period when acquisition can only occur, or only occur efficiently, within a certain developmental stage in ontogeny. A number of distinct neural correlates have been identified that subserve this task, all of which are associated with a decline in neural plasticity. This suggests a case of multiple realizability of a cognitive construct with respect to its neural correlates. But this identification is complicated by the fact that a critical period is operationalized relationally with respect to the lifetime of the individual organism. This means that instead of a one-to-many relationship between the cognitive construct and its neural correlates, we may instead have a many-to-many relationship.

	TRS1-149	4.00 – 4.15

44. A Developmental Examination of Perceptual Tuning for Young versus Older Adult Faces

Lindsey Short, Catherine Mondloch
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We examined whether the perceptual system is optimized for young adult faces. Young and older adults discriminated and judged the normality of young and older face pairs consisting of an unaltered and distorted same-identity face. Both age groups were more accurate for young faces—but only when judging normality. We then examined the emergence of this bias in childhood. Children showed a young adult bias in normality/attractiveness judgments; however, this bias extended to the discrimination task. Adults' young adult bias is thus specific to referencing a norm whereas children's bias reflects a general deficit in processing differences in older faces.

	TRS1-149	4.15 – 4.30

45. Haptic grasping configurations in early infancy reveal different developmental profiles for visual guidance of the Reach vs. the Grasp

Jenni M Karl, Ian Q Whishaw
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How do independent Reach and Grasp movements become integrated under visual control throughout development? 3D linear kinematics were used to compare reaching in 4 to 24 month old infants, unsighted adults, and sighted adults. 24 month old infants persisted in using an open Grasp to contact the target, similar to unsighted adults, even though Reach transport and orientation accurately anticipated target contact, similar to sighted adults. The results argue that the Reach and the Grasp are adaptively uncoupled in early infancy, likely to capitalize on different sensory cues - vision for the Reach and haptics for the Grasp.

FRIDAY 4TH JULY	TRS2-147	3.30 – 4.30

LANGUAGE AND READING III

	TRS2-147	3.30 – 3.45

46. The Language of Lectures: Offsetting Challenging Words

Srdan Medimorec, Kavita V. Schaffer, Philip I. Pavlik Jr., Andrew Olney, Arthur C. Graesser, Evan F. Risko
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Recent studies (e.g., Graesser et al., 2011) have used the Coh-Metrix text analyzer to assess differences in language use across academic disciplines. McNamara (2013) suggested that text difficulty on one dimension (e.g., word concreteness) can be compensated for by simplifying another dimension (e.g., syntax). We provide a test of this idea by analyzing language use across humanities and natural science lectures. Results are consistent with the idea that decreases in word concreteness in lectures are compensated for by increases in ease on other dimensions (e.g., syntax). Discussion focuses on the potential mechanisms underlying this putative compensation behaviour and its implications for instruction.

	TRS2-147	3.45 – 4.00

47. Alike or Different: Comparing the online processing of metaphors and similes

Carlos Roncero, Roberto G. de Almeida
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Studies have suggested that metaphors (education is a tree) and similes (education is like a tree) engage similar forms of processing, based on omnibus sentence reading times that may not have been sensitive enough to capture processing differences. We asked participants to read expressions in a self-paced moving window paradigm and checked for interpretation differences by following expressions with explanations that contained either a figurative or a literal property. Simile vehicles had longer reading times, while figurative-property explanations were read faster after metaphors, but slower after similes. These results suggest metaphors and similes are processed differently and convey different meanings.

	TRS2-147	4.00 – 4.15

48. The good, the bad, and the ugly: Incremental processing of evaluative adjectives

Robert Redford, Craig Chambers
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A spoken-language eye-tracking experiment examined the time course of processing evaluative adjectives (e.g., pretty), which involve social knowledge for interpretation. Participants viewed arrays of images while hearing instructions containing evaluative vs. simple perceptual adjectives (e.g. "Click on the yellow/pretty dress"). Results showed that, although identification was slower for evaluative adjectives, identification of intended targets nevertheless began before the following noun. Interestingly, eye-movement patterns did not differ for adjectives of positive vs. negative valence (pretty vs. ugly) nor were they related to separately-assessed subjective judgements about the "fit" between images and evaluative descriptions. Implications for theories of on-line comprehension are discussed.

	TRS2-147	4.15 – 4.30

49. What the Neighbours Say about the Bayesian Reader

Derek Besner, Darcy White, Max Coltheart
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The central assumption in Norris's Bayesian account of visual word identification is that the reader must select between competing possibilities in order to identify a word. A straightforward prediction derived from this account is that when having to identify an exception word (an item that violates the typical spelling-sound correspondences), the more neighbours the word has the slower the time to read the word aloud. We examined a published corpus of thousands of words in order to address this issue. Alas, poor Yorick.

FRIDAY 4TH JULY	TRS2-149	3.30 – 4.30

NEUROPSYCHOLOGY

	TRS2-149	3.30 – 3.45

50. Amygdalar Atrophy as a Predictor of Cognitive Decline in Mild Cognitive Impairment

Kylee Tamera Ramdeen, Rolf A Heckemann, Alexander Hammers, Yanica Klein-Koerkamp, Olivier Moreaud, Sandrine Keignart, Alexandre Krainik, Aurélie Richard-Mornas, Pascal Hot
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Little is known of the clinical relevance of amygdalar atrophy in Mild Cognitive Impairment (MCI). In this study, hippocampal and amygdalar volumes of 22 MCI patients and 22 controls were derived from magnetic resonance images segmented by an automatic multi-atlas segmentation procedure. The volume loss was greater in the amygdala (41%) than in the hippocampus (34%) in patients when compared to controls. Multiple regression analyses revealed that both hippocampal and amygdalar volume loss in MCI predicted memory impairment after controlling for the volume of the other. Amygdalar atrophy may thus have similar clinical implications to hippocampal atrophy in predicting AD.

	TRS2-149	3.45 – 4.00

51. Deficits in spontaneous facial mimicry in patients with Parkinson's disease

Esztella Vezer, Steven R. Livingstone, Lucy McGarry, Frank A. Russo *
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A secondary motor symptom of Parkinson's disease (PD) is a deficit in the formation of emotional facial expressions, creating a 'mask-like' appearance in patients. We hypothesized that this motor deficit would affect PD patients' spontaneous mimicry and perception of emotional facial expressions. Using facial electromyography, we observed that PD patients exhibited reduced mimicry compared to controls, and reduced accuracy in the identification of negative emotions. Facial muscle activity during angry stimuli predicted accuracy scores on the perceptual task across both groups. To our knowledge, this is the first study to document deficits in facial mimicry in patients with Parkinson's disease.

	TRS2-149	4.00 – 4.15

52. Benign Epilepsy with CentroTemporal Spikes (BECTS) : still considered as a benign neurologic condition? Study of the Psycho-Affective, Neuropsychological, Behavioural and Electrophysiological Profile in patients in the active phase and remission.

Sandrine Mendizabal
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Although BECTS is officially considered as a benign syndrome without cognitive impairments, a growing body of literature highlights the existence of a wide range of cognitive deficits, particularly of visual Working Memory (vWM). The aim of this study was to investigate a link between the hemisphere encompassing the epileptic focus and a specific pattern of cognitive deficits. Method: 12 children in BECTS active phase, 8 in remission, and their 20 controls, tested with a match-detection task coupled with electroencephalography, in neuropsychology. We found specific cognitive deficits for the patients, and some attenuations of the electrophysiological activity related to the vWM.

	TRS2-149	4.15 – 4.30

53. Smoking status, cognition and neurobiology in schizophrenia

Farena Pinnock, Walter Heinrichs, Narmeen Ammari, Leah Hartman
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Smoking status is a potentially important consideration in data interpretation given nicotine's effect on cognition in schizophrenia patients and in the general population (Brody et al., 2004; Tregellas et al., 2007). Thus we examined whether smoking status has a differential association with cognition and regional cortical thickness in 82 patients and 91 healthy control participants. Results indicate equivalent cognition and cortical thickness in smoking and non-smoking patients. However, patients' cognition and cortical thickness differed significantly from non-smoking controls. Moreover, non-smoking controls significantly outperformed smokers on cognitive tasks.

SATURDAY 5TH JULY	TRS1-147	8.30 – 9.30

SYMPOSIUM: **MATHEMATICAL COGNITION**
Chaired by Jo-Anne LeFevre

Numerical processes are ubiquitous. In this series of presentations, we will explore the basic processes involved in mathematical cognition and the relations between basic quantitative knowledge and other cognitive and affective factors. The presenters in this symposium will describe exciting new developments in the field that arise from a variety of methodologies. Empirical evidence related to theories of math cognition will be presented that encompasses the role of memory versus procedures, assessment of math anxiety, quantitative predictors of individual differences in mathematics performance, and the role of the IPS in exploring domain-specific processes in numerical tasks.

	TRS1-147	8.30 – 8.45

54. Retrieval-Induced Forgetting of Arithmetic Facts and Identity Rule

Jamie Campbell, Kate D. Dufour
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Adults (N = 72) repeatedly solved either a set of simple addition (0+2, 1+5, 2+3) or multiplication problems (0×2, 1×5, 2×3) during a practice phase and then switched operations during a test phase that included counterparts to the practiced problems and control problems. Both multiplication and addition showed retrieval-induced forgetting (RIF) for non-rule-based problems. The 0×N, 0+N, and 1+N problems did not present item-specific RIF from practice of the cross-operation counterparts, but 1×N problems did, despite evidence from generalization of practice that they were solved using a general procedure.

	TRS1-147	8.45 – 9.00

55. The relations between quantitative skills and adults' mental arithmetic skill

Carla Sowinski
Carleton University carla.sowinski@carleton.ca

In this talk, I will examine individual differences in identification, comparison, and ordering of numbers in both symbolic (digits) and non-symbolic formats (e.g., dots) in relation to adults' (N = 146) performance on math dependent variables (timed addition, subtraction, and multiplication, as well performance on the Brief Math Assessment; Steiner & Ashcraft, 2012). Findings suggest that symbolic ordering is the best predictor of the math outcomes, however other predictors account for unique variance depending on the outcome.

	TRS1-147	9.00 – 9.15

56. Functional Diversity of the Intraparietal Sulcus: Evidence Against a Domain-Specific Number Module

Marcie Penner-Wilger, Michael L. Anderson
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There is debate over whether the horizontal segment of the intraparietal sulcus (HIPS) houses a domain-specific number module. To address this debate, we first used cross-domain modeling. Bilaterally the HIPS showed activation across a wide range of non-numerical tasks. Second, we compared the functional diversity of the HIPS and domain-general ROIs that contribute to number processing – the left AG and PSPL bilaterally. The functional diversity of these ROIs was near or above the whole-brain average. Importantly, HIPS bilaterally were significantly more diverse than the whole-brain average. Results support the view that the HIPS does not house a domain-specific number module.

	TRS1-147	9.15 – 9.30

57. Investigating the factors of math anxiety: Timing of self-report matters

Alex M Moore, Amy J McAuley, Mark H Ashcraft
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This project investigates the interrelations between the Abbreviated Math Anxiety Scale (AMAS), math achievement, and task performance in Base 8 addition. Using the Accessibility Model of Emotional Self-report (Robinson & Clore, 2002), we presented the AMAS either before or after task completion, and observed typical math anxiety effects when self-report was assessed before, but not after, task completion. Importantly, nuanced relationships between math anxiety, achievement, and task performance were discovered depending on the sub-factor considered and the timing of AMAS administration. The results are described in terms of differences between emotional beliefs and memory for in-task emotional experience.

SATURDAY 5TH JULY	TRS1-149	8.30 – 9.30

REASONING

	TRS1-149	8.30 – 8.45

58. BLANK

	TRS1-149	8.45 – 9.00

59. Roles of Numeracy, Cognitive Reflection, and Information Processing Styles in Heuristics and Biases

Rick Mehta, Hrefna Thomasdóttir
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The current study examined how well the Berlin Numeracy Test (BNT), a recently developed measure of numeracy, would predict performance on a battery of heuristics and biases decision making tasks relative to the Cognitive Reflection Test (CRT) and the Rational-Experiential Inventory (REI, a measure of information processing styles). The BNT and CRT were equally strong predictors of performance, and were stronger predictors than the REI. However, the BNT was a unique predictor of performance – even after variance on the CRT was statistically controlled. Furthermore, the REI could not account for performance after variance on the BNT and CRT were considered.

	TRS1-149	9.00 – 9.15

60. To switch or not to switch: Age differences in information search and decision quality in experience-based judgments

Pete Wegier, Julia Spaniol
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In past studies of experience-based choice, older adults have been found to search for less information before making a decision—compared to younger adults—but do not suffer declines in subsequent decision quality. We used an experience-based proportion judgment task to investigate age differences in patterns of information search. When patterns were unrestricted, no differences in accuracy were found between age groups; however, older adults were found to use different patterns of information search. A second study restricted search to either of two specific patterns and found both age groups showed significantly better performance when using one pattern over the other.

	TRS1-149	9.15 – 9.30

61. BLANK

SATURDAY 5TH JULY	TRS2-147	8.30 – 9.30

MEMORY I

	TRS2-147	8.30 – 8.45

62. Encoding difficulty and recognition: A context effect

Tamara M Rosner, Sarah Davies, Rosemary Lai, Bruce Milliken
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Rosner et al. (2013) Krebs et al. (2013) recently reported better recognition memory for incongruent over congruent selective attention items. The present study addressed whether better recognition memory is linked to the longer naming times at study for the incongruent items, or is instead linked to attention processes that are sometimes engaged for difficult encoding conditions. Across two experiments, naming times were slower for difficult than easy items, yet recognition memory was better for difficult items when easy and difficult items were studied in separate blocks only, rather than intermixed. The results favour an attentional account of this recognition effect.

	TRS2-147	8.45 – 9.00

63. The Affective Devaluation of Inhibited Stimuli within Memory

David De Vito, Anne E. Ferrey, Mark J. Fenske
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Ignoring a visual stimulus causes it to become devalued, potentially reflecting an affective consequence of cognitive inhibition. Such 'inhibitory devaluation' occurs regardless of whether the ignored item is externally present or solely represented in visual working memory. Here we explored whether inhibition also devalues stimuli represented in longer-term memory by obtaining affective ratings within a memory-inhibition (Think/No-Think) paradigm. Stimuli whose memories were inhibited (No-think items) subsequently received more negative evaluations than non-inhibited stimuli (Novel-baseline items). This result replicated with both printed-word and line-drawn-object stimuli. Stimulus value may be modulated by cognitive inhibition whenever engaged to prioritize perception and memory retrieval.

	TRS2-147	9.00 – 9.15

64. What produces the production effect? Tests of a distinctiveness-based strategy

Glen E. Bodner, Alexander Taikh, Angela M. Lambert
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The memory advantages of producing items (e.g., saying them aloud) over silent reading have typically been ascribed to enhanced item distinctiveness, yet the use and influence of a production-based distinctiveness heuristic at test ("did I produce this item?") have not been evaluated. We measured participants' recognition and recall strategies and examined whether use of a distinctiveness-based strategy modulated the production effect. We also examined whether factors designed to increase or decrease use of a distinctiveness-based strategy modulated the production effect. Our findings suggest that the production effect appears to have more than one cause across study designs and memory tests.

	TRS2-147	9.15 – 9.30

65. Implicit learning is path dependent

Randall K. Jamieson
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It is typically assumed that implicit learning is unaffected by the order in which training items are studied--the assumption of path independence. That assumption is wrong. We present experimental data from an artificial grammar task to demonstrate and force a consideration of path dependence in implicit learning. We redress the theoretical shortcoming by adapting an established exemplar model to capture the experimental data. We conclude that other implicit learning is path dependent and that models of implicit learning must be revised to acknowledge that fact.

SATURDAY 5TH JULY	TRS2-149	8.30 – 9.30

AUDITORY PROCESSING I

	TRS2-149	8.30 – 8.45

66. An Examination of Motor and Perceptual Thresholds using Vocal, Behavioural, and Event-Related Responses to Frequency-Altered Feedback

Nichole Scheerer, Jeffery Jones
Wilfrid Laurier University nikkischeerer@gmail.com

Different sizes of vocal error are required for perceptual awareness and compensatory responses, supporting a perception-action dissociation and dual stream view of auditory processing. In this event-related potential study, participants produced vocalizations while exposed to frequency-altered feedback (FAF), and then reported whether their feedback was altered. Participants compensated for, and detected feedback alterations at, 10 and 15 cents, respectively. Detection rates correlated with vocal responses and P2 amplitudes. Negligible differences between the FAF magnitudes that elicited perceptual and motor responses suggests variability in the speech signal, rather than separate processing streams, creates different criteria for triggering perceptual and motor responses.

	TRS2-149	8.45 – 9.00

67. Compensations to Pitch-Shifted Auditory Feedback during Visual Attentional Load

Anupreet Tumber, Nichole Scheerer, Jeffery Jones
Wilfrid Laurier University anu.tumber@gmail.com

Auditory feedback is crucial for speech motor control, however, the role of attention in this process is unclear. In this event-related potential study, participants produced vocalizations while exposed to frequency-altered feedback (FAF) in a single-task condition. In a dual-task condition, participants also identified target letters in a rapid serial visual presentation stream. Compensatory vocal responses and N1 amplitudes were smaller following FAF in the dual-task condition. This suggests that increasing attentional load reduces the salience of auditory feedback, and results in smaller responses to FAF. Moreover, these results suggest that attention plays a role in speech motor control.

	TRS2-149	9.00 – 9.15

68. The Predictability of the Magnitude of Auditory Feedback Perturbations influences Vocal and Event-Related Responses

Nichole Scheerer, Jeffery Jones
Wilfrid Laurier University nikkischeerer@gmail.com

Fluent speech production relies on a feedback system driven by sensory feedback, and a feedforward system driven by internal models. However, the factors that dictate the relative weighting of these systems are unclear. In this study, participants produced vocalizations while exposed to frequency altered feedback (FAF) perturbations that were either predictable or unpredictable in magnitude. Vocal and P1-N1-P2 event-related potential responses revealed smaller vocal responses and N1-amplitudes, and shorter vocal, P1 and N1 response latencies following predictable FAF perturbations. These results suggest that exposure to predictable FAF perturbations makes auditory feedback unreliable, resulting in increased weighting of the feedforward system.

	TRS2-149	9.15 – 9.30

69. Investigating the role of repeated exposure to alterations of vocal auditory feedback

Arden Roe DeMarco, Nichole E. Scheerer, Jeffery A. Jones
Wilfrid Laurier University dema1020@mylaurier.ca

When speakers hear altered auditory feedback (AAF) regarding their vocal pitch (F0), a compensatory response is elicited. The present study was designed to determine whether repeated exposure to AAF can modify this compensatory response. Participants heard their F0 shifted downward over multiple sessions on the same day, or over several days while event related potentials (ERP) were recorded. We found that repeated exposure, regardless of when the exposure took place, reduced behavioural F0 compensation magnitude and increased P200 response amplitudes as a reaction to AAF. This suggests repeated exposure does have an effect on responses to AAF.

SATURDAY 5TH JULY	TRS1-147	8.30 – 9.30

SYMPOSIUM: **HOW TO MANIPULATE ATTENTION**
Chaired by Christine Lefebvre

In this Symposium, we explore the workings of visual attention, using electrophysiology to measure its deployment as well as its inhibition. The presentations will discuss, in turn, how low-salience distractors placed between targets increase attentional demands (Fortier-Gauthier), how low-salient distractors also increase attentional demands when they are similar to targets (Drisdelle), how higher loads in working memory (Jolicoeur) can interfere with the deployment of attention on target stimuli, as well as how attention travels on and subsides from a complex visual object (Lefebvre).

		8.30 – 8.45

70. Attention might move rather than spread on a curve

Christine Lefebvre, Talia Losier, Thibaud Audevar, Pierre Jolicoeur
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We recorded EEG while subjects determined if the two ends of a lateral curve were labelled with the same colour. Curves could end on a lateral or central point. Processing lateral visual stimuli yields an increase in negativity at posterior electrodes controlateral to the processed stimuli. This controlateral negativity returned to zero faster when the curve ended at a central point compared to when it finished at a lateral point, providing evidence that attention spreads sequentially on a traced curve, and then disengages from the maintained representation of the curve once the end point is reached.

		8.45 – 9.00

71. Relative spatial location of distractors modulate attentional deployment delay

Ulysse Fortier-Gauthier
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We explored the impact of distractors surrounding potential targets during a visual search task. The task was to identify and count the number of inverted T letters of a target color during a succession of 6 stimuli presented on screen. Each stimulus was formed of letters around an imaginary circle. 2 letters (an L and a T) of the same color were presented at a distance of 2 items in each hemifield, inverted or not, and were either bordered on the circumference by no additional grey distractor, 2 inside the area between the 2 color letters, 2 outside the area or 2 inside and 2 outside. The amplitude of the N2pc was larger for irrelevant distractors outside than for distractors inside or inside and outside. On the other hand, activity following the N2pc was displaying the inverted pattern with the largest amplitude related to the inside and outside condition, while the outside only condition and inside condition showed reduced amplitude. This pattern of activity is compatible with a systematic delay of attentional deployment with increasing crowding where the distractors are being less disruptive to the deployment of attention outside than inside the area delimited by 2 potential targets.

		9.00 – 9.15

72. The effect of spatial distance and physical similarity between a target and a salient distractor on attentional selection: Evidence from the N2pc component

Brandi Lee Drisdelle, Pierre Jolicoeur
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Our objective was to investigate the neural mechanisms of visuo-spatial attention by manipulating the spatial distance and physical similarity of salient items in a search task. Similarity of stimuli was manipulated using line orientation, where lines with smaller orientation deviations from the target were considered more similar and thus more difficult to differentiate. Distance was also manipulated; a target and a salient distractor where either adjacent or separated by three non-salient distractors. Results demonstrate an increase in N2pc with increasing similarity and a decrease in N2pc with decreasing distance. No interaction is observed between physical similarity and spatial distance.

		9.15 – 9.30

73. Components in the machine: Dynamics of attention and sensory memory revealed by electroencephalography

Pierre Jolicoeur
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Human electrophysiology has provided strong complementary evidence to that provided by psychophysics and other neurobiological measures, and enables a deeper and more complete understanding of fundamental mechanisms of attention and memory. I will summarize recent work on mechanisms of selective visual attention reflected by event-related potential indices of spatial attention (N2pc) and working memory (SPCN and P3), and by event-related changes in oscillatory electric brain activity (event-related spectral perturbations).

SATURDAY 5TH JULY	TRS1-149	9.45 – 10.45

AGING

	TRS1-149	9.45 – 10.00

74. How Does Mood Affect Cognitive Control in Younger and Older Adults?

Linda Truong, Lixia Yang
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Research has demonstrated that emotion can be both beneficial and detrimental to cognitive control. How does emotion influence cognitive control in older adults, considering age-related cognitive control declines in the face of preserved emotional processing? The current study examined whether induced positive, negative, or neutral mood influences use of proactive and reactive control modes (Braver, 2012) in younger and older adults. Preliminary analyses on AX-CPT task response times suggested use of a proactive control strategy by younger adults (n=45) that did not vary by mood induction. Data collection for older adults is ongoing and results will be discussed.

	TRS1-149	10.00 – 10.15

75. Age-related differences in neural oscillations during a visuospatial working memory task

Renante Rondina II, Rosanna K Olsen, Lily Riggs, Jed A Meltzer, Jennifer D Ryan
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Our previous work has shown that spatial memory formation is supported through the binding function of the hippocampus. However, aging is associated with structural and functional changes in the hippocampus. Spatial memory formation was examined in younger and older adults using a short-delay task; neural recordings were obtained with magnetoencephalography. In younger adults, binding demands were reflected in hippocampal theta oscillations, which were correlated with performance. Older adults' memory performance was similar to that of younger adults, but instead correlated with parietal alpha oscillations. This suggests older adults used hippocampal independent cognitive processes to support the online maintenance of relations.

	TRS1-149	10.15 – 10.30

76. Improving Associative Memory in Older Adults with Unitization

Fahad Naveed Ahmad, Myra Fernandes, William Hockley
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We examined if unitization of pre-experimental associations reduces associative deficit in older adults. In Experiment 1, during encoding, younger and older adults studied compound (e.g. store keeper) and non-compound (e.g., needle birth) word pairs. In yes-no associative recognition test older adults showed a discrimination advantage for compound word (CW) pairs. In Experiment 2, reducing study time decreased associative recognition in younger adults, but did not produce a discrimination advantage for CW pairs. In Experiment 3, younger adults showed a discrimination advantage for CW pairs in a forced-choice test. We suggest unitization of pre-experimental associations alleviates age-related associative deficit.

	TRS1-149	10.30 – 10.45

77. Aging and Unitization: Unitization Supports Relational Learning in Healthy Older Adults but not those At-Risk for MCI

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The relational memory theory of hippocampal function emphasizes the role of the hippocampus in forming lasting representations regarding arbitrary relations among distinct items. Consistent with this account, relational learning in transverse patterning (TP) is impaired in amnesic patients and age-related reductions in hippocampal volumes relate to deficits in TP. Despite these deficits, some amnesic patients can learn novel relations in this task when given a unitization strategy. Here we examined whether older adults benefit from a unitization strategy in the TP task. Healthy older adults benefited from unitization, while those at-risk for MCI had difficulties retaining relations in all conditions.

SATURDAY 5TH JULY	TRS2-147	9.45 – 10.45

MEMORY II

	TRS2-147	9.45 – 10.00

78. Working memory load varies during sentence processing

Elisabet Service, Cassandra Chapman, Tiffany Deschamps
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In the sentence span paradigm, sentences have to be comprehended, and after each, a word added to a memory list. The elusiveness of syntactic complexity effecs in this task may be caused by the memory words being encountered after completion of syntactic processing. We manipulated the location of the memory word during processing of simple sentences. Memory was poorer when the words were presented in sentence-internal compared to sentence-final positions. We conclude effects of syntactic processing on memory can best be studied in interference paradigms, which allow detection of momentary syntactic demands at strategic points in phrase processing.

	TRS2-147	10.00 – 10.15

79. Word frequency sequency effects support criterion-calibration rule

Samuel Hannah
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Research on whether a decision criterion can shift within a recognition memory test has been the subject of much debate, yielding evidence against (e.g., Stretch & Wixted, 1998; Verde & Rotello, 2007) and in favour of within-test shifts (e.g., Benjamin & Bawa, 2004; Singer, Gagnon & Richards, 2002; Singer & Wixted, 2006). Hannah and Allan's (2011) criterion-calibration rule allows for a criterion that moves trial-by-trial to the approximate middle of the range of stimulus strength. Once in the middle, only negligible--and typically unobservable--shifts then occur. Data averaged over the entire test would thus typically reveal no shifting behaviour. A modified version of the rule yields simulations leads to predictions that following study of high- and low-frequency words, recognition would show criterion shifts when high-frequency test words are preceeded by low-frequency test words, but with that effect dropping out over trials. Along with the simulations, we present preliminary evidence from an ongoing experiment testing these predictions.

	TRS2-147	10.15 – 10.30

80. Categorical and Sub-categorical Properties in Immediate Recall for Mixed-Lists

Jordan Richard Schoenherr, Robert Thomson, Guy Lacroix
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The category-order effect (COE) is observed when the categorical properties of items within the first half of a given list affect recall performance in an immediate serial-recall task. In two experiments, we examined whether this recall advantage is a consequence of categorical properties (e.g., semantic-relatedness and category set-size) or whether the advantage is due to sub-categorical properties (e.g., orthographic similarity and word frequency). These experiments revealed that sub-categorical properties such as orthography (Experiment 1) and frequency (Experiment 2) produced effects that had been previously attributed to categorical representations in long-term memory.

	TRS2-147	10.30 – 10.45

81. Central Attentional Resource Requirements for Encoding Sequential Versus Simultaneous Displays in Visual Short-Term Memory

Biljana Stevanovski, Randi A. Doyle
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We investigated the central attentional resources used to encode sequential versus simultaneous displays. Participants performed a visual memory task and a speeded tone pitch discrimination task. When completed concurrently, performance decrements in these tasks revealed competition for attentional resources. Encoding sequential and simultaneous displays required similar attentional resources; dual-task effects on tone task response times and accuracy were not affected by display type. Although sequential displays yielded higher memory accuracy than simultaneous displays, this pattern was related to the number of to-be-encoded items in initial displays. Implications of the results are discussed, focusing on previous reports and short-term consolidation.

SATURDAY 5TH JULY	TRS2-149	9.45 – 10.45

AUDITORY PROCESSING II

	TRS2-149	9.45 – 10.00

82. The Physiological Underpinnings of Why We Love to Groove

Claire Slavin-Stewart
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Music, in particular groovy music, compels us to move. Groove is defined as a pleasurable drive toward action. The present study examines whether brain activity, respiration, and heart rate are modulated by groove. The EEG data revealed a main effect of groove and an interaction between groove and EEG frequency bands. Analysis of heart rate demonstrated that high-groove music elevates heart rate compared to low-groove music. The measure used for Heart Rate Variability (HRV) indicated that HRV was lower for high-groove versus low-groove music. The results suggest that there are physiological underpinnings to the drive to move to groovy music.

	TRS2-149	10.00 – 10.15

83. A unified approach to studying vocal attractiveness

David Russell Feinberg
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Most research on vocal attractiveness takes a functionalist perspective, tackling questions about why voices are attractive and what ultimate functions these perceptions serve. On the other hand, most research on voice perception and processing takes a mechanistic approach, tackling questions about proximate neural and cognitive mechanisms that give rise to our perceptions. Here I present research marrying mechanistic, functionalist, and developmental approaches to voice attractiveness in an effort to provide a more comprehensive view of the field. Here I unite research on psychophysics, memory, cognitive bias, averageness, hormones, behavioural ecology, and developmental the trajectory of preferences for voices.

	TRS2-149	10.15 – 10.30

84. Computationally Modeling Musical Emotion Appraisals Using Audio and Physiological Features

Naresh N. Vempala, Frank A. Russo
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Listeners provide emotion appraisals of music by perceiving emotion-specific features within music. Previous studies and models have supported this position. Another position is that listeners not only perceive emotion in music but also feel it; their emotion appraisals are based on this experienced emotion. Studies of physiological responses during music listening support this position. We propose that listeners make emotion appraisals based on a combination of what they perceive as well as what they experience during the listening process. We explore these positions using neural networks, and discuss the implications of these networks as possible cognitive models of emotion appraisal.

	TRS2-149	10.30 – 10.45

85. Coordination of expressive movements with music: Underlying mechanisms and novel treatments for emotion processing disorders

Frank Russo
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Research in my lab has examined the role of mimicry in face-to-face communication. The mimicry is typically spontaneous involving subtle muscle activations that are detected using electromyography or facial motion capture. The extent of mimicry is correlated with emotional accuracy and trait empathy. Experimental manipulations that interfere with mimicry lead to decrements in emotional accuracy and slowed reaction times. I will argue that the rhythmic temporal arts provide scaffolding for the coordination of expressive movements. Progress will be described on new imitation therapies we have developed that use song to support the rehabilitation of spontaneous mimicry in clinical populations.

SATURDAY 5TH JULY	TRS1-147	11.00 – 12.00

SYMPOSIUM: **INDIVIDUAL DIFFERENCES AND PERFORMANCE IN COGNITIVE TASKS**
Chaired by Lisa Boucher

We consider how cognitive predispositions and resource limitations are critical determinants of success in navigating complex, dynamic environments. The first talk examines how central capacity limitations affect the use of perceptual (acoustic) and phonemic (long-term) information during speech perception. The second talk examines how psychopathic characteristics affect interference in an emotional Stroop task. The third talk investigates the extent to which autistic-like traits in subclinical populations predict language lateralization in a dichotic listening task. In the final talk, working memory capacity and thinking style are related to biases in decision-making in the context of a syllogistic reasoning task.

	TRS1-147	11.00 – 11.15

86. Overconfidence in Nonlinearly Separable Category Structures as Evidence for Dissociable Category Learning Systems

Jordan Richard Schoenherr, Guy Lacroix
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Two learning systems are believed to determine people's ability to classify object and events. Whereas the representations of a hypothesis-testing system are believed to be available to subjective awareness, those of procedural-learning system are believed to be inaccessible. We re-examined these claims by examining differences in categorization response accuracy and trial-by-trial confidence. In two experiments, participants exhibited greater overconfidence when learning rule-based category structures relative to information-integration category structures. We additionally found evidence that suggested that the hypothesis-testing system failed to encode exceptional exemplars or negative feedback, leading to overconfidence relative to the procedural-learning system.

	TRS1-147	11.15 – 11.30

87. Psychopathic Characteristics and Facial Expression Recognition in a Face-word Stroop Task

Angel Mackenzie, John Logan
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Psychopathy is a disorder of personality characterized by shallow affect and impulsive behaviour. Psychopathic characteristics can be measured in the population and scored continuously. Participants (320 undergraduates) were presented with facial expressions with superimposed emotion words (eg. "happy") that were congruent or incongruent with the emotion represented in the facial expression. The study's objective was to explore whether differences in facial expression recognition exist based on an individual's psychopathy score; specifically, whether these differences are influenced by face-word congruence, ie. whether congruent face-word images produce facilitation (faster, more accurate recognition) and incongruent face-word images produce interference (slower, less accurate recognition).

	TRS1-147	11.30 – 11.45

88. Language Laterality as a Predictor for Autistic-Like Traits

Georgina Faddoul
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Autism spectrum disorder (ASD) is associated with language deficits, which is related to atypical language lateralization. The goal of the current study was to investigate the extent to which autistic-like traits at a subclinical level would predict language laterality. It was hypothesized that individuals with higher autistic-like traits, as measured by the autism quotient questionnaire (AQ) would display less hemispheric lateralization on a linguistic dichotic listening task than those with lower autistic-like traits. The results failed to yield the expected association. This negative finding may have been due to the poor psychometric properties of the AQ.

	TRS1-147	11.45 – 12.00

89. Individual Differences Influence the Degree of Source Expertise Bias in Syllogistic Reasoning

Lisa Boucher, Guy Lacroix
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Similar to Copeland, Gunawan, and Bies-Hernandez (2011), the present study investigated the influence of source expertise characteristics on people's syllogistic reasoning performance. Each conclusion was presented by either an expert or a non-expert. In the present experiment, visual images of the sources were added as a manipulation. Furthermore, individual differences measures were included to investigate whether working memory capacity and thinking styles relate to the source expertise bias. In contrast to Copeland et al., the bias was not found among the full sample of participants, but rather only among those who scored low on the Cognitive Reflection Test (Frederick, 2005).

SATURDAY 5TH JULY	TRS1-149	11.00 – 12.00

COGNITIVE PROCESSES I

	TRS1-149	11.00 – 11.15

90. Do gestures matter? The implications of learning mathematics on a tablet computer

Adam K Dubé, Rhonda N McEwen
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The gestures used to control math applications on tablet computers may augment how number concepts are mentally represented. Adults completed a number line task on a tablet using either a tap or a drag gesture (n = 20 per condition). Using a tap gesture produces a gesture-concept mismatch—tapping is a discrete gesture whereas the number line is a continuous concept—and this may cause the number line to be incorrectly represented as a discrete concept. Participants in the tap condition performed worse on subsequent near and far transfer tasks, suggesting physical interactions may mediate how number concepts are learnt.

	TRS1-149	11.15 – 11.30

91. Beyond the Lab: Visuomotor Tasks on a Portable Tablet

Christopher Dale Bedore, Hugo Lehmann, Liana Elizabeth Brown
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The double step task and interception task are two commonly used laboratory-based tests to assess visuomotor function. Here we developed a version of each task for use on a tablet (iPad) and compared its results to the "standard" in-lab versions. We found, on the double-step task, that participants produce similar reaching patterns in both the laboratory and iPad versions, adjusting to the displaced target. The results from our interception task will also be presented and discussed. Ultimately, these tablet tasks may be integrated in the clinical assessment of brain injury causing visuomotor deficits.

	TRS1-149	11.30 – 11.45

92. Negative Slot Machine Sounds Make Losses More Memorable

Michelle Jarick, Candice Jensen, Trista Simpson, Michael Dixon, Kevin Harrigan
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Unprecedented growth in slot machines over the years has caused concern for problem gambling in Canada. Slot machines design, complete with exciting jingles following wins serves to entice the senses and reinforce gambling behaviour. We investigated the effect sound has on the recollection of wins and losses during a gambling session. Participants estimated the frequency of wins or losses following two sessions gambling with a slot machine simulator: with audio feedback for wins only or audio feedback for both wins and losses. Subjective estimations revealed that participants did overestimate the amount of wins, but not when presented with losing sounds.

	TRS1-149	11.45 – 12.00

93. Event-related responses to feedback regarding decisions made using relevant and irrelevant information

Vivian O. Cheng, Nichole E. Scheerer, Jeffery A. Jones
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Gamblers use available information when placing bets, but it is unclear how the relevance of the information influences their evaluation of the outcome. In this event related potential study, participants placed bets on horse races after being provided with relevant (horses' winning percentages), or irrelevant (horse colours) information. Three experiments with different win/ loss probabilities were conducted to examine whether probability interacts with the relevance of information to change how decision feedback was processed. Results indicated that the feedback related negativity was sensitive to information relevance, while the P3 indexed outcome probabilities.

SATURDAY 5TH JULY	TRS2-147	11.00 – 12.00

MEMORY III

	TRS2-147	11.00 – 12.00

94. Body position induces an "incongruency effect" on memory (you might want to read this lying down)

Todd A Girard, Vanessa Amodio, Juliet Peers, Candice Bodnar
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Body position and context can affect some forms of perception and cognition. To investigate whether congruency of body position influences verbal episodic memory, we tested healthy undergraduates on their memory for word lists under same and different body positions (lying and standing) across study and recognition phases. Contextual memory theories predicted a congruency effect such that recognition would be greater when participants were in the same position as at study. However, in direct contrast to this expectation, we observed a robust "incongruency effect": Participants demonstrated greater accuracy and faster responses when body position differed across study and test.

	TRS2-147	11.15 – 11.30

95. I just met you, and memory's hazy: Producing your name will help recall, maybe?

Kathleen L. Hourihan, Alexis R.S. Smith
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Research has shown that saying a word aloud improves our memory for that word relative to words from the same set that were read silently: the production effect. Production improves memory for single words, word pairs, sentences, and paragraphs; can it improve memory for face-name associations? Participants studied 32 face-name pairs by reading half of the names aloud and half of the names silently, and were tested with cued recall. Surprisingly, there was no production effect observed in the study. There are several possible reasons discussed as to why the production effect was not observed in this study.

	TRS2-147	11.30 – 11.45

96. Facial characteristics influence recall accuracy for romantic reputations

Jillian O'Connor
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Women have enhanced recognition memory for information encountered alongside the faces of men they find attractive. Also, social information regarding fidelity alters women's face preferences. We tested whether recall accuracy for romantic reputations was influenced by facial characteristics associated with perceptions of attractiveness. Participants were shown faces labelled "unfaithful" or "faithful". After a distractor task, participants were asked to recall the reputation of each face. Faithful reputations were recalled more accurately for faces perceived as more trustworthy, but surprisingly, unfaithful reputations were recalled less accurately. This is the first study to demonstrate that facial characteristics alter memory for social information.

	TRS2-147	11.45 – 12.00

97. Truth and Accuracy Appraisals in Autobiographical Remembering

Alan Scoboria
University of Windsor s

Various conceptualizations of autobiographical remembering propose roles for multiple distinct metamemorial appraisals. Within and between frameworks, the term 'belief' is used loosely to refer to different constructs. The research reported in this talk distinguishes belief in the occurrence of events from belief in the accuracy of memory representations. Two studies (N=299; N=1,026) are reported in which different procedures were used to elicit autobiographical memories, which participants then rated in terms of autobiographical belief, belief in accuracy, recollection, and other characteristics. Confirmatory factor analytic techniques reveal distinct belief in occurrence, belief in accuracy, event cohesion, and recollection latent variables.

SATURDAY 5TH JULY	TRS2-149	11.00 – 12.00

AUDITORY PROCESSING III

	TRS2-149	11.00 – 11.15

98. Music training enhances implicit imitation of timing in both music and language domains

Bing-Yi Pan, Annabel Joan Cohen
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In 17 short tasks (13 singing, 4 speaking) of the AIRS Test Battery of Singing Skills, 20 musicians and 20 non-musicians were asked to repeat a vocal sung or spoken model (no particular focus was directed to timing). We hypothesized that musicians would implicitly imitate timing of the model more accurately than would non-musicians. Over all tasks, timing accuracy of sung and spoken responses was higher for musicians--in 11 tasks (2 language) $p < .05$, and in 7 tasks (all music) $p < .01$, suggesting that music training enhances implicit imitation of timing in both music and language domains.

	TRS2-149	11.15 – 11.30

99. Effects of complexity and music training in a rhythm discrimination task in younger and older adults

Katherine Thompson, Annabel Joan Cohen
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In a same-different rhythm recognition study, similar to Grahn and Brett (2009), 30 young and 30 older adults (M= 21.8 and 75.6 years respectively) in each trial compared a final rhythm to 2 previously presented. Half of each group was musically trained. Accuracy decreased with age, $F(1, 58)=12.77$, $p<.001$, and rhythm complexity (beat-based versus non-beat based), $F = 33.37$, the latter paralleling Grahn and Brett for healthy adults (M=57 years), further substantiating their distinction between Parkinson's disease and normal aging on rhythmic tasks. Hours current musical engagement correlated with accuracy in complex-rhythmic conditions for younger participants only, $r(58)= .26$, $p=.04$.

	TRS2-149	11.30 – 11.45

100. Role of endogenous rhythms and motor familiarity in timing of duet music performance

Anna Zamm, Chelsea Wellman, Caroline Palmer
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Joint actions like ensemble music performance require that people coordinate the timing of actions with partners whose endogenous rhythms and motor sequences may differ from their own. We address these factors in duet piano performance: Pairs of pianists were matched or mismatched for natural frequencies (endogenous rhythms), as measured in stable rates of solo performance. Pair members learned and performed melodies using the same or different hands, as a manipulation of motor sequences. Timing of duet performance revealed that synchronization was enhanced between pairs matched for natural frequencies. This effect transcended the hand movements used, supporting generalization across effectors.

	TRS2-149	11.45 – 12.00

101. Auditory Feedback Perturbations Affect Duet Music Performance

Alexander Pantelis Demos, Caroline Palmer, Marcelo M Wanderley, Ruby Dixon
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Group music performance requires tight temporal coordination. To test action simulation and dynamical systems accounts of joint action, we manipulated auditory feedback during piano duets. During performance, auditory feedback from self, partner, or both were removed unpredictably and temporarily from sound delivered to both pianists. We measured the temporal disruption caused by feedback removal and the recovery time following its return. Consistent with dynamical systems, removal of auditory feedback from one or both persons created temporal disruption; the return of coordination was also equivalent across feedback conditions. These findings suggest that musicians coordinate by forming a coupled dynamical system.

SATURDAY 5TH JULY	TRS1-147	2.30 – 3.30

SYMPOSIUM: **SHARING AND DISTINGUISHING INTERPERSONAL ACTIONS**
Chaired by Jeremy Hogeveen

Humans are incredibly adept at perceiving, understanding, and predicting the actions of others. The ability to accomplish this impressive social feat requires a dynamic interpersonal action representation system: whereby we simulate others' actions in our own sensorimotor coordinates in order to plan similar, distinct, or complementary actions of our own. In the proposed symposium, speakers will consider how this interpersonal action representation system works. Talks will focus on imitation, where action simulation leads to overt replication of others' bodily movements, and also on joint action, where action simulation needs to be run in parallel with potentially distinct planned movement sequences.

	TRS1-147	2.30 – 2.45

102. BDNF Val66Met polymorphism configures sensorimotor resonance in the human mirror system

Vincent Taschereau-Dumouchel, Sébastien Hétu, Elsa Massicotte, Yvon, C. Chagnon, Philip L. Jackson
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Heated debates in the mirror neuron literature have opposed two views of their ontogeny: the genetic (present at birth) and associative learning perspectives (acquire through experiences), but no genetic factor has been associated to their function so far. We conducted a study on the BDNF Val66Met polymorphism shown to affect experience-dependent plasticity in the primary motor cortex, the brain region mainly targeted in TMS studies of the system. Our results indicate that Met participants presented less sensitivity and specificity during action observation but no difference in associative learning. These results represent the first direct evidence of a genetic variant affecting sensorimotor resonance in the mirror system.

	TRS1-147	2.45 – 3.00

103. Elucidating and enhancing the brain's imitation control network

Jeremy Hogeveen, Sukhvinder S Obhi, Michael J Banissy, Idalmis Santiesteban, Caroline Catmur, Clare Press, Geoffrey Bird
Wilfrid Laurier University jeremy.hogeveen@gmail.com

Humans often unintentionally mimic their interaction partners, but are also adept at controlling this "automatic" behavioural tendency. In fact, the failure to appropriately modulate imitation has been linked to disorders of social cognition such as autism. Evidence suggests the human mirror system is likely involved in the performance of imitation during social interactions. However, using transcranial direct current stimulation applied to inferior frontal cortex (IFC), we show that the mirror system plays a more dynamic role in the control of imitation than previously assumed. Specifically, ramping up IFC excitation both increased imitation, and imitation-inhibition, depending on which response was context-appropriate.

	TRS1-147	3.00 – 3.15

104. On the processes underlying the action prediction in individual and social contexts

Tim Welsh
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To complete joint action tasks, individuals need to be able to predict their own action capabilities and the capabilities of their co-actors. Recent research suggests that "self" and "other" action predictions are based on a simulation of the individual's own performance. Key evidence supporting the role of individual simulation in action prediction involves the effect that recent action execution has on action judgments and how the threshold of capability is adjusted based on the characteristics of other people. In the present talk, the evidence in favour of the simulation hypothesis, and how it fits with ideomotor theory, will be discussed.

	TRS1-147	3.15 – 3.30

105. Monitoring shared goals in joint action

Janeen Loehr
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Efficient and flexible behaviour requires that people monitor the outcomes of their actions to ensure that their goals are achieved. Monitoring the outcome of a joint action, in which multiple individuals coordinate with each other to achieve a shared goal, poses unique challenges to the action monitoring system. This talk will present evidence that people are able to prioritize shared action goals over the individual action goals that comprise them, monitor their own and others' actions in parallel, and take ambiguity with respect to the agent responsible for an unfavourable outcome into account when monitoring shared goals during joint action.

SATURDAY 5TH JULY	TRS1-149	2.30 – 3.45

COGNITIVE PROCESSES II

	TRS1-149	2.30 – 2.45

106. Frontal and posterior networks underlying probabilistic reasoning follow distinct timecourses: a multimodal MEG/fMRI study

Jen Whitman
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We identified functionally connected brain networks underlying probabilistic reasoning by combining functional magnetic resonance imaging (fMRI) data with magnetoencephalography (MEG) data. With a temporal resolution of 50 ms and a spatial resolution of 4 mm, we described networks formed from changes in the power of cortical oscillations. Deciding how to respond recruited a frontal network involving increased alpha (~10 Hz) and beta (~20 Hz) power in anterior cingulate and prefrontal cortices. Several posterior networks activated by the task were dominated by decreased alpha and beta power and increased theta (~5 Hz) power in parietal and lateral occipital regions.

	TRS1-149	2.45 – 3.00

107. The role of the mirror system in processing emotional action in visual and auditory modalities

Lucy M.J. McGarry, Frank A Russo, Emily S Cross
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The human mirror system (MS) is differentially responsive to a) visual observation of emotional vs. neutral body actions; and b) auditory observation of emotional vs. neutral vocalizations. However, MS responsiveness to auditory observation of emotional body actions remains unclear. In addition, questions remain about top-down vs. bottom-up influences of emotion. The current fMRI study manipulated judgment type as well as stimulus type (emotional vs. neutral) presented via vision or audition. Both emotion manipulations elicited enhanced activation of the inferior frontal gyrus under both modes of presentation, suggesting that the MS plays a special role in emotion processing.

	TRS1-149	3.00 – 3.15

108. The nearly null cognitive effects of relaxation

Bruce Oddson
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Stress can been showed to impair cognition; relaxation can remove these impairments. Less is known about relaxation's comparison to neutral states. The topic is pertinent due to interest in the impact of positive emotional states – because these tend to be conflated with relaxation. I show that relaxation has a nearly null effect on change detection and visual search. Subjective ratings and some physiological data show that the control and relaxation groups show considerable overlap in terms of actual relaxation during task performance. Results show no carry over effect of relaxation and little impact of reported state on each task.

	TRS1-149	3.15 – 3.30

109. Boredom, Aggression, and Mind-Wandering

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Boredom has been linked to a variety of cognitive and emotional disturbances such as depression, aggression, and executive functions including poor self-control. We surveyed 2,330 undergraduate students on measures of boredom, aggression, and mind-wandering to investigate how these constructs were related. Using hierarchical regression analyses, results indicated that boredom was significantly predicted by depression, aggression and spontaneous mind-wandering. In a separate fMRI study we found that a boredom induction evoked default network activation. Taken together, these results imply a strong relationship between boredom and mind-wandering, warranting future investigation in groups with cognitive and emotional disturbances, such as individuals with TBI.

	TRS1-149	3.30 – 3.45

110. Visual Word Identification: Is Semantic Processing Capacity Free?

Derek Besner, Michael Reynolds
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It is a received view in cognitive psychology, neuroscience, and social cognition that semantics is "automatically" activated by a printed word. One definition of "automatic" is that a process needs no resources. We discuss several experiments in which the Stroop task is examined with the PRP paradigm given that this paradigm allows one to determine whether a process is resource demanding. The central result is that the semantically based Stroop effect is additive with SOA on RT, a result which, together with other findings, is consistent with the conclusion that semantic activation is resource demanding

SATURDAY 5TH JULY	TRS2-147	2.30 – 3.15

MEMORY IV

	TRS2-147	2.30 – 2.45

111. Serial Order Coding: Shared Mechanism in Verbal and Visuospatial STM

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Verbal sequences containing non-adjacent repeated items are recalled less well than ones with unique items (repetition inhibition; the Ranschburg effect). We studied repetition inhibition using a visuospatial serial order reconstruction task. This replicated the verbal Ranschburg effect. However, the pattern of recall errors in sequences with repeated items did not match that found in the verbal domain. In a second experiment, serial visuospatial STM interfered with digit recall more than non-serial visuospatial STM. This pattern of results suggests that verbal and visuospatial domains may share a general ordering mechanism. However, this may be complemented by modality-specific processes.

	TRS2-147	2.45 – 3.00

112. Is it possible to learn more than one sequence with the Hebb repetition paradigm?

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The Hebb repetition effect refers to the better recall of a repeated sequence in immediate serial recall. Although the effect has been reproduced many times, it is still unknown whether more than one lists can be learned simultaneously. Sixty participants performed a spatial reconstruction task with sequences of seven dots. In the two-list condition, two sequences were repeated every fourth trial. In the control condition, only one list was repeated. Our results showed that recall performance for the repeated sequences improved to the same extent in the one and the two sequence conditions.

	TRS2-147	3.00 – 3.15

113. Cognitive Offloading in a Perceptual Task: The Role of Working Memory Demand

Timothy L Dunn, Evan F Risko
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Cognitive offloading (i.e., trading off internal processes for external ones) can be considered a means of subverting our capacity limitations. We tested this idea by manipulating working memory (WM) demands across two tasks that featured both upright and rotated displays and measured spontaneous head tilting (a form of cognitive offloading). Surprisingly, results demonstrated that spontaneous head tilt increased as a function of WM demand despite no increase in the cost of stimulus rotation. This result suggests that cognitive offloading is influenced by non-specific demands placed on the cognitive system (i.e., demands putatively not related to the internal processes being offloaded).

SATURDAY 5TH JULY	TRS2-149	2.30 – 3.45

ANIMAL BEHAVIOUR

	TRS2-149	2.30 – 2.45

114. Rudimentary metacognitive control? Information-seeking Behaviour in Old and New World Monkeys

Heidi L. Marsh, Alexander Vining, William A. Roberts
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Lion-tailed macaques and capuchin monkeys were tested on an object-choice task, in which hidden food could be optionally located by peering under the objects through Plexiglas. Both species chose correctly without looking through the Plexiglas, when shown the location of food, in keeping with a metacognitive interpretation. When shown the absence of food under one object, both species sought information by looking under the objects, although they could have inferred the food's location by logical exclusion. This behaviour may represent a rudimentary version of metacognitive control in both species, compared to great apes and humans.

	TRS2-149	2.45 – 3.00

115. Midsession Reversals of Go/No-Go Task Contingencies in Chickadees and Pigeons

Neil McMillan, Christopher B. Sturdy, Marcia L. Spetch
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We trained both pigeons (Columba livia) and black-capped chickadees (Poecile atricapillus) on analogous go/no-go procedures. Responses to one stimulus were reinforced with food, while responses to the other led to a timeout; these contingencies reversed every 40 trials. We were interested in whether subjects would produce errors (consistent with previous research) resulting from deliberate reversals in choice behaviour, or alternatively from an inability to inhibit responding near the reversal to stimuli which are proximally (but not currently) rewarded.

	TRS2-149	3.00 – 3.15

116. Interval Timing in the Domestic Dog

Krista Macpherson, William A. Roberts
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A peak procedure was used with dogs trained on 30 second fixed intervals. When 1 minute probe trials were introduced, the dogs' rate of responding rose to a peak around 30 seconds, even in the absence of reward. In a second experiment, a bi-section task was used in which dogs had to learn to approach one feeder when given an 8 second signal, and another when given a 2 second signal. The signal had both visual (light) and auditory (tone) properties. When the signal was dissociated, dogs successfully used the tone, but not the light, in making their selections.

	TRS2-149	3.15 – 3.30

117. Dog Deception Using Transparent Containers that were Obviously Baited or Non-Baited

Candice Dwyer, Mark Cole
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8 dogs chose between transparent containers, 1 obviously holding food and the other obviously empty. On 20 trials, 1 experimenter (cooperator) pointed to the baited bucket, whereas on 20 trials, a different experimenter (deceiver) pointed to the empty bucket, both saying "look", before the dog was released. The dogs chose the bucket pointed to by the cooperator on most of their choices, whereas they went to the bucket pointed to by the deceiver on about half of their choices. These results replicate earlier findings by Petter, Musolino, Roberts, and Cole (2009) in showing no evidence of human intentionality in dogs.

	TRS2-149	3.30 – 3.45

118. Differential Actions of Low-Dose Nociceptin on Anxiety-Like Performance in Alcohol-Withdrawn vs. Control Rats

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Nociceptin, an endogenous ligand at the NOP receptor, has previously been shown to attenuate or exacerbate anxiety-like performance in rats following a biphasic dose response curve. In addition, divergent actions on anxiety-like performance have been observed in alcohol-dependent vs. control animals, indicative of alcohol-induced increased sensitivity in nociceptin transmission. We assessed this hypothesis by examining the actions of low doses of nociceptin on two tests of anxiety – the shock-probe burying and elevated plus maze. Consistent with our hypothesis, nociceptin (0.25 micrograms) three weeks after alcohol administration reduced anxiety to a greater extent than did other doses only in alcohol-withdrawn rats.

THURSDAY 3RD JULY	Student Lounge / Cara Commons / TRS1-073	2.30 – 4.00

POSTER SESSION A **A1 – A16 are assigned to Student Lounge**
COGNITIVE PROCESSES **A17 – A44 are assigned to Cara Commons**
A45 – A60 are assigned to TRS1-073

A1 Erroneous cognitions: key in the development of problem gambling?

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The cognitive model of problem gambling (PG) asserts: Gambling fallacy (GF) susceptibility is key in the development and maintenance of PG. The current study (n = 4121, 5 year longitudinal design with 92% retention rate), evaluated the relationship between gambling fallacy susceptibility and actual gambling engagement measures that are known to increase with PG severity: gambling expenditures (money), amount of time spent gambling, and number of gambling formats engaged in. It was found that GF are statistically - but not practically - significantly associated with gambling engagement measures. Implications for problem gambling prevention and treatment are discussed.

A2 Is search for Kanizsa illusory contour figures always inefficient?

Natasha Dienes, Lana M Trick
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Li, Cave and Wolfe (2008) used a horizontal-vertical orientation-based search task to assess the attention demands of processing illusory contour figures. They found that Kanizsa illusory contour figures cannot guide attention in a visual search task, but that figures composed of a real contour and the Kanizsa inducers can. The current experiments replicate this pattern of results using different spacings, stretched figures and a diagonal-horizontal orientation-based search. These results indicate that although some searches for Kanizsa illusory contour figures may be easier than others, the search is always inefficient compared to figures with a real contour.

A3 The Spatial Resolution of Attention: What is the Contribution of Parafoveal Information During Visual Search?

Michael Reynolds, Devine Heinze Kehoe, Ben Bauer
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Visual search performance can be explained by models of visual attention that postulate a serial attention mechanism that selects a subset of items for elaborative processing and a parallel (pre-attentive) mechanism that guides attention to salient locations in the visual display (e.g., Wolfe, 1994). The present study examines the spatial resolution of pre-attentive guidance in feature and conjunction search conditions using gaze-contingent moving windows (McConkie & Rayner, 1975). Evidence suggested that multiple items are compared in parallel for both feature and conjunction search conditions. The data were consistent with a weaker guidance signal from the conjunction target and that signal from the conjunction target only guides attention when focal attention is within 7° of the target. No such limitation was observed for guidance from feature targets.

A4 When is a "4" a "four": Evidence for task specific differences in script processing

Michael Reynolds, Natalie Ford
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Three experiments are reported that utilize a variant of the task switching procedure to examine whether processing is reconfigured in response to switches between numerals and number words. Three tasks were used (1) naming, (2) parity judgment, and (3) magnitude estimation. In each task subjects were shown numerals (e.g., '4') and number words ('four') in a repeating AABB pattern. Insight into whether numerals and number words were being processed differently was inferred by comparing response times on switch (A-> B and B->A) trials to non-switch trials (A->A and B->B). Additional insight into the processes that were changing was gained by examining response repetition and item level effects. Implications for models of numerical cognition are discussed.

A5 Timing Accuracy: The Effect of Feedback

Janel Fergusson, Peter Graf
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Many everyday tasks require us to attend to and accurately judge the passing of time, such as steeping the perfect cup of tea or meeting a coworker in 5 minutes. Previous research has suggested that current models of time perception might require modification in order to explain timing in this range. The present study was designed to determine whether subjects are able to use feedback to improve their timing accuracy. Subjects were asked to produce intervals of 2, 4, and 6 minutes while engaged in an easy or difficult secondary task. Following each production, subjects received feedback regarding their accuracy.

A6 What about non-standard architectures? An investigation on how an artificial neural network is detected by Systems Factorial Technology

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Systems Factorial Technology is a methodology that can identify information processing architectures (serial self-terminating, serial exhaustive, parallel self-terminating, parallel

exhaustive, and coactive). Although its applicability to many paradigms involving human experiments has been shown in previous studies, its ability to detect architectures unlisted above remains unclear. By applying the methodology to the responses times of a Bidirectional Associative Memory model, a common type of artificial neural network, we show that SFT can mistakenly detect the underlying architecture as being serial exhaustive, where the BAM is a recurrent network of parallel units. This research shows that SFT is an incomplete methodology that may not be appropriate for complex architectures as it may lead to wrongful conclusions and interpretations.

A7 Effects of Emotional Experience and Valence in Lexical Decision

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Kousta et al. (2009) and Yap and Seow (2013) reported faster lexical decision latencies for positive and negative words as compared to neutral words. However, these three types of words were not matched for emotional experience (EE; Newcombe et al., 2012). We collected EE ratings for these words, and using hierarchical multiple regression analyses, we observed that EE accounted for significant amounts of unique lexical decision latency variability above and beyond valence, in both yes/no and go/no-go lexical decision tasks. We explain these results using the idea of situated conceptualization within perceptual symbol systems theory (Barsalou, 2009).

A8 Repetition Blindness Isn't: Recall Following RSVP is Not Unbiased

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The common assumption in studies of repetition blindness (RB) of the RSVP of letters in words is that the recall in this task is an unbiased, if possibly somewhat attenuated, report of the perceptual experience. Following the paradigm of Vokey, Allen & Tangen (CSBBCS 2012), standard trials of recall following RSVP were intermixed at random with various other forms of retrieval (e.g., partial report, recognition). The results demonstrated that RB is a property of the retrieval task and not a failure of perception (i.e., encoding and representation) of the RSVP experience, and thus not repetition "blindness".

A9 Pitch Perception, Harmonic Range, and the Role of Musical Expertise

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Current models suggest pitch is derived from both temporal and spatial mechanisms, but is limited to temporal mechanisms at high harmonic frequencies. However, the influence of musical training on the effectiveness of temporal mechanisms is under debate. Musicians and non-musicians were presented successive paired tones of various ranges of harmonic frequencies. They were asked to resolve the direction (up or down) of the implied fundamentals of each pair when they moved congruently or incongruently with the directions of the harmonic ranges. Results suggest that musicians are better than non-musicians at resolving pitch, especially at high harmonic frequencies (> 10,000 Hz).

A10 Dopaminergic medication impairs learning but not decision making in Parkinson's disease

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Learning is the cognitive function most frequently worsened by dopaminergic therapy in Parkinson's disease (PD). This result could reflect impairments in either learning or how learning is measured (e.g., response selection). We tested 28 PD patients on and/or off medication and 32 healthy controls. In Session 1, participants learned to associate images with key-presses through trial-and-error via feedback. In Session 2, participants provided key-presses to images learned in Session 1, without feedback to preclude new learning. Medication impaired learning in PD patients but did not influence decision performance at test. We demonstrated that dopaminergic therapy specifically impairs learning in PD.

A11 Gender Differences and the Impact of Scaffolding on Learning with a Multi-Agent Intelligent System

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In this study, we investigated gender differences and the effectiveness of pedagogical agent scaffolding on 68 university students' learning by using MetaTutor computer-based learning environment to learn about the human circulatory system. Several theoretically-based predictions were tested in this study: (1) there would be a gender by scaffolding condition interaction effect scaffolding on learning gains and several other learning and self-regulatory processes; and (2) participants in prompt and feedback condition would achieve a significantly higher proportional learning gain than those in control condition. The results showed that there was a significant main effect of gender differences on proportional learning gain.

A12 Relaxation states change response strategy in the RAT creativity task

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We evaluated the impact of passive and active relaxation manipulations. Passive relaxation was induced using 20 minutes exposure to a 8 Hz binaural beat frequency.

Active relaxation was generated using Heartmath's quick coherence protocol. Participants completed the Remote Associates Test (RAT) while physiological data was collected (GSR, HRV, EEG). RAT scores did not differ by group. However, the percentage of correct answers was significantly higher in the coherence group and was very strongly correlation to self related relaxation within each group. Relaxation did not change RAT measured creativity cognitive processes but does change participants' approach.

A13 Generalization Effects in Canadian and Chinese Adults' Simple Addition

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Several recent studies suggested that skilled adults use automatic procedures to solve small simple addition problems (e.g., 2 + 3 = 5) rather than fact retrieval from long term memory. A behavioural signature of procedure use is generalization from practice of one set of problems to a different set of problems. Thirty-six Canadian and 36 Chinese adults were tested in an addition generalization paradigm. The results showed a generalization effect in response time (RT) for the rule-based 0 + N problems (e.g., practicing 0 + 4 facilitated subsequent performance of 0 + 8) for both the Chinese and Canadian groups. There was no such effect for 1 + N problems, ties (e.g., 2 + 2), small non-tie (sum < 10) or larger non-tie simple additions for either group. The result indicate that Chinese and Canadians adults both solve simple non-zero addition problems by direct memory retrieval rather than by algorithmic procedures.

A14 Peak-end and recency effects in retrospective mind wandering judgments

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The present study examined the relation between "in-the-moment" thought-probes and global retrospective report of mind wandering depth (measured on a 7-point scale) during a sustained attention task (Metronome Response Task). Shortly after task completion, participants retrospectively rated their overall mind wandering depth during the entire task. Results indicated that participants' peak-end levels of mind wandering (i.e., average of the maximum and last probe) correlated strongly with their retrospective reports. In addition, thought probes that appeared later in the task were more strongly correlated with participants' retrospective report than thought probes that appeared early in the task.

A15 Painters' Decline: Toward the Use of Art as a Screening Tool for Alzheimer's Disease

Katherine Matthews, Jeremy Burman, Susan Murtha
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This preliminary correlational study focuses on the artwork of artist and Alzheimer's patient William Utermohlen (1933-2007). Two main variables were analyzed: complexity and similarity. Complexity was analyzed by measuring each images fractal dimension and lacunarity value, and similarity was analyzed by measuring each images structural similarity index when compared to a 2003 photo of Utermohlen. The results suggest that, as Utermohlen's symptoms progress with age: (1) fractal dimension decreases while lacunarity value increases; (2) similarity to the photo of Utermohlen decreases; (3) fractal dimension increases and lacunarity value decreases as MMSE scores decrease; and (4) the similarity to the 2003 photo of Utermohlen decreases as MMSE scores decrease.

A16 Lost in space: Sense-of-direction and spatial anxiety in math anxious individuals

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Engaging with math can be troubling for individuals who experience math anxiety (MA). Recent research has suggested that one of the cognitive antecedents of MA is difficulty with spatial processing (Maloney et al., 2012). We sought to extend this research by (1) investigating the relation between MA and sense-of-direction and (2), investigating the relation between MA and spatial anxiety (SA). Results demonstrate a correlation between MA and sense-of-direction and a correlation between MA and SA. Critically, the correlation between MA and sense-of-direction was completely mediated by SA. Implications for understanding the cognitive basis of math anxiety are discussed.

A17 Dissociating the Neural Correlates of Executive Control

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Executive functioning is dissociable into three processes: updating, inhibition and shifting. However, few studies have directly investigated the fractionation of executive control in the brain, and none have used matched tasks to investigate the dissociability of these processes in a within-subject neuroimaging protocol. Using a novel paradigm that manipulates executive control demands while keeping other task demands constant, we directly assessed the dissociability of the neural correlates of these three executive processes. Our results suggest that while there are overlapping patterns of activity, common to all processes, executive functions are dissociable both behaviourally and in the brain.

A18 All in One Fell Stroop: Examining Consciousness Thresholds with a Multiple-Response-Paradigm

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We aimed to develop a method for establishing objective and subjective thresholds of consciousness (e.g., Cheesman and Merikle, 1984, 1986) using a multiple-response-paradigm. In a near threshold Stroop task (Expt 1), we required word identification and subjective report of word reading on each trial. Stroop effects were shown with and without awareness, and were eliminated at objective threshold. Experiment 2 extended this by manipulating proportion congruent, whereby strategic word reading should only occur with awareness. A congruency by proportion-congruent interaction occurred only with awareness, with larger Stroop effects in the high-congruency condition. This multiple-response-paradigm replicates key findings efficiently and dynamically.

A19 Everyday Attention: Digital Annotation's Influence on Lecture Performance

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Note-taking during lectures has been suggested to reduce mind wandering and increase accuracy on memory tests. The present study explores the impact of digital annotation during a video lecture on attention and memory for lecture material. Participants were assigned to either annotate or not, while viewing a lecture. Digital annotation prior to a probe predicted mind wandering and memory accuracy on probe associated questions, however, annotating in and of itself did not influence mind wandering or memory for the lecture material. Implications for the use of digital annotation in lectures will be discussed.

A20 A Self-Regulatory Approach to Understanding Boredom Proneness

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We investigated the relationship between self-regulation and boredom proneness using measures of self-control, regulatory focus, regulatory mode, and cognitive flexibility. Results identified prophylactic factors for distinct boredom proneness components. Trait self-control, promotion focus, and prevention focus were buffers against boredom proneness for those with a high need for external stimulation. Promotion focus, locomotion, and the tendency to seek alternatives were buffers against boredom proneness for those with a high need for internal stimulation. These findings suggest that active and effective goal pursuit reduces the likelihood of experiencing boredom by allowing individuals to satisfy their need for stimulation.

A21 Metacognitive Monitoring during Category Learning: How Success affects Future Behaviour

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Past research on category learning has found that although highly variable categories support superior performance with new items (relative to learning with low variability categories), metacognitive judgments do not reflect this. In the current study, participants classified birds into families, of both high and low variability, and made category learning judgements. Results indicated that participants were generally overconfident in the low variability families, suggesting that they considered high repetition more useful for learning than it actually was. Judgements were also higher following correct than incorrect trials, indicative of the belief that we learn more from success than from mistakes.

A22 Implicit Statistical Learning from Attended and Unattended Information: A Culturally Universal Phenomenon?

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Campbell et al. (2012) found that young adults, primarily Westerners, showed implicit statistical learning from attended, but not unattended information. Given Chinese's holistic processing (Nisbett et al., 2001), they may also process and learn from unattended information. In this study, Canadians and Chinese viewed red and green pictures sequentially, and performed a task with pictures of one colour. Unknown to them, pictures in each colour stream were arranged into triplets. Participants' implicit memory for these arrangements was then tested using a speeded detection task. Our results revealed similar implicit learning from both attended and unattended streams across the two cultures.

A23 The Effects of Ego Depletion on Category Learning

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Prior research has suggested that self-regulatory exertion ("ego-depletion") temporarily reduces the capacity for executive functioning (Schmeichel, 2007). The present study examined whether temporarily influencing participants' executive functioning, via an ego-depletion manipulation, would differentially impact rule-based and non-rule-based category learning. Participants were either asked to write a story with no restrictions (e.g., control), or without using two common letters (e.g., ego-depletion). Next,

category-learning performance was assessed. Ego depletion participants performed more poorly on the final blocks of the rule-based task, but did not differ from controls on the non-rule-based task, demonstrating that executive functioning resources are required for rule-based learning.

A24 Cognitive Style Predicts Acceptance of Destructive Ownership Violations in Moral Dilemmas

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We investigated whether individual differences in cognitive ability and cognitive style influence acceptability of destructive ownership violations in moral dilemmas. Participants responded to trolley-style dilemmas varying on the ownership of the object, and whether a destructive ownership violation occurred as a means (Experiment 1; n=61) or as a side-effect (Experiment 2; n=53). Acceptability was influenced by ownership, such that it was less acceptable for an agent to sacrifice another's property than their own. In addition, performance on the CRT predicted acceptability rates when destructive ownership violations occurred as a means, but not when it occurred as a side-effect.

A25 Action-effect learning and flanker congruence

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This study examined whether an abstract perceptual feature (i.e., flanker congruency) can be learned as an action-outcome. In an acquisition phase, participants' actions determined flanker congruency. In a test phase, violation of the previously learned action-effects incurred the highest cost when flankers were expected to be congruent, suggesting that participants did rely on their own actions to predict flanker congruency. A control experiment failed to replicate the same results when using only visual stimuli as predictors of flanker congruency, confirming the critical role of actions. Thus, we offer the novel proposal that action-effect learning can include abstract perceptual features.

A26 A look at driver and passenger gender effects in young drivers

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Young drivers are at disproportionate risk of collision, particularly when there are passengers. This may indicate that young drivers have difficulty coordinating social demands with those of driving. However, these demands may vary given what the passenger is doing (sitting silently vs. conversing) and the gender of the driver and passenger. A driving simulator measured driving in three conditions: baseline (no passenger), silent passenger, and conversing passenger. Male and female drivers were tested with either male or female passengers. Results suggest that driving performance varies as a function of the gender of the driver and social context (passenger activity).

A27 Mental rotation vs. Reorientation: Common or independent spatial processes?

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Participants (N=67) performed computer-based mental rotation and virtual-reality reorientation tasks. Reorientation accuracy was significantly higher in relation to featural (wall colour) than geometric (room dimension) cues. Males were both more accurate at reorientation and better at isolating featural cues. Performance related to the geometric cues in the reorientation task was significantly correlated with performance on the mental rotation task for females only. Results demonstrate interesting sex differences in the way geometric and featural cues are processed in solving spatial problems, and show that that mental rotation and reorienting depend on common processes in some individuals but not in others.

A28 Gender Differences in Identifying Basic and Social Emotional Facial Expressions

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The present study examined gender differences in the identification of basic and social emotional facial expressions. Participants were presented with photographs and asked to identify the emotional expression depicted. Choices included happy, sad, angry, contempt, sarcasm, and neutral. Overall, universal facial expressions (happy, angry and sad) were recognized better than social expressions (sarcasm, and contempt). Although males tended to identify angry expressions more consistently than females, there were no significant differences in the identification of the happy facial expressions. Females were more consistent, however, at identifying social facial expressions. Results are discussed in the context of Type Theory of Emotion

A29 Does analytic thinking suppress acceptance of rape myths?

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While rape myth acceptance has consistently been shown to predict important behavioural outcomes, such as proclivity for sexual violence and victim-blaming tendencies, little research attention has been directed to examine the cognitive processes that may modulate rape myth endorsement. In this study, we applied a dual-process model of cognitive processing to this question by examining whether analytic processing suppresses rape myth acceptance. Participants were randomly assigned to

complete a scrambled sentence task that has either been previously shown to prime analytic processing or a counterpart serving as control. Our findings and implications will be presented at the conference.

A30 Attention and Visuospatial Working Memory in Mental Rotation

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Gender differences in Shepard-Metzler mental rotation likely reflect differences in cognitive strategy (e.g. holistic vs. piecemeal) but variation in visuospatial working memory and visual selective attention could also play a role. We measured performance on mental rotation (MRT), attentional visual field (AVF), and visuospatial working memory (VSWM) tasks with 45 male and 45 female participants. Men outperformed women on all tasks but were slower in MRT. Accuracy in AVF and VSWM predicted accuracy in MRT in women but not in men. These results suggest that differences in attention and working memory contribute to the gender disparity in mental rotation.

A31 Digits vs. Words: Exploring Patterns of Eye Movements on Addition Problems Presented in Different Formats

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Mental arithmetic is a commonly used skill that can involve solving mathematical problems in different formats. The present study examined undergraduates as they solved addition problems presented as number words (e.g., TWO + THREE) and digits (e.g., 2 + 3). Response times, accuracy, eye movements and self-reports of strategy use (e.g., counting, retrieval) on each problem were obtained. Eye-tracking measures across interest areas (e.g., first number, + sign, second number) varied with problem format (digit vs. word), with self-reports supporting the eye patterns found. These format differences suggest that there are independent cognitive processes used for each problem format.

A32 The influence of social presence on looking behaviour to security videos

William Kendall, Alan Kingstone
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Surveillance has become common in public spaces today, and often serves to enhance security. But what factors influence how people attend to security feeds? We recorded looking behaviour to security videos while manipulating social presence and task-demands, two factors that can have a profound impact on looking behaviour. Our results suggest that social presence, but not task-demands, modulates how people attend to security videos. This suggests that, for detecting security risks, the social context in which security videos are viewed may be more important than the task involved.

A33 Use of Procedural Knowledge in Mental Subtraction: Evidence from Eye Movement Patterns

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Adults who use mental procedures other than retrieval to solve simple arithmetic problems are slower than those who rely on retrieval. We examined how this extra time was distributed across problem components when adults (n = 40) solved basic subtraction problems (e.g., 17 - 9). For each individual, we calculated ex-Gaussian parameters for RT distributions (i.e., mu and tau). Participants who reported non-retrieval solutions had larger mu and tau values and spent more time looking at the operands compared to retrievers. We propose that eye-movement patterns reflect mental procedures commonly reported by adults, even if traditional introspective methods are unavailable.

A34 Gender-specific differences in autism spectrum cognitive profiles: Wechsler Intelligence Scales versus Raven's Progressive Matrices

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We sought to determine whether gender-related differences in cognitive profiles of adults with autism spectrum disorder (ASD) depend on the assessment used. We compared the cognitive profiles, measured using the Wechsler Adult Intelligence Scale-III (WAIS-III) and Raven's Progressive Matrices (RPM), of 21 females to those of 54 males with ASD. Males scored significantly higher overall (FSIQ; $p = .02$), and on the verbal (VIQ; $p = .03$) but not performance (PIQ; $p = .79$) subtests. No gender differences were found for the RPM. These results may have important implications when interpreting research findings and in clinical assessments of autistic abilities.

A35 I made you blink!

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The attentional blink (AB) reflects a deficit in the ability to identify a second target item if it is presented in close temporal proximity to the first. Research has demonstrated that relaxing cognitive processing results in an attenuation of this effect (Olivers et al., 2006). We have taken the opposite approach. We demonstrate that it is possible to fool the system into engaging selective attention processes, resulting in an AB for T1 items that generally would not produce an AB, when they are presented in a context with similar items that require selective attention.

A36 Do numerosity and perceptual averaging rely on a shared mechanism?

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People can accurately judge the number of items in a set (numerosity) and their average size (size averaging) but it is unclear whether these processes rely on a shared mechanism. We tested whether numerosity interferes with subjects' ability to compute the average size and variability of a set of circles. Subjects enumerated or detected a repeated colour in 280 sets of circles, then evaluated their average size and estimated their variability (range and distribution). Numerosity did not interfere with either size averaging or variability judgments, suggesting they are mediated by different mechanisms.

A37 Improving Task Switching Performance in Children through Music and Dance Training

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A body of correlational evidence demonstrates improved task switching in individuals trained in music or dance. The current study used a randomized control design to examine whether training causes changes in cognitive performance. Fifty children aged six to nine were trained in music or dance for three weeks. A control group of 24 children that did not receive training was also collected. A significant decrease was found in reaction times for global switch cost on the colour-shape task switching measure in both trained groups. It appears that a brief period of training can improve task switching in young children.

A38 Monetary rewards speed conscious visual perception

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Visual stimuli that have been assigned monetary reward are prioritized for attention. Specifically, rewarded stimuli are more distracting during visual search, and reflexively capture eye movements. Here we asked how prioritization occurs: Does reward have early effects on perception, or effects on later processes such as response selection? Subjects performed a temporal-order-judgement task after first associating high-reward with one spatial location, and low-reward with another. Stimuli at the high-reward location were reported as appearing earlier in time than those at the low-reward location. The results demonstrate that reward has an early effect, altering the processes that lead to conscious perception.

A39 Individual differences in media multitasking are associated with trait-level boredom

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In an online study, we examined the relation of media multitasking with the general tendency to experience boredom, using two measures of both constructs. We found that individuals who reported a propensity towards media multitasking in everyday life also reported a propensity towards experiencing boredom. Importantly, this relation is driven by media multitasking, and not simply media use in general. These findings are discussed in terms of two hypotheses: chronic over-stimulation may lead to greater levels of stimulation required to achieve satisfactory levels of arousal, or difficulty concentrating on a task when distracted may be attributed to boredom.

A40 The Coffee Shop Effect: Investigating the Relationship Between Ambient Noise and Cognitive Functioning

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Eighty-nine participants completed compound remote associate (CRA) problems while exposed to either a low, moderate, or high volume of ambient noise. The CRA task is thought to measure cognitive flexibility and creativity. Compared to participants in the low-volume condition, participants in the high-volume condition correctly answered more of the most difficult CRA items. This suggests that higher noise levels can enhance cognitive flexibility relative to lower noise levels. Additional work is proposed to further investigate the relationship between sound and cognitive flexibility. The results of this study may be useful in defining environments that are conducive to creativity and learning.

A41 The Impact of Eating Patterns and Attitudes on Cortical Responses to Facial Expressions

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Previous research demonstrated that individuals with eating disorders display cognitive processing difficulties towards facial expressions. These difficulties are observable to a milder degree in those who are not diagnosed with an ED, but display similar characteristics towards emotional regulation and eating. The current study examined the response to facial expressions in individuals without EDs, but score high on the EAT-26. Results demonstrated a main effect of emotion at the P200 component, and an interaction (emotion x intensity x montage x EAT-26) at the P300 component. Results

support sensory processing sensitivities in individuals with ED tendencies in facial expression processing.

A42 Music-Induced Mood Improves Retention in Sensorimotor Adaptation

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Sensorimotor adaptation involves learning to adapt movements to distortions in sensory feedback. Reward feedback increases persistence of adapted movements when the distortion is removed, suggesting improved retention. Music that induces positive emotions has similar neural properties as other rewards and thus might influence reinforcement mechanisms in adaptation. Here, positively-valenced music increased retention of adapted movements in comparison to negative music and silence. When different motor outputs were associated with music alone or with reward feedback plus music, retention for the movements associated with positively-valenced music alone prevailed. Music that induces a positive mood can increase retention of sensorimotor adaptation.

A43 The Separability of Storage and Processing in Visuospatial Working Memory: Evidence from a Dual-Task Paradigm

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Logie (1995) argued that the visuospatial sketchpad – like the phonological loop – of Baddeley and Hitch's (1974) Multicomponent Model of Working Memory can be subdivided into two subcomponents: a cache for storing visuospatial information and an inner scribe for processing visuospatial information. Until now, evidence for the separability of visuospatial processing/storage has come from intervening task experiments (e.g., Klauer & Zhao, 2004). The current experiments used a dual-task design in which participants performed a pursuit-tracking task while simultaneously completing secondary tasks that taxed either visuospatial storage or processing. Results support distinct storage and processing subcomponents in visuospatial working memory.

A44 On Telling More Than We Can Know: Expanding on Nisbett & Wilson (1977)

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We investigated a new approach to produce the classic dissociations of Nisbett and Wilson (1977). For images with no easily-nameable features (reconstructed from the first 10 eigenvectors of a 320-eigenvector image pixel-map space of Monet and Picasso paintings), participants were asked to create a large set of scales that appeared to discriminate labelled "M" from "P" images. They then rated new, unlabelled images on their best five scales, and then classified them. Performance was barely above-chance, but performance based on scale ratings was substantially above-chance.

A45 Cognitive control as a function of trait mindfulness: An event-related potential study

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Mindfulness meditation has been shown to have positive effects on various aspects of well-being. However, the cognitive mechanisms are less understood. This study investigates the relationship between cognitive control and trait mindfulness. We examined stimulus and response-locked event-related-potentials (ERPs) while individuals completed the digit Stroop task. Facets of trait mindfulness predicted accuracy, error rates, and Stroop interference. These findings, as well their corresponding electrophysiological correlates, are discussed in terms of the cognitive control processes that vary as a function of trait mindfulness.

A46 Processing of number sequences by adults: Serial search plus obligatory activation of familiar patterns

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Adults' ability to determine whether three-digit sequences are in ascending order (e.g., 3 4 5 vs. 3 5 4) is correlated with arithmetic skill on multi-digit problems (e.g., 45 + 27; 32 x 7). The source of this correlation, however, is not clear. Seventy-eight adults judged whether sequences were in ascending, descending, or either ascending or descending order. Descending sequences were harder to recognize than ascending sequences. Evidence was obtained that the serial search process is influenced by obligatory activation of familiar sequences. Relations between various measures of performance and arithmetic skill will be discussed.

A47 It's All About the Timing: Investigating the Self-Report of Math Anxiety

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This study examined the nature of self-report as measured by the Abbreviated Math Anxiety Scale (AMAS). We manipulated the timing of self-report, either before or after task completion. Results show typical reaction time effects in relation to math anxiety (i.e., slower high math anxious responding) when self-report was collected before the experimental task, but not after. Also, the interrelations between self-report, math achievement, and task performance depended on the report timing and the sub-factor of the AMAS. Principles from the Accessibility Model of Emotional Self-report are discussed to characterize the nature of self-report results found.

A48 What Older Adults' Perception of Emotional Faces During Binocular Suppression Reveals About Theories of Aging

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In a binocular suppression study, we measured how quickly younger and older adults perceived emotional faces during binocular suppression. In this binocular suppression situation, a mask was presented in one eye while faces gradually appeared in the other eye. Two emotional faces (happy, sad, angry, or neutral) were presented (one pixelated the other clear) and participants identified the location of the clear face. Older adults perceived angry faces faster (supporting the Threat Advantage Hypothesis) and sad faces slower than neutral faces (supporting the Socioemotional Selectivity Theory). Younger adults perceived emotional faces no faster than neutral faces.

A49 Younger and Older Adults Demonstrate Similar Attention and Inhibition During Binocular Suppression

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In this study, we measured how quickly younger and older adults identified words during binocular suppression. In a priming phase, target and distractor words were presented and participants read the target word. In a binocular suppression phase, a mask was presented in one eye and participants identified the word which gradually appeared in the other eye. Words were either repeat targets or distractors from the priming task or new words. Both groups identified previously presented words significantly faster than new words. Contrary to the Inhibitory Deficit Hypothesis, both groups identified previously attended words significantly faster than previously ignored words.

A50 GRE Verbal Reasoning Prep Books are not created equal

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Graduate Record Exam (GRE) performance is one of the factors used to decide whether to accept or reject graduate school applicants. Anecdotal evidence suggests that GRE prep book tests differ widely in difficulty, giving different feedback to test-takers. Over 400 undergraduate students were randomly assigned to take GRE Verbal Reasoning prep test from one of the six publishers. The results showed that test difficulty varied substantially between the publishers, measures of crystallized and fluid intelligence explained substantial proportion of variance in GRE tests, and participants were very poor in assessing their own performance immediately following the test.

A51 A bird in the hand: Prospective memory cues disrupt encoding of surrounding stimuli

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Of interest in this study was the influence of an event-based prospective memory (ProM) cue on recognition memory for words presented immediately before and after the cue at study. In the study, participants were asked to categorize words by selecting the appropriate keyboard key, and were instructed to press a different key with the ProM cue (a type of bird) was presented periodically throughout the task. Following the categorization task, participants were given a recognition memory test. Results demonstrated that recognition performance was poorer for words presented immediately after the ProM cue, suggesting the cue disrupted proper encoding.

A52 Does culture reduce the impact on cognition during schema violation?

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Research has shown that gender schemas are less rigid amongst the French Canadian population compared to English Canadians. Recent studies have demonstrated that the difference between attitudes of Anglophones and Francophones could be linked to culture or language. Using event-related potentials and the implicit association task (IAT), permits the examination of the impact of schema violations directly on cognitive process. The current study examined the impact of entrenchment in Francophone culture on schema violations during a Gender and Sexuality IAT. Results demonstrate that entrenchment impacts cognition when violating a schema. Significant P2 and N400 components were discovered.

A53 Cognitive Flexibility in Generalized Anxiety Disorder and its Impact on Interpretation Biases

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Generalized anxiety disorder (GAD) is characterized by excessive worry. Studies show that people with GAD interpret ambiguous information in a negative way. The belief that uncertainty is intolerable is causally related to negative interpretations of ambiguity. There is no research on how cognitive inflexibility (CI) may relate to these biased interpretations. We investigated how aspects of CI contribute to interpretation bias in people with diagnosed GAD. Relative to the belief that uncertainty is intolerable, the tendency to perceive challenging situations as uncontrollable was uniquely associated with a greater interpretation bias. Implications for cognitive theories of GAD will be discussed.

A54 The Effects of Feature Similarity on Same-Different Categorization of Letter-Based Stimuli

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Bamber's (1969) fast-same effect precludes explanations of same-different judgments proposing serial comparison of letter-strings before judgment. Participants might process all features comprising stimuli separately and in parallel, as in Taylor (1976). More features in common between stimuli might hinder same-different judgment independently of the number of common letters. This experiment investigates the effects of the number of common letters and the similarity of their features. If categorization happens at the feature level, response times for similar letter strings should be highest. If stimulus features are not processed, then results should be identical to Bamber's for both similar and dissimilar stimuli.

A55 The Effect of Music and Distraction on Spatial Ability

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This study aimed to determine whether Mozart and similar sounding music could elicit an increase in spatial-reasoning ability. Participants listened to a Mozart Sonata for 2 Piano's, Yanni's Acroyali, or sat in silence. Half the participants were given a distraction task of a word search puzzle. Participant's arousal level was self-reported and participant's completed a spatial ability test. The results revealed that listening to Mozart or similar sounding music lead to a significant increase in spatial performance, while distraction had no effect. Arousal scores were not significantly different across groups, indicating that listening to music may cause a calming effect.

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A57 The Numerical Distance Effect and Math Achievement: Assessing the validity of magnitude comparison paradigms

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The numerical distance effect (NDE) is the inverse relationship between response times and the distance between two numbers in numerical magnitude comparison tasks. This robust effect has been obtained using multiple magnitude comparison paradigms. In addition, the size of an individual's NDE has been found to predict mathematical achievement. The present investigation assessed the convergent validity of these measures and their ability to predict mathematical ability and numeracy. Results demonstrate that the NDEs obtained from simultaneous comparison, standard comparison, and primed-standard comparison tasks were correlated; however, only the NDE in the simultaneous comparison task related to math achievement and numeracy.

A58 Hear this, see that? Effects of audiovisual congruency on recognition memory

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Multimodal semantic congruency has been demonstrated to improve object identification and discrimination (Chen &Spence, 2010). We report two experiments examining the impact semantic congruency has on memory. Participants were presented with audiovisual word pairs followed by a recognition test. Recognition memory was found to be improved for words belonging to incongruent presentations. Results suggest higher cognitive processes may be recruited to resolve sensory conflicts, leading to superior recognition for incongruent words.

A59 Human vision is attuned to the diffuseness of natural light

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Vision scientists have long known that human vision relies on the ecologically valid assumption that light usually comes from overhead. Here we use measurements from a custom-built multidirectional photometer and results from lightness matching experiments to show that vision is also attuned to the diffuseness of natural light, i.e., the extent to which light comes mostly from a single direction (e.g., sunny day) or from a broad range of directions (e.g., cloudy day). Our findings support the notion that many seemingly arbitrary perceptual errors follow from a strategy of estimating lightness and shape via statistical inferences from ambiguous retinal images.

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FRIDAY 4TH JULY	Student Lounge / Cara Commons / TRS1-073	8.30 – 10.00

POSTER SESSION B
ANIMAL / DEVELOPMENT / NEURO

B61 – B76 are assigned to Student Lounge
B77 – B104 are assigned to Cara Commons
B105 – B120 are assigned to TRS1-073

B61 The Effect of Sucrose Concentration in Feeding Behaviours of the Rat: An Omission Contingency Experiment

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The aim of this study was to further investigate the role of sucrose on training and performance. The experiment was a single-case alternating treatments design using three different concentrations of sucrose (0%, 0.5%, and 5%). Nose-pokes during a tone that signaled the arrival of liquid indicated feeding behaviour or lack of self-control. Results indicated that higher concentrations of sucrose evoked more nose-pokes during the tone. This suggests that sucrose evokes feeding behaviours, which may not be useful in training certain behaviours.

B62 How does variable response effort influence risk-sensitive decision making in pigeons?

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Risk, or food intake variability, influences animals' preference for constant or variable alternatives during foraging. A modified version of Scalar Expectancy Theory (SET) has shown predictive ability in the past, but is limited in its account of response effort. In the present study, pigeons performed a colour discrimination task in two exposure conditions. The effort condition incorporated variable pecking while the delay condition acted as a control by matching the temporal duration. We found that variable preference was reduced in the effort condition compared to the delay condition. Our results suggest magnitude estimation and attention have implications for modified SET.

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B64 Nucleus accumbens dopamine and the disinhibitory effect of alcohol on conditioned sexual inhibition in male rats: A microdialysis study

Katuschia Germé, Lindsey Gossip, Roberto Mormina *, Cecilia Nease, Alina Spevak, Tracey D'Cunha, James Pfaus
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Male rats trained to associate a neutral odor (almond) with sexually nonreceptive females display a conditioned ejaculatory preference (CEP) for an unscented receptive female. Acute treatment with alcohol during the copulatory test disrupts this CEP. Moreover, alcohol-treated males have a greater number of Fos-positive cells in the nucleus accumbens (NAc) compared to controls. Here we show that males injected with alcohol had increased dopamine transmission in the NAc in the presence of the previously conditioned odor relative to saline-injected controls. Dopamine transmission in the NAc reflects the learned association between odor and sexual inhibition, and its disinhibition by alcohol.

B65 Overtraining in the Shock-Probe Conditioning Task Recruits More than the Hippocampus

Jessica E Taylor, Desire Simons, Hugo Lehmann
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Damage to the hippocampus causes retrograde amnesia of an object-fear association in rats. Recent evidence, however, suggests that repeated reinstatements, meaning re-experiencing the learning event or reactivating the memory, may prevent the retrograde amnesic effects of hippocampal damage, suggesting that reinstatements increase the recruitment of non-hippocampal memory systems. Here we examined whether repeated training (2 vs.10 sessions) in the shock-probe test, an object-fear association task, mitigates the amnesic effects of post-training hippocampal damage. We found that overtraining rats in the shock-probe test did not prevent the amnesia that follows the hippocampal damage, but that non-hippocampal networks indeed contribute more.

B66 Behavioural consequences of prenatal exposure to dizocilpine in the adult rat

Maria Athanassiou, Dan Madularu, Cristina Catania, Stephanie Gallant, Loïc Welch, Wayne G Brake, Dave G Mumby
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The aim of this study was to explore the effects of prenatal NMDAR blockade on behaviour in the adult offspring, by assessing object recognition memory and reactivity to MK-801 and amphetamine (AMPH) at two stages of rat adult development. We hypothesized that prenatal NMDAR blockade would result in impaired object recognition memory in the adult rat. In addition, we expected that the offspring of the MK-801-treated dams would show increased locomotor activity in response to systemic injections of MK-801 and AMPH. The results show that prenatal MK-801 exposure resulted in impaired object recognition memory at an earlier stage in adult development, as well as increased locomotor activity to MK-801, but not AMPH. Taken together, these data support previous finding showing that prenatal NMDAR blockade results in cognitive impairment in early adulthood. However, these effects do not seem to persist throughout adult development.

B67 The use of mathematical learning strategies by parents during play

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The use of mathematical strategies is associated with better numerical performance by kindergarteners (e.g., Chan, Au, & Tang, 2014). However, little is known on the use of mathematical strategies used by parents with younger children. Thus, this study examined the use of such strategies in numeracy during a 30-minute naturalistic play session of thirty-four parent-toddler dyads at their home. Our findings reveal that parents who engaged in longer and more frequent purposeful play episodes (versus play-based learning episodes) used significantly more mathematical strategies including representing and emotional scaffolding in which parents support their child's learning with enthusiasm.

B68 Methods of division: What works best for fourth grade students?

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Research in mathematical cognition regarding children's ability to do division has tended to focus on what children know about division even before they receive formal instruction. In contrast, the current study examined the types of methods used by Grade 4 students after they had received formal instruction in Grade 3. In one-on-one interviews, Grade 4 students were asked to solve division problems. These children unexpectedly used Inverse Multiplication most often as a method for solving division problems, and used many other methods that were not formally taught as part of the curriculum, even though other methods were more explicitly taught.

B69 A differential contribution of Math and Language-gender stereotype to adolescent's academic attitudes

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Implicit association tests have emerged in recent years as a useful tool measuring the influence of stereotypes on behaviour. The present study investigated the potential influence of stereotypes on grade 8 student's academic motivations. Similar to an investigation by Steffens and Jelenec (2011), math-male and language-female stereotypes were coded separately. Both stereotypes contributed uniquely to the prediction of student's attitudes towards success, failure and mastery in school. The influence of each stereotype varied by gender of participant as well as through an interaction of math and language stereotypes.

B70 Preschooler's Psychophysiological Status and Their Learning Performance

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We have used a complex of psychophysiological parameters for a psychophysiological rating (PR) determination. There were IQ, complex sensomotor reaction time, complex reaction time of choice, speed of information processing, brain capacity, ratio of strength of the nervous system accuracy of object tracking reaction. Our research has shown that preschooler's PR credibly correlates with their quantitative and qualitative indicators of mental capacity, attention concentration, and learning performance results at the end of 1st year studies.

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B72 Differential Attentional Performance in Caesarean Delivered versus Vaginally Delivered Infants

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The first experience an infant encounters is that of birth, yet little is known about its role in brain development. Recently, research has shown that vaginally and caesarean delivered rat pups exhibit small differences in the development of the somatosensory cortex, an area involved in spatial attention. To explore the role that childbirth method plays in brain development, attentional performance of caesarean and vaginally delivered infants was assessed. Results demonstrated that caesarean delivered infants had longer latencies to initiate a target-directed eye movement in a Posner cueing paradigm than vaginally delivered infants, suggesting that childbirth method affects attentional processes and brain development.

B73 Developmental Changes in Interval Time-Place Learning

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Young children (aged 5-10 years) were trained on a modified interval time-place task using an iPad. The location of hidden toys varied between three rooms in a house. Unbeknownst to the children, the toy was found in one room for the first 30 seconds, another room for the second 30 seconds, and the last room for another 30 seconds. Each child had 20 separate training sessions. Results of training and test sessions confirmed that the children were able to learn the temporal and spatial contingencies without instruction. Furthermore, there were aged related differences in this ability.

B74 Electrophysiological Differences between Monolinguals and Bilinguals on the Flanker Task

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There are mixed findings regarding the existence of a bilingual advantage on executive control tasks using behavioural measures, but clearer differences between groups may emerge using event-related potentials. We compared monolinguals and bilinguals on a flanker task while EEG was recorded. Participants pressed the left or right key to indicate the direction of the middle chevron that was flanked by chevrons pointing either in the same direction or the opposite direction. Results showed similar behavioural performance but monolinguals had a larger N2 effect than bilinguals, suggesting more effortful conflict monitoring for monolinguals and therefore better performance by bilinguals.

B75 Saliency coding in the superior colliculus during free-viewing of natural dynamic scenes

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The visual saliency map is thought to be coded in a predominantly cortical network, but saliency-coding was important for primitive species long before evolution of cortex. We examined the role of the primate midbrain superior colliculus (SC) in saliency-coding during free-viewing of natural dynamic scenes. We used a computational model to predict saliency across space and time. The activation of superficial-layer SC neurons was closely associated with model-predicted saliency. Conversely, intermediate-layer SC neurons were only associated with model-predicted saliency of stimuli/locations that were defined as behaviourally relevant. These results implicate the SC in a central role in the saliency network.

B76 Painting a Picture of How Hemispheric Asymmetries are Related to Artwork

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Research has shown that there are asymmetries in art (e.g., brightness is biased to the left). We explored whether certain attributes are asymmetrically represented in art in a fashion that is consistent with known functional hemispheric asymmetries (e.g., logical processing and left hemisphere dominance/rightward art asymmetry). Participants viewed left and right halves of paintings, one presented above the other (counterbalanced), and rated which half displayed more of certain attributes. Results showed that ratings of left and right hemi-art differed in a way that may be explained by asymmetries in hemispheric processing. Up/down counterbalancing was also related to some ratings.

B77 Response to placebo in children with ADHD: Multidimensional evaluation and exploration of its determinants

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This study evaluates placebo response(PR) as assessed by several observers and explores its correlates in children with ADHD. 614 ADHD children were completed the Restricted Academic Situation Scale (RASS).Parents and teachers were asked to evaluate the child's behaviour while treated with Methylphenidate or Placebo. A highly significant PR was identified according to parents and teachers ratings. In contrast, the children's behaviour as assessed by RASS deteriorated significantly after placebo [Ps<0.001].Several factors have been associated with PR and further analysis revealed 2 patterns of this phenomina. These results suggest that the observed PR is mainly due to expectations rather than any "objective" improvement.

B78 Association of catechol-O-methyltransferase (COMT) gene with the reverse placebo effect in children with ADHD

Weam Yousef Fageera, Zia Choudhry, Sarojini M. Sengupta, Natalie Grizenko, Ridha Joober
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Placebo response(PR) could be modulated by specific brain circuits, especially the dopamine (DA) system.Thus, genetic factors coding for proteins involved in DA neurotransmission may modulate PR. Variations within the Catechol-O-methyltransferase (COMT) gene, a major catabolizing enzyme for DA, may therefore be implicated in modulating PR. Four SNPs were genotyped in 371 Caucasian children with ADHD. PR and methylphenidate response were calculated as the difference score of the Restricted Academic Situation Scale (RASS) before and after placebo and methylphenidate. Children performance on the RASS deteriorated after placebo, suggesting a reverse placebo effect (RPE). This RPE was completely reversed by methylphenidate. Two SNPs, rs6269, rs4818, and the haplotypes were significantly associated with the RPE[Ps < 0.005] but not with MR. These results suggest that DA system and COMT gene variation are involved in RPE in ADHD.

B79 Functional Neuroimaging of Word and Picture Identification: Modularity of Mind Revisited

Layla Gould, Marla Mickleborough, Kathryn Anton, Chelsea Ekstrand, Eric Lorentz, Ron Borowsky
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Experiment 1 investigated whether word and picture identification activate separate, or shared, brain regions. In order to examine whether differences in visual complexity between pictures and words are substantive, Experiment 2 used fMRI to examine activation during a picture-word Stroop task, which perfectly controls for visual complexity as the same stimulus is used for both the picture and word naming conditions. The results revealed a large amount of shared activation, and some modular activation, for words and their corresponding pictures in both experiments. These results support the notion that reading and picture identification share a substantial common functional architecture.

B80 Bimanual grasping without a corpus callosum

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Bimanual grasping (BMG) can elucidate how goal-directed behaviour arises from interactions between hemispheric-coordination and -specialization. We have found that BMG involves the right-hemisphere for both hands "holistically", suggesting that interhemispheric-transfer of motor control occurs downstream in the premotor/motor cortex. To demonstrate this, we examined patient AP who is acallosal anterior to area M1. AP grasped an object in left/right visual-field, and showed impaired BMG but normal unimanual grasps, and non-specific hemispheric-specializations for both. Thus, callosal connections between premotor/motor cortices support the interhemispheric-transfer for right-hemisphere-specialization; lack of connections causes grasp-computation duplication in both hemispheres, resulting in no hemispheric-specialization and poor coordination.

B81 Processing speed and the implication of visual short-term memory: Evidence from the sustained posterior contralateral negativity

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The SPCN, or Sustained posterior controlateral negativity, is an electrophysiological component known to index item into visual short-term memory. In this study, participants performed a target discrimination task (reporting the orientation of the target) during a visual display containing both salient and irrelevant distractors. Subjects with slower response times showed larger SPCN amplitudes regardless of the presence or absence of irrelevant distractors in the display. These results suggest that difficulties in initial processing require a longer maintenance of information in VSTM (reflected by a larger SPCN and a longer response time) to complete the task.

B82 Neural correlates of updating mental models in a picture morphing task

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Mental models encapsulate beliefs about the rules that govern our environment. When observations do not match expectations, we update our model.
We developed a task where pictures morphed over time from one object to another (e.g., a bat to an umbrella). Activations associated with participants' indicating a change from the first object to a second object were observed in the insula, medial and inferior frontal regions, and inferior parietal cortex.
These regions were distinct from areas of activation that represented different object categories. The insular and IPL represent candidate regions for model updating and accord well with patient data.

B83 The Effects of Memorization Technique, Fluid Intelligence, and Cognitive Load on Route Recognition: Behavioural and fMRI Evidence

Kristen Blackler, Erin L Beatty, Marie-Eve Jobidon, Alexandra Muller-Gass, Oshin Vartanian
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Participants memorized a route embedded in a map—using either cardinal directions or surrounding landmarks. Recognition was assessed next day in the fMRI scanner under varying working memory (WM) load. When WM load was high, memory was worse for routes encoded using cardinal directions. This suggests that landmark-based encoding buffers against memory loss when WM load is high, accompanied by activation in inferior parietal lobule—a region that supports spatial WM. Fluid IQ predicted performance only when participants who memorized routes using cardinal directions underwent high WM load, suggesting that disadvantageous training increases the influence of individual differences in performance.

B84 Auditory-motor learning modulates memory-based expectations during auditory perception

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We investigated whether prior production of auditory stimuli modulates memory-based expectations during subsequent perception of those stimuli. Musicians learned melodies by producing or perceiving them and were then asked to detect out-of-key pitch alterations in the melodies they had learned. Alterations elicited N1, N2, and P3 event-related potential components. Whereas production learning enhanced N2 amplitudes compared to perception learning, N1 and P3 components correlated with acoustic and tonal features of the out-of-key pitches. Findings point toward a hierarchy of memory-based expectations that are influenced by auditory-motor associations during perception.

B85 Mindfulness Treatment Decreases ERP Indices of Affect Intensity Following Negative Feedback in Adolescents with ADHD

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Boys with ADHD often exhibit emotion regulation difficulties when challenged or blocked from a desired outcome. This pilot study examined the impact of a mindfulness treatment on the intensity of negative affect experienced in the context of negative feedback. 9 boys with ADHD (aged 12-15) and 6 waitlist controls completed a Go-No-Go task that included negative feedback in response to errors pre- and post-treatment. Feedback-related negativity (FRN) was measured. Significant decreases in FRN amplitudes were found for the treatment group only. Results suggest that mindfulness may help boys with ADHD decrease negative affect intensity in the face of challenge.

B86 Altered white matter integrity in whole brain and segments of corpus callosum, in young social drinkers with binge drinking pattern

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Using diffusion tensor imaging (DTI), we investigated links among decrements in neural white matter, binge drinking, and cognitive performance in early adulthood, a period of continued brain development. Healthy moderate to heavy social drinkers, ages 18-25, completed spatial working memory tasks and DTI. Mean fractional anisotropy (mean FA, a measure derived from DTI) was lower for Binge than for Non-binge males, but higher for Binge than for non-Binge females. Compromised white matter was linked with impaired cognitive functioning across groups. In males, binge drinking and drug use were linked with degradations in neural white matter.

B87 BLANK

B88 Imagining and Perceiving Timbre: An EEG Study

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Musical imagery maintains information about timbre. For example, similarity in both perceived and imagined timbre help pitch discrimination. To further investigate perceived and imagined timbre, we recorded EEG activity during pitch discrimination tasks with both perceived and imagined initial timbres. Timbral similarity varied from Identical to Close to Far. Results revealed that participants performed better and faster with Identical timbres. Additionally, a frontal decrease and a posterior increase in activity were observed in all tasks, particularly in the imagery task. However, in the perception task, the posterior increase was stronger in the Close and Far conditions than the Identical condition.

B89 Repetitive TMS to the premotor cortex and near-hand effects

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Near-hand benefits show that individuals process targets more quickly, accurately, and precisely with a hand nearby. One explanation is that visual-tactile bimodal-cells, activated when either visual or tactile stimuli are presented on or near the skin, are recruited by near-hand targets and contribute to target processing. The current study tested this hypothesis by applying rTMS to a region thought to house bimodal-cells and measured saccades performance to targets. The hypothesis predicted that rTMS would interfere with saccade onset latency in the real-hand condition but not in the no-hand and fake-hand control conditions. Initial analyses support the bimodal-cell recruitment hypothesis.

B90 Sensory integration precedes the perception of vection as mirrored by the N2 component of the human event-related brain potential

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Vection describes the sensation of illusory self-motion in the absence of physical movement. We tested whether sensory integration of visual information adds to vection: 13 participants were exposed to a pattern of moving black-and-white vertical stripes, divided into a central and a peripheral visual field. The strongest vection was induced when the periphery of the stimulus was moving whereas the center remained stationary. This stimulation was also accompanied by a pronounced occipital N2 of the event-related brain potential. Our findings mirror elaborated processing of information from the central and peripheral visual field and suggest that sensory integration may trigger vection.

B91 Musicianship and Neural Synchronization at Multiple Timescales

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Neural synchronization to external oscillatory stimuli can be measured using spectral EEG at short (tones) and long timescales (rhythms). It has been shown that subcortical synchronization to tones is more robust in musicians than nonmusicians, suggesting a type of experience-dependent plasticity. In the current study, cortical synchronization to rhythms was also found to be more robust in musicians. Additionally, the extent of cortical synchronization to rhythms correlated with subcortical synchronization to tones. These findings indicate that the experience-dependent plasticity observed in musicians

manifests itself at multiple cortical levels corresponding to oscillations at different timescales present in music.

B92 Working memory encoding in the attentional blink and its role in early attentional processing: Evidence from human electrophysiology

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The Attentional blink (AB) is the difficulty of correctly reporting a target close to an earlier one in a rapid serial visual presentation stream. Recent models have suggested that encoding targets into working memory (WM) reduces attentional capacity available. In this electrophysiological study, costs of encoding into WM were manipulated by having to report two or three targets. Results show N2pc amplitude, which reflects the deployment of visual attention, was lower with a higher memory load. This suggests WM engages mechanisms that overlap the deployment of spatial attention and that encoding information affects subsequent processing at many levels.

B93 Individual differences in anxiety influence verbal long-term memory accuracy and confidence

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We examined the influence of encoding duration in high- and low-anxious undergraduates on memory accuracy and confidence. Participants encoded words for 750 or 4000ms, and later made recognition and confidence judgments in their memory for targets and lures. Anxious had poorer accuracy and lower confidence compared to non-anxious individuals, and endorsed lower confidence specifically for correct memory responses. Longer encoding duration benefited both accuracy and confidence, and there was no differential effect across groups. Results suggest anxious persons have unrealistically low confidence in their memory, especially when correct, and that allowing additional encoding time does not alleviate the effect.

B94 Interfering with episodic memory: Do semantically related words help or hinder?

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Participants were asked to either study or retrieve a target list of categorized words while simultaneously making size judgments to another set of words heard concurrently. We manipulated semantic relatedness of distractor to target words, and whether distraction occurred during the encoding or retrieval phase of memory. Recognition was poorer when distractors were present during encoding, and when distractors were semantically related, with the effect of relatedness being greater with distractors present at retrieval. Results indicate that semantic relatedness is an important factor to consider when assessing the effects of divided attention on memory.

B95 Cortical oscillations in inhibitory control: evidence for a differential role of gamma and theta band activity in performance monitoring

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We used neuromagnetic brain recordings to assess the role of theta and gamma oscillations in inhibitory control in both go/no-go and go/switch tasks. Failures of inhibitory control (default responses to no-go or switch cues) were accompanied by increased frontal theta activity, whereas high-frequency sensorimotor gamma activity had a delayed onset for erroneous responses. This suggests that theta activity reflects error processing, whereas, gamma activity reflects timing of integration of motor intentions with cue processing during both correct and erroneous responding. Frontal theta and sensorimotor gamma oscillations may therefore have complementary roles in performance monitoring during inhibitory control.

B96 Mapping the Saccadic Suppression of Motion Perception

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When a saccadic eye movement is made, an image of the environment sweeps across the retina, producing visual motion which is not informative about the movement of objects in one's surroundings. As a person will deactivate an intruder alarm when entering his or her home to avoid false alarms, motion perception is suppressed during saccadic eye movements where non-informative, self-produced motion signals are known to occur. Using briefly presented motion probes (~50ms), we identified a period of suppressed motion perception preceding saccadic eye movements. This suggests active perisaccadic suppression possibly realized by sending copies of motor commands to perceptual areas such as hMT+

B97 Prism Adaptation and Bimanual Grasping: Probing the Cross-talk between Sensorimotor Systems

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We probed the cross-talk between sensorimotor systems by studying the transfer of sensorimotor learning between reaching and grasping. In our study, we used a prism adaptation paradigm where we distorted the proprioceptive and motor control of the participant's left arm. Then, we examined how this distortion affected the unadapted right arm during unimanual reaching and bimanual grasping. We found that prism-adaptation aftereffects did transfer to the unadapted arm, and from reach to grasp

control. However, we observed opposite adaptation effects for reaching and grasping, suggesting that the two motor systems operate in a mutually inhibitory fashion.

B98 The capacity of audio-visual integration need not be limited to one item

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A limit to the number of visual events that can be bound to an auditory event has been estimated at 1. We modulated stimulus onset asynchrony (SOA) and recorded both behavioural and electrophysiological data in a task where participants had to keep in mind multiple visual candidates for auditory binding. We revealed that the capacity of audio-visual integration exceeded 1 at slow but not fast SOA. Our analysis of the visual N1 component shows that the fast rate of presentation used to establish this 'strict' upper bound of audio-visual integration capacity disrupts the perceptual processes that, at slower rates, increase capacity.

B99 The feedback-related Negativity (FRN) and P300 as indices of violation of expectancy

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Expectancy drives our decision making strategies. Two event-related potentials (ERPs) , namely the feedback-related negativity (FRN) and P300 , are used to index violation of expectancy. However, it is unclear how expectancy based on long-term knowledge drives ERPs differently from expectancy learned performing a new task. In the current study, we compared the FRN and P300 in a population of knowledgeable hockey fans to a population of non-fans as they made decisions about the outcomes of hockey games. Preliminary results suggest that fans show larger FRN and P300 amplitudes than non-fans in response to a loss of a statistically favourable team.

B100 Brain responses to semantic ambiguity in worry: An event-related potential (ERP) investigation.

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Generalized Anxiety Disorder (GAD) is characterized by chronic worry about various topics. The Intolerance of Uncertainty model of GAD posits that anxious individuals interpret ambiguity negatively. This novel study investigates the neural correlates of interpretation biases in individuals high and low in worry through use of ERPs. Participants were presented with ambiguous sentences followed by words implying threat or benign interpretations. Data from 36 participants (19 high and 17 low worriers) show differential P600 ERP responses to benign compared to threat interpretations in high, but not low worriers $t(34)=-2.37$, $p=.023$. This may suggest a negative interpretation bias in high worriers.

B101 Emotion from a Different Angle: Facial Threat Signals Affect Female Spatial Processing

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Making use of facial threat signals requires both emotion and spatial processing – both the emotion and the gaze-target must be identified. Females typically outperform males on emotion recognition tasks, whereas males typically outperform females on spatial processing (SP) tasks. Evolutionary theories suggest that females' advantage in recognition of threat emotions, in particular, developed due to survival demands; we extend this theory, suggesting that threat localization via SP of gaze direction also promoted survival. Using a novel measure, we tested and found support for the hypothesis that gaze localization would be preferentially enhanced in females for threat compared to nonthreat expressions.

B102 Sex Differences in Spatial Performance? Roles of Task Type, Stimulus Type, and Testosterone

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Research suggests males typically outperform females on measures of spatial cognition, including the Perceptual Abilities Test (PAT; subtest of the Dental Admissions Test (DAT)). Numerous factors appear to be related to the sex difference in spatial cognition, including task and stimulus type, and prenatal and circulating testosterone (T) levels. We further examined the influence of these factors by testing participants on two sample tasks from the PAT and two comparable novel tasks, and measured 2D:4D (prenatal T index) and salivary T. Results of this study may guide future research examining mechanisms underlying the commonly reported sex difference in spatial performance.

B103 Neural network modulation in older adults after executive control training

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The fronto-parietal control network (FPCN) is thought to subserve goal-directed cognition (GDC), which is known to decline with advancing age. Here, we investigated whether a strategy-based executive control training intervention would alter recruitment of the FPCN in healthy older adults. We also investigated whether functional brain changes would be associated with improvements in GDC and structural integrity of frontal-posterior white matter tracts. We observed post-training increase in activation within the FPCN during a task requiring GDC. These increases

were positively correlated with post-training performance on the GDC task and with integrity of white matter pathways connecting frontal and posterior brain regions.

B104 In-flight Investigation of Stress and Workload with Subjective and Objective Metrics

Sravya Atluri, Heather Wright-Beatty, Lauren Sculthorpe-Petley, Paul Kissmann, Gregory Craig, Joao Araujo, Jocelyn Keillor
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Pilot workload and stress were assessed with an event-related potential (ERP) study using an auditory oddball paradigm on the National Research Council of Canada Convair-580 research aircraft. The ERP results were compared to subjective workload/stress assessment data from the Dundee Stress State Questionnaire. Significant mismatch and reorienting negativity components were observed in the ERP data. Demonstration of the ability to monitor these effects in flight is an important step in assessing pilot task saturation.

B105 Enhanced Visual Processing When Targets Presented Near the Hands

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Placing a hand near a target seems to influence how it is processed. One possible explanation for near-hand effects is that bimodal neuron recruitment contributes to the representation of targets near the hands in comparison to far from the hands. The purpose of the study was to determine if the resolution of target location for reaching is influenced by the hand near the target. Results showed that when hand was present and near the target there was a reduction in reaching spatial error, error variability, and movement time when compared to the no-hand condition.

B106 The Effects of Facial Attractiveness on Spontaneous Facial Mimicry

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Facial mimicry, or the subconscious mirroring of other's emotional facial expressions plays a significant role in social bonding. The current study investigated whether mimicry increases with more attractive faces. Facial muscle activity was recorded using electromyography and attractiveness was manipulated by facial averaging. Emotionally congruent facial responses were observed in relevant facial regions (i.e., mimicry was observed). Although, the extent of mimicry did not vary as a function of attractiveness, the strength of observers' zygomaticus responses increased for faces that were more averaged and rated as more attractive. The corresponding trend was not found in observers' corrugator responses.

B107 Altering beat-based timing using transcranial direct current stimulation

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Time intervals can be represented relative to a recurrent beat (beat-based timing), or by representing absolute durations (nonbeat-based timing). Here, we alter beat-based and nonbeat-based timing by modulating excitability of the cerebellum and the supplementary motor area (SMA) using 2mA transcranial direct current stimulation. Subjects discriminated beat rhythms which elicit beat-based timing and nonbeat rhythms which do not elicit beat-based timing. Discrimination of beat rhythms but not nonbeat rhythms was improved by increasing SMA excitability and impaired by decreasing SMA excitability. Conversely, discrimination of beat rhythms but not nonbeat rhythms was impaired by increasing cerebellar excitability and improved by decreasing cerebellar excitability.

B108 Modulation of Facial Expression Perception in Body Context

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The present study tested the proposal that facial expression perception is modulated by context as a function of how similar the target facial expression is to the context's emotionally congruent facial expression (e.g. anger in a disgust context). Faces expressing the six basic emotions and neutral were mixed and combined with the seven emotions expressed by just the body in a face expression categorization task. Results show that facial expression perception is influenced by which bodily expression it is combined with. The extent of this influence varies with the facial expression but no extreme shift in categorization was ever found.

B109 Social Anxiety Influences Performance Monitoring: An Electrophysiological Investigation

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The current study sought to clarify the effect of anxiety-provoking situations on the error related negativity (ERN), and to examine the any effects of social anxiety on performance and performance monitoring. The response-locked event related potentials of 15 undergraduates, who varied in levels of social anxiety, were measured. All participants completed a Flanker task during both control (i.e., alone in the room) and social (i.e., observed from the doorway) conditions. Behavioural results showed that socially anxious participants response times were longer, with more incorrect answers during the social condition compared to their non-socially anxious peers. Electrophysiological results revealed more negative ERN amplitudes for socially anxious participants during the social condition, in comparison to the control condition, and to

non-socially anxious participants. The results suggest that state specific anxieties negatively impact performance and influence the performance monitoring system.

B110 BLANK

B111 Differential effects of semantic relatedness and repetition on hippocampal activation

Leanne Karyn Wilkins, Cornelia McCormick, Todd A Girard, Mary Pat McAndrews
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We investigated how the pre-existing semantic relationship between object and scenes moderates the effect of repeated presentation in an incidental continuous recognition paradigm. We compared first and second presentation for objects paired with semantically related (e.g., grapes-supermarket) or unrelated (e.g., cup-swimming pool) scenes. Participants made recognition decisions on the central object only. Hippocampal activation remained consistent for the related condition across presentation, whereas there was an increase in anterior hippocampal activation for the unrelated condition at second presentation. These results suggest binding of objects and backgrounds takes place incidentally and that novelty effects are influenced by that binding.

B112 The manifestation of anxiety disorders after traumatic brain injury: A review

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Anxiety disorders commonly occur after traumatic brain injury (TBI). Although anxiety disorders are known to be strong predictors of social, personal, and work dysfunction, they remain largely unexplored and poorly understood in the context of TBI. We provide an overview of the limited published research to date on anxiety disorders that develop following TBI, including post-traumatic stress disorder, social anxiety disorder, specific phobia, generalized anxiety disorder, obsessive-compulsive disorder, and panic disorder. This review also examine factors that influence the expression of these conditions, including injury-related and psychosocial variables and putative neural correlates where known.

B113 Take Your Seats: Leftward Asymmetry in Classroom Seating Choice

Victoria Harms, Lisa Poon, Austen Smith, Lorin Elias
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Theatre patrons show a bias towards sitting on the right side of a movie theatre. Two competing theories have attempted to explain this asymmetry; one posits that expectation of processing demand drives the bias, the other posits that basic motor asymmetries drive the bias. To test these theories we assessed the real world classroom seating choices of university students using photographs. A bias to choose seats on the left side of the classroom was observed, in contrast to the right side bias observed in theatre seating studies. These results support the suggestion of a processing-expectation bias.

B114 Impact of Psychological Comorbidity on Neurocognitive Functioning Following Traumatic Brain Injury

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In persons with mild traumatic brain injury (mTBI), psychological distress has been suggested to maintain some cognitive deficits past the acute recovery phase. There remains a need to examine the relationship between such post-injury symptoms. Individuals with mTBI (n=232) underwent neuropsychological assessment. In total, 25% of the sample had no psychological comorbidity, 25% received one co-morbid diagnosis, 42% received two co-morbid diagnoses, and 8% received three co-morbid diagnoses. Analyses revealed that the presence of multiple co-morbid diagnoses was associated with greater deficits in abstract reasoning, visual attention, task shifting, and visual and verbal fluency. Implications of these findings are discussed.

B115 The Influence of Affective State and Time Since Injury on Test Effort in Patients with Mild Traumatic Brain Injury

Sanya Sagar, Brian Mainland, Kerry Lawson, Tisha Ornstein
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The Test of Memory Malingering (TOMM), a forced-choice technique for detecting feigned cognitive deficits, appears to be sensitive to incomplete effort in patients with mild traumatic brain injury (mTBI). The current study examined the effects of affective state, as well as time since injury, on TOMM performance. Contrary to previous studies, increased symptoms of depression and anxiety were associated with poorer TOMM performance within an mTBI population. Time since injury was unrelated to TOMM performance. However, time since injury was associated with lower scores across a wider range of neurocognitive tests in suboptimal TOMM performers, in particular.

B116 Working memory and arithmetic ability in pediatric arterial ischemic stroke

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Thirty-two children with a history of arterial ischemic stroke (mean age=9.5±2.7 years) and 32 demographically equivalent controls were tested on standardized measures of

working memory, executive function behaviour, and academic achievement. Relative to controls, working memory performance of stroke participants was significantly lower across all tasks. Executive behaviour as it applies to working memory and cognitive set shifting was clinically impaired in 37% and 30% of the stroke patients, respectively. Deficits in metacognitive and behavioural-regulatory executive functions predicted poor performance in pencil and paper arithmetic in children with stroke. Findings elucidate areas of cognitive impairment and their neuropsychological correlates.

B117 Laterality of Basic and Social Emotions

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The present study examined hemispheric laterality within the context of Type Theory which categorizes emotional facial expressions as either basic or complex/social. Participants were presented with two different facial expressions followed by a target facial expression and asked to identify if the target face was among the two originally presented. The finding of an overall right hemisphere advantage contradicts theories suggesting different categories of emotions are processed in different hemispheres. There was some support for basic emotions being identified faster and more accurately than complex emotions, including sarcasm. Type Theory and the influence of labelling on laterality effects are discussed

B118 Are neuropsychological tests sensitive to body position?

Candice Bodnar, Vanessa Amodio, Todd A Girard
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Body position has been shown to influence specific cognitive abilities. We extend this investigation to assess whether body position influences standardized neuropsychological test performance. We administered tests with alternate versions assessing memory (CVLT-II), reading and estimated intelligence (WRAT-IV) and spatial cognition (JLO) in standing and lying positions. Body position had negligible and nonsignificant effects on mean test scores. Performance across test versions standing and lying were significantly correlated, but not highly reliable. In sum, results support minimal effect of body position on neuropsychological test performance at the group level, but warrant caution at the individual level.

B119 Single subject statistical analysis of ERP data for applications in brain injury

Rober Boshra, Jason Satel, Lauren Sculthorpe-Petley, Ryan D'Arcy, Thomas Trappenberg
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For event-related potentials (ERPs) to be useful in brain injury diagnosis, acquisition times must be very short. Here, we use machine learning techniques for the extraction and interpretation of data from a five minute experimental protocol that produces five traditional ERP components. Using a novel preprocessing technique on the average of two epochs for each subject followed by support vector classification produced 100% accuracy in single-subject ERP classification of all components. This offers a reliable and robust method to classify a variety of ERPs using short training time, low memory usage, and single-subject training data.

B120 BLANK

FRIDAY 4TH JULY	Student Lounge / Cara Commons / TRS1-073	4.30 – 6.00

POSTER SESSION C
ATTENTION / MEMORY

C121 – C136 are assigned to Student Lounge
C137 – C164 are assigned to Cara Commons
C165 – C180 are assigned to TRS1-073

C121 Item-individuation as measured by quantification and tracking performance in the blind field of an individual with cortical blindness

Lana Mae Trick, James Gaydon Reed Jones
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Item-individuation is the ability to consider objects as individuals, separate from others. Historically, two tasks have been used to assess item-individuation: multiple-object tracking (monitoring positions of multiple independent items as they move among distractors) and quantification (determining the number of items in a display). Although tracking and quantification are both thought to require individuation, they are very different tasks, and in this study we compared tracking and quantification performance in an individual with homonymous quadrantanopia in the upper left visual field: an individual who exhibited blindsight. This study revealed evidence of dissociations between tracking and some forms of quantification.

C122 It's All About Me: Stressor---Task Relatedness Influences Task Utility & Performance In Depression

Aadil Bharwani, Melaina Vinski, Scott Watter, Paul W Andrews
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Poor performance by depressed individuals on attention-related tasks is presented as evidence that depression engenders cognitive deficits. According to the Analytical Rumination Hypothesis however, limited cognitive resources are allocated towards sustained analysis of the depressogenic stressor and at the expense of low-utility tasks. Thus, we investigated whether relatedness between task stimuli and depressogenic stressors mediates task performance. Across groups, stressor-related stimuli resulted in fewer commission errors. Additionally, depressed individuals exhibited fewer omission errors when presented with stressor-related stimuli. These results suggest that depression is associated with reallocated, not impaired attention, and that stressor-task relatedness increases task utility and improves performance.

C123 Electrophysiological indexes of spatial relation evaluation in visual working memory

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This project uses a multiple frame protocol to test how the modulation of visuospatial attention and visual working memory (VWM) will modulate event-related potentials (ERPs) associated with them (namely the negativity 2 posterior contralateral (N2pc) and the sustained posterior contralateral negativity (SPCN)). Participants were asked to count how many times they were presented with a specific target. Results indicate that the N2pc modulations are related to the stimuli characteristics (especially the numbers and colors of the items) while SPCN modulations were related to both passive maintenance of information in VWM and evaluation of the spatial relations.

C124 Inhibition of Return: A phenonmenon in search of a definition and a theoretical framework

Kristie R Dukewich, Raymond M. Klein
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Inhibition of return (IOR) is an effect whereby people are slower to respond to a target presented at a recently inspected location compared to a target presented at a new location. We surveyed experts in IOR about their opinions regarding various aspects of the IOR literature. We found variety both between and within experts surveyed, suggesting that most researchers hold unique implicit assumptions about IOR. These varied assumptions may be hindering the creation or acceptance of a theoretical framework regarding IOR. This variety hints that what has been given the label "IOR" may be more than one phenomenon requiring more than one theoretical explanation.

C125 Eye remember you! The importance of eye contact in recognizing faces

Kaitlin Laidlaw, Erin Shin, Alan Kingstone
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We've previously demonstrated that people find it especially hard to avoid looking at the eyes of another's face. To investigate what purpose this bias serves, a follow-up study tested whether looking at the eyes facilitates face recognition. Participants were instructed to avoid looking at the eyes or, as a control, the mouths of a series of faces. They then completed a recognition task. While avoiding either the eyes or mouths hindered recognition performance compared to a free viewing baseline condition, avoiding the eyes resulted in a greater performance decrement, suggesting that unrestrained attention to another's eyes can facilitate later recognition.

C126 A look back at the wandering mind during reading

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Mind wandering frequency and predictability during reading has been well researched. Yet the reaction to, and effect on, reading behaviour after a mind wandering episode has not been investigated. We addressed this question by asking

students to read "War & Peace" and to self-report when they were mind wandering, and if and where they reread text. Two experiments, using paper and computer-based formats, demonstrated that rereading events occurred 45% and 31% of the time, respectively. These findings indicate that during reading people are perceptive of a possible impact of mind wandering and often compensate by rereading.

C127 Overt Retrospective Cues Elicit Location Specific Enhancement of Visual Working Memory

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Recent studies have shown that retrospective cues prevent degradation of items stored in visual working memory. Whether this protective effect occurs following overt rather than covert attentional shifts remains unknown. Participants performed a change-detection task where they either fixated centrally or made a saccade before memory was tested for a target presented centrally or peripherally. Our results showed a significant enhancement in detection accuracy and response times if a saccade was made to the location of the tested item. However, this facilitative effect only occurred when the memory target was presented in its original location.

C128 Where Have You Been, What Did You See, and How Did You Get Here: Effects of Prior Trial History in the Context of Spatial Cuing

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A series of exogenous and endogenous spatial cuing experiments explored the effect of prior trial history on performance in a two choice target identification task. Current trial RTs were affected by prior trial cue validity, target identity, and target location. Further, the effect of prior trial history differed for the two types of cuing. These results demonstrate that prior trial effects are a rich source of systematic variance that merits further investigation and theoretical consideration.

C129 Visibility of Sexual Features Influences Eye Movements in Women, but not in Men

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Humans are biased toward sexual stimuli; however, is the bias gender specific? Eye-tracking was used while participants viewed images of the same clothed or nude individual. Males showed an initial fixation to the face whether it was nude or clothed, with shorter fixation duration on the face of nude females. Female participants showed an initial fixation to the face only when viewing clothed images; but when a nude image was presented, the initial fixation was on the pelvic area of both male and female images. This suggests that the bias for sexual imagery is more evident and fluid in females.

C130 Attention to Faces in Scenes in Adults with Autism Spectrum Disorders and Typical Adults

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Individuals with autism spectrum disorders (ASD) show atypical face processing (Barton et al., 2007). Here, we studied how adults with and without ASD direct their attention to faces in naturalistic scenes. Both groups made more and shorter fixations when viewing multiple- compared to single-character scenes. Overall, viewers with ASD made fewer and shorter fixations on faces, compared to controls. Introducing motion primarily affected fixations directed to the background in both groups. However, only controls showed a significant overall reduction in the number of fixations made when motion cues were introduced. These findings provide insights into typical and atypical social attention.

C131 Do the Eyes Follow the Ears? Eye Movements and Laterality Effects in a Focused Attention Dichotic Task

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The present study examines the relationship between eye movements and the ear advantage typically found in dichotic listening. Participants were presented with two blocks of dichotic trials and asked to report only the word heard in one ear in each block. Eye gaze was monitored to assess where participants looked when focusing attention to each ear. The finding of an Attentional Condition by Area of Interest interaction suggests that when processing speech sounds presented to a single ear, participants direct their visual attention toward that ear, thereby creating an attentional blindness in the opposite visual field.

C132 The Sexual Image Stroop Task: Predicting Sexual Interest Based on the Pattern of Delays in the Processing of Sexual Content

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The goal of the current study was to examine the relationship between the patterns of delays in the processing of sexual content and the sexual interest of the participant (i.e., heterosexual males and heterosexual females). Utilizing a modified Stroop paradigm with four image types (i.e., naked males, naked females, non-sexual images, scrambled) we found that for heterosexual male participants (N=25) there was a significant delay when responding to images of naked women, compared to other

image categories. However, heterosexual female participants (N=50) did not display sexual-interest specificity. Instead, they demonstrated increased delays for all sexual images, regardless of content.

C133 The Beneficial Effects of Perceptual Variability on Sustained Attention

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Here, we present a striking, and arguably counter-intuitive example of a situation in which increasing the difficulty and complexity of a novel vigilance task actually results in smaller performance decrements over time. In a 'stable' condition participants monitored for the same critical target throughout the task, whereas in a 'variable' condition, participants monitored for many possible instantiations of the critical target. Despite the fact that performance was overall worse in the variable condition (indicating it was the objectively more difficult condition) the vigilance decrement was significantly reduced in response times relative to the stable condition across both of the Experiments reported here. These findings are discussed in terms of the role of task engagement and stimulus variability in alleviating the vigilance decrement.

C134 Mindfulness-Based Martial Arts Treatment Enhances Attention Orienting in Adolescents with ADHD

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ADHD is associated with challenges in attentional control that impact on behavioural, social and academic outcomes. This study assessed the impact of Integra Mindfulness Martial Arts (MMA) on attentional control in 13 boys with ADHD (7 treatment and 6 waitlist controls, aged 12-15). The ERP N2 component (reflecting stimuli-orienting and discrimination) was measured during a Go/No-Go computer task. Results indicated a significant group by time interaction, with the N2 significantly increasing for infrequent NoGo trials and decreasing for frequent Go trials in the treatment group only. Findings suggest that MMA may help improve attentional orienting in children with ADHD.

C135 Inhibition of attention to irrelevant areas of a scene during visual search

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Scene context aids search due to expectations about object location. However, it is unclear what attentional mechanisms direct gaze: in addition to enhancing target-relevant regions, are target-irrelevant regions inhibited? We investigated this by examining whether previously-inhibited scene regions would interfere with subsequent search. Participants performed six searches for different objects within the same scene, and we varied the target-relevant region across the first five searches. In the sixth search, we found longer initial processing times and less effective initial fixation placement when the target-relevant region differed. Results support the likelihood that inhibition is an attentional mechanism used in contextual guidance.

C136 Self-Esteem as an Embodied Metaphor to Cue Attention

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Embodied cognition holds that abstract concepts are grounded in perceptual-motor representations. If embodied metaphors map onto space, then processing these concepts should orient attention. Participants viewed centrally presented words consisting of high or low self-esteem traits (e.g. brave, timid) before detecting a target above or below the cue. Participants were faster to detect targets when their location was compatible with high and low self-esteem cues. This effect was observed when participants processed the semantics of the word, but not when processing its typography. These results show that self-esteem concepts orient attention, suggesting they are grounded in a spatial metaphor.

C137 Eye tricked you: The effects of a distractor face on visual search

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We investigated whether individual differences in social competence influenced search when a face was included as a distractor. Participants were asked to detect an object in a 4- or 12-item array. A face distractor gazing to the target, away from the target or straight ahead was present in 80% of trials. In face absent trials, typical search patterns were found. In face present trials, participants were overall less efficient at detecting the target. Individual differences in social competence were related to performance only when gaze indicated conflicting information about the target's location.

C138 Does training with self-motion improve target tracking performance in a three-dimensional environment?

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This study sought to determine if the type of training received in a motion simulator affects performance when maneuvering through a 1D or 3D virtual environment. During training participants performed a tracking task with no motion, motion correlated to joystick movements, motion turbulence (uncorrelated to joystick movements), or correlated plus turbulence motion. During test all participants performed the tracking task with correlated plus turbulence motion. We report performance differences related to the match between the training and test phase, and the extent to which this effect is greater in 3D environments relative to 1D environments.

C139 Feature Integration in the Dorsal Visual Pathway

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While much is known about the hierarchical processing in both the dorsal and ventral pathways, less is known about how and when ventral and dorsal stream information is integrated into motion processing. Using direction judgments of superimposed surfaces, we show that both color and speed, as independent object features, are integrated into dorsal stream object representations beyond direction computation circuitry in area MT. Integration of color requires top-down task demands while speed integration utilizes bottom-up segmentation cues. Finally, color and speed as object features allow for competitive selection between surface representations reducing the time needed for perceptual decision making.

C140 Object-substitution masking reveals the graded nature of conscious perception

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In two experiments, object-substitution masking (OSM) coupled with a delayed report paradigm (Wilken & Ma, 20004; Zhang & Luck, 2008) was used to address an ongoing debate concerning whether conscious perception is the result of discrete or gradual processes. Responses following target orientation discrimination were gathered on a continuous scale (0-360 degrees) and submitted to a mixture modelling analysis providing separable estimates of accuracy (whether information is available to conscious access) and precision (the perceptual quality of conscious information). Results from both experiments revealed that OSM can both delete and degrade information from conscious awareness.

C141 Mind Wandering During Lectures: An Ecologically Valid Exploration

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Throughout an entire undergraduate course, student mind wandering was gauged using intermittent thought probes placed randomly within each lecture. Quiz questions at the end of each class assessed memory for material associated with moments of mind wandering or on-task thought. While results were manifold, key revelations include a conspicuous lack of a mind wandering increment over the span of a lecture, an increase in performance related to simply including probes in a lecture, and better memory for material covered before than after a probe. Interestingly, the greatest costs to performance were associated with moments of intentional than unintentional mind wandering.

C142 Attention Modulates Colour Perception across the Visual Field in Natural Scenes

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Despite the fovea-biased cone distribution in the retina, our perception is of full colour across the entire visual field. Indeed, observers perceive colour throughout images with large achromatic regions, with colour spreading increasing with retinal eccentricity. Here we use occasional gaze contingent ''colour chimeras'' to investigate colour spreading at different eccentricities under a low or high cognitive load. Results show that observers miss the colour chimera images when the achromatic region is closer to the fovea under high cognitive load, but not under low cognitive load. This finding suggests that the percept of colour spreading can be modulated by attention.

C143 Mind wandering and reading: Does difficulty matter?

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We examined whether objective reading difficulty was related to mind-wandering (MW) during a naturalistic reading task. Participants read easy (Flesch-Kincaid grade 9), medium (grade 13) and difficult (grade 17) passages and intermittent thought probes assessed MW. Measures of subjective difficulty, interest, and reading comprehension were also obtained. Contrary to research by Feng, D'Mello, and Graesser (2013), MW was not more frequent for objectively difficult passages. Subjective difficulty, however, was related to MW, with interest ratings mediating this relationship. Passages receiving high subjective difficulty ratings were also rated as less interesting, which in turn increased mind-wandering, leading to poorer reading comprehension.

C144 Electrophysiological Correlates of Distractor Removal and Pseudoneglect

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Distracting noise increases healthy participants' leftward attentional biases or pseudoneglect. Here we tested whether attentional biases interact with distractor-sensitive EEG components. Participants made perceptual judgements about grating-scales with added pixel noise to capture attentional biases. We found that biases rose as noise increased. EEG results showed a positive-going deflection between the P2 and N2 components – arguably a distractor positivity, or PD. The PD was more pronounced at right posterior electrodes and only there its amplitude changed as a function of noise. Our data offer new insights into the neural mechanisms underlying right-brain functions of visuospatial attention and awareness.

C145 Mind wandering and the attentional blink

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In two studies we investigated the hypothesis that mind wandering is associated with attentional under-investment in the environment. In Study 1 we found that mind wandering indexed by thought-probes during a sustained attention task negatively predicted the size of the attentional blink in a subsequent RSVP task. In Study 2 we replicated this relation and found that spontaneous, but not deliberate mind wandering, negatively predicted the magnitude of the attentional blink. We suggest that mind wandering may index a form of cognitive flexibility, which may serve to prevent individuals from over-investing attention in any particular event in the environment.

C146 Perceptual averaging of three-dimensional shapes

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Previous research has shown that the visual system averages over two-dimensional features (e.g., size, orientation). Yet in the real world, perception includes three-dimensional information, such as volume. Here we show that humans are able to average volume across the visual field. Using a tachiscopic presentation, we presented 3D shapes (cube, spheres, cylinders) at different set sizes (4,8,12). Participants then chose between two shapes – one at the average volume of the previous screen, the other controlled by adaptive threshold (75% accuracy). We find that participants threshold of volume is within 20% of the actual average volume, irrespective of the set size.

C147 Detecting change in 3D: Assessing depth as a cue in visual attention

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The present study investigated whether prolonged gaze could facilitate memory for verbal information. Participants were asked to remember a list of words that were read aloud by a female experimenter who either displayed staring behaviour or not. Next, the participants were presented with a combination of new words and words they had been previously presented. Participants preformed a recognition test where they identified by button press whether a given word had been presented previously or not. Results showed that females benefit from prolonged gaze on recognition tests; however, this benefit was not observed in males demonstrating that that prolonged gaze has differential effects on memory in males and females.

C148 Attention enhances phase-locking in the frequency-following response

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The auditory brainstem phase locks its response to the individual frequencies of stimulating sounds, and this response is probably essential to how we interpret our auditory environment. Previous research has shown that attention may modulate brainstem-level frequency encoding as measured by the frequency-following response (FFR). However, although general attentional effects have been reported, the ability of the FFR to reflect frequency-selective enhancement in the auditory periphery has not been investigated, and no attentional effects have yet been observed for phase-locking analyses of the FFR. In our study we calculated the phase-locking value for seventeen participants' FFRs at frequencies that were treated across trials as both the target and a distractor in an auditory target-detection task. Although we observed attentional modulation of the phase-locking values, these effects were not frequency-selective. This study has implications for understanding at what level of acoustic processing there is selective top-down enhancement.

C149 Limitations on the Effectiveness of Bottom-Up and Top-Down Attention During Visual Working Memory Encoding

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It is well established that visual working memory (VWM) performance is associated with the allocation of attention, however, the limits on this selection mechanism are unknown. In the present study, we examined the effectiveness of top-down and bottom-up selection mechanisms during VWM encoding. Items could appear with or without the transient capture of attention or top-down spatial cues. We varied the number of cued locations between 1 - 6, and examined target accuracy and memory precision for both cued and uncued sample items. Results indicate that the effectiveness of attention is primarily limited to a small number of top-down cues.

C150 Contextual Variation is Not Always Detrimental to the Spacing Effect

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The spacing effect describes the reliable finding that items are best remembered if they are repeated at spaced out intervals compared to repeated in immediate succession; however contextual variation during repetitions can weaken the effect. In this experiment, two types of intra-item contextual variation (words that changed in either colour or font) were compared to a same context condition in a traditional verbal spacing paradigm. The results demonstrated a spacing effect for same context items and colour-changed items but not font-changed items. The data provide some support for the encoding variability account of the spacing effect.

C151 Error gradients in the Brown-Peterson Paradigm

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Data from two Brown-Peterson experiments were scored in two ways. With traditional scoring (was the entire consonant trigram recalled) performance decreased with increasing delay. With immediate serial recall scoring (was the first letter recalled first, etc.), standard position error gradients (Experiment 1) and protrusion gradients (Experiment 2) were observed. When the first letter was not recalled first, it was more likely to be recalled second than last. When not recalled in the correct list, the letter retained its original position. These gradients indicate that forgetting in the Brown-Peterson paradigm follows the same principles found in long-term memory tasks.

C152 Re-examining the sequential-simultaneous paradigm: orientation judgements and iconic memory

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In orientation judgment experiments using a sequential-simultaneous paradigm, responses are always more accurate on sequential trials. We investigated whether this sequential advantage resulted from persistent iconic traces of the last stimulus. Response accuracy on sequential and simultaneous trials was compared at multiple delays between stimulus offset and the response slide. Accuracy was reduced for the last stimulus for delays greater than one second; however, the sequential advantage was equivalent for all delays. Our results suggest that iconic traces confer some accuracy improvement for the last stimulus at short delays, but they are not sufficient to explain the sequential advantage.

C153 Evidence for the role of motor affordances in object memory

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In line with the embodied cognition perspective, some researchers suggested that the motor system is recruited during retention. For instance, the language production architecture would be responsible for the retention of verbal material (Jones et al., 2006). The objective of the present study was to explore the role of motor affordances in object memory using a recognition task where participants were asked to memorize pairs of objects. When the objects of each pair were arranged to interact together, motor suppression was more interfering than when the objects did not interact, suggesting that motor affordances play a role in object memory.

C154 Context reinstatement and the desirable difficulty effect

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Contrary to findings of "desirable difficulty" (Bjork, 1994), Yue et al. (2013) failed to find a recognition benefit for studied words presented as blurry versus clear. In their study, intentional encoding instructions were used, and test words were presented auditorily. We examined whether a desirable difficulty effect for blurry over clear words would occur under other conditions. Data were collected for three groups across which intentionality of encoding and context reinstatement were manipulated. A recognition benefit was observed for blurry over clear words for both incidental and intentional encoding, as long as context was fully reinstated at test.

C155 Repetition can be costly: The non-intuitive effect of repeating items on remembering

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Following recent debates on the role of stimulus repetition in conflict detection and cognitive control (Egner, 2007), and recent interest in the effect of conflict on remembering (Krebs et al., 2013; Rosner et al., 2013), we examined how stimulus repetition influences performance on a later recognition memory task. In a series of experiments, we found that recognition memory performance is often better for non-repeated than repeated items. The impact of processing fluency on perception and encoding processes is discussed.

C156 The Bland and the Beautiful: The Effects of Emotion and Motivational Intensity on Memory

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Stimulus valence, here defined as the intrinsic attractiveness/repulsiveness of a picture, affects the scope of attention. Competing theories make different predictions about the effects of valence on attention scope. To examine them, participants were exposed to sequences of positive, neutral and negative pictures, each followed by a series of unrelated words. Recognition memory accuracy was worse for the first vs. the second and third word following each picture series, but there was no influence of valence. Interestingly, in both experiments, recognition decision speeds showed a trend for an interaction between response type, length and valence.

C157 Shared Feature Identification and Recognition in Mild Cognitive Impairment

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The study aimed to clarify the level at which semantic knowledge impairment occurs in mild cognitive impairment (MCI). Participants were 30 healthy older adults and 21 MCI patients. MCIs performed better on the identification task than the generation task, suggesting that the deficit may be due to a lack of access to semantic knowledge. MCI responses in the biological category were more impaired than in the artifact category. MCIs committed proportionally more errors on every error type but the proportion of the superordinate type error in the biological category was significantly greater than that of any other error type.

C158 A Way with Words: Fluency of Processing in a Lexical Decision-Making Task

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Perception of everyday objects is difficult when objects are obscured by interposed obstacles. The present study examined the shape of the relationship between speed/accuracy of perception and the amount of an object available for perception. We required university students to make fast word/non-word decisions about letter strings (words and pronounceable pseudo-words) displayed on a computer. Each letter string was partially obscured with cross-hatched lines varying in density. We expected that a linear increase in mask density would result in a linear increase in the time required for lexical decision making, but the results showed a curvilinear relationship between these variables.

C159 Perceptual distinctiveness in object memory

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Memory is better for an item that differs from its context (the isolation effect; von Restorff, 1933). This effect has been mostly demonstrated using simple features such as shapes or letters. In the present study, we explored the isolation effect using more ecological stimuli, namely objects. Participants had to memorise sequences of seven objects and recall them in their order of presentation. In half of the lists, the fourth object was isolated by presenting it in a unique size. The results showed no isolation effect, unless participants were familiarised with the size of the objects prior to the experiment.

C160 Effects of initial testing and previewing on recognition

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An initial test has been found to improve memory on a final test more than an additional study experience (i.e., the testing effect). We compared recognition accuracy for words across two tests that were either the same or different. Rather than showing a benefit of initial testing, recognition accuracy decreased across tests in both the same-test and different-test conditions. We also examined whether merely "previewing" the items on the first test, rather than committing old/new responses, might protect against this decrease. However, recognition accuracy was similar on the second test whether the first test involved previewing or responding.

C161 The Own-Race Bias in Context Memory of Faces: A Cross-Culture Comparison

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It has been suggested that the own-race bias in face recognition (i.e., superior memory for faces of one's own relative to other races) is driven by more elaborated encoding processing of one's own race. The current study examines the own-race bias in context memory across Western and East Asian cultures. Caucasian Canadian and Chinese participants studied Western and East Asian faces under different contextual instructions and then were tested on their memory for faces and the corresponding contexts. The results showed an own-face bias in context memory, an effect significant only in Canadians but not in Chinese participants.

C162 The Impact of Motion on Memory for Object Location and Form

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Two experiments examined participants' ability to remember either the location or the form of visual stimuli while concurrently discriminating between directional (left/right) motion cues provided by a motion seat. Motion cues occurred either during stimulus encoding (E1) or retention (E2). The ability to remember the location of visual stimuli was significantly impaired by motion cues presented during either encoding or retention. In contrast, the motion cues did not interfere with memory for the visual stimulus form. This study supports the theory that the encoding/retention of location and form information is served by separable mechanisms in working memory.

C163 The Influence of Backward Associative Strength and Gist in the DRM Paradigm when Creating Stories at Recall

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Activation-monitoring theory (AMT) and fuzzy-trace theory (FTT) are used to explain false memories in the Deese-Roediger-McDermott (DRM) paradigm. These theories differ in their reliance on backward associative strength (BAS) and gist. Using situational feature lists (Cann et al., 2011) and DRM word lists, we present two experiments manipulating backward associative strength and gist strength, and present a new method of eliciting false memories in the DRM paradigm. The results indicate that situational feature word lists, weak on BAS, elicited significantly more false memories compared to weak BAS DRM word lists. The findings are discussed in relation to AMT and FTT.

C164 A Single-System Account of Intact Identification Priming in Memory Dysfunction

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After studying a list of words, both amnesic patients and controls show facilitated ability to identify the words when they are presented tachistoscopically. However, only the controls can recognize the studied words. This dissociation has been taken as evidence for two distinct memory systems: an explicit memory system serves recognition while an implicit memory system serves priming. We produce the dissociation using MINERVA2, a single-system model of memory. We explain the dissociation as an interaction between two factors: encoding fidelity and time permitted for retrieval. The simulations question the theoretical necessity of partitioning memory into multiple systems.

C165 Are personal semantics distinct from episodic and semantic memory? An electrophysiological study of memory for repeated events and autobiographical facts

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Memory for repeated events (REs) and autobiographical facts (AFs) are two poorly understood forms of personal semantics, related to but arguably distinct from episodic and semantic memory. We tested Renoult et al.'s (2012) hypothesis that REs should look more similar to episodic memory whereas AFs should look more semantic. We recorded the EEG of 20 healthy participants while they verified the veracity of sentences probing four types of memory: general (i.e., semantic) facts, REs, AFs, and unique (i.e., episodic) events. As predicted, REs were more akin to unique events, and AFs were more similar to but distinguishable from general facts.

C166 Viewpoint independence in implicit spatial learning: Evidence from contextual cueing paradigm

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Repeated configurations of random elements induce better search performance than that of the displays of novel random configurations (contextual cueing effect). In this study, we examined whether such spatial learning can be transferred to a different viewpoint of a 3D scene. When the scene contained clear indication of the view change and different items in the scene contained unique identity information, significant contextual cuing was found in both before and after viewpoint change of 45 degree, suggesting view-independent representation of the scene. A series of experiments were conducted to examine the mechanisms of such viewpoint independent learning.

C167 Left to recollect? Laterality effects in whole-brain functional connectivity of the angular gyrus during rest and recall

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The angular gyrus (AG) is consistently reported in neuroimaging studies of episodic memory and is considered a fundamental node of the "recollection network" (Rugg & Vilberg, 2013). These studies often report left lateralized activations (Wagner et al., 2005), though it is unclear why. Using fMRI during rest and task, whole-brain functional connectivity of the left and right AG were compared. Results from both univariate and multivariate techniques suggest that both left and right AG are part of the "recollection network", although, the reported left bias may be supported by increased connectivity specific to the non-medial temporal nodes of this network.

C168 Intentional Forgetting of Factual Information: A Comparison of Reliable and Unreliable Sources

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This study examined how knowledge of source reliability would influence the extent to which people choose to encode information selectively. Participants were given statements from two sources to study. They were told that each source was either reliable or unreliable, either before or after the study phase. Participants completed a free recall test and were then required to judge statements from both sources as true or false. Results indicated that participants accounted for source reliability, and selective

forgetting occurred under some conditions. These results are novel and are discussed in the context of theories of selective rehearsal and retrieval inhibition.

C169 Item-Based Directed Forgetting for Sound Effects and Spoken Words

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The picture superiority effect refers to the finding that pictures are easier to remember than words. Crutcher and Beer (2011) demonstrated an analogous advantage in free recall of sound effects compared to their spoken labels. We compared recognition for sounds (e.g., bagpipes, footsteps) and spoken words using the item-based directed forgetting procedure. Across three experiments, a similar directed forgetting effect was observed for both types of stimuli with no advantage of sounds over words. Despite their perceptual differences, recognition memory is remarkably similar for sounds and words that participants try to remember or try to forget.

C170 The Residual Protective Effects of Enactment

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Across several studies, we explored whether enactment of studied words provided some protection from the detrimental effects of dual-task interference. Following full attention (FA) encoding of either read or enacted words, participants completed recall (Exp 1 and 2) or recognition (Exp 3 and 4) under either full or divided attention (DA) conditions, with a concurrent animacy task. While enacted and read words were not differentially immune to interference during the initial test, final recall tests revealed that after initial test, enacted words were relatively less susceptible to corruption than read, suggesting that DA may differentially interfere with the reconsolidation process.

C171 Impact of directed forgetting instructions on memory reconsolidation during sleep

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Research suggests that a reactivation process consolidates memories during sleep and destabilizes memories during wakefulness. Limited research addresses the role of sleep in forgetting and reconsolildation of destabilized memories. A list-method directed forgetting (DF) procedure in which participants learned two lists on night 1 and received DF instructions on night 2 was conducted. On night 2, one group also received a memory reactivation treatment intended to destabilize memory of learned lists. This group showed significantly decreased directed forgetting on next-day cued-recall compared to controls ($p<.05$). Analyses on the role of sleep stages in this memory performance will be presented.

C172 The pen is mightier than the pixel: Note-taking technology and context in memory

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The use of computers in the classroom has been shown to reduce performance on subsequent memory tests. The present experiment examines the use of computers for note affects memory performance by examining how memory performance differs for lists of aurally presented words when study involves either handwriting the to-be-remembered items with a pencil and paper or typing them on a computer. At test, items were recalled by writing either writing them down or typing them so that the context at study either matched or mismatched the context at test. Consistent with past findings, performance was better when items were handwritten at study. There was no effect of writing method at test, nor was there evidence for better memory performance when the context and study and test matched compared to when the mismatched.

C173 Lineup composition and lineup presentation influence eyewitness misidentifications

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Police have long been advised to avoid constructing lineups in which the person suspected of a crime stands out from the non-suspects (fillers). We used morphing software to manipulate suspect-filler and filler-filler similarity. For simultaneous lineups, innocent suspect misidentifications decreased with increased suspect-filler similarity, but only when filler-filler similarity was low. For sequential lineups, innocent suspect misidentifications increased dramatically with increasing filler-filler similarity, with little effect of suspect-filler similarity. None of our manipulations affected correct identifications. These preliminary data suggest lineup composition effects depend on whether the lineup is presented simultaneously or sequentially.

C174 Effects of target distinctiveness and test format on face recognition

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Police conduct identification tests by presenting eyewitnesses with a single person suspected of the crime (showup) or with the suspect and a set of known innocents (lineup). We tested memory for typical and distinctive targets using showups and lineups. For target-present trials, accuracy was higher for distinctive than typical faces and test format had no effect. For target-absent trials, accuracy was higher for showups than for lineups and target distinctiveness had no effect. Although accuracy

on showups was either the same or better than lineups in this experiment, the suggestiveness of showups raises questions about their use in police investigations.

C175 Students don't like numbers: Sex and discipline effects

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Previously, we have shown that students' interest in taking quantitative vs. non quantitative psychology courses is very low and that women are less interested in quantitative courses than men (Uttl, White, & Morin, 2013). The objectives of the current study were to replicate these findings, to determine the magnitude of sex differences within psychology majors, and to compare the dislike for numbers across disciplines. Over 700 students rated their interest in 44 undergraduate psychology courses. The results replicated our earlier findings, showed large sex differences in dislike for numbers within psychology majors, and general dislike for numbers regardless of students' major.

C176 Prospective Memory, Big Five, and Symptoms of Psychopathology

Bob Uttl, Carmela A White, Kayla Mathison, Laura M Grant, Vanessa Vandergaag, Cassidy L L Wilson
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Correlations between prospective memory (ProM) and the Big Five, and between ProM and psychopathology reported in previous studies are generally small and inconsistent. To examine these relationships, over 700 undergraduate students completed a battery of cognitive tasks including measures of episodic ProM, Big Five, and symptoms of psychopathology. The results showed nearly zero correlations between episodic ProM and the Big Five traits, with the exception of Openness. Moreover, small negative correlations were found between episodic ProM and symptoms of psychopathology, including obsessive-compulsive, anxiety, paranoid ideation, and psychoticism symptoms.

C177 Stare to Remember: Prolonged mutual gaze, verbal memory, and gender

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The present study investigated whether prolonged gaze could facilitate memory for verbal information. Participants were asked to remember a list of words that were read aloud by a female experimenter who either displayed staring behaviour or not. Next, the participants were presented with a combination of new words and words they had been previously presented. Participants preformed a recognition test where they identified by button press whether a given word had been presented previously or not. Results showed that females benefit from prolonged gaze on recognition tests; however, this benefit was not observed in males demonstrating that that prolonged gaze has differential effects on memory in males and females.

C178 Prior knowledge enhances both familiarity and recollection type of associative memory

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We investigated how prior knowledge can influence associative processing by asking participants to associate novel houses with famous or nonfamous faces. We found that how well participants recognized the intact face house pairs, as compared to recombined pairs, was enhanced by famous faces. Even how well the participants recognized single houses was enhanced when the houses were paired with the same famous face as at encoding, but not with another famous face that was studied nor with a non-famous face. Together, the results indicated that both recollection and familiarity of associations can be enhanced by prior knowledge.

C179 Relocated targets in repeated contexts could be learned again in contextual cueing paradigm

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Repeated contexts of nontargets facilitate visual search in comparison to novel arrangements of nontargets, while the location probability of targets were matched between repeated and novel context (contextual cueing effect). In the present study, we examined whether relocated targets in the repeated contexts could be learned again following learning of original target-context association. After an initial learning phase, target locations in the repeated context were switched with that in the random contexts. Contextual cueing effect was again observed after new learning. Contrary to Zellin et al (JoV, 2013), we found that contextual cueing can be adaptive for relocated targets.

C180 Intrinsic Reference Direction can facilitate Implicit Spatial Learning: Evidence from Contextual Cueing Paradigm

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It has been proposed that a spatial layout can be better learned with presence of an intrinsic reference direction. Here we examined this phenomenon in a task involving implicit learning in a contextual cueing paradigm where repeated configurations of random elements induce better search performance than that of novel configurations. We varied the information about intrinsic axis by manipulating the orientation of the individual objects in the scene to be either coherent or not. A greater contextual cueing effect was found for the coherent condition suggesting that the presence of intrinsic axis can benefit implicit learning.

SATURDAY 5TH JULY	Student Lounge / Cara Commons / TRS1-073	1.00 – 2.30

POSTER SESSION C
LANGUAGE / PERCEPTION

D181 – D196 are assigned to Student Lounge
D197 – D224 are assigned to Cara Commons
D225 – D240 are assigned to TRS1-073

D181 Processing of (pseudo)constituents in English opaque and pseudo-compounds: Effects of morphemic structure

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Does the language system attempt meaning construction whenever morphemic representations are available? We examined whether exposure to a pseudo-compound (e.g., carpet) or an opaque compound (e.g., hogwash) affects the ease of processing the first (pseudo)constituent (e.g., car or hog). Our results indicate that meaning construction occurs whenever morphemes are available; the influence is dependent on the presence of a morphemic structure. First (pseudo)constituents are facilitated following opaque compounds but are inhibited following pseudo-compounds. Pseudo-compounds may produce processing difficulty due to conflict between the constructed bi-morphemic structure and the word's monomorphemic structure.

D182 Semantic representations of words in memory affect reading and spelling in children

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A reader's ability to efficiently identify a word is dependent on the quality of the word's representation in memory. The current study examined how components of words interact in memory, by exploring semantic effects on reading/spelling. Twenty-eight grade three students read, spelled and selected each word's meaning from three options. Children read and spelled more words accurately when they knew the meaning, compared to when they did not know the meaning. This research furthers knowledge about effects of meaning on reading/spelling in the lexical quality hypothesis and highlights the importance of teaching both written and oral forms of words together.

D183 Spatial-attentional and orthographic-lexical interactivity during reading processes

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The dorsal visual-stream specializes in spatial attention and phonetic decoding, whereas the ventral visual-stream specializes in object processing and lexical reading. In seclusion, their behaviour has been examined, however, their interactivity in reading remains relatively unexplored. We paired lexical identity cues (expect a word or a non-word; to engage the ventral stream) with spatial cues (expect target on left or right; to engage the dorsal stream) to investigate their interactions in three experiments: 1.Orthographic lexical-decision 2.Naming 3.Go/no-go naming (name words only). Results indicate that spatial attention interacts with reading processes when orthographic information is relied upon in lexical decision.

D184 Verbal Implicit Statistical Learning: Evidence for Dual-Task Interference

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The explicit process of working memory (WM) may affect the implicit process of statistical language learning. Participants were exposed to an artificial language containing words that could be segmented from the transitional probabilities of syllables (Saffran, et al., 1997). Participants were concurrently engaged in one of four WM tasks: (1) verbal WM, high-load; (2) verbal, low-load; (3) visuospatial WM, high-load; (4) visuospatial, low load. Compared to a control condition (no WM task), word segmentation abilities were reduced for those completing either verbal WM task. The results suggest interference in implicit learning when focused on material of the same domain.

D185 The Assignment of Smooth and Jagged Words: An ERP Investigation of Sound-Symbolism

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Sound-symbolism examines the nonarbitrary elements that exist within language. Research has demonstrated nonsense words like "bouba" crossmodally match round and smooth objects, whereas nonsense words like "kiki" crossmodally match jagged and angular objects. We present new behavioural and electrophysiological evidence to demonstrate how nonsense words are crossmodally categorized. Using an implicit association task (IAT), participants learned to categorize nonsense words (either jagged or smooth) congruently or incongruently in accordance to sound-symbolism. Electrophysiological evidence demonstrated a late negative EEG-waveform (N400) between congruent and incongruent word categorizing. Although electrophysiological results were marginal, behavioural results were more profound of this nonarbitrary sound-symbolic relationship.

D186 Effects of varying initial accuracy of word-referent associations on word learning

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In cross-situational word learning, initially inaccurate associations help adults learn word-referent mappings, while initially accurate associations help children. The present study explored the effects of initial accuracy on word learning in 4-year-olds, 7-year-olds, and adults within a single learning trial. In a pre-study phase, half of word-referent associations presented were correct, and half, incorrect. In the learning phase, each word was presented with its correct referent. Recognition performance showed learning only in adults. Initial inaccuracy led to less bias in responding than initial accuracy for all groups. The findings are relevant for understanding fast mapping processes in word learning.

D187 The influence of concreteness and SND on explicit semantic tasks

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Investigations of how semantic neighbourhood density (SND; Buchanan, Westbury, & Burgess, 2001) may interact with other word properties (e.g., concreteness) to influence recognition response times (RTs) have shown promising results (Danguecan & Buchanan, 2014). Arguably, semantic processes are maximally revealed using tasks requiring explicit semantic access (Pexman et al., 2007). This study compares recognition RTs for words varying in concreteness and SND using three explicit semantic tasks requiring: 1) food/non-food word categorization, 2) concrete/abstract categorization, and 3) sentence-word relatedness judgments. The effects of SND and concreteness varied by task, and will be discussed using a new model of semantic processing.

D188 Visual Verbs Versus Visual Verbs: A Study of Within-List Variability

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In psycholinguistic studies, word categorizations (e.g. face-, arm- and leg-related) are often treated as though they are distinct and homogenous categorizations. However, a specific line of research has demonstrated variability amongst these word lists through subjective measures. The present study explored the within-category variability of a list of visual action verbs through objective measures using ERPs, with a lexical decision task. ERP results supported clear N400 differences amongst the verbs, and results of the factor analysis revealed two significant factors. Factor one correlated strongly with meaningfulness, and ERP results of factor two supported a possible effect of semantic richness.

D189 Individual Differences in Repetition Blindness

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When stimuli are presented rapidly repetitions are often undetected; a phenomenon called repetition blindness (RB) (Kanwisher, 1987). Grouping of nonlinguistic items prevents RB (Goldfarb & Treisman, 2011) and individual differences may exist for grouping effects for linguistic stimuli (Jackson & Buchanan, in preparation). We sought to confirm these differences and determine whether they are due to different processing strategies. Participants viewed RSVP streams of letters and words and provided judgments of frequency. Reaction times and strategy choices were collected and will be discussed in the context of familiarity –based versus enumeration –based strategies.

D190 The role of perspective-taking in event imagination

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The current study used ERP methodology to investigate the cognitive effort associated with imagining events from different visual perspectives. Slow-cortical potential (SCP) negativity was measured while participants read verb phrases depicting ongoing activities (e.g., I was acting) and then imagined themselves participating in these events from the first or third-person perspective for five seconds. SCP amplitudes demonstrated that imagining events was more difficult from the third-person perspective than from the first-person perspective. These effects also varied according to topographical region. This study represents a novel neurocognitive investigation of the effects of visual perspective on event representation.

D191 An Analysis of Spelling Knowledge in First Graders

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Recent research on spelling development has focused on children's sensitivity to the manner in which particular spellings are influenced by the characteristics of the neighbouring elements within words – i.e., context-specific spellings. However, there have been relatively few detailed analyses of individual differences in sensitivity to these spellings, particularly among beginning spellers. The present study examined first graders' knowledge of a variety of context-specific spellings. Analyses revealed considerable individual differences in both overall sensitivity and sensitivity to particular types of spellings. We discuss the implications of these findings for models of spelling development and instruction.

D192 The missing-symbol effect: Examination of properties of the attentional beam in reading

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When reading and searching for a target letter, participants miss more letters in frequent function words than in rare content words. The Attentional Disengagement model proposes that the missing-letter effect is due to the timing of attentional disengagement. This study examined the properties of the attentional beam within the context of a symbol detection task. When detecting symbol transformations around the text, a higher rate of omission for probes was observed in proximity of content than function words. These results are explained as a function of the impact of cognitive load on the attentional beam.

D193 Song and musical training can enhance learning novel words

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We examine the effect of song and musical training on incidental learning of unfamiliar words. Learners hear English datives (Dave sells Brad a book), followed by two Korean translations differing in word order and/or inflections. The Korean sentences are sung, or spoken with either natural or monotone intonation. Learners attempt to discover the rules for the differences in three blocks of study-test trials, followed by unexpected tests for word learning. Current data (36 participants) indicate singing condition superiority for noun learning, but the singing advantage was restricted to participants with advanced musical training. Musical training also influenced verb learning.

D194 Multimodal Processing of Speech: The Relationship between Beat Gesture Synchrony and Speech Comprehension

Josh Romano, Craig Chambers
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Beat gestures (rhythmic, meaningless oscillations of the hand/arm produced during speech) occur in tight synchrony with stressed syllables in speech. The present study aimed to determine how this relationship affects real-time comprehension of spoken language. We conducted three experiments: Experiment 1 tested if participants could explicitly detect asynchronies between speech and gesture. Experiments 2 & 3 tested the effects that asynchronies had on on-line language processing. Results showed strong detection of synchrony/asynchrony in the explicit judgement task, and more subtle effects of asynchrony on processing speed in real-time comprehension. Implications for theoretical and methodological approaches to speech-gesture processing are discussed.

D195 Studying the relationship between RAN and orthographic processing

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Bowers and Wolf (1993) related rapid automatized naming (RAN) to reading because of its contribution to orthographic processing. However, the nature of the RAN-orthographic processing relationship remains unclear. In this study we examine (a) what kind of orthographic processing (lexical vs. sub-lexical; accuracy vs. response time) is predicted by RAN, and (b) what processing skills mediate the RAN-orthographic processing relationship. One hundred undergraduate students were tested on measures of RAN, orthographic processing, phonological recoding, and speed of processing. We conclude that RAN correlates only with lexical orthographic processing response time and that speed of phonological recoding mediates their relationship.

D196 Personality variables and Non-Native Phoneme Learning

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During language acquisition we begin to process a range of phoneme categories more accurately and efficiently to the exclusion of other possible category structures. As adults, our speech perception system has become language-specific, often making learning new phoneme categories challenging. Personality research has demonstrated that individual differences in behavioural predisposition can dramatically affect learning. In the present study we examined participants' ability to learn a non-native phoneme category, their subjective awareness of their performance, and the extent to which conscientiousness, intelligence, and general predispositions to self-monitor lead to accurate acquisition of a nonnative phoneme category. The results suggest that, though related, global self-monitoring and the subjective awareness of performance on a trial-to-trail basis differ. Moreover, intelligence and personality appeared to mediate this relationship in accuracy but do not appear to have the same influence on confidence.

D197 On the Nature of Morality: Why Empathy is Not Necessary For Moral Judgment

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Empathy is the ability to vicariously share the emotions of others. It is widely agreed that empathy is needed for moral judgment. In this paper, I examine whether empathy plays a significant role in moral judgment. I argue that the existing data in emotion research does not support the traditional view that empathy is necessary for moral judgment. I examine which emotions may be responsible for moral judgment. I draw the conclusion that humans are able to make moral judgments without empathy, and that moral judgment is driven by other emotions, such as disgust and distress.

D198 BLANK

D199 So that's what good poker players are made of!

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The purpose of this study was to comprehensively and rigorously examine the individual characteristics that contribute to poker playing skill. Individual differences investigated in this study were: general intelligence, social intelligence, mathematical ability, working memory capacity, susceptibility to gambling fallacies, risk perception, personality, age, gender, poker playing experience, and propensity for problem gambling. One counter-intuitive finding was that poker skill was not significantly associated with mathematical ability. It was found however, that good players are more likely to be male, to have lower susceptibility to gambling fallacies, a greater tolerance for financial risks, and superior social information processing skills.

D200 Eye don't remember: Excessive eye contact impedes memory

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Past research demonstrated that eye contact is associated with a number of cognitive benefits, including improved memory performance. However, it is unclear whether such memory benefits are mediated by heightened physiological arousal. In the present study, participants studied a list of words read aloud by an experimenter, who either repeatedly made eye contact or repeatedly avoided eye contact. Rather than improving memory, repeated, excessive eye contact was found to impede performance in a subsequent word recognition task. Results and implications will be discussed in the context of an arousal-performance hypothesis.

D201 The aftermath of a romantic relationship with a psychopath: The effect of personality sub-factors

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One percent of psychopaths survive relatively undetected in the community. Yet, personality factors associated with their ability to inflict harm on others without coming in contact with the criminal justice system has been a neglected area of research. To examine this issue, fifty survivors of a romantic relationship with a psychopath were assessed for emotional functioning and relationship experiences. Preliminary analysis indicates psychopaths' interpersonal style was associated with abuse frequency and contributed to victims' post traumatic stress, and psychopaths' emotion deficits was associated with versatility of abuse. Discussion will center on the manifestation of psychopathic traits in a romantic setting.

D202 Cross-modal associations between color and haptics

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Research has shown cross-modal associations between color and auditory information (e.g., vowel types), color and odor, color and taste, and recently hinted at the possibility of associations between color and touch. Accordingly, the present study investigated the associations between color and five haptic sensations: roughness, hardness, heaviness, elasticity, and adhesiveness. Haptic stimuli were rendered using SensAble PHANTOM OMNI®. The discussion addresses the issues of the naturalness of the found associations, the mediating factors, and the implications of the findings for the field of haptic color rendering in virtual reality for the visually impaired.

D203 Context, Contrast, and Tone of Voice in Auditory Sarcasm Perception

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Four experiments investigated context and tone of voice as markers of sarcasm. In all experiments, a computer-generated positive or negative context was followed by a positive statement spoken in a sincere or sarcastic tone of voice. Participants were asked to identify the intonation as sincere or sarcastic. Stimuli were either the same as in previous research (Experiments 1-2) or vignettes adapted from a validated test (Experiment 3-4). Furthermore, Experiments 2 and 4 included ambiguous contexts. In all experiments, results were as predicted by contrast effects. The findings suggest that context and tone are processed in parallel to convey communicative intent.

D204 The effects of trans-cranial Direct Current Stimulation (tDCS) on the Contrast Sensitivity Function (CSF)

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Trans-cranial Direct Current Stimulation (tDCS) has polarity specific effects on the excitability of neurons. These effects have been shown to modulate visual function, measured as contrast sensitivity to a single frequency. Anodal-tDCS increases, while cathodal tDCS decreases, sensitivity to contrast. We selected four points to represent the low, midrange and high spatial frequencies and measured contrast sensitivity under both anodal and cathodal tDCS. Results demonstrate a decrease in contrast sensitivity (from pre-test to test) under tDCS, regardless of polarity, for higher spatial frequencies.

Lower spatial frequencies were unaffected by tDCS, which indicates a limit in the spatial extent of tDCS.

D205 Evaluating Gender Differences in Perceptual Profiles of Individuals with Autism Spectrum Disorder

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Due to robust gender differences in Autism Spectrum Disorders (ASD), the current knowledge regarding perceptual abilities in ASD are for the most part based on studies using predominantly male participants. The goal of this study was to assess whether ASD-specific perceptual profiles defined by social (face identity discrimination task) and non-social (block design task) perception are equivalent across gender. Males did significantly better than females on the social, face identity discrimination task; no significant gender difference was found for the non-social task. These findings should shape the differential approach to assessment and therapy of females with an autism spectrum disorder.

D206 Depth magnitude from stereopsis: Assessment techniques and the role of experience

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Stereopsis can signal the amount of depth between two points. Techniques used to assess depth magnitude typically involve visual and/or haptic transformations. Here we compare the relative accuracy of three methods:(i) haptic sensor, (ii) digital caliper, and (iii) virtual ruler, using a simple depth estimation task with naïve and experienced observers. While experienced observers were accurate regardless of methodology, naïve observers showed systematic errors. We argue that unpracticed observers are more strongly influenced by other depth cues, and that training allows observers to attend to the disparity signal. In such cases, veridical depth estimates are obtained, regardless of the methodology.

D207 Attentional scope reveals different mechanisms underlying face and body inversion effects

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The perception of faces and bodies both show an inversion effect (better performance with upright vs. inverted stimuli), suggesting similar mechanisms of holistic processing. To examine this possibility, we primed observers to adopt global or local attentional scopes while identifying upright and inverted faces and bodies. Upright faces benefitted from global scope (better performance for global vs. local attention) and showed inversion decrements regardless of scope. Attentional scope did not affect upright-body performance, but local scope abolished the inversion effect. Thus, face and body inversion effects may be driven by different mechanisms with body perception less reliant on holistic processing.

D208 Global and Local Processing Of Multistable Stimuli: Effects of Aging

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Age-related changes impact older adults' multistable perception (two percepts for one stimulus) and may be due to changes in local (neural) and global (attention) mechanisms. Young (18-30 years), young-old (60-79) and older-old (80+) adults viewed a multistable stimulus under conditions of priming, volition (holding one percept by attention) and adaptation. Young adults were more stable using volition, and were affected by adaptation but not priming. Young-olds were affected by adaptation but not priming. Older-olds were least affected by adaptation and most affected by priming. Age-related local and global deficits affect multistable perception but this is most apparent at oldest ages.

D209 Visuo-haptic identification: Effects of object similarity and congruency

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We investigated visuo-haptic object identification. Healthy undergraduates were presented with novel objects haptically, visually, or bimodally, and were asked to identify the objects both visually and haptically. Once identification was flawless, participants were presented with bimodal trials (two objects: one seen and one grasped) and they identified the visual or the haptic object. Crucially, half of the trials were incongruent. We observed visual dominance and interference from incongruent information. We also observed that object similarity guided both visual and haptic identification errors, and that object similarity mediated interference. Our findings suggest that visual and haptic identification follow similar principles.

D210 The Impact of Sensory Dominance and Congruency Effects on Multisensory Integration

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Healthy undergraduates were presented with pictures, sounds, and bimodal stimuli of animals and musical instruments, and asked to identify their modality (Experiment 1) or location (Experiment 2). During bimodal trials, we varied spatial and semantic congruency. We observed visual dominance (better performance for pictures), item-specific sensory dominance (better performance for musical instruments on trials with sounds), as well as multisensory facilitation (better performance for congruent bimodal

trials over unimodal trials). Additionally, during bimodal trials, spatial congruence facilitated reaction time while semantic congruence facilitated accuracy. Altogether, semantic information and spatial information uniquely affected unimodal processing and multisensory integration.

D211 Modelling Probability Effects as Differences in Neuron Tuning

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Compared against infrequently-occurring orientations, brief presentations of gratings with frequently-occurring orientations result in more precise tilt reproductions, accompanied by a more kurtotic distribution of estimation errors. Using the Nengo neural system simulation platform, we modelled this orientation task to test the assumption that these probability effects are mediated at the level of V1 neuron tuning functions. A broadening of the V1 tuning functions was sufficient to reproduce the effects of stimulus probability on response distribution kurtosis in this model. We conclude that the perceptual effects are consistent with stimulus probability affecting the width and mixture of V1 population tuning functions.

D212 Effects of anxiety on the perception of depth-ambiguous biological motion stimuli are mediated by inhibitory ability

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Orthographically projected biological motion stimuli are depth-ambiguous and so their projection when oriented towards the viewer is the same as when oriented away. Despite this, observers tend to interpret such stimuli as facing the viewer more often, and some have argued that this facing-the-viewer (FTV) bias may exist for sociobiological reasons. We assessed participants' anxiety, assessed their inhibitory ability using a Go/No-Go task, and then assessed their FTV bias. We found that inhibitory ability significantly mediated the relationship between anxiety and the FTV bias (i.e., more anxious individuals had difficulty inhibiting the facing-the-viewer percept, resulting in greater FTV biases).

D213 Attention capture and faces: An eye tracking study

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Our attention can move to objects in visual space without overt movement (covert attentional orienting). Due to their social significance, faces and human bodies are objects that attract or modulate attention. We hypothesized that response time patterns in visual search could be accounted for by two possible mechanisms. First, we could saccade to social stimuli first in a scene. Second, we could allot more time to processing a socially relevant stimulus. We examined whether faces would be saccaded to first more often, and whether the duration of fixation to faces was greater, than other images in a visual search paradigm.

D214 The role of size and rotation changes in the visual perception of whole human bodies and individual body parts

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The perception of whole headless bodies is not sensitive to changes in size or inversion/rotation. However, it is unclear whether these invariances are represented at the level of the whole/global body, or if they are built from local invariances at the level of body parts. Here we investigated the role of size and rotation changes in the perception of whole headless bodies and body parts. In Experiments 1 and 2 we replicated previous findings of size and rotation invariance in the perception of whole bodies, validating the use of our stimuli and paradigm. In Experiment 3 we observed size invariance in the perception of body parts, but Experiment 4 revealed sensitivity to changes in rotation in body-part perception. Our findings demonstrate that whole-body perceptual size invariance occurs relatively early, perhaps at the level of individual body parts, whereas whole-body rotation invariance likely emerges later in the visual-processing hierarchy.

D215 Revealing a global-processing bias for texture in scene perception

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Investigations of scene processing have demonstrated that the parahippocampal place area (PPA) represents scenes by processing global spatial cues (i.e., shape). Recent fMRI experiments show that PPA also processes non-spatial cues (i.e., texture). If texture is indeed important in scene perception, we should observe a global-processing bias for texture. We investigated this across three experiments that cued participants to make speeded texture judgments at both global (i.e., scene/background) and local (i.e., object/foreground) levels. Results demonstrate a consistent global-processing bias for texture, and reveal the importance of non-spatial processing in the interaction between object and background elements in scene perception.

D216 The Influence of Vocal Training on Vocal Responses to Altered Auditory Feedback

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Development of proper vocal control is dependent on auditory feedback. When feedback is altered in a frequency-altered feedback paradigm, a reflexive-like compensation called the pitch-shift reflex is elicited. The present study examined the effects of training on this reflex. It was predicted that vocal variability and

compensation for the altered feedback would decrease with training. Singers and non-singers were assigned to one of two conditions: training and no training. All participants completed a pre-test and a post-test. Interestingly, preliminary results indicate no training effects. This study contributes to a better understanding of speech development and assists in improving training programs.

D217 Colour and Emotion in Drawings

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Previous research has found consistent colour-emotion associations. Our studies explored how colour relates to the expression and perception of emotions. In Study One, participants coloured drawings depicting emotional scenarios. One group also provided personal emotional responses to the drawings before colouring them. Contrary to our hypotheses, describing personal emotional responses did not affect colour use, and participants did not demonstrate typical colour-emotion associations. In Study Two, participants viewed drawings of emotional scenarios in one of seven colours, and rated the intensity of the depicted emotions. Colour did not affect ratings of emotional intensity, but participants reported typical colour-emotion associations.

D218 Perception of acceleration and deceleration as a function of pattern complexity and direction

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There is disagreement as to whether humans perceive positive and negative acceleration similarly. We tested whether an asymmetry exists based on the complexity of the motion pattern viewed by comparing acceleration and deceleration detection in horizontally translating (simple) and radially moving (complex) random dot arrays. Motion direction was also manipulated to determine whether it modulates the effect of pattern complexity. Results indicate that observers detect acceleration and deceleration similarly in all conditions, however performance is better when viewing radial motion than translation. Direction affects radial motion sensitivity but not translation sensitivity, as performance was better for contraction than for expansion.

D219 The influence of low level visual properties on scene preference, recognition and eye-movements

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Past research has shown that humans have a preference for images of nature scenes over images of urban cities, and that eye-movement behaviour is significantly different across these categories (Ulrich et al., 1991; Berto, Massaccesi & Pasini, 2008). To build on these findings, we explored the influence of low-level visual properties on images preference, recognition, and eye-movements. We replicate past findings, demonstrating preference and longer fixation-time for nature scenes versus urban cities. We then demonstrate that the visual spatial frequencies (high vs. low) significantly influence preference, recognition, and scene preference and can partially explain the preference for nature scenes.

D220 The role of talker identity in perceptual learning

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In three experiments, we investigate the impact of top-down knowledge on perceptual learning. Listeners hear an ambiguous speech sound (between /s/ and /ʃ/) in /s/-biased lexical contexts and then categorize sounds on a/s/-/ʃ/ continuum. Preliminary results: Listeners do not show perceptual learning when the speaker's voice changes between exposure and test (Experiment1), even when visual information leads them to report that the speaker remained constant (Experiment2). In contrast, learning does occur when the speaker remains constant, but visual information leads listeners to report hearing two different speakers (Experiment3). These results support claims that perceptual learning for speech is acoustically driven.

D221 Functional motion threshold: The role of practice when discriminating direction in a turbulent motion simulator

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Motion threshold studies usually examine absolute thresholds in environments that isolate vestibular cues. These studies do not capture "functional" thresholds that reflect motion perception in real-world environments. This study used a motion simulator to present continuous motion turbulence with embedded directional motion targets. We examined accuracy and response time to identify motion targets and to measure practice effects across 4 sessions. Results indicate that participants can reliably discriminate motion direction within a noisy environment, and that the minimum acceleration that could be reliably detected decreased across sessions. These results suggest that learning can affect the observed functional motion threshold.

D222 Can Visual Beat Perception be Improved?

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Research suggests that beat perception occurs effortlessly for auditory but not visual rhythms. However, this visual disadvantage may arise because of the stimuli traditionally used, where visual beat is defined through spatial and/or motion changes.

We investigated visual beat perception with stimuli that were defined purely through temporal modulation and found less pronounced performance differences between modalities. We also investigated the role of experience in beat perception and found that performance significantly improved after 5 training days. These results suggest that the auditory advantage may simply be due to an experiential difference between visual and auditory beat perception.

D223 Looking for emotion cues: Allocation of attention varies with age, emotion, and whether stimuli are static or dynamic

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In most studies investigating emotion perception participants judge isolated static faces; in the real world faces move and are viewed in context (with bodies, in scenes). We examined where children (4-5 years; 8-9 years) and adults (n = 32 per age group) look when judging emotion. Allocation of attention varied with age, emotion, and condition (static/dynamic). Notably, the proportion of time adults spent looking at the head did not vary across dynamic versus static stimuli (M=.81), but children looked less at the head when stimuli were static. Studies using static isolated faces may underestimate children's use of adult-like cues.

D224 Do Real Tools Prime Hand Actions More Than Photographs of Tools?

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We investigated whether pictures of tools prime action as well as real tools. Participants previewed a tool or a photo of a tool and then performed a "grasp-to-move" (GTM) or "grasp-to-use" (GTU) action. The identity of prime and probe could be the same (congruent trials) or different (incongruent trials). Participants responded faster for congruent (vs. incongruent) primes, real (vs. photo) primes, and the GTM (vs. GTU) task but there were no significant interactions. Thus seeing any real tool primes a motor response more than a photo but the priming advantage is not specific to the tool identity.

D225 Enhancing motor performance using motor imagery and visual feedback

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Practicing a motor task using motor imagery often enhances performance, but not as much as physical practice enhances performance. Can practicing a motor task using a combination of motor imagery and visual feedback reduce this gap in performance? Comparisons of pegboard assemblies pre- and post-training on a novel pegboard assembly task showed improvements after physical practice, motor imagery, and visual feedback relative to both an inter-manual transfer control and standard control condition. These results support the idea that either motor imagery or visual feedback alone can improve motor performance, however, combining them may be ineffective when training sessions are brief.

D226 Inconsistent Visual Information Disrupts Perception of Vestibular Motion

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The purpose of this study was to extend the understanding of how the visual and vestibular systems interact. Thirty participants received vestibular motion cues from a dynamic motion seat (left/right tilts: 10°, 20°, 30°, 40°) that occurred simultaneously with a horizon line indicator that tilted left/right 10°, 20°, 30°, or 40°. Participants determined whether the motion cue and the tilt depicted on the horizon indicator were the same or different and estimated the magnitude of the motion cue. The ability to estimate the magnitude of the motion cue was significantly impaired by inconsistent visual information from the horizon indicator.

D227 Image vs. Reference Frame Rotation in Rotated Word Identification: New Evidence from Multi-item Displays

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Humans have a tremendous ability to identify objects displayed in non-canonical orientations. Research investigating this ability has largely focused on single item displays, however, investigating this ability using rotated multi-item displays (e.g., a rotated paragraph) provides challenges to the perceptual system that could disentangle the putative normalization processes involved. The current study manipulated stimulus orientation locally (i.e., individual items) and globally (i.e., display as a whole) in a multi-item display in a reading task. Results are consistent with the use of frame rotation, rather than mental rotation, as the mechanism by which individuals read rotated words in a multi-item display.

D228 Using Display Backlight Strobing to Decrease Perceived Motion Blur

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Relative to CRT displays, moving objects appear to be blurred on LCDs because motion is represented as a series of rapidly updated images. The eye moves over these static images when tracking moving objects, which results in perceptual blurring. Backlight strobing (the rapid and undetectable flashing of the monitor's backlight) mitigates the effects of motion blur. This improvement in image quality has yet to be framed in the context of visual perception theory. The current experiment examined the effects of

backlight strobing on target detection in moving displays. Backlight strobing improved target detection for serial, but not pop-out searches.

D229 Retinal Motion and Stereoacuity Revisited

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Stereoacuity of moving line targets presented using CRT displays are reportedly unaffected by lateral motion up to 2.5 deg/s. Here we re-assess the effects of lateral retinal motion on stereoacuity using custom built hardware that permits precise timing and movement of 'real' targets. Observers were asked to indicate the relative depth of two real vertically aligned luminous lines. We varied motion velocity and exposure time; there was no effect of either on performance. We conclude it is likely that the observed resilience to retinal motion reflects the rapid acquisition of the disparity signal, not the properties of the display system.

D230 Appreciating art through action? Evaluating the contribution of visuo-motor similarity, sound and expertise

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One way to increase art appreciation is to create congruency between the actions performed by the artist and the viewer. Leder, Bar & Topolinski (2012) found stroking motion improved the rating of impressionist images while stippling motions improved the rating of pointillist paintings. In Experiment 1, we failed to reproduce their results. In Experiment 2, we achieved an interaction between viewing and production only when the visuo-motor relationship was transparent. Experiment 3 demonstrated the effect cannot be reproduced by hearing the sounds associated with drawing production. Expertise may also be important, rendering the links between production and exposure to art an overt process.

D231 Head orientation influences the perceived tilt of global motion.

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Aubert's (1861, Arch Pathol Anat, 20: 381-393) finding that a vertical line is perceived as tilted in tilted observers ("A-effect") was tested using moving stimuli. Observers judged the tilt of a line and global motion while standing or laying on side. Postural effects were consistent with the A-effect, and when lying down shifts in the point of subjective equality were significantly smaller for motion (95%CI: 2D = -11.49 +/- 5.86 deg., 3D= -17.08 +/- 4.77 deg.) than the line (95%CI: -23 +/- 4.76 deg.). Findings will be discussed in terms of their implications for sensory integration.

D232 An Examination of Intolerance of Uncertainty as a Mediator of Paranoia and Interpretation Bias in People with High and Low Worry

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Paranoid beliefs in people with high worry are predictive of greater negatively biased interpretations of ambiguous situations (IB). People with high worry also report difficulty tolerating uncertainty (IU), which has been associated with paranoia and greater IB.The current study investigated the degree to which IU mediates the relationship between paranoid beliefs and IB in people with low (LW) and high worry (HW). Paranoid beliefs, IU, and IB were correlated in both groups. IU was a full mediator in the LW group and a partial mediator in the HW group, suggesting a different relationship among the variables in each group.

D233 Visual distortions induced by simple and complex shapes

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Motivated by theories of shape representation based on deformation processes, we have recently discovered that complex natural contours induce perceptual distortions in the surrounding visual space (Goren & Elder VSS2013). Here, we assess whether similar distortions are induced by simpler (linear and circular) geometric figures. We find that visual space is perceptually compressed near both simple and complex contours. Interestingly, the magnitude of this compression is greatest near complex parts of natural shapes, less for circular shapes and even less for linear shapes. We discuss these results in terms of recent theories of perceptual shape representation.

D234 How Aging affects Multisensory Integration and Driving Performance

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There is evidence to suggest that multisensory integration is heightened in old age but how these changes manifest themselves during complex, everyday tasks, such as driving, has yet to be revealed. The current study employed a cutting edge driving simulator to manipulate the sensory information (visual, auditory, and vestibular) available to younger (18-35) and older (65+) drivers. Our preliminary findings reveal that when the visual representation of the driving environment is augmented by the addition of either congruent sounds or physical motion, driving performance is altered. This effect is most prominent among older adults, the implications of which are discussed.

D235 Classification Image Analysis Reveals Decision Strategies in 2AFC Tasks

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Two-alternative forced choice (2AFC) designs are frequently used in psychophysical experiments, but there is still debate regarding how observers perform such tasks. The optimal strategy is to obtain a decision variable for each alternative and choose the larger one. Observers could use other strategies or guess when the situation is ambiguous. We developed a method using classification image analysis that estimates observer's decision variables on a trial-by-trial basis and allows for an intuitive visualization of observers' strategies. We apply our method to 2AFC signal detection tasks and show that observer's results fit the optimal strategy with intrinsic spatial uncertainty.

D236 Turning in Front of Motorcycles: The effect of lane position on motion-camouflage

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What influence does an oncoming motorcycle's trajectory have on a driver's decision to turn left in front of it? Using a high-fidelity driving simulator, we examined the deceleration profiles of drivers intending to make a left-turn at an intersection where they were confronted with a motorcycle on a collision course, either in a left-of-lane or a right-of-lane position. Braking was consistent with motion-camouflage impairing the detection of left-of-lane position motorcycles.

D237 Mental Rotation Accuracy and Response Time on Occluded and Nonoccluded Blocks and Bodies

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Accuracy and RT were recorded as 128 participants (60 male, 68 female) completed a mental rotation task using novel stimuli. This task involved the presentation of pairs of shapes made with block or human figures rotated relative to each other. The stimuli also had occluded parts or not. Participants were asked to discriminate the stimuli as same or different. Aside from typical mental rotation findings, accuracy data showed a reduced effect of occlusion with human figures. This finding supports the use of embodied cognition when processing human figures compared to block figures. The reverse pattern was observed on RT, suggesting that additional time is required to engage embodied cognition strategies, especially with occluded figures.

D238 The emergence of distributed representation in group learning

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In a distributed processing system, knowledge is represented by distributed patterns of activation. Whereas distributed representation has been examined in networks of neurons, it has not been examined in networks of individuals. We report an experiment in which undergraduates were trained to match numeric targets (e.g., "80% of the group respond") and then tested on untrained targets. Groups demonstrated learning over training, which transferred to novel targets. More critically, response patterns suggested a distributed representation of knowledge. We propose that principles of parallel processing and distributed representation are as central to group behaviours as to the brains that underlie them.

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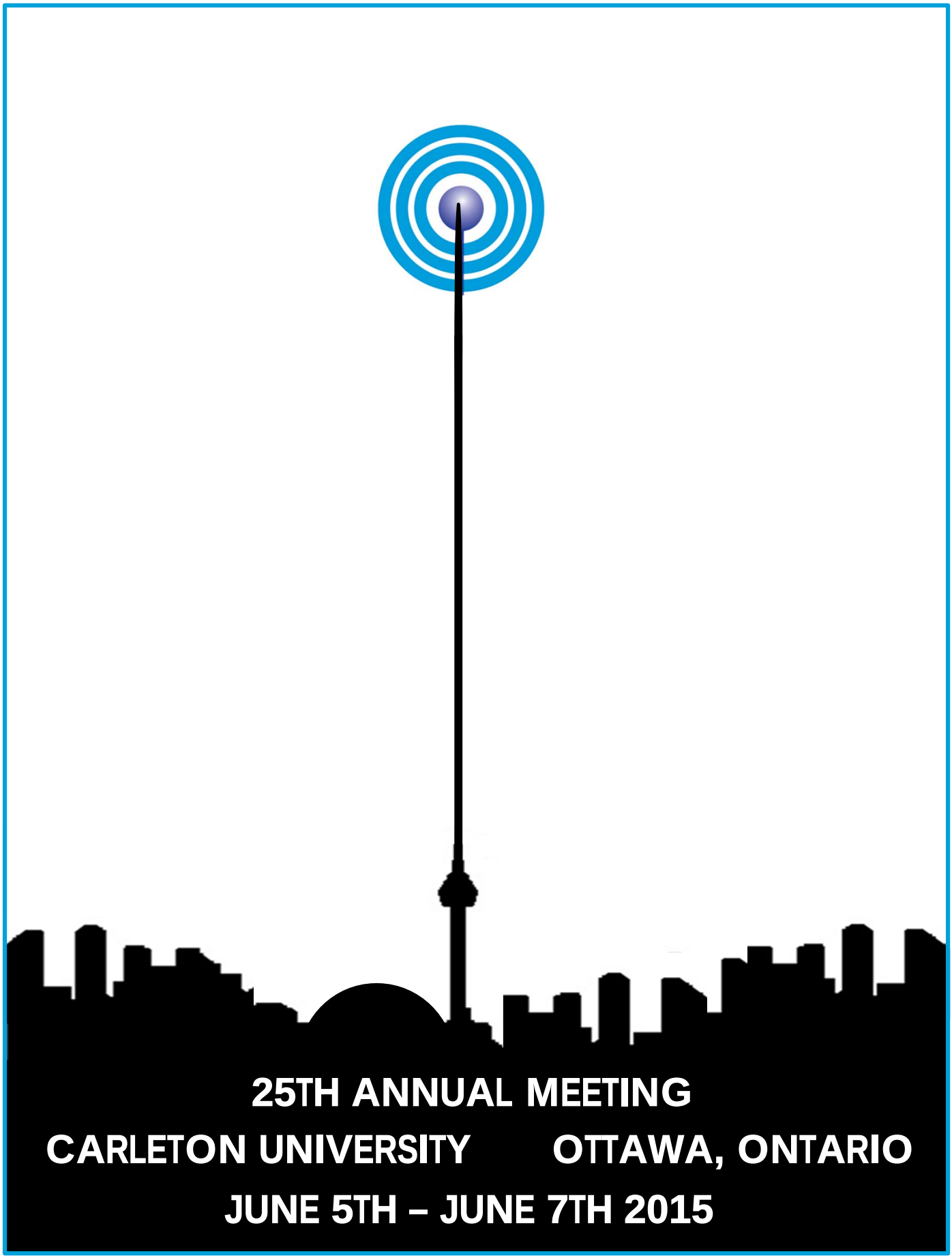
Abstracts with letters (eg., B103) are assigned to posters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