

# BBCS~SCCB

## 11-13 JUNE, 2010

HALIFAX — NOVA SCOTIA — CANADA



## Message from the Organizers and Committee

Welcome to Halifax and the 25th Annual Meeting of the Canadian Society for Brain Behaviour and Cognitive Science! We are very excited to host you all here, and this promises to be a fantastic meeting. We have (at press time) 275 registrants, 126 talks, 182 posters, and several symposia, including the President's Symposium organized by Rob Sutherland, and of course the Annual Hebb Lecture given by Colin McLeod. Conferences are a lot of work and planning so we are extremely grateful for all the time spent, decisions made, and support given by our local committee and others who have contributed to the success of this meeting.

## 2010 CONFERENCE CREDITS

### **BBCS Organizing Committee:**

#### **Conference Co-ordinators:**

Ray Klein and Leslie Phillmore

#### **With the assistance of:**

Chelsea Quinlan, Jon Fawcett, Aaron Newman, Nathan Crowder, Cindy Hamon-Hill, Shannon Johnson, Nicole Conrad, Vickie Armstrong, Jason Ivanoff, Heath Matheson.

#### **Program Committee:**

Nicole Conrad, Patti Devlin, Leslie Phillmore, Raymond Klein

#### **Graduate Awards Committee:**

Nathan Crowder, Debbie Kelly, Bruce Milliken, Aaron Newman, Leslie Phillmore, Jean Saint-Aubin

#### **Conference Volunteers:**

Tim O'Leary, Kate Thompson, Jenn Richards, Therese Chevalier, Laura Goodman, Amanda Hudson, Jillian Filliter, Jeff MacLeod, Yoko Ishigami, Nicole White, Heather Phelan, Anne Brochu, Lisa Verge, Chelsea Denaro, Lori Bowden

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### **This conference was sponsored by:**

Dalhousie University: Faculty of Science, Dalhousie University: Department of Psychology, Saint Mary's University, CSBBCS and Pearson Canada.



### **The organizing committee wishes to thank:**

Alison Martin - logo design,  
Christopher Dean (Typographer)- Program Design

Organization of this conference was aided tremendously by Roberta Dexter of Plan Ahead Events.



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**Maps are on page 13 and the back cover of the program**

## General Information

### Welcome Reception

Please join us in the University Club Pub from 4:00-7:00 PM on Friday, June 11, 2010 for an opening reception with a cash bar and complimentary snacks.

Registration will open in the lobby of the University Club during the Welcome Reception:  
Friday, June 11, 2010: 4:00-7:00 PM

The registration desk will be open in the lobby of the Ken Rowe Building:

Saturday, June 12, 2010 7:30 AM – 12:00 PM 2:00 PM – 5:00 PM

Sunday, June 13, 2010 8:00 AM – 12:00 PM 2:00 PM – 5:00 PM

### Meeting Rooms

Meeting rooms are located in two buildings on the Dalhousie campus: The University Club and the Kenneth Rowe Building.

- The University Club – Registration and Opening Reception Friday on Lower Level; Poster Sessions in the Great Hall on the Third Level
- The Kenneth Rowe Building – Registration Saturday and Sunday, Hebb Lecture, Symposia, Talks, business meeting; Rooms indicated in schedule

The conference lunch on Saturday, June 12 will be in the McInnis Room in the Dalhousie Student Union Building (adjacent the Kenneth Rowe Building).

### Maps

Maps highlighting the locations pertinent to conference activities appear on page 13 and the back cover.

There are also campus maps located around the university and room maps are in each building.

#### Lunch and Coffee Breaks

- Complimentary light refreshments will be offered on Saturday and Sunday during scheduled morning and afternoon breaks, as indicated in the program.
- From 12:00-2:00 PM on Saturday, June 12, 2010, lunch will be provided in the Student Union Building, MacInnis Room, for registered attendees (costs included as part of the registration fee).
- On Sunday, June 13, 2010, lunch is not provided as part of the conference programming. Restaurant options have been provided in the program and 2 hours, from 12 – 2 PM has been allotted to accommodate the group.

### Banquet

The Closing Banquet will be hosted on Sunday, June 13, 2010 at the Loyola Conference Hall in the Sobey's Building at Saint Mary's University (location is indicated on the map on the back cover).

## **Internet Access on Campus**

Many buildings on campus have WiFi, including the Rowe Building, Student Union Building, the Killam Library (probably most reliable), and the University Club. If you are staying in residence you will have free internet access in the residence through ResNet. (please ask at your respective front desk). This user id will also be used for wireless access. If you do not have a guest account (needed for access to WiFi on campus), please ask for one at the registration desk.

There is a computer lab available (Sunday 12:00 – 5:00 pm) in the Rowe Building on the 3<sup>rd</sup> floor.

## **Smoking**

Smoking is not permitted in any building at Dalhousie University (or inside any public facility off campus).

## **Parking**

Parking is available on side streets of the University and meters do not require payment after 6 PM Monday – Friday or anytime on Saturday and Sunday.

# **Program Information**

This year's program consists of 182 poster presentations and 126 oral presentations. Among the oral presentations is the Donald O. Hebb lecture by Colin M. MacLeod.

## **Poster Sessions**

The poster sessions will be held in the Great Hall at the University Club. The first poster session takes place from 5:00-7:00 PM on Saturday, June 12, 2010 featuring a cash bar. The second poster session will be held from 5:00-7:00 PM on Sunday, June 13, 2010 in the same location, with a cash bar.

Poster boards will be marked with numbers identical to the abstract numbers indicated in the program.

The Great Hall will be open from noon to allow you to put up posters. Please mount your poster at least 30 minutes prior to the poster session (i.e., by 4:30 PM), and remove posters promptly at the end of each poster session.

## **Executive Members**

Colin MacLeod (President), University of Waterloo, [president@csbbcs.org](mailto:president@csbbcs.org)

Robert Sutherland (Past President), University of Lethbridge, [pastpresident@csbbcs.org](mailto:pastpresident@csbbcs.org)

Peter Dixon (President-Elect), University of Alberta, [presidentelect@csbbcs.org](mailto:presidentelect@csbbcs.org)

Peter Graf (Secretary/Treasurer), University of British Columbia, [secretary@csbbcs.org](mailto:secretary@csbbcs.org)

William Hockley (Member at Large 2007-2010), Wilfrid Laurier University, [executive2@csbbcs.org](mailto:executive2@csbbcs.org)

Debbie Kelly (Member at Large 2009-2012), University of Saskatchewan, [executive3@csbbcs.org](mailto:executive3@csbbcs.org)

## **Future BBCS Conference Dates**

BBCS 2011 will be hosted at the University of Manitoba, in Winnipeg, on June 24-26, 2011.

BBCS 2012 will be hosted at Queen's University, in Kingston, on June 7-9, 2012.

BBCS 2013 will be hosted at University of Calgary, in Calgary, on June 7-9, 2013



## Halifax Dining & Night Life

### Cafés, Bistros

#### **Argyle Bar & Grill/1575 Argyle St./492-8844/www.theargyle.ca**

In the heart of the entertainment district. Offers wood-oven pizza and extensive lunch and dinner menus. Dance the night away in the Aqua lounge.

#### **Cheapside Café/1723 Argyle St./www.cheapside.ca**

The Café offers a laid-back setting for morning pastries and a cappuccino, a nouveau sandwich or a light entrée.

#### **Coburg Café/6580 Coburg Rd./429-2326/ - Handy for Lunch**

Fair Trade Coffee and espressos, speciality teas, soup, sandwiches, free wi fi.

#### **Economy Shoe Shop Café and Bar/1663 Argyle St./423-7463/ www.economyshoeshop.ca**

A taste of Europe. Three unique settings in one. Popular summer patio. European ales!

#### **FID/The Courtyard 1569 Dresden Row/422-9162/www.fidresto.ca/**

"Dennis Johnston, chef-proprietor of Fid, serves some of the most interesting food in Halifax. The restaurant may be casual, but there is nothing casual about the food." Open for brunch (11-2) and dinner on weekends.

#### **Fireside/500 Brunswick St./423-5995/www.thefireside.ca**

Casual dining in a comfortable room with many fireplaces. Menu ranging from traditional to eclectic.

#### **Henry House Restaurant & Pub/1222 Barrington St./423-5660/www.henryhouse.ca**

Microbrew, delicious pub food, live music on weekends. Fairly close.

#### **il Mercato/5650 Spring Garden Rd./422-3866/www.il-mercato.ca**

Award winning trattoria. Northern Italian cuisine, handmade desserts and gelati. A local favorite.

#### **Jane's on the common/2394 Robie St./431-5683/www.janesonthecommon.com**

A local favourite. Many awards.

#### **McKelvies/1680 Lower Water St./421-6161/http://mckelvies.com**

Local favourite for Fish. Better than Salty's.

#### **Morris East Restaurant/5212 Morris St./444-7663/http://morriseast.com**

Gourmet, wood oven pizza. Fairly close.

#### **Pete's Frootique/1515 Dresden Row/425-5700/www.petefrootique.com**

Make your own salads are a great deal, sandwiches, soup, sushi to go, upscale grocery store with some seating.

#### **Ristorante aMano/1477 Lower Water St./423-6266/www.ristoranteamano.ca**

Excellent thin crust pizza

#### **Saege Bistro/5883 Spring Garden Rd./429-1882/www.saege.ca - Handy for Lunch**

An award-winning and inviting up-scale neighbourhood bistro. Enjoy seasonal flavours from the eclectic and modern menu. Lunch, dinner and weekend brunch.

**Salty's on the waterfront/Historic Properties, 1869 Upper Water St./www.saltys.ca**  
Overlooking Halifax Harbour. Local seafood. Steak, chicken, lamb and pasta also available. You pay for the view.

**Wired Monk Coffee Bistro/5147 Morris St./422-2219/www.wiredmonk.com**  
Coffee shop with free internet access.

**Wooden Monkey/1707 Grafton St./444-3844/www.thewoodenmonkey.ca**  
Local food, caters to vegetarians.

## Fine Dining

**Bish World Cuisine/1475 Lower Water St./425-7993/www.bish.ca**  
Elegant setting and excellent food on the waterfront.

**Cafe Chianti/5165 South St./423-7471/www.cafechianti.ca**  
Excellent Italian and Eastern European cuisine.

**Chives Canadian Bistro/1537 Barrington St./420-9626/www.chives.ca**  
Award winning chef uses local ingredients.

**Fiasco/1463 Brenton St./429-3499/www.fiascorestaurant.com**  
European-style cooking using fresh products ranging from seafood to game. All complimented with traditional sauces.

**Five Fishermen/1740 Argyle St./422-4421/www.fivefishermen.com**  
Serving fresh seafood for over 30 years, evening dining only, popular mussel bar and award winning wine list.

**Hamachi Steakhouse Bar & Grill/Bishop's Landing, 1477 Lower Water St./422-1600/  
www.hamachirestaurants.com**  
The only Teppanyaki bar and grill in the Maritimes. Watch skilful master chefs prepare fresh seafood and steak on large dining room grills. Waterfront views and patio.

**Onyx Dining Room & Cocktail Lounge (Dinner only)/5680 Spring Garden Rd./  
428-5680/www.onyxdining.com**  
Traditional French cuisine with an Asian influence. Rated Four Diamonds by CAA/AAA. Wine Spectator Award of Excellence recipient every year since opening.

## Ethnic Cuisine

**Athens Restaurant/6273 Quinpool Rd./422-1595/www.athensrestaurant.com**  
Family restaurant specializing in Greek cuisine along with seafood, pasta, pizza and grilled favourites. Excellent value for breakfast, lunch, dinner. Just off the map.

**Café Istanbul Kebap & Meze House/5986 Spring Garden Rd./405-4028/  
www.cafeistanbul.ca - Handy for Lunch**  
Enjoy a unique dining experience at Café Istanbul! The open concept kitchen allows you to watch the creation of your meal. The emphasis on freshness is exemplified by the use of local Nova Scotia lamb, one of the restaurant's specialties. The menu offers an array of Turkish appetizers, which are best sampled in the Special Meze platter (perfect for sharing). The décor is distinctly Turkish with a contemporary twist.



**Chabaa Thai Restaurant/1546 Queen St./406-3042**

Exquisite Thai menu.

**Hamachi House/5190 Morris St./425-7711/www.hamachirestaurants.com**

Excellent sushi. Fine Japanese dining.

**Jean's Restaurant/5986 Spring Garden Rd./Cantonese/444-7776/  
www.jeansrestaurant.ca - Handy for Lunch**

Cantonese and Szechuan cooking, flavourful with a deft touch of spicy heat.

**Sushi Nami Royale/1535 Dresden Row/422-9020/www.sushinami.ca**

Japanese fine-dining. The menu offers a selection of authentic and new fusion cuisine. OK for Dinner, too slow for lunch.

**Sushi Shige/5680 Spring Garden Rd./422-0740/**

Excellent sushi and service, Local favourite for Sushi.

**Talay Thai Restaurant/1261 Barrington St./404-3700/www.talaythaihalifax.com**

Offers Thai dishes like cashew chicken, garlic shrimp and more. Local favourite for Thai.

**Gingergrass/1284 Barrington St./425-8555/www.gingergrass.ca**

Thai & Vietnamese Cuisine.

**Pubs, Lounges & Cabarets****The Dome/1726-1740 Argyle St./422-5453/www.thedome.ca**

Dance the night away at one of Halifax's most popular nightclubs. Showcases the city's top DJs along with many international guest DJs.

**Durty Nelly's Authentic Irish Pub/Corner of Argyle and Sackville Streets/406-7640/  
www.durtynellys.ca**

Designed and built in Ireland, Durty Nelly's was reconstructed piece by piece in Halifax. Traditional Irish pub menu.

**Lower Deck Pub/Historic Properties, 1869 Upper Water St./425-1501/  
www.lowerdeck.ca**

Popular downtown night spot. Live music nightly. Pub fare, ice-cold draught.

**The Palace/1721 Brunswick St./420-0015/www.thenewpalace.com**

Large, pulsating club. DJs play until the early morning hours. Dancing until 3:30am.

**Stainer's Wharf Pub & Grill/5075 George St./492-1800/www.stainerswharf.com**

Live music & Decent bar food.

**Your Father's Moustache Pub & Eatery/5686 Spring Garden Rd./423-6766/  
www.yourfathersmoustache.ca**

Full bar service, extensive menu, regular local live entertainment. Seasonal roof-top patio.

**View [www.edining.com](http://www.edining.com) for a wider range and information on all Halifax Dining or [thecoast.ca](http://thecoast.ca)**

**Halifax Weather and Climate: Summer - Halifax, Nova Scotia (NS), Canada**

June/July are among the driest months in Halifax with only occasional rainy weather and showers. However, despite warm daytime temperatures, there is usually a breeze, especially by the waterfront, and it cools off at night. Dress accordingly when going from the conference to dinner.

**Downtown Halifax Retail District**

Spring Garden Area is the retail heart of the Halifax. Alongside Citadel Hill and the Public Gardens, this vibrant area is a delight to explore. Unique boutiques with fashions from around the world flourish alongside stylish restaurants, bars and cafés. Many Spring Garden Area businesses are locally owned, this guarantees exceptional customer service and a superior range of unique products and services. Grab a latte, stroll our streets, examine locally made crafts and artwork. From books to fashion, from perfumes to pewter, you'll find it all in the Spring Garden Area.

## Awards

### The Richard Tees Distinguished Leadership Award:

The Executive Committee of BBCS selects an annual recipient for outstanding leadership and service to the BBCS community, considering in its selection:

- Advancement and administration of the Canadian Society for Brain, Behaviour, and Cognitive Science.
- Contributions to the training of students and technical staff in psychology both at one's own institution and nation-wide.
- Advancement of research and scholarship by involvement with granting agencies that fund research concerning brain, behaviour, and cognition.
- Contributions to Canadian journals of psychology.
- Advancement of research and scholarship by basic and applied scientific contributions to the discipline.
- Promotion of interaction between BBCS and other psychology organizations and direct service to the latter organizations.
- Promotion of scientific and administrative collaborations that advance the causes of the scientific study of brain, behaviour, and cognition.

### The 2010 Richard Tees Distinguished Leadership Award Winner: Michael E.J. Masson

*Excerpts from the nominating letter:*



Mike joined BBCS in 1990, the year of the Society's founding. Since then he and his students have presented more than 30 papers/posters at BBCS annual meetings. Mike has actively recruited faculty and grad students to the Society, including both of us. Mike served as President-Elect, President, and Past President of BBCS from 2000-2003 and was the host and organizer for the 2007 BBCS annual meeting at the University of Victoria. Mike has made sustained and substantial contributions to the advancement and administration of BBCS.

#### **Contributions to the training of students and technical staff in psychology both at one's own institution and nationwide.**

Mike has supervised more than two dozen undergraduate and graduate theses/dissertations, and he routinely teaches core statistics courses. For the last several years, Mike has routinely participated in UVic's Co-op Education Program by hiring undergraduates as full-time RAs for a work term...Mike has made many very significant contributions to training and he continues to be a leader in this regard.

#### **Advancement of research and scholarship by basic and applied scientific contributions to the discipline.**

Mike has published 80 peer-reviewed articles, as well as a number of book chapters and one co-edited volume. His publications have to date attracted more than 3,300 citations (Harzing's). Mike has given invited presentations of his scientific work in eight countries. He served as Acting Editor of *JEP:LMC* in 2005-06, has been Associate Editor of that journal and of *PB&R* and *M&C*, and served on the boards of those journals and *JEP:HPP* and *JML*. He was elected Fellow of the APA in 1996, and Fellow of APS in 2006. He was the 2003 recipient of the University of Victoria's Faculty of Social Sciences Award for Research Excellence. His work on the relation between literacy development and video game experience (with colleagues Daniel Bub and Chris Lalonde) attracted media attention from television, radio, and newspapers. Mike is a prominent research psychologist whose work continues to have substantial impact.

## **Promotion of scientific and administrative collaborations that advance the causes of the scientific study of brain, behaviour, and cognition**

Much of the foregoing evidences Mike's exemplary record of establishing and maintaining close and productive collaborations. In addition to the many accomplishments summarized above, as Chair of UVic's Department of Psychology from 1997 to 2002, and in a variety of other university-, faculty-, and departmental-level roles, Mike has made numerous contributions to the causes of scientific psychology. He is also unfailingly gracious, generous, and patient with students and colleagues who seek out his advice and assistance in matters of methodology, analysis, and theoretical interpretation of data.

## **Donald O. Hebb Distinguished Contribution Award**

The Donald O. Hebb Award is made to an individual who, in the opinion of the selection committee (composed of the five immediate BBCS past presidents), has made a significant contribution to the study of brain, behaviour, and cognitive science. The awardee is invited to give the Donald O. Hebb Distinguished Contribution address at the annual BBCS meeting.

In making its selection the committee will consider the following three criteria:

- An individual whose research has been sustained and meritorious and has enhanced the knowledge base of brain, behaviour, and cognition,
- An individual whose training of students, postdoctoral fellows and colleagues has had a significant impact on brain, behaviour, and cognitive science, and
- An individual whose influence has been exerted through leadership as a theorist or spokesperson for the discipline.

Normally, the awardee shall have conducted a significant proportion of his/her research training or disciplinary work within Canada. The awardee is invited to give the Donald O. Hebb Distinguished Contribution address at the annual BBCS meeting of that year.

### **The 2010 Donald O. Hebb Award Winner:**

#### **Colin M. MacLeod**

*Excerpts from the nominating letter:*



Colin M. MacLeod, a graduate of McGill University (B.A.) and the University of Washington (Ph.D.), is recognized internationally for his groundbreaking empirical work and theoretical innovation in cognitive psychology, most notably in the domains of attention and memory. For 35 years, his research has added extensively to our understanding of the fundamental cognitive processes involved in attending to, remembering, and interpreting the world around us.

From the outset, MacLeod has been fascinated by memory. He is a leading expert on directed forgetting, an experimental paradigm that models updating memory when information changes.... Upon joining the faculty of the University of Toronto in 1978, MacLeod became a member of the best known group of memory researchers in the world, a stimulating environment that gained immensely by his presence... With then graduate student Kevin Dunbar, MacLeod first demonstrated that classic Stroop interference was not caused simply by the faster process interfering with the slower one, and then traced the development of interference with extended practice. Indeed, this constant emphasis on the powerful influence of learning is the hallmark of all of his work. MacLeod then wrote the definitive review of the Stroop literature—among the most cited papers in all of psychology over the past 20 years... Most recently, MacLeod has drawn on his unique expertise in both attention and memory to challenge one of the core theoretical constructs in cognition: Inhibition.

As impressive as MacLeod's contributions to knowledge are, they are paralleled by an extraordinary dedication to serving the academic and scientific community. Both at the University of Toronto (1978-2003) and at the University of Waterloo (2003-present), he has supervised a host of students—undergraduate, graduate, and postdoctoral. Training of young scientists clearly is a high priority for him. At the University of Toronto at Scarborough, he was Chair of the Division of Life Sciences (Psychology and Biology) and then Vice-Principal of the college. In 2002, on the occasion of the 175th anniversary of the University of Toronto, he was selected as one of the university's "Great Minds," a distinction reserved for only a very few faculty and alumni.

Outside the university, MacLeod's contributions have been equally remarkable. He served on and chaired the NSERC Grant Selection Committee for Psychology, as well as serving on Psychology's NSERC Reallocations Committee twice. He has recently served on the CFI adjudication panel for Psychology as well. He has organized scholarly conferences in Canada (Lake Ontario Visionary Establishment), the United States (The Place of Inhibitory Processes in Cognition, Arlington Texas), and internationally (Tsukuba International Conference, Tsukuba Japan), and has always sought to increase the internationalization of Psychology.

In addition to service on a number of editorial boards of top-tier journals, he has performed major service for the field as Editor of not one but two major journals. From 1992-1996, he was Editor of the Canadian Journal of Experimental Psychology. From 2002-2006, he was the first non-American Editor of Memory & Cognition, one of the top two journals in the field internationally. Not surprisingly, his accomplishments have been recognized both nationally and internationally. He has been sought after as a visiting scholar worldwide, including France, Israel, Japan, and the Netherlands. He has been made Fellow of the Canadian Psychological Association, the American Psychological Association, and the Association for Psychological Science.

Colin MacLeod is an outstanding scientist who is world-renowned for his highly cited contributions to cognitive psychology and cognitive science. He is, in every respect, an outstanding recipient of the BBCS Hebb Award.

## **Donald O. Hebb Graduate Student Awards From 2009**

The Donald O. Hebb Graduate Student Award is made to the individual who, in the opinion of the award committee, has presented the best paper or poster at the annual meeting. Last year's winners were:

### **Spoken Presentation:**

**Winner:** Greg Louis West, University of Toronto, "Electrophysiological evidence for biased competition in V1 favoring motivationally significant stimuli"

**Honourable mention:** Jason David Ozubko, University of Waterloo, "When you don't have a clue about the cue: Costs associated with item specific".

### **Poster Award:**

**Winner:** Gillian Dale, Brock University, "Individual differences in diffusion of attention predict the attentional blink".

**Honorable mention:** Adam K. Dubé, University of Regina, "The relationship between adults' conceptual understanding of inversion and associativity".

**Presentations entered in this year's competition are marked with an asterisk in the short program.**

**Candidates for the award for best paper:**

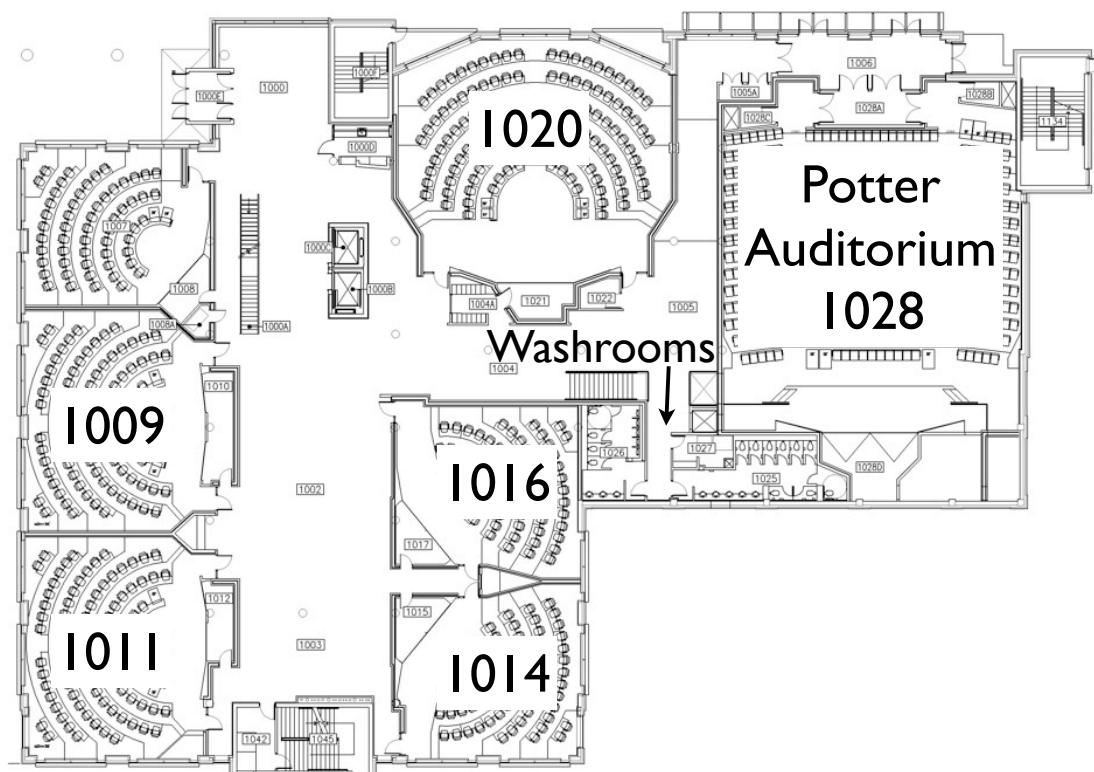
- (10) Michael John Taber – Type Of Emergency Response Focus Board Visual Display Affects Allocation of Attention and Development of Situation Awareness
- (17) Tiffany Deschamps – The reading span task: storage vs. processing, or encoding vs. retrieval?
- (18) Jonathan Matthew Fawcett – Event-method directed forgetting: A new paradigm for understanding the intentional forgetting of events and actions
- (19) Erin Anne Maloney – The effect of mathematics anxiety on the representation of symbolic numerical magnitude
- (20) Allison Anne Brennan – Person perception informs understanding of visual cognition
- (26) Eric L.G. Legge – Landmarks, Skylines, Compasses and Contexts: Visual Information Learning and Integration in the Central Australian Desert Ant: *Melophorous bagoti*
- (40) Rachel N. Dingle – A midline azimuthal channel in human spatial hearing.
- (59) Michael A. Lawrence – The influence of attention on the probability and fidelity of memory
- (62) Tricia Lawrie – Other-race face description and recognition response bias
- (159) Mary H. MacLean – Personality predicts temporal attention costs in the attentional blink paradigm
- (161) Ben D. Amsel – Tracking the Timecourse of Conceptual Knowledge Activation
- (162) Nathaniel Barr – Differential access to causal versus associative relations in semantic memory
- (170) Christopher M. Warren – Topological Changes in the Electrophysiological Response to Infrequent Targets Implicate the Locus Coeruleus – “Norepinephrine System
- (175) Beatriz R. Sarmiento – Does audiovisual interaction depend on context?
- (176) Ryan Blagdon – Perceptual versus motoric attention: An fMRI investigation of the speed-accuracy tradeoff in decision-making
- (177) Therese M. Chevalier – Differences in White Matter Connectivity in Bilaterally Deaf Individuals vs. Normally Hearing Controls
- (188) Chris Cowper-Smith – What's Your Next Move? Directional Biases for Sequential Limb and Eye Movements
- (192) Peter A. Jansen – Chimaera Neural Networks for Self-Organizing Grammar Acquisition

**Candidates for the award for best poster:**

- (75) Elena Cañadas – Attentional Control Can be Transferred to New Members of Social Categories
- (83) Alexandra Mueller – Detection of changes in driving environments: Effects of task relevance and size
- (84) Helen Monkman – Discriminability Matters: On Form and Colour Differences in Memory
- (91) Kate M. Thompson – Exploring the differential withdrawal of attention from F and R items in directed forgetting.
- (92) Randi Alison Doyle – Gender differences on a computerized Mental Rotations Test
- (95) Amanda Gadke – Improvements in Executive Function: Effects of Age and Lifestyle
- (101) Jeremy P. Hogeveen – Motor priming and the Chameleon effect: Evidence for a common mechanism

- (102) Edward N. Wilson – Neurovascular architecture following monocular deprivation in monkey primary visual cortex
- (103) Gabrielle Roddy – Noise complicates everything: biological motion, attention and dual task performance.
- (104) Bruno Richard – Non-Parametric test to describe response time distributions within a visual search paradigm
- (106) Nicole Gervais – Olfactory discrimination following selective damage to the entorhinal cortex
- (112) Stephanie Solcz – Priming Modulates Bias in Deductive Reasoning
- (114) John Brand – Rapid averaging: Two means cannot be computed in parallel without cost
- (115) Selma Hamdani – Rat's Ultrasonic vocalizations as indices of affect in conditioned cue preference and conditioned cue avoidance
- (117) Amanda Hudson – Selective Control of Attention to Emotionally Salient Stimuli
- (118) Judy Ann Prasad – Selective lesions of the thalamic reuniens in rats increase impulsive responses in the 5-Choice Reaction Time Task
- (124) John Grundy – The bivalency effect and generalized response slowing triggered by unexpected stimulus features
- (125) Kirk A. Stokes – The cognitive locus of memory impairment in the Irrelevant Sound Effect: Rehearsal isn't everything.
- (128) Catherine Smith – The effect of juvenile pretraining on cognitive performance after NMDA blockade
- (139) Adam Spadaro – The Role of an Intervening Event in a 2afc Task
- (143) Leanne M. Fraser – The Triple Test: A New Approach Using Old Tests to Measure Emotionality in Mice

### The 1st floor Rowe Building



## Program-at-a-glance

### Friday, June 11, 2010

**4:00 – 7:00 Registration**

**University Club**

**4:00 – 7:00+ Welcome Reception**

**University Club Pub  
(snacks & cash bar)**

### Saturday, June 12, 2010

**7:30 – 12:00 Registration**

**Ken Rowe Building**

**2:00 - 5:00**

#### **8:30 – 10:00 Paper Session Group 1**

I. Symposium: Psychology and the Instance	(Abstracts 1-6)	Room 1020
II. Attention I	(Abstracts 7-12)	Room 1009
III. Memory I	(Abstracts 13-18)	Room 1011
IV. Cognitive Processes I	(Abstracts 19-24)	Room 1014
V. Animal Behaviour	(Abstracts 25-28)	Room 1016

#### **10:00 – 10:30 Nutrition Break**

#### **10:30 – 12:00 President's Symposium**

(Abstracts 29-32)

Room 1028

Systems Dynamics and the Organization of Long-Term Memory

Organizer: Rob Sutherland

#### **12:00 - 2:00 Lunch: Discussion of NSERC changes • MacInnes Room of the SUB**

**ALL WELCOME:** cost is covered by your registration fee.

#### **2:00 – 3:00 Paper Session Group 2**

VI. Symposium: Addiction: Affective, Cognitive, and Motivational Mechanisms	(Abstracts 33-36)	Room 1020
VII. Perception I	(Abstracts 37-40)	Room 1009
VIII. Language and Literacy I	(Abstracts 41-44)	Room 1011
IX. Cognitive Processes II	(Abstracts 45-48)	Room 1014

#### **3:00 – 3:30 Nutrition Break**

#### **3:30 – 5:00 Paper Session Group 3**

X. Symposium: The Unification of Psychological Science: Exploring and Expanding Boundaries	(Abstracts 49-54)	Room 1020
XI. Attention II	(Abstracts 55-59)	Room 1009
XII. Memory II	(Abstracts 60-64)	Room 1011
XIII. Music and Emotion	(Abstracts 65-69)	Room 1014

#### **5:00 – 7:00 Poster Session I**

(Abstracts 70-150)

**University Club**



**Sunday, June 13, 2010****8:30 – 10:00 Paper Session Group 4**

XIV. Symposium: Quantitative Methods in  
Cognitive Science: Recent Advances  
and Case Studies

(Abstracts 151-154)

Room 1020

XV. Attention III

(Abstracts 155-160)

Room 1009

XVI. Semantic Knowledge and Categorization

(Abstracts 161-166)

Room 1011

XVII. Cognitive Processes III

(Abstracts 167-171)

Room 1014

XVIII. Perception II

(Abstracts 172-177)

Room 1016

**10:00 – 10:30 Nutrition Break****10:30 – 12:00 Paper Session Group 5**

XIX. Symposium: Numerical Cognition:  
Function, Process, Structure

(Abstracts 178-183)

Room 1020

XX. Attention IV

(Abstracts 184-189)

Room 1009

XXI. Language and Literacy II

(Abstracts 190-195)

Room 1011

XXII. Cognitive Processes IV

(Abstracts 196-200)

Room 1014

XXIII. Animal Neuroscience

(Abstracts 201-205)

Room 1016

**12:00 – 2:00 Lunch**

On your own (please refer to suggestions on page XX)

**2:00 – 3:00 Business Meeting****Room 1028****3:00 – 3:30 Nutrition Break****3:30 – 5:00 Hebb Address****Room 1028****“When Learning Met Memory” • Colin MacLeod****5:00 – 7:00 Poster Session 2**

(Abstracts 206-286)

**University Club****7:15 – 10:30 Closing Banquet****Saint Mary's University****Loyola Conference Hall (Sobey's Building)**

(map showing St. Mary's is on the back cover)

## Short Program

**Note: \* denotes Students' Talks and Posters under consideration for Hebb Prizes**

**Saturday, June 12 • Paper Session Group I • 8:30 – 10:00 AM**

### **I Symposium: Psychology and the Instance (Abstracts 1-6) Room 1020**

- (1) The instance and immediate priming**  
Leboe, Jason Perry
- (2) Context-sensitive knowledge and skilled performance: What skilled typists don't know in general**  
Crump, Matthew John
- (3) Selective attention and the control of episodic integration**  
Milliken, Bruce; Shore, David ;Vaquero, Joaquín
- (4) Parallel retrieval and the chorus of instances**  
Jamieson, Randy
- (5) The role of feature instances in concepts**  
Hannah, Samuel
- (6) The Mark of the Instance: Autoassociative Neural-Nets as Exemplars of Storage and Retrieval in Instance Theory.**  
Vokey, John Richard;Tangen, Jason Marcus

### **II Attention I (Abstracts 7-12) Room 1009**

- (7) 8:30 Item-specific memory in visual search: Evidence from eye-tracking**  
Solman, Grayden J.F.; Smilek, Daniel
- (8) 8:45 Take a break! Fatigue selectively influences eye movements during visual search**  
Lanthier, Sophie Nicole; Risko, Evan Frank; Smilek, Daniel; Kingstone, Alan
- (9) 9:00 Gaze in the natural environment: does research into visual attention scale up?**  
Foulsham, Tom; Kingstone, Alan
- (10)\* 9:15 Type Of Emergency Response Focus Board Visual Display Affects Allocation of Attention and Development of Situation Awareness**  
Taber, Michael John, Klein, Raymond M.McCabe, John
- (11) 9:30 Characterizing the nature of attentional orienting elicited by the mental number line**  
Ristic, Jelena; Giesbrecht, Barry
- (12) 9:45 The causal roles of the dorsal and ventral fronto-parietal networks in orienting spatial attention**  
Chica, Ana B.; Bartolomeo, Paolo ;Valero-Cabre, Antoni

**III Memory I (Abstracts 13-18)****Room 1011**

- (13) 8:30 **Prospective Memory and Aging: Fictions, Facts, and Some Controversies**  
Uttl, Bob
- (14) 8:45 **Chronic Marijuana Use and Prospective Memory Task Performance**  
Cuttler, Carrie; Relkov, Tonia; Jubenville, Theresa; McLaughlin, Ryan; Graf, Peter
- (15) 9:00 **Autobiographical Memory and Self-report in Elders**  
Humphrey, Diane Elizabeth; Tomas-Smigura, Michelle
- (16) 9:15 **Checking-in on the Memory Deficit and Meta-Memory Deficit Theories of Compulsive Checking**  
Cuttler, Carrie; Graf, Peter
- (17)\* 9:30 **The reading span task: storage vs. processing, or encoding vs. retrieval?**  
Deschamps, Tiffany; Service, Elisabet
- (18)\* 9:45 **Event-method directed forgetting: A new paradigm for understanding the intentional forgetting of events and actions**  
Fawcett, Jonathan Matthew; Taylor, Tracy L.; Nadel, Lynn

**IV Cognitive Processes I (Abstracts 19-24)****Room 1014**

- (19)\* 8:30 **The effect of mathematics anxiety on the representation of symbolic numerical magnitude**  
Maloney, Erin Anne; Ansari, Daniel; Fugelsang, Jonathan A.
- (20)\* 8:45 **Person perception informs understanding of visual cognition**  
Brennan, Allison Anne; Watson, Marcus R.; Kingstone, Alan; Enns, James T.
- (21) 9:00 **Getting the right answer: Effects of presentation side on judgments of truth**  
Westbury, Chris F.
- (22) 9:15 **An Examination of Sex Differences in Iowa Gambling Task Performance in Typically Developing Children and Adolescents**  
Filliter, Jillian; Gillespie, Jacqueline; Rouette, Julie; Phelan, Heather; Johnson, Shannon
- (23) 9:30 **Gesture in Space**  
Foroud, Afra; Eskes, Gail; Newman, Aaron J.; Klein, Raymond
- (24) 9:45 **The Cognitive Failures Questionnaire: A fuller exploration of dimensions and rotations**  
Ishigami, Yoko; Frankland, Bradley W.

**V Animal Behaviour (Abstracts 25-28)****Room 1016**

- (25) 8:30 **Choice Performance in Environments with a Distinctive Shape**  
Horne, Murray R.; Pearce, John M.
- (26)\* 8:45 **Landmarks, Skylines, Compasses and Contexts: Visual Information Learning and Integration in the Central Australian Desert Ant: *Melophorous bagoti***  
Legge, Eric L.G.; Spetch, Marcial; Cheng, Ken
- (27) 9:00 **Lateralization of Geometric and Featural Information by the Clark's Nutcracker**  
Kelly, Debbie M.
- (28) 9:15 **Pattern Perception in Rats During Foraging**  
Cole, Mark; Musolino, Evanya

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**10:00 - 10:30 Nutrition Break**


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**Saturday June 12 • 10:30 - 12:00 • President's Symposium**


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**Systems dynamics and the organization of long term memory**
**Room 1028 (Potter Aud.)**

Organizer: Robert Sutherland

- (29) Retrograde amnesia and the organization of long-term memory**  
Sutherland, Robert J.
  - (30) The network organization of recent and remote memory**  
Frankland, Paul W.
  - (31) Hippocampus and Memory: Consolidation or Transformation**  
Winocur, Gordon
  - (32) A bridge over troubled water: Reconsolidation as a link between and neuroscientific memory research traditions** **cognitive**  
Nader, Karim
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**12:00 - 2:00 Paid Conference Lunch**


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Discussion of recent changes at NSERC • MacInnes Room: Student Union Building

All Welcome • Cost is covered by your registration fee.

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**Saturday June 12 • 2:00 - 3:00 • Paper Session Group 2**


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**VI Symposium: Addiction: Affective, Cognitive, and Motivational Mechanisms (Abstracts 33-36)**
**Room 1020**

- (33) Cognitive-motivational effects of stress, cues, and alcohol in male problem drinkers and problem gamblers**  
Zack, Martin
- (34) The role of pharmacology vs expectancy on the positive and negative reinforcing effects of nicotine**  
Barrett, Sean P.
- (35) Role of positive mood in BAS risk for problematic drinking**  
O'Connor, Roisin M.; Murray, Jessica; Stewart, Sherry H.
- (36) Effects of Alcohol and Nicotine on Subjective and Physiological Responses to Gambling**  
Stewart, Sherry Heather

**VII Perception I (Abstracts 37-40)****Room 1009**

- (37) 2:00 **Discrimination & Identification of Periodic Motion Trajectories**  
Wilson, Hugh R.; Or, Charles; Thabet, Michael; Wilkinson, Frances
- (38) 2:15 **Pretty n Ugly Patterns: Attribution of Discrepancy**  
Graf, Peter; Gao, Jess; Kim, Tracy
- (39) 2:30 **2nd order relational face processing of faces of different race and photographic polarity**  
Matheson, Heath; Bilsbury, Tanya; McMullen, Patricia
- (40)\* 2:45 **A midline azimuthal channel in human spatial hearing**  
Dingle, Rachel N.

**VIII Language and Literacy I (Abstracts 41-44)****Room 1011**

- (41) 2:00 **Words in the mind: Are there graded effects of semantic similarity on morphological processing in children?**  
Deacon, S. Helene; Downing, Jennifer; Gonnerman, Laura M.; Quemart, Pauline
- (42) 2:15 **Effects of Proficiency on Morphological Priming in Second Language French Learners: an ERP study**  
Nichols, Emily
- (43) 2:30 **Effects of acoustic cues and phonetic contexts on Cantonese tone perception and acquisition**  
Tong, Shelley Xiuli
- (44) 2:45 **Effects of processing difficulty on word order choice**  
Gonnerman, Laura

**IX Cognitive Processes II (Cognition, Intelligence and Creativity) Room 1014 (Abstracts 45-48)**

- (45) 2:00 **Hebb and Cattell: The genesis of the concepts of fluid and crystallized intelligence**  
Brown, Richard E.
- (46) 2:15 **Computational Evidence that Word Co-occurrence Models Predict Turing Test Humanness Judgments**  
MacInnes, Joseph; Laszlo, Sarah; Armstrong, Blair
- (47) 2:30 **Making inspiration explicit: A case for dual process theory in poetic composition.**  
Beatty, Erin L.; Ball, Linden J.
- (48) 2:45 **Retrieval fluency predicts reasoning bias: The case of the Wason selection task**  
Thompson, Valerie Anne; Evans, Jonathan

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**3:00 - 3:30 Nutrition Break**

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**Saturday June 12 • 3:30 - 5:00 • Paper Session Group 3**


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**X Symposium: The Unification of Psychological Science: Exploring and Expanding Boundaries (Abstracts 49-54) Room 1020**

- (49) **Psychology in fragments: A graduate student perspective**  
Matheson, Heath; Fawcett, Jonathan
- (50) **Psychology: What Went Wrong**  
Nadel, Lynn
- (51) **Impaired Influence of Familiar Configuration on Scene Segmentation in Medial Temporal Lobe Amnesia**  
Peterson, Mary A.; Barense, Morgan D.
- (52) **Rethinking psychotherapy from a cognitive neuroscience perspective**  
Ryan, Lee
- (53) **Clinical Neuroscience as an Emerging Discipline**  
Newman, Aaron; Johnson, Shannon
- (54) **A new look at an old assumption**  
Kingstone, Alan; Risko, Evan

**XI Attention II (Abstracts 55-59) Room 1009**

- (55) **3:30 Context-specific learning of episodic integration in repetition effects**  
D'Angelo, Maria C.; Milliken, Bruce
- (56) **3:45 The Role of Feature Integration and Perceptual Grouping in Explicit Learning**  
Fiacconi, Christopher Mark
- (57) **4:00 Multifocal exogenous and endogenous attention in visuo-spatial working memory**  
Botta, Fabiano; Lupiáñez, Juan
- (58) **4:15 Pop-Out search is affected by higher level task demands: Evidence for the role of episodes**  
Thomson, Dave R.
- (59)\* **4:30 The influence of attention on the probability and fidelity of memory**  
Lawrence, Michael A.

**XII Memory II (Abstracts 60-64) Room 1011**

- (60) **3:30 I said, you said: The production effect gets personal**  
MacLeod, Colin M.
- (61) **3:45 Physiological arousal, gaze direction, and face recognition**  
Goodman, Laura; Phelan, Heather; Rouette, Julie; Kerr, Michelle; Johnson, Shannon
- (62)\* **4:00 Other-race face description and recognition response bias**  
Lawrie, Tricia; Arbuthnott, Katherine D.
- (63) **4:15 Response bias as a stable cognitive trait in recognition memory and beyond**  
Kantner, Justin; Lindsay, D. Stephen
- (64) **4:30 The role of faces and emotion in item-method directed forgetting**  
Quinlan, Chelsea; Taylor, Tracy

**XIII Music and Emotion (Abstracts 65-69)****Room 1014**

- (65) **3:30 Does body expression affect infants' recognition of vocal expressions of emotion? Intermodal perception of emotion during infancy**  
Tsang, Christine D.; Goldhar, Talia S.; Longfield, Danielle
- (66) **3:45 Colour and Emotion Associations in Elders**  
Humphrey, Diane Elizabeth; Vandewiel, Tonia
- (67) **4:00 Different kinds of yuck? Examining the nature and alleviation of disgust**  
McEachern, Justine; Skye, Aimee
- (68) **4:15 Non-native acquisition of lyrics and melody of an unfamiliar song**  
McIver, Alexis J.; Lamarche, Anick M-J; Cohen, Annabel J.
- (69) **4:30 Both music and video contribute to the parsing of a short motion picture animation**  
Hamon-Hill, Cindy; Cohen, Annabel J.; Klein, Ray

**Saturday June 12 • 5:00 - 7:00 • Poster Session I  
(Abstracts 70-150) • University Club**

- (70) **A Holographic Memory Model of Human Strategy Acquisition**  
Mouck, Andrew Howes
- (71) **Adults conceptual understanding of arithmetic: An eye movement study**  
Robinson, Katherine Macleod; LeFevre, Jo-Anne
- (72) **Are Pessimists Immune to the Undoing Effect?**  
Tanner, Angie; Furrow, David; Birt, Angie
- (73) **An Investigation of the Relative Position Priming Constraint**  
Stinchcombe, Eric J.
- (74) **Are you looking at me? The role of eye gaze in eliciting changes to spatial attention as a reaction to facial expressions.**  
Benarroch, Miriam
- (75)\* **Attentional Control Can Be Transferred to New Members of Social Categories**  
Cañadas, Elena; Rogriguez-Bailón, Rosa ; Milliken, Bruce; Lupiáñez, Juan
- (76) **Can You Think of a Reason Why Fred Needs to Buy a Hammer?: The Effects of Strategies Use on Source Monitoring in 4-year-old Children**  
McKay, Lee-Ann
- (77) **Base Rate Neglect: Now You See It, Now You Don't**  
Pennycook, Gordon; Thompson, Valerie
- (78) **Can they see me?: Cues of observation on trustworthy behavior**  
Harvey, Evan A.; Shedden, Judith M.
- (79) **Cognitive Health Screening in General Aviation**  
Van Benthem, Kathy
- (80) **Come dance with me (and then we'll build a house)**  
Honey, Lynn; Spencer, Jason
- (81) **Conditional control of flavour avoidance and flavour aversion by contextual cues**  
Brown, Adam R.; Penney, Alexander M.; Skinner, Darlene M.; Martin, Gerard M.
- (82) **Dance to the music: The effect of free movement on emotional engagement**  
McGarry, Lucy; Russo, Frank

- (83)\* **Detection of changes in driving environments: Effects of task relevance and size**  
Mueller, Alexandra
- (84)\* **Discriminability Matters: On Form and Colour Differences in Memory**  
Monkman, Helen; Brown, Matthew; Herdman, Chris
- (85) **Does the level of processing of background context help memory?**  
Kelly, Harm Kenneth; Fernandes, Myra
- (86) **EEG Coherence and Executive Functions in Young and Older Adults**  
Davies, Stephannie; Johns, Erin K.; Phillips, Natalie A.
- (87) **Electrophysiological Correlates of Eyewitness Identification**  
Friesen, Krista B; Tanaka, James W; Lindsay, D. Stephen
- (88) **Emotional Narratives are Resistant to Directed Forgetting**  
Kowal, Carla; Smith, Stephen D.; Di Nella, Michelle S.
- (89) **Evaluating the Word Superiority Effect With Visual Noise**  
Anderson, Nicole; Bird, Gordon
- (90) **Examining the Role of Dissociation and Need for Cognition in the Deese-Roediger-McDermott Paradigm**  
Cann, David R.; Techentin, Cheryl
- (91)\* **Exploring the differential withdrawal of attention from F and R items in directed forgetting.**  
Thompson, Kate M.; Hamm, Jeff; Taylor, Tracy L.
- (92)\* **Gender differences on a computerized Mental Rotations Test**  
Doyle, Randi Alison; Voyer, Daniel
- (93) **Horizontal-Vertical length comparison and the perceptual symmetry law in left visual neglect**  
Charras, Pom; Lupiáñez, Juan; Bartolomeo, Paolo
- (94) **How rapid is rapid averaging?**  
Whiting, Brittany; Oriet, Chris
- (95)\* **Improvements in Executive Function: Effects of Age and Lifestyle**  
Gadke, Amanda
- (96) **In situ examination of protease activity in the visual system**  
Duffy, Kevin Richard; Duffy, Michael Sean
- (97) **Intentionally forgetting a video segment is more effortful than remembering it: A probe study**  
Fawcett, Jonathan Matthew; Taylor, Tracy L.; Nadel, Lynn
- (98) **Interference of action-relevant space with selective visual attention**  
Gozli, Davood Ghara; Brown, Liana E.; Reynolds, Michael
- (99) **Laterality of Phonological, Orthographic, and Semantic Processing: One or both hemispheres?**  
Mathesius, Jeffrey Robert; Rutherford, Barbara J.
- (100) **Morphological Processes in Elementary School Children**  
Bourassa, Derrick Charles; Beaupre, Jennilee ; MacGregor, Krista
- (101)\* **Motor priming and the Chameleon effect: Evidence for a common mechanism**  
Hogeveen, Jeremy P.
- (102)\* **Neurovascular architecture following monocular deprivation in monkey primary visual cortex**  
Wilson, Edward N.; Duffy, Kevin R.
- (103)\* **Noise complicates everything: biological motion, attention and dual task performance**  
Roddy, Gabrielle; Saunders, Daniel; Troje, Nikolaus; Gurnsey, Rick



- (104)\* Non-Parametric test to describe response time distributions within a visual search paradigm**  
Richard, Bruno; Ellemberg, Dave; Johnson, Aaron
- (105) Now you see it, now you don't! Differences in contingency learning as a function of evidence construal**  
Skye, Aimee
- (106)\* Olfactory discrimination following selective damage to the entorhinal cortex**  
Gervais, Nicole; Cole, Emily; Mumby, Dave G.
- (107) Orthographic knowledge in adults with childhood histories of reading difficulties: Strength or weakness?**  
Conrad, Nicole J.; Campbell, Jocelyn; Parrila, Rauno
- (108) Parallel Response Selection in Dual Task Situations via Automatic Category-to-Response Translation**  
Thomson, Sandra Jean; Watter, Scott
- (109) Parallels Between Absolute Identification and Function Learning Tasks**  
Brown, Mark Andrew; Neath, Ian
- (110) Phantom eye loss and related illusions in asymmetric dark adaptation**  
Cassidy, Benjamin Nicholas; Schawerna, Franca Louise; Wilkinson, Frances
- (111) Presence and Immersion: Transportation into a Narrative World**  
Douglas, Shawn; Keefer, Kateryna V.; Chan-Reynolds, Michael
- (112)\* Priming Modulates Bias in Deductive Reasoning**  
Solcz, Stephanie; Fugelsang, Jonathan
- (113) Producing Benefits Learning: The Production Effect Endures and Improves Memory for Text**  
Ozubko, Jason David; Hourihan, Kathleen L.
- (114)\* Rapid averaging: Two means cannot be computed in parallel without cost**  
Brand, John; Oriet, Chris; Sykes Tottenham, Laurie
- (115)\* Rat's Ultrasonic vocalizations as indices of affect in conditioned cue preference and conditioned cue avoidance**  
Hamdani, Selma; White, Norman M.
- (116) Science, Missing Data, Secrecy, and Public Policy: What Is Ethical?**  
Uttl, Bob; Smibert, Dylan; Morin, Alain; Wells, Gregory
- (117)\* Selective Control of Attention to Emotionally Salient Stimuli**  
Hudson, Amanda; Jacques, Sophie
- (118)\* Selective lesions of the thalamic reunions in rats increase impulsive responses in the 5-Choice Reaction Time Task**  
Prasad, Judy Ann; MacGregor, Emily Marilyn; Chudasama, Yogita
- (119) Self-relevant semantic learning does not alter physical face perception**  
LeBarr, A. Nicole; Heisz, Jennifer J.; Shedden, Judith M.
- (120) Semantic interference in a colour matching task**  
Cheesman, Jim
- (121) State and Trait Differences in Attention and Memory for Emotional Images**  
Sears, Christopher Roy; Newman, Kristin; Ference, Jennifer; Thomas, Charmaine
- (122) Subjective auditory components of sarcasm**  
Voyer, Daniel; Techentin, Cheryl
- (123) Taking a look at the effect of reading speed during shared book reading: An eye movement monitoring study**  
Turgeon, Krystle-Lee; Roy-Charland, Annie; Beaudry, Olivia; Saint-Aubin, Jean
- (124)\* The bivalency effect and generalized response slowing triggered by unexpected stimulus features**  
Grundy, John; Benarroch, Miriam; Shedden, Judith

- (125)\* The cognitive locus of memory impairment in the Irrelevant Sound Effect: Rehearsal isn't everything**  
Stokes, Kirk A.; Arnell, Karen M.; Goldhawk, Matthew P.
- (126) The effect of arousal level on driving: Narrow pupils make for sloppy drivers**  
Yanko, Matt Ryan; Spalek, Thomas M.
- (127) The Effect of Emotional Valence and Arousal on Time Perception: Evidence from a Temporal-Bisection Task**  
Smith, Stephen D.; McIver, Theresa A.; Di Nella, Michelle S.; Crease, Michelle L.
- (128)\* The effect of juvenile pretraining on cognitive performance after NMDA blockade**  
Smith, Catherine; Wartman, Brianne C.; Holahan, Matthew R.
- (129) The effects of brief daily binocular vision on the anatomical changes induced in the lateral geniculate nucleus (LGN) by daily periods of monocular deprivation**  
Dingle, Rachel N.
- (130) The Effects of Conversation on Working Memory and Situation Awareness in Simulated Driving**  
Heenan, Adam; Johannsdottir, Kamilla; Brown, Matt; Herdman, Chris
- (131) The effects of reverse occlusion on neuron structure and neurofilament labeling in the lateral geniculate nucleus**  
O'Leary, Timothy P.; Kutcher, Matthew R.; Mitchell, Donald E.; Duffy, Kevin R.
- (132) The Embodied Insult Detection Effect**  
Wellsby, Michele; Siakaluk, Paul D.; Pexman, Penny M.; Pickett, Sarah; Newcombe, P. Ian; Owen, William J.
- (133) The impact of semantic similarity on action production and action identification**  
Macdonald, Scott; Desmarais, Geneviève
- (134) The Influence of Context at Study on Memory for Repeated Items**  
Bancroft, Tyler; Hockley, William
- (135) The influence of training on flanker interference**  
Lin, Olivia Ying-Hsin; MacLeod, Colin M.
- (136) The Oblique Effect in the Horse**  
Carey, Andrea Danielle; Barnfield, Anne Mary Clare; Timney, Brian
- (137) The relationship between neurofilament content and soma size in the cat Lateral Geniculate Nucleus**  
Crowder, Nathan A.; Duffy, Kevin R.
- (138) The Rivermead Behavioral Memory Test: Does It Measure Prospective Memory?**  
Uttl, Bob; Siegenthaler, Amy L.
- (139)\* The Role of an Intervening Event in a 2afc Task**  
Spadaro, Adam; Milliken, Bruce
- (140) The role of initial light adaptation in the phantom eye loss illusion**  
Schawerna, Franca Louise; Cassidy, Benjamin Nicholas; Wilkinson, Frances
- (141) The silhouette illusion: Evidence for a viewing-from-above bias**  
McAdam, Matthew; Troje, Nikolaus F.
- (142) The study of social networks in cognitive psychology: the organization of dream reports**  
Viau-Quesnel, Charles; Schweickert, Richard; Fortin, Claudette
- (143)\* The Triple Test: A New Approach Using Old Tests to Measure Emotionality in Mice**  
Fraser, Leanne M.; Brown, Richard E.; Holmes, Andrew; Ramos, Andre
- (144) Time-Of-Day Preference and Mind-Wandering**  
Vinski, Melena; Fenske, Mark; Watter, Scott

- (145) To what extent do proportion congruent and conflict adaptation effects reflect a single common mechanism?**  
Torres-Quesada, Maryem; Funes, Maria Jesús; Lupiáñez, Juan
- (146) Transient cognitive deficits in young-adult rats following a mini-stroke in the hippocampus**  
Booker, Ashley Marie; McLeod, Amy; Lehmann, Hugo
- (147) Trapped: Assessing Attractiveness of Potential Food Sources to Bumblebees**  
Hudon, Tamara; Plowright, Catherine
- (148) Unlearned Visual Pattern Preferences in Bumblebees (*Bombus impatiens*)**  
Orbán, Levente; Plowright, Catherine
- (149) What do early environment and sex-influenced differences in Yucatan miniature pigs (*Sus scrofa*) really reflect?**  
Walsh, Carolyn J.; Mian, Riana; Kouwenberg, Amy-Lee; Martin, Gerard M.
- (150) What do people talk to themselves about?**  
Morin, Alain; Uttl, Bob

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**Poster session ends 7:00 pm**

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**Sunday June 13 • 8:30 - 10:00 • Paper Session Group 4**


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**XIV Symposium: Quantitative Methods in Cognitive Science: Room 1020**  
**Recent Advances and Case Studies (Abstracts 151-154)**

- (151) **Bayesian Information Criterion as a Practical Alternative to Null-Hypothesis Testing**  
 Masson, Michael E.J.
- (152) **Assessing Response Time Mixture Distributions**  
 Dixon, Peter
- (153) **How to Make Speed and Accuracy Your Friends**  
 Christie, John
- (154) **Modeling linguistic components of evoked response potentials with generalized additive models**  
 Baayen, Harold; Tremblay, Antoine; Hendrix, Peter

**XV Attention III (Abstracts 155-160) Room 1009**

- (155) 8:30 **Optimizing integration of task and response rules in goal representation**  
 Pandey, Mamata; Oriet, Chris
- (156) 8:45 **Does Task Switching Involve Endogenous Self-Control Processes?**  
 Arbuthnott, Katherine Diane
- (157) 9:00 **Social Incentives Affect Joint-Attention Performance**  
 Pottruff, Molly M.; Abu-Zeid, Rami; Krupp, Daniel Brian; Shedden, Judith M.
- (158) 9:15 **The representation of the second target during the attentional blink**  
 Jannati, Ali; Spalek, Thomas M.; Di Lollo, Vincent
- (159)\* 9:30 **Personality predicts temporal attention costs in the attentional blink paradigm**  
 MacLean, Mary H.; Arnell, Karen M.
- (160) 9:45 **Stimulus-response compatibility in a simulated “real-world” driving task**  
 Ryan, Matthew Paul

**XVI Semantic Knowledge and Categorization (Abstracts 161-166) Room 1011**

- (161)\* 8:30 **Tracking the Timecourse of Conceptual Knowledge Activation**  
 Amsel, Ben D.; Cree, George S.
- (162)\* 8:45 **Differential access to causal versus associative relations in semantic memory**  
 Barr, Nathaniel; Fugelsang, Jonathan; Stolz, Jennifer
- (163) 9:00 **Automaticity of Basic-Level Categorization Accounts for Naming Effects in Recognition Memory**  
 Richler, Jennifer J.; Gauthier, Isabel; Palmeri, Thomas J.
- (164) 9:15 **Modeling the episodic basis of feature representation in categorization**  
 Hannah, Samuel; Mewhort, Douglas
- (165) 9:30 **Comparison between family resemblance-based and rule-based categorization by means of neural network modeling and behavioral study**  
 Morissette, Laurence C.

- (166) 9:45 Is the whole more typical than the sum of its parts?**  
Dumesnil, Etienne; Cousineau, Denis

## **XVII Cognitive Processes III (Abstracts 167-171)**

**Room 1014**

- (167) 8:30 Time Flies Sometimes: Estimation Accuracy of 2-6 minute Durations**  
Fergusson, Janel; Graf, Peter
- (168) 8:45 Dynamic neural field model of saccade initiation**  
Trappenberg, Thomas; Marino, Robert; Coe, Brian; Munoz, Douglas
- (169) 9:00 Mental Ability and Rule Extraction without Focused Attention**  
Houlihan, Michael
- (170)\* 9:15 Topological Changes in the Electrophysiological Response to Infrequent Targets Implicate the Locus Coeruleus - Norepinephrine System**  
Warren, Christopher M.; Tanaka, Jim W.; Holroyd, Clay B.
- (171) 9:30 Generalization of the proportion congruency effect across conflict types. How general is it?**  
Funes, Maria Jesús; Montoro-membila, Nuria; Torres, Maryem; Lupiáñez, Juan

## **XVIII Perception II (Abstracts 172-177)**

**Room 1016**

- (172) 8:30 The Time Course of Category Congruence Effects: Determining the Extent to Which Subliminally Presented Stimuli are Processed**  
Perry, Jason R.; Lupker, Stephen J.
- (173) 8:45 Long-term priming for repeated subliminally presented words**  
Breuer, Andreas T.; Masson, Michael E. J.; Bodner, Glen E.
- (174) 9:00 Interference from unimodal and multimodal information in a Stroop-like task**  
Saunders, Carla; Desmarais, Geneviève
- (175)\* 9:15 Does audiovisual interaction depend on context?**  
Sarmiento, Beatriz R.; Milliken, Bruce; Shore, David I.; Lade, Sarah; Sanabria, Daniel
- (176)\* 9:30 Perceptual versus motoric attention: An fMRI investigation of the speed-accuracy tradeoff in decision-making**  
Blagdon, Ryan; Bowen, Chris; Rusak, Benjamin; Ivanoff, Jason
- (177)\* 9:45 Differences in White Matter Connectivity in Bilaterally Deaf Individuals vs. Normally Hearing Controls**  
Chevalier, Therese M.; Newman, Aaron J.

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**10:00 - 10:30 Nutrition Break**

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**Sunday June 13 • 10:30 - 12:00 • Paper Session 5**


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**XIX Symposium: Numerical Cognition: Function, Process, Structure (Abstracts 178-183)**
**Room 1020**
**(178) Semantic Alignment and Number Comparison**

Campbell, Jamie; Sacher, Sean G.

**(179) Effects of Numerical Surface Format on the Size-Congruity Effect: Digits, Number Words, and Pseudohomophones**

Barnum, Geoffrey

**(180) When negative is not so negative: Adults' performance on simple subtraction problems**

Robert, Nicole D.; LeFevre, Jo-Anne

**(181) Wun, tue, thrie: Solution strategies in arithmetic with pseudo-homophones, words, and digits**

LeFevre, Jo-Anne; Robert, Nicole; Barnum, Geoffrey; Pyke, Aryn

**(182) The Roles of Phonological and Visuo-spatial Working Memory Resources in Simple Fraction Strategies**

Faulkenberry, Thomas

**(183) The relations between non-symbolic and symbolic processing in whole numbers and fractions**

Hallett, Darcy

**XX Attention IV (Abstracts 184-189)**
**Room 1009**
**(184) 10:30 Using inhibition of return to illustrate the psychological scientist's challenge to avoid unreality and uncontrol**

Klein, Raymond M.; Hilchey, Matthew D.

**(185) 10:45 Adaptive Qualities of Inhibition of Return**

Snyder, Janice J.; Schmidt, William C.; Chatterjee, Anjan

**(186) 11:00 Are there Anisotropies in Covert and Overt Visual Orienting?**

Harris, Jonathan

**(187) 11:15 Looking for Habituation in an Attentional Paradigm**

Dukewich, Kristie R.; Enns, James T.

**(188)\* 11:30 What's Your Next Move? Directional Biases for Sequential Limb and Eye Movements**

Cowper-Smith, Chris; Eskes, Gail; Westwood, David

**(189) 11:45 Why are return saccades slow?**

Wang, Zhiguo; Satel, Jason; Trappenberg, Thomas P.; Klein, Raymond M.

**XXI Language and Literacy II (Abstracts 190-195)**
**Room 1011**
**(190) 10:30 Reading Aloud: Is Interactive Activation Necessary?**

Robidoux, Serj; Besner, Derek

**(191) 10:45 Basic Processes in Reading Aloud: Where Computational Models Fail, and How to Fix Them**

Besner, Derek; O'Malley, Shannon; Robidoux, Serje

**(192)\* 11:00 Chimaera Neural Networks for Self-Organizing Grammar Acquisition**

Jansen, Peter A.; Watter, Scott; Humphreys, Karin R.

**(193) 11:15 Flipping the Cost/Benefit Coin: Reconsidering of "Automatic" Phonological Recoding When Reading Aloud**

Robidoux, Serje; Besner, Derek

**(194) 11:30 Context Dependent Lexical Processing: Evidence from the Task Choice Paradigm**

O'Malley, Shannon; Derek, Besner

**(195) 11:45 Testing the specificity of the attentional beam in reading with the missing-color effect**

Saint-Aubin, Jean; Klein, Raymond M.; Deacon, Helene; Thompson, Celina

**XXII Cognitive Processes IV (Abstracts 196-200)****Room 1014****(196) 10:30 Visual concealment: What factors do people use to choose hiding places?**

Malcolmson, Kelly A.; van der Werf, Dan; Smilek, Daniel

**(197) 10:45 Sex differences in wayfinding: evidence from a real world environment**

Corbin, Ilona; St. John, Robert

**(198) 11:00 The contribution of a head-based reference system for updating spatial relations**

Teeter, Christopher; Latif, Nida; Sun, Hongjin

**(199) 11:15 Observer Locomotion Facilitates Scene Recognition Across a Wide Range of Viewpoint Shifts**

Wade, Mark A.; Sun, Hongjin; Teeter, Christopher

**(200) 11:30 Does Object Manipulability really matter in Object Recognition: The role of both Grasping and Functional Knowledge of Object Use in Visual Recognition**

Salmon, Joshua Paul; McMullen, Patricia A.; Tougas, Michelle

**XXIII Animal Neuroscience (Abstracts 201-205)****Room 1016****(201) 10:30 Two versions of the win-stay task identified by lesions and outcome devaluation**

Nahas, Elia; White, Norman M.

**(202) 10:45 The Effects of Maternal Care on Offspring Fitness in the Zebra Finch (*Taeniopygia guttata*)**

Phelan, Heather L.; Phillmore, Leslie S.

**(203) 11:00 Analysing mouse behavior in a social setting in IntelliCages**

Mohammed, Abdul Kadir; Codita, Alina; Winblad, Bengt; Lipp, Hans-Peter

**(204) 11:15 Seasonal variation in gene expression in response to playback of vocalizations by black-capped chickadees (*Parus atricapillus*)**

Roach, Sean; Veysey, Andrew; Cormier, Jacquelyn; Phillmore, Leslie S.

**(205) 11:30 Neural Correlates of Contextual Fear Conditioning in the Absence of the Hippocampus**

Sparks, Daniel William; Lehmann, Hugo

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**12:00 - 2:00 Lunch (on your own)**


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**Sunday June 13 • 2:00 - 3:00 • Business Meeting • Room 1028**

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**3:00 - 3:30 Nutrition Break**

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**Sunday June 13 • 3:30 - 5:00 • Hebb Lecture**

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**“When Learning Met Memory”****Room 1028 (Potter Aud.)**

Given by the 2010 Hebb Award Winner

**Colin MacLeod, University of Waterloo**

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**Sunday June 13 • 5:00 - 7:00 • Poster Session 2  
(Abstracts 206-286) • University Club**

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- (206) **'Volitional' and 'Reflexive' Orienting: On Psychometric Properties and Individual Differences**  
Waechter, Stephanie; Risko, Evan F.; Stolz, Jennifer A.
- (207) **Adapting to simulated blindness**  
Mahon, Andrew; Taylor, Jessica; Brown, Liana
- (208) **Are static and dynamic facial expressions processed by separate neural networks?**  
Ouellette, Nicole; Hamon-Hill, Cindy; Barresi, John.
- (209) **Are People's Attitudes About Risk Really So Inconsistent? Not If You Ask Them**  
Tombu, Mike; Duncan, Matthew; Mandel, David
- (210) **Are there memory biases in alcohol consumption?**  
Flesch, Corie Ann; Roy-Charland, Annie; Homeniuk, Andrew
- (211) **Assessing the effect of familiarity on change blindness for two classes of stimuli**  
Tovey, Mark
- (212) **Attentional load does not modulate the early visual-evoked gamma oscillation**  
Ghorashi, Shahab; McCarley, Robert; Spencer, Kevin
- (213) **Attentional Set and Hemispheric Priming in a Dichotic Word/Emotion Task**  
Techentin, Cheryl; Voyer, Daniel
- (214) **Auditory perceptual organization by location modulates serial short-term memory**  
Chamberland, Cindy; Tremblay, Sebastien; Hughes, Robert W.; Macken, Bill J.; Jones, Dylan M.



- (215) **Automatic versus controlled temporal preparation**  
Capizzi, Mariagrazia; Correa, Ángel; Sanabria, Daniel
- (216) **If I keep on winning I am going to go broke: Physiological Responses to Slot Machine Outcomes**  
Sandhu, Rajwant
- (217) **Bilingualism and language-specific attention control**  
Duncan, Hilary D.; Karpowicz, Lila; Segalowitz, Norman; Phillips, Natalie A.
- (218) **Challenging the reliability and validity of cognitive measures: the case of the numerical distance effect**  
Maloney, Erin Anne; Risko, Evan F.; Preston, Frank; Ansari, Daniel; Fugelsang, Jonathan A.
- (219) **Change Blindness Across Glances**  
Theus, Alex; Brown, Matt; Herdman, Chris
- (220) **Change Detection and Confidence**  
Fitzgerald, Ryan; Oriet, Chris; Price, Heather
- (221) **Coda-deletion strategies in young children**  
Penney, Catherine G.
- (222) **Correlates of Psychophysiological and Experiential Measures of Emotion**  
Birt, Angie
- (223) **Developing the reverse association in children's multiplication and factoring**  
Robinson, Katherine M.; Campbell, Jamie I.D.
- (224) **Development of a paradigm for testing olfactory reversal learning in mice**  
Wright, Lisa Dawn; Schellinck, Heather
- (225) **Direction, but not distance, cues support memory retrieval in texture discrimination**  
Wright, Sandra; Slade, Loni; Skinner, Darlene; Martin, Gerard
- (226) **Direction, but Not Visual Cue, Changes Support Response Reversal Learning**  
Tomlin, Julian R.; Wright, Sandra L.; Skinner, Darlene M.; Martin, Gerard M.
- (227) **Do intervening distractors matter in the attentional blink? A test of two theories**  
Lagroix, Hayley E. P.
- (228) **Effects of Learning Latin on English Spelling**  
Crawford, Nathanael Andrew; Beall, Michael; Deacon, Helene
- (229) **Effects of Spatial Separation on the Integration of Conflicting Multisensory Information**  
Rasmussen, Sean A.; Desmarais, Geneviève
- (230) **Effects of task specificity on error related brain activity: An electrophysiological study**  
Cohen, Jessica E.; Shedden, Judith M.
- (231) **Emotion enhances temporal resolution and augments the effect of covert spatial attention on temporal resolution**  
Nicol, Jeffrey R.; MacIsaac, Amy E.; Murphy, Dana R.
- (232) **Endocannabinoid Signaling in the Rodent Anterior Cingulate Cortex Mediate the Neuroendocrine Response to Acute Stress**  
McLaughlin, Ryan; Hill, Matthew; Lee, Tiffany; Gorzalka, Boris
- (233) **Examining the Time-Course of Implicit Learning of Tip-of-Tongue States**  
D'Angelo, Maria C.; Humphreys, Karin R.
- (234) **Goal priming and resource harvesting decisions**  
Arbuthnott, Katherine Diane; Lawrie, Tricia; Shearer, Rana
- (235) **Graduate School Admission Requirements and Their Presentation on Schools' Websites**  
Uttl, Bob; McDouall, Joanna; Stevens, Brittney

- (236) **Hemispheric asymmetries in the visual perception of emotions**  
Brodersen, Etta Marie; Voyer, Daniel
- (237) **Heteronormativity and the Mismatch effect: The Role of Context in the Processing of Schema Incongruent Information**  
Shilhan, Julie; Young, Melissa; Dickinson, Joel
- (238) **Hippocampal-prefrontal cortical circuits subserve inhibitory response control in the rat**  
Liu, Yuchen; Doobay, Victoria Melissa; Chudasama, Yogita
- (239) **How forgetting one thought could lead to another: The control of working memory resources in intentional forgetting**  
Fawcett, Jonathan Matthew; Taylor, Tracy L.
- (240) **Independence of graphomotor programs for print and cursive writing in a case of acquired dysgraphia**  
Ingles, Janet; Fisk, John; Fleetwood, Ian; Darvesh, Sultan
- (241) **Influence of Feature-based Cues on Spatial Resolution**  
Rajic, Jason Daniel; Wilson, Daryl E.
- (242) **Influence of Memory-Relevant and Memory-Irrelevant Features on Attentional Allocation**  
Wilson, Daryl Edward; Cheung, Tracy
- (243) **Is illness-induced anorexia part of an energy conservation and predator avoidance strategy during immune challenge in the field cricket *Gryllus texensis*?**  
Fairn, Evan R.; Adamo, Shelley A.
- (244) **Is it a poem? How handheld devices affect cognitive processing of literary language**  
Riegel, Christian; Robinson, Katherine M.; LeFevre, Jo-Anne; Herdman, Chris M.
- (245) **Is the performance of persons with autism data driven? The case of contingency use and higher order processing**  
Hayward, Dana A.; Burack, Jacob A.; Shore, David I.; Kovshoff, Hanna; Iarocci, Grace; Mottron, Laurent
- (246) **Judging the authenticity of smiles: A study of the perceptual processes and the explicit knowledge that contribute to the appreciation of micro-expressions**  
Bleach, Carolyn; Perron, Mélanie; Roy-Charland, Annie
- (247) **Lesions of Basolateral and Central Amygdala Differentiate Conditioned Cue Preference Learning With and Without Unreinforced Pre-Exposure**  
Naeem, Maliha
- (248) **Levels of processing versus transfer-appropriate processing after two study trials**  
Burnett, A. Nicole; Bodner, Glen E.
- (249) **Local vs. global processing in the search for a change**  
Mullin, Conor; Richards, Eric
- (250) **Manual and saccadic inhibition of return in visual neglect**  
Bourgeois, Alexia; Chica, Ana; Bartolomeo, Paolo
- (251) **Measuring the Components of Attention**  
Butler, Beverly C.; Eskes, Gail A.; Klein, Raymond M.
- (252) **Metamemory for Faces, Names, and Words**  
Watier, Nichola; Collin, Charles
- (253) **Modulation of Inhibition of Return by target duration and reorienting events (Cue-back)**  
Martín-Arévalo, Elisa; Lupiáñez, Juan

- (254) **Novel-View Scene Recognition is Enhanced by Active Compared to Passive Scene Rotation**  
Wade, Mark A.; Sun, Hongjin; Dzebic, Vedran
- (255) **On the move: The role of prediction in maintaining object-based inhibition of return**  
Krueger, Hannah Marie; Kwasnicka, Dominika; Hunt, Amelia
- (256) **Pitch Contour Detection and Embodied Cognition**  
Reimchen, Melissa; Granzow, John Edward; Vokey, John Richard
- (257) **Quantitative and Research Methods Requirements for Undergraduate Major and Honours**  
Uttl, Bob; Mitchell, Christina
- (258) **Rats orientation at the start point is important for place and direction learning in a water T-maze**  
Skinner, Darlene; Peckford, Genieve; Martin, Gerard
- (259) **Re-examining Dissociations of Remembering and Knowing: Orthogonal Judgments vs. Independent Ratings**  
Brown, Aaron A.; Bodner, Glen E.
- (260) **Reading and understanding complex words: Are children aware of the morphological structure of words?**  
Francis, Kathryn; Deacon, Helene
- (261) **Reexamining the Relationship between Diffusion/Focus of Attention and the Attentional Blink**  
Dale, Gillian; Arnell, Karen M.
- (262) **Repetition and distinctiveness in item memory**  
Fazaluddin, Anjum; Singer, Murray; Andrew, Kathy M.
- (263) **Self-control effort as a function of Stroop congruence probability**  
Cote, Leonard; Arbuthnott, Katherine Diane
- (264) **Short-term spatial memory in fetal alcohol spectrum disorder: an fMRI study**  
Hall, Jonathan George; Bolster, Richard Bruce; Malisza, Krisztina L.; Chudley, Albert E.; Longstaffe, Sally; Clancy, Christine; Shiloff, Deborah; Gervai, Patricia
- (265) **Solving Speed-Accuracy Space**  
Lawrence, Michael A.
- (266) **Source and Destination Memory: Active and Passive Engagement**  
Graf, Peter
- (267) **Source Monitoring and Prospective Memory in Younger and Older Adults**  
Hutchings, Veronica
- (268) **Strategies in Single-Digit Addition: How Do You Know "2 + 1 = 3"?**  
Barnum, Geoffrey; Smith-Chant, Brenda
- (269) **Testing the embodied view of object recognition**  
Matheson, Heath; McMullen, Patricia
- (270) **Testing the habituation hypothesis: The effects of stimulus intensity on inhibition of return**  
Dukewich, Kristie R.; Lawrence, Michael A.; Klein, Raymond M.
- (271) **The Attentional Disengagement Model of the Missing-Letter Effect: A Test of the Attentional Beam**  
Lalande, Amanda; Roy-Charland, Annie
- (272) **The effect of attention style on intentionally forgetting among high anxiety sensitive individuals**  
Noel, Melanie; Taylor, Tracy L.; Stewart, Sherry H.; Quinlan, Chelsea K.

- (273) The effect of immune system activation on aggressive behavior in the male cricket *Gryllus texensis***  
Simpson, Alexander G.; Fairn, Evan R.; LeDue, Emily E.; Adamo, Shelley A.
- (274) The effect of ventral hippocampal lesions on discrimination and reversal learning**  
Abela, Andrew Robert; Hill, Carolyn; Chudasama, Yogita
- (275) The Effect of Word Frequency and Regularity on BOLD activation during Go No-Go Naming**  
Cummine, Jacqueline; Esopenko, Carrie; Sarty, Gordon E.; Borowsky, Ron
- (276) The effects of faces, emotion, and context on the mere exposure effect**  
Quinlan, Chelsea; Johnson, Shannon; Filliter, Jillian
- (277) The Effects of Trait Mindfulness on Multiple Components of Attention: Evidence from an Emotional Attention Networks Test**  
Ganaden, Rachel; Smith, Stephen D.
- (278) The Function of Aggression in Orphaned Worker Bumblebees (*Bombus impatiens*): A Tool of Reproductive Suppression?**  
Sibbald, Emily D.; Plowright, C.M.S.
- (279) The Impact of Training on Object Naming and Action Production**  
Dinan, Randal; Desmarais, Geneviève
- (280) The importance of form and action congruence in novel object identification**  
Hudson, Pamela Lynn; Desmarais, Geneviève
- (281) The influence of neighbourhood size on recall performance of short and long nonwords**  
Jalbert, Annie; Neath, Ian; Surprenant, Aimée M.
- (282) The temporal parameters of visual-proprioceptive intermodal perception in adults**  
Collins, Stephanie; Yuill, Kathryn; Moore, Chris
- (283) Using change detection to explore the role of features and context in object recognition**  
LaPointe, Mitchell; Vokey, John R.; Wu, Wen; Tangen, Jason
- (284) Visual Search in Autism: a consistent islet of ability?**  
MacLeod, Jeffrey W.; Bryson, Susan E.; Klein, Raymond M.
- (285) When Does the Cognate Advantage Arise in Masked Translation Priming?**  
Nakayama, Mariko; Hino, Yasushi; Sears, Christopher R.; Lupker, Stephen J.
- (286) Why Teaching Quantitative Courses Is Hazardous to Your Career**  
Uttl, Bob; Smibert, Dylan

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**Poster session ends 7:00 pm**

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**Sunday June 13 • 7:15-10:30 • Banquet**  
**Loyola Conference Hall (Sobey's Building) • Saint Mary's University**

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# Abstracts

Note: \* denotes Papers and Posters under consideration for student competition

## **I Symposium: Psychology and the Instance (Abstracts 1-6)**

### **Instance theory: News from the front**

Organizer: Randall Jamieson

Abstract: The symposium highlights both theoretic and empirical applications of instance theory to problems of attention, knowledge, learning, memory, and performance.

### **(1) The instance and immediate priming**

Leboe, Jason Perry

In studies of immediate priming, participants are presented with a sequence of two events; a prime event followed by a probe event. Immediate priming effects occur when similarities between a prime and probe event either facilitate or impair performance of a probe task. Such effects are often thought to originate from an influence of the prime event on the activation level of abstract mental representations. Alternatively, such effects might originate from memory representations for specific prior processing instances. In this presentation, I will discuss immediate priming results that favour an instance-based approach to immediate priming effects.

### **(2) Context-sensitive knowledge and skilled performance: What skilled typists don't know in general**

Crump, Matthew John

I investigate how knowledge and performance are constrained by context in skilled typing. The experiments demonstrate that expert typing is disrupted when attention is focused on hand information, that knowledge of key locations is poor in the absence of tactile feedback, and that normal typing is strongly mediated by the feel of the keys. I argue that typing knowledge is strongly bound to processing context, and discuss how instance-based cue-driven retrieval processes hold insight for understanding skilled performance.

### **(3) Selective attention and the control of episodic integration**

Milliken, Bruce

Shore, David

Vaquero, Joaquín

There is now abundant evidence that the retrieval of specific processing episodes can play a role in tasks that require people to perform nominally non-remembering tasks. There is also plenty of evidence that attention plays a role in the encoding of specific processing episodes. Yet there are large gaps in our understanding of how attention shapes the contribution of specific processing episodes to performance in non-remembering tasks. This issue will be discussed with reference to two procedures not usually studied together, one a repetition priming procedure and the other a dual-target procedure that produces an attentional blink-like effect.

### **(4) Parallel retrieval and the chorus of instances**

Jamieson, Randy

My talk addresses indirect learning of structure. I report experiments in which participants studied letter-strings constructed according to the rules of a finite state grammar and then completed test strings so that they were consistent with the grammar (Jamieson & Mewhort, 2010, QJEP). I describe an instance-based model of memory. I show the model predicts peoples' decisions in the experiment. I argue that parallel retrieval of studied instances underlies peoples' decisions in the artificial grammar task. Performance in the artificial grammar task can be understood using first principles of human memory.

### **(5) The role of feature instances in concepts**

Hannah, Samuel

In typical discussion of concepts and categories, a concept is defined as a collection of features, where features are usually depicted as some abstract tokens of specific properties. The focus of most theories lies on how these features are collected. What is less disputed is the tacit treatment of features as abstract tokens. In this talk I will review recent work that challenges this

view, and which highlights the importance of representational breadth: People working with concepts use a range of feature representations, including specific feature representations.

**(6) The Mark of the Instance: Autoassociative Neural-Nets as Exemplars of Storage and Retrieval in Instance Theory.**

Vokey, John Richard  
Tangen, Jason Marcus

Autoassociative (PCA) artificial neural networks trained on vectors of sub-symbolic features are explored as instantiations of the memory storage and parallel retrieval responsible for item-specific and emergent structural effects in instance theory. Simulations of some classic experiments in instance theory are reported, culminating in a discussion of what should count as the markings of an instance theory (e.g., how do we know from the relationship between inputs and outputs that the source of the effects is memory for instances?).

**II Attention I (Abstracts 7-12)**

**(7) Item-specific memory in visual search: Evidence from eye-tracking**

Solman, Grayden J.F.  
Smilek, Daniel

A growing body of research has recently examined the influence of trial-to-trial repetition in visual search. Contrary to intuitive expectations, the prevailing conclusion from this work is that memory for previous target locations has little impact on the efficiency of visual search. We present eye-tracking data that contradicts this conclusion, demonstrating significant improvements in visual search performance driven by guidance to specific item locations. Further, we show that these improvements can be observed even for imperfect display repetitions. These findings can be reconciled with prior reports if search within a single fixation and search requiring eye movements are treated independently.

**(8) Take a break! Fatigue selectively influences eye movements during visual search**

Lanthier, Sophie Nicole  
Risko, Evan Frank  
Smilek, Daniel  
Kingstone, Alan

Over the course of a visual search task, performance improves, fixation number decreases, and fixation duration increases. Do these changes reflect a change in a single process or changes in different separable processes? Across two experiments we demonstrate that (a) changes in fixation duration over time fail to predict better search or changes in fixation number and (b) fixation duration reflects fatigue and is separable from fixation number.

**(9) Gaze in the natural environment: does research into visual attention scale up?**

Foulsham, Tom  
Kingstone, Alan

In 3 experiments mimicking realistic situations, we recorded participants' gaze as they: 1) walked around campus; 2) looked for a mailroom to retrieve an envelope; and 3) took part in a realistic memory/comprehension task (a poster session). While walking, participants selected navigationally and socially important features with head and eye movements--behaviours shown to a lesser degree by participants viewing videos of the same activity in the lab. The realistic search and memory tasks allowed us to investigate aspects of visual search and information gathering untouched by lab approaches. Together, these experiments provide powerful new data for exploring everyday attention.

**(10)\* Type Of Emergency Response Focus Board Visual Display Affects Allocation of Attention and Development of Situation Awareness**

Taber, Michael John  
Klein, Raymond M.  
McCabe, John

Thirty-two participants responded to situation awareness (SA) questions during a simulated offshore helicopter crash while information related to handling the emergency was presented on a Smartboard. Responses were assessed from two

types of display (static versus dynamic) in a between subject design. Results indicate that the dynamic display significantly decreased reaction time, increased response accuracy and improved prediction of future emergency conditions. Results further indicate that reaction time and accuracy were significantly affected by SA measurement technique. Because the dynamic display improves performance and situational awareness, we recommend an integration of this type of display into offshore emergency management systems.

### **(11) Characterizing the nature of attentional orienting elicited by the mental number line**

Ristic, Jelena  
Giesbrecht, Barry

Empirical evidence suggests that number magnitude elicits automatic attentional orienting. However, these orienting effects are slower to emerge than typical automatic attention shifts, suggesting that they are not purely automatic. We used EEG to measure the neural consequences of orienting elicited by number cues and the spatio-temporal dynamics of the underlying control areas. The data revealed that mental number line modulated the visual P1 ERP component, suggesting a shift of attention occurred in response to the cues. However, source analyses revealed that the modulation was dependent on the brain networks implicated in the control of both automatic and voluntary orienting

### **(12) The causal roles of the dorsal and ventral fronto-parietal networks in orienting spatial attention**

Chica, Ana B.  
Bartolomeo, Paolo  
Valero-Cabre, Antoni

A dorsal fronto-parietal network might be involved in attentional orienting (both endogenous and exogenous), while a ventral network is not related to the orienting of attention but is key in re-orienting attention. We tested the causal roles of right IPS (dorsal) and right TPJ (ventral) during endogenous and exogenous orienting using Transcranial Magnetic Stimulation. Both the dorsal and the ventral network play a causal role in orienting attention, although their effects are clearly dissociable. Right TPJ plays a causal role during the orienting of exogenous but not

endogenous attention, while right IPS is involved in both types of orienting.

## **III Memory I (Abstracts 13-18)**

### **(13) Prospective Memory and Aging: Fictions, Facts, and Some Controversies**

Uttl, Bob

The research on prospective memory (ProM) and aging has a controversial past. Craik (1983) predicted that age declines on ProM tasks would be large. In contrast, Einstein and McDaniel (1990) declared that ProM was spared by aging. Most of the current writers assert that the findings are inconsistent. However, a series of meta-analyses reveals that this inconsistency is more apparent than real and can be traced to poor measurement methods, age confounds, and conceptual confusions. Greater focus on measurement and methods is one way out of the "inconsistent findings"; conundrum.

### **(14) Chronic Marijuana Use and Prospective Memory Task Performance**

Cuttler, Carrie  
Relkov, Tonia  
Jubenville, Theresa  
McLaughlin, Ryan  
Graf, Peter

Previous research suggests that marijuana use is associated with impairments in retrospective memory and with subjective (self-reported) problems with prospective memory. This is the first study to examine the relationship between marijuana use and objective prospective memory task performance. Three groups of students with different histories of marijuana use (lifetime abstainers, experimenters, chronic users) completed three objective tests of prospective memory and three subjective measures of prospective memory. The results revealed no differences on the objective tests. The pattern of results on the subjective measures also indicated that chronic marijuana use has few, if any, detrimental effects on prospective memory.

### **(15) Autobiographical Memory and Self-report in Elders**

Humphrey, Diane Elizabeth  
Tomas-Smigura, Michelle

The Memory Observation Questionnaire (MOQ2) and the Autobiographical Memory Interview were

administered to 10 adults 50-90 years of age recruited from retirement homes along with their relatives in London, Ontario. Correlations of the measures were found particularly for Semantic Memory in the Autobiographical Memory Interview and the MOQ2 self-report form (Pearson Correlation = .61). The relationship between different types of memory and memory measures will be discussed.

### **(16) Checking-in on the Memory Deficit and Meta-Memory Deficit Theories of Compulsive Checking**

Cuttler, Carrie

Graf, Peter

The memory deficit and meta-memory deficit theories provide intuitive accounts for obsessive-compulsive checking. They propose that deficits in memory and/or a lack of confidence in memory contribute to the compulsion to check. We reviewed the literature to examine whether, as predicted by the theories, these deficits are unique to individuals with checking compulsions as opposed to being common to all patients with obsessive-compulsive disorder. The results indicate that retrospective memory deficits are not unique to checkers. However preliminary evidence suggests that prospective memory deficits are unique to checkers and therefore may hold the key to better understanding this common compulsion.

### **(17)\* The reading span task: storage vs. processing, or encoding vs. retrieval?**

Deschamps, Tiffany

Service, Elisabet

The reading span task (RST) combines word storage with sentence processing to measure verbal working memory (vWM) capacity. Poor correlations between performance on the two task components led some theorists to posit that vWM consists of separate syntactic and general resource modules (Caplan & Waters, 1996). Our experiments use a RST to show that sentence processing can spontaneously occur within the "storage" task, and word encoding and rehearsal processes interfere with sentence processing. These results present difficulties for modular theories of vWM, and suggest a dissociation between encoding and retrieval processes (Craig, Govoni, Naveh-Benjamin & Anderson, 1996) in RST performance.

### **(18)\* Event-method directed forgetting: A new paradigm for understanding the intentional forgetting of events and actions**

Fawcett, Jonathan Matthew

Taylor, Tracy L.

Nadel, Lynn

Instructions to Remember (R) or Forget (F) were integrated within videos depicting continuous visual events. Participants responded more accurately to true or false statements (E1-3) and cued-recall questions (E4) regarding R segments than F segments – even when encouraged to attend to F segments by virtue of having to perform concurrent discrimination (E2) or conceptual segmentation (E3) tasks. The final experiment (E5) demonstrated a larger R>F difference for specific than general statements, suggesting that participants encoded a general representation of the events they intended to forget. We hypothesize that participants preferentially encoded R segments, selecting specific details for covert rehearsal.

## **IX Cognitive Processes I (Abstracts 19-24)**

### **(19)\* The effect of mathematics anxiety on the representation of symbolic numerical magnitude**

Maloney, Erin Anne

Ansari, Daniel

Fugelsang, Jonathan A.

We investigated the numerical representations of high mathematics anxious (HMA) and low mathematics anxious (LMA) individuals by examining their performance on a variant of the symbolic numerical comparison task. HMA individuals were found to have a larger numerical distance effect than the LMA group, suggesting that the HMA individuals have a less precise mental representation of numerical magnitude than their LMA peers. These data are consistent with the claim proposed by Maloney, Risko, Ansari & Fugelsang (2010) that mathematics anxiety may result in reaction to low-level numerical and mathematical deficits.



**(20)\* Person perception informs understanding of visual cognition**

Brennan, Allison Anne

Watson, Marcus R.

Kingstone, Alan

Enns, James T

Does person perception - the impressions we form from watching others' behavior - hold clues to the mental states of people engaged in cognitive tasks? We investigate this with a two-phase method: participants search (on a computer screen or in a natural setting) and other participants rate their video-recorded behavior. We find ratings are sensitive to stable traits (search ability), temporary states (cognitive strategy), and environment (task difficulty). Different visible behaviors are critical to success across settings: eye movements for computer screen search and head movements for natural setting search. Positive emotions are linked to search success in both settings.

**(21) Getting the right answer: Effects of presentation side on judgments of truth**

Westbury, Chris F.

Experimental evidence suggests that right-handed people tend to view elements on the right side of space as more positively valenced than elements on the left side (Casasanto, 2009). We demonstrate that this finding also applies to truth attribution, by showing that right-handed subjects are more likely and quicker to believe factual statements presented on their right than to believe the same statements presented on their left. We also discuss the effect of manipulating the cue for side of presentation, finding differences depending on whether we used a pointing human, a hand, or an arrow.

**(22) An Examination of Sex Differences in Iowa Gambling Task Performance in Typically Developing Children and Adolescents**

Filliter, Jillian

Gillespie, Jacqueline

Rouette, Julie

Phelan, Heather

Johnson, Shannon

In adult samples, males typically outperform females on the Iowa Gambling Task (IGT). In children and adolescents, sex differences are unclear. We examined sex differences on IGT performance in youths aged 8 to 16 (30 males

versus 27 females). Using repeated measures ANOVA to examine proportion of selections from advantageous decks, we found a main effect of block ( $F(5,275) = 3.466, p = .005$ ), with improvement across the six blocks, but no effect of sex nor a block by sex interaction. Interestingly, females improved steadily across blocks, whereas male performance worsened until the fourth block and then improved.

**(23) Gesture in Space**

Foroud, Afra

Eskes, Gail

Newman, Aaron J

Klein, Raymond

The present work is an examination of the qualitative aspects of gesture production during speech followed by the question of whether the perception of language related gestures cue visual attention. In the first study, movement notation was used to describe the movements speakers make when describing an activity/event versus a temporal sequence of events. For the second study, we created videos of a model producing simple limb movements based on the descriptions of the gestures produced in the first study. These videos were inserted in an attention cueing task. Results from both the descriptive and cueing studies will be discussed.

**(24) The Cognitive Failures Questionnaire: A fuller exploration of dimensions and rotations**

Ishigami, Yoko

Frankland, Bradley W.

The Cognitive Failures Questionnaire (CFQ) is widely used to assess the frequency of everyday slips/errors although its factor structure is unclear. Using data from 3339 undergraduates, the present study compared the principle components structures for 3 through 7 factors, using both orthogonal and non-orthogonal rotations. The best structure for the group as a whole was a 4-factor solution with non-orthogonal rotation: General attention, Interpersonal relations, Distractibility, and Interpersonal communication. There were minor sex differences in factor structure. A subset of 484 students completed the CFQ more than once, and demonstrated good test-retest reliability at 1 year.

## **V Animal Behaviour (Abstracts 25-28)**

### **(25) Choice Performance in Environments with a Distinctive Shape**

Horne, Murray R.

Pearce, John M.

According to Miller and Shettleworth (2007), animals compute a ratio of the relative associative strengths of the correct to incorrect locations when making a choice in an environment. The aim of the study was to assess this rule by comparing the predictions derived from their model with empirical behavioural data. Rats were trained to find a submerged platform in a rectangular swimming pool with various combinations of featural cues located in the correct and incorrect corners. Subsequently, rats were given novel test configurations to test the ratio rule. As the results contradicted this rule, an alternative is proposed.

### **(26)\* Landmarks, Skylines, Compasses and Contexts: Visual Information Learning and Integration in the Central Australian Desert Ant: *Melophorous bagoti***

Legge, Eric L.G.

Spetch, Marcia L.

Cheng, Ken

We conducted three experiments in the Central Australian desert on a solitary foraging ant: *Melophorus bagoti*. In the first two experiments, we investigated foragers' ability to use visual landmarks to exit a circular arena which provided an undifferentiated panorama. Surprisingly, foragers did not use our artificial landmarks as beacons, but instead they learned a context specific local vector. In a third experiment we tested how foragers respond to multiple sources of conflicting information. Results from this experiment indicate that the ants integrate sources of conflicting information using a type of weighted average. In all three experiments, ants were trained in situ.

### **(27) Lateralization of Geometric and Featural Information by the Clark's Nutcracker**

Kelly, Debbie M.

During visual orientation, birds encode both geometric and featural cues. Previous research with chicks has shown that the left brain hemisphere predominately encodes landmark

information, whereas the right relies on geometric information. We investigated the lateralization of geometric and featural cue encoding by Clark's nutcrackers engaged in a spatial search task. Two groups of nutcrackers were studied. The first group learned a spatial location with both featural and geometric information available and subsequently received tests in which the distinctive features were removed or translated from the original training location. A second group of nutcrackers learned a spatial location with only geometric information available and subsequently received tests in which the geometric information was expanded. All nutcrackers were trained under binocular viewing conditions. Testing was conducted with binocular and monocular (i.e., left-eye or right-eye occlusion) viewing conditions. We will compare our results to recent studies examining spatial lateralization with other avian species.

### **(28) Pattern Perception in Rats During Foraging**

Cole, Mark

Musolino, Evanya

Rats searched for food that was located atop 8 of 16 towers arranged in a 4 X 4 matrix. In successive phases, the same eight towers were always baited, either in a checkerboard pattern (4 rats) or in a randomly-selected pattern (4 rats). Baited and non-baited towers were switched on Trials 41, 61, 71, and 81. Performance declined significantly from Trials 40-41, 60-61, 70-71, and 80-81, combined, for the rats assigned to the random patterns but not for those assigned to the checkerboard patterns. It was concluded that the checkerboard rats had learned more than the mere locations of food.

### **President's Symposium: Systems Dynamics and the Organization of Long-Term Memory (Abstracts 29-32)**

Organizer: Rob Sutherland

Abstract: Recent work on the neurobiology of memory supports the view that even long after a learning episode memories undergo dynamic transformations. Many of these recently discovered phenomena stand in contrast to the traditional notion of systems consolidation, in which the hippocampus is temporarily necessary for supporting memory retrieval until the completion of a time-dependent process of permanent storage

in neocortical sites. The dynamic changes involve reorganization of which neural networks are engaged in storage and retrieval processes and possibly in the nature of the information that is represented. Recent work shows that retrieval of long-term memories may normally trigger a period of reorganization of the memory trace, even at the systems level.

### **(29) Retrograde amnesia and the organization of long-term memory**

Sutherland, Robert J.

We evaluate the hypothesis that hippocampal retrograde amnesia normally exhibits a temporal gradient, affecting recent, but sparing remote memories, using experimental evidence from rats. Surprisingly, the evidence does not provide much support for the idea that there is a lengthy process of systems consolidation following a learning episode. Instead, recent and remote memories tend to be equally affected. With extensive hippocampal damage gradients are flat or, in the case of memory tasks with flavour/odour cues, the retrograde amnesia covers a period of less than 100 hr. There is consistent evidence that during learning the hippocampus interferes with memory acquisition by other systems. This contributes to the breadth and severity of retrograde amnesia relative to anterograde amnesia. Multiple, distributed learning episodes can overcome this interference supporting a parallel dual-store theory or a Distributed Reinstatement Theory in which each learning episode adds directly to associative strength in other systems by triggering a short period of memory replay.

### **(30) The network organization of recent and remote memory**

Frankland, Paul W.

While the hippocampus may play an essential role in the expression of memories soon after encoding, memory expression may become independent of the hippocampus at later time points. One view is that the transition of the memory from a hippocampus-dependent to -independent form reflects a time-dependent process of reorganization, leading to the permanent storage of the memory in cortical networks. Our lab uses molecular and behavioral approaches to understand this consolidation process, and, in my talk, I will highlight two new studies aimed at 1) identifying the broad network

of cortical regions supporting remote contextual fear memories, and 2) understanding the role of myocyte enhancer factor 2 in this process.

### **(31) Hippocampus and Memory: Consolidation or Transformation**

Winocur, Gordon

Standard consolidation theory asserts that the hippocampus is critical to the storage of memories, until they are transferred to extra-hippocampal structures. I present evidence, from animal and human studies, that the pattern of amnesia associated with hippocampal damage is related to the type of memory tested, rather than the age of the memory. This evidence points to an alternative view which maintains that a memory, in its original form is detailed and context-dependent, and always represented in the hippocampus. With time it becomes transformed and represented in neocortex in a generic form that captures the gist of the original memory, while shedding much of the context. The former type of memory is always sensitive to hippocampal damage, but the latter is not.

### **(32) A bridge over troubled water: Reconsolidation as a link between cognitive and neuroscientific memory research traditions 10:30 – 12:00 Rowe Building Room 1028**

Nader, Karim

The standard view of system consolidation posits that the hippocampus (HC) plays a time-limited role in memory processes, after which the memory can be supported by cortical structures. The anterior cingulate cortex (ACC) has been identified as a key structure in the expression of such remote, HC-independent, contextual fear memory. Here, we show that following reactivation, 30 days old remote contextual fear memory can temporarily be supported by either the ACC or dorsal HC, before once again requiring the ACC. Similar effects were found with 45 day old memories. Furthermore, we show that both recent and remote contextual fear memories undergo cellular reconsolidation in the ACC, even though at the early time point the ACC was not necessary for retrieval of the memory. Together these data suggest that although the ACC is preferentially required for retrieving older memories, the structure is always involved in processing the memory following retrieval, and

once retrieved the memory is also processed by the dorsal HC.

## **VI Symposium: Addiction: Affective, Cognitive, and Motivational Mechanisms (Abstracts 33-36)**

Organizers: Sherry Stewart and Sean Barrett

**Abstract:** This symposium will highlight recent human psychopharmacology research from across Canada. Individual talks will focus on topics as diverse as: the cognitive and motivational effects of stress in male problem gamblers and drinkers; parsing positive and negative reinforcement mechanisms for human substance use; the role of state affect in personality risk for problematic drinking; and the effects of alcohol and nicotine, alone and combined, on subjective responses to gambling. The symposium will illustrate the use of such lab-based experimental techniques as stress/mood induction, drug challenge, and substance administration outcomes. Theoretical and practical implications for better understanding addiction will be discussed.

### **(33) Cognitive-motivational effects of stress, cues, and alcohol in male problem drinkers and problem gamblers**

Zack, Martin

Stress, cues and priming can trigger relapse in substance abusers. Their effects in problem gamblers are unclear as are the cognitive processes that mediate them. In study 1, stress increased desire for alcohol in problem gamblers, drinkers, gambler-drinkers and controls but inhibited desire to gamble in problem gamblers and gambler-drinkers. Gambler-drinkers alone subsequently displayed Stroop interference to Alcohol and Gambling words. In study 2, stress increased desire for alcohol in problem drinkers who received alcohol but decreased it in those who received placebo. Stress reliably impaired both Go and Stop responses to Alcohol words on a modified Stop Signal Task.

### **(34) The role of pharmacology vs expectancy on the positive and negative reinforcing effects of nicotine**

Barrett, Sean P.

Many lab based drug-challenge studies fail to distinguish between the pharmacological effects of the substance and placebo effects associated with the belief that one has received the substance. In

this research, the respective roles of pharmacology and expectancy on the positive (e.g. incentive motivation) and negative (e.g. withdrawal relief) reinforcement properties of nicotine were examined in two studies using different modes of administration (cigarettes and inhalers). In each case, positive reinforcement was affected by expectancy but not pharmacology and for tobacco negative reinforcement was affected by pharmacology not expectancy. Implications for the design and interpretation of drug administration studies will be discussed.

### **(35) Role of positive mood in BAS risk for problematic drinking**

O'Connor, Roisin M.

Murray, Jessica

Stewart, Sherry H.

Evidence links the motivation to seek out reward (i.e., strong behavioural approach system, BAS) with problematic drinking. Much is still to be understood about in-the-moment influences on drinking behaviour. Theory suggests that those with an elevated BAS are responsive to positive stimuli. Alcohol's salience as a positive cue may increase when high BAS individuals are in a mood-congruent state. We used a musical mood induction to examine the influence of positive (vs. negative) mood on drinking. An elevated BAS was associated with heavy drinking not only when positive mood was induced, but specifically when positive-high arousal (excited) mood was induced.

### **(36) Effects of Alcohol and Nicotine on Subjective and Physiological Responses to Gambling**

Stewart, Sherry

This study examined unique and combined effects of alcohol and nicotine on three indices of responses to gambling: subjective ratings of "like gambling"; and "excitement"; and heart rate increase. Sixteen regular gamblers completed four experimental conditions: alcohol/nicotine; alcohol/denicotinized cigarettes; placebo beverage/nicotine; and placebo beverage/denicotinized cigarettes. Results showed alcohol/nicotine increased heart rate, a peripheral marker for sensitivity to brain reward. The alcohol/nicotine combination also increased ratings of "like gambling"; and "excitement";. This is the first demonstration that a combination of substances can affect physiological and subjective responses to gambling. Concurrent

drinking and smoking may be an appropriate target for gambling treatment.

## **VII Perception I (Abstracts 36-39)**

### **(37) Discrimination & Identification of Periodic Motion Trajectories**

Wilson, Hugh R.

Or, Charles

Thabet, Michael

Wilkinson, Frances

Although most work on motion perception has involved translation, many visual motion trajectories are periodic. Here we develop a novel experimental paradigm to measure discrimination thresholds for periodic trajectories. We used a temporal 2AFC procedure in which one interval showed a dot moving in a circular path, while the other interval showed the same dot moving in a path with a radius that deviated sinusoidally from a circle. Sinusoidal amplitude thresholds of 1.0-4.0 arc min. improved with increasing frequency and were not due to speed changes. These data provide a background for future studies of motion learning.

### **(38) Pretty n Ugly Patterns: Attribution of Discrepancy**

Graf, Peter

Gao, Jess

Kim, Tracy

The occurrence of an unexpected event may produce a discrepancy reaction, which can be attributed in a flexible manner (e.g., increased familiarity or fame). We asked whether the discrepancy attribution process results in more positive judgements (H1) or in more polarized judgements (H2). We displayed a long series of coloured dots on a 5 by 5 grid, a few of them (5%) for a non-standard duration (300 or 500 ms rather than 400 ms), and we asked participants to rate each pattern on either a prettiness scale or on an ugliness scale. The results favour H1.

### **(39) 2nd order relational face processing of faces of different race and photographic polarity**

Matheson, Heath

Bilisbury, Tanya

McMullen, Patricia

It has been suggested that face processing is served by a number of specialized processes within the human visual system. One such process analyzes

the metric relations between face parts or the '2nd order relations' between features. It is well known that face race and faces with reversed photographic polarity affect face processing in negative ways. We investigated the role of 2nd order relational processing in face processing across these variables using an explicit feature displacement task. Results suggest that race but not polarity affects 2nd order relational processing and implicates another candidate process in deficits associated with polarity reversal.

### **(40)\* A midline azimuthal channel in human spatial hearing**

Dingle, Rachel N.

Neurophysiological and psychophysical evidence has driven the formulation of a hemifield model of mammalian sound localization in which the perceived location of a stimulus is based on the relative activity of two hemifield-tuned azimuthal channels that are broadly responsive to contralateral auditory space and have overlapping medial borders. However, neurophysiological work in mammals has consistently found neurons selective for sound sources at the midline, which may indicate the existence of a third, 'midline', perceptual channel. In three experiments, the existence of three (left, right, midline) perceptual channels for azimuth in man was examined using auditory selective adaptation paradigms.

## **VIII Language and Literacy I (Abstracts 41-44)**

### **(41) Words in the mind: Are there graded effects of semantic similarity on morphological processing in children?**

Deacon, S. Helene

Downing, Jennifer

Gonnerman, Laura M.

Quemart, Pauline

There is abundant evidence that the mental lexicon is organized according to fundamental units of meaning, or morphemes. Traditionally, morphemes have been viewed as discrete units of processing, but there are recent suggestions that morphological representations emerge through statistical learning. We provide the first developmental test of these ideas. We find that, consistent with statistical learning, the degree of semantic relatedness between morphologically complex words determines the degree of priming

demonstrated by children in grades 3 and 5. These findings will be discussed in relation to models of statistical learning and of mental lexicon development.

**(42) Effects of Proficiency on Morphological Priming in Second Language French Learners: an ERP study.**

Nichols, Emily

This study aimed to help understand how age of second language (L2) acquisition affects processing of inflectional morphology using event-related potentials (ERPs). A group of early learners of French as a second language was used in order to investigate this question. A lexical decision morphological priming paradigm was used in which participants viewed videos of native French speakers saying verbs. Embedded in the list of stimuli were inflected real words that preceded their uninflected (infinitive) stems with several items intervening (e.g., the prime *marche* followed several words later by *marcher*). Previous work using this paradigm has shown that priming with inflected forms attenuates N400 amplitude to morphologically related targets for regularly but not irregularly inflected words in native French speakers, suggesting differences in processing of regulars and irregulars. We found that early second language learners showed morphological priming effects for regulars, similar to native speakers. These differences in brain responses between regular and irregular morphological stimuli suggest that early learners of a second language have similar morphological processing to native speakers.

**(44) Effects of acoustic cues and phonetic contexts on Cantonese tone perception and acquisition**

Tong, Shelley Xiuli

Two experiments were designed to examine whether the acoustic cues (F0 and Contour), and phonetic contexts (sharing consonants and vowels) influence Cantonese tone perception and acquisition. Children are the best in identifying the target tone in high level-high rising (same F0, different contours) contrasts, but they are the worst in identifying mid level-low level (different F0, same contour) contrast. Furthermore, children's performances differ significantly in three conditions: same onset/different rime, different onset/same rime, or different onset/different rime

Findings highlighted the importance of the distinctiveness of acoustic cues and the similarity of phonetic contexts in tone perception and acquisition.

**(43) Effects of processing difficulty on word order choice**

Gonnerman, Laura

Recent theories have proposed that processing difficulty affects both individuals' choice of grammatical structures and the distribution of these structures across languages of the world (e.g., Hawkins, 2004). I will report on a series of experiments testing the effects of word order on the processing of sentences with English verb particle constructions (e.g., 'he looked up the interesting word' vs. 'he looked the interesting word up'). The pattern of results indicates that lexical and syntactic factors interact with both working memory and age to influence processing ease. These findings support the notion that word order is influenced by performance factors.

**IX Cognitive Processes II (Cognition, Intelligence and Creativity)  
(Abstracts 45-48)**

**(45) Hebb and Cattell: The genesis of the concepts of fluid and crystallized intelligence**

Brown, Richard E.

Hebb (1942, *Proc. Amer. Phil. Soc.* 85, 275-292) divided intelligence into Intelligence A, the development of direct intellectual power, by neural maturation, and Intelligence B, the establishment of routine modes of response to common problems, or of perceptual and conceptual modifications leading to qualitative modifications of behavior. Cattell (1943, *Psych. Bull.* 40, 153-193) developed the concepts of "crystallized" and "fluid" intelligence. This talk examines the ideas of Hebb and Cattell on intelligence, their correspondence, and how the following sentence came about: "Hebb has independently stated very clearly what constitutes two thirds of the present theory" (Cattell, 1943, page 179).

#### **(46) Computational Evidence that Word Co-occurrence Models Predict Turing Test Humanness Judgments**

MacInnes, Joseph

Laszlo, Sarah

Armstrong, Blair

The Turing test--developed to quantify whether artificial intelligence matches human intelligence--remains an unachieved benchmark. We propose that cognitively-inspired objective functions for evaluating "humanness" may facilitate research in this area. We compared metrics of discourse similarity for both human foils and AIs derived from the Hyperspace Analogue to Language (HAL) and Latent Semantic Analysis (LSA) algorithms in text from a high-profile Turing competition. Results indicated that the similarity metrics derived from these algorithms are reasonably proficient at differentiating between human and artificial intelligences with a singly thresholded discriminant function. Further improvements may be achieved with a bounded discriminant.

#### **(47) Making inspiration explicit: A case for dual process theory in poetic composition.**

Beatty, Erin L.

Ball, Linden J.

Psychological research has neglected poetry writing despite poetic expertise representing a unique area of human creativity, which has the capacity to inform our theoretical understanding of artistic creativity. Dual process theory suggests that reasoning is accomplished by two systems, one that is relatively automatic and gist-based and another that is more deliberate. This theory offers a parallel to expert poets' creative process. We suggest that poets' inspiration originates from automatic processes and creative writing takes the output and explicates it with the more deliberate system. We interviewed five expert poets about their creative process, the findings of which are discussed.

#### **(48) Retrieval fluency predicts reasoning bias: The case of the Wason selection task.**

Thompson, Valerie Anne

Evans, Jonathan

Metacognitive Dual Process Theory assumes that analytic reasoning varies with the strength of a

metacognitive experience associated with the output of automatic, heuristic processes. This feeling of rightness (FOR) is determined by the fluency with which the heuristic response was generated. Fifty-two participants solved Wason's selection task by identifying cases relevant to testing a conditional rule (if p, then q). Participants fluently (but erroneously) selected cases that were mentioned in the rule with higher FOR and less evidence of analytic engagement than their unmentioned counterparts. We conclude reasoning biases occur when fluently generated heuristic responses give rise to strong FORs.

#### **X Symposium: The Unification of Psychological Science: Exploring and Expanding Boundaries (Abstracts 49-54)**

Organizers: Jonathan Fawcett and Heath Matheson

Abstract: One of the major challenges facing contemporary research in Psychology is the development of a general and overreaching theory of brain and behaviour. One of the primary obstacles thwarting this goal is the increase in specialization within Psychology and the Neurosciences, as well as a decrease in communication between subfields. In this symposium, participants will attempt to bridge the gaps between disparate research areas. Topics will include (a) a historical perspective regarding the fragmentation of psychology, (b) perception/memory, (c) laboratory/applied research, and, (d) clinical/experimental psychology.

#### **(49) Psychology in fragments: A graduate student perspective**

Matheson, Heath

Fawcett, Jonathan

One of the major challenges facing contemporary research in Psychology is the development of a general and overreaching theory of brain and behaviour. Though some attempts have been made to develop such theories, research in psychology remains largely fragmented and desultory. One of the major obstacles contemporary researchers face is the ever increasing specialization within Psychology and Neuroscience and the decrease in communication between subfields. In this talk we plan to address this challenge by presenting research that bridges the gaps by using broad theoretical perspectives and diverse methods for investigating psychological issues at different levels.

**(50) Psychology: What Went Wrong**

Nadel, Lynn

Once upon a time there was a scientific field known as Psychology, the study of mind and behavior. There was general agreement as to what counted as part of the field and what didn't, there were only a handful of journals to read, and any theorist worth his or her salt aimed to explain IT ALL. Books regularly published chapters about "systems of psychology" that fit this description. Then, just like that, it all fell apart - the field suddenly felt fragmented and grand theories of everything became impossible. In my brief talk I will try to explain what happened and why.

**(51) Impaired Influence of Familiar Configuration on Scene Segmentation in Medial Temporal Lobe Amnesia**

Peterson, Mary A.

Barese, Morgan D.

Scene segmentation was long considered an early perceptual process immune to memory influences. Contrary this view, memory for familiar objects affects scene segmentation, but only when familiar objects are present in their upright orientation with their parts configured appropriately. The medial temporal lobe (MTL) was long considered a declarative memory structure that played no role in perception. We report that two amnesic patients with MTL lesions failed to show normal effects of familiar configurations on scene segmentation. Our results are consistent with the view that the perirhinal cortex of the MTL is involved in object perception and scene segmentation.

**(52) Rethinking psychotherapy from a cognitive neuroscience perspective**

Ryan, Lee

Since Freud clinicians have known that traumatic memories contribute to psychopathology, yet controversy remains about what is essential to bring about therapeutic change. While recollection of past events is a common element in psychotherapy, there is a lack of consensus on the role of recollection in therapy. Recent research on memory reconsolidation provides a mechanism for understanding the psychotherapy experience. I will argue that the essential ingredients of change include 1) activating old memories, 2) concurrently providing new emotional experiences that can be incorporated into newly reconsolidated memories, and 3) reinforcing the strength of the new

memories by practicing a new way of behaving and experiencing the world in a variety of contexts. The implications of this new neurobiologically-grounded synthesis for clinical practice and research will be discussed.

**(53) Clinical Neuroscience as an Emerging Discipline**

Newman, Aaron

Johnson, Shannon

We are now able to visualize the activity of the human brain with a high degree of spatial and temporal resolution, and ask questions such as how brain organization may be changed by experience, including injury and disease processes, as well as associated interventions. However, basic science holds the promise of many more applications that could improve the diagnosis and treatment of many diseases. Taking a neo-Hebbian approach, we will discuss the direct role that neuroscience can have on our understanding of psychological disorders and, in turn, treatment decisions. We also argue that a better understanding of clinical disorders is essential for guiding the research of experimental psychologists and neuroscientists.

**(54) A new look at an old assumption**

Kingstone, Alan

Risko, Evan

Whether we measure human performance in a controlled lab setting or in an uncontrolled natural setting, a critical assumption is that our act of measurement is not changing the underlying cognitive process that we seek to understand. The present talk shows that this assumption is dubious. In 4 experiments, looking behavior was recorded covertly. Participants either wore an eyetracker or not. Results revealed profound differences in the looking behaviour of individuals who thought that their eyes were being recorded. These data indicate that eye trackers can act as an implied social presence thus leading to biases in looking behavior.

**XI Attention II (Abstracts 55-59)****(55) Context-specific learning of episodic integration in repetition effects**

D'Angelo, Maria C.

Milliken, Bruce

Repetition effects can be thought to depend on the efficiency of episodic integration processes that combine prior experiences with current



perception and action. We hypothesize that these integration processes are subject to learning, and predict that shifts in repetition effects can be measured in some contexts but not in others. Results indicate that context-specific priming effects for two different probes in a rapid-word naming task can occur. Additional results show that in some contexts, performance can initially show repetition costs, but with practice repetition priming can be observed. These results support the notion that context-sensitive episodic integration processes can influence repetition effects.

**(56) The Role of Feature Integration and Perceptual Grouping in Explicit Learning**  
Fiacconi, Christopher Mark

We investigate how episodic integration processes impact both performance and ability to verbalize contingencies in a spatial priming task. Participants reported the location of a target letter following presentation of a passively perceived prime display. On a high proportion of trials, the target appeared in the same location as a letter in the preceding prime. Participants' performance and their ability to verbalize this contingency were affected profoundly by both local and global correspondence between prime and target displays.

**(57) Multifocal exogenous and endogenous attention in visuo-spatial working memory**

Botta, Fabiano  
Lupiañez, Juan

In this study, by combining a cuing paradigm (with two cued locations) with a visuo-spatial working memory task, we investigated whether and how the attentional bias on information storage into VSWM is affected by cue-to-probe distance, by the two attentional foci distance, and by the presence of any meridian between the cued and the probed positions, and between the two attentional foci. Results clearly showed that meridians affected the spatial distribution as well as the multifocal allocation of attention exclusively in the endogenous cuing condition. Results pointed to different mechanisms underlying exogenous and endogenous attentional modulation on storage into VSWM.

**(58) Pop-Out search is affected by higher level task demands: Evidence for the role of episodes**

Thomson, Dave R.

Malkjovic and Nakayama (1994) demonstrated that response times decrease in a pop-out search task when target-defining features repeat from trial n-1 to trial n. These priming of pop-out (PoP) effects have been argued to reflect changes in low-level attentional control settings (Lee, Mozer & Vecera, 2009). If low-level control settings are responsible for PoP, then a shift in higher order task demands from one trial to the next should not affect PoP. Our results show that PoP effects for color and shape-defined targets can be modulated when the task requirements alter predictably from one trial to the next.

**(59)\* The influence of attention on the probability and fidelity of memory**

Lawrence, Michael A.

Typical studies of memory employ discrete stimuli that permit quantification of the probability memory, but not the fidelity of memory. Continuous stimuli, combined with mixture modelling, permit quantification of both the probability and fidelity of memory. Applying these tools to the study of how spatial attention affects memory, it is found that while endogenous spatial attention affects both the probability and fidelity of memory, exogenous spatial attention affects only the probability of memory. These results should serve to constrain models of attention, memory, and their interplay.

**XII Memory II (Abstracts 60-64)**

**(60) I said, you said: The production effect gets personal**

MacLeod, Colin M.

Saying a word aloud makes it more memorable than simply reading it silently. This benefit--the production effect--has been attributed to enhanced distinctiveness for the produced items (MacLeod et al., 2010). In two experiments, the production effect was shown to be reliable when production was done by someone other than the rememberer (i.e., by the experimenter or by another participant), but substantially smaller than the benefit from self-production. Intriguingly, when production was done by both the rememberer and

another person, this reduced the benefit of self-initiated production. Distinctiveness--and hence the production effect--is greatest when it is personal.

**(61) Physiological arousal, gaze direction, and face recognition**

Goodman, Laura

Phelan, Heather

Rouette, Julie

Kerr, Michelle

Johnson, Shannon

Relationships between physiological arousal, facial recognition, and eye gaze were examined in a sample of forty-nine adults. Participants were tested on face discrimination and recognition tasks and skin conductance responsivity (SCR) was measured. Surprisingly, there was no difference between SCR for direct gaze and averted gaze faces. However, participants recognized more male faces with direct gaze compared to averted gaze. Male participants showed a significant and unexpected relationship between increased physiological arousal and poorer facial recognition. Results suggest complex relationships between arousal and face processing that interact with the sex of the stimulus and viewer.

**(62)\* Other-race face description and recognition response bias**

Lawrie, Tricia

Arbuthnott, Katherine D.

Many researchers have observed that people are more accurate at own- than other-race face recognition (Meissner & Brigham, 2001). However, people also adopt a more conservative response criterion (more correct rejections and miss errors) for own-race face recognition (Sporer, 2001), which has received less attention. In this research, participants studied own-and other-race faces and either described one of the studied faces or performed an unrelated task. Description resulted in more conservative response bias for the other-race face recognition than controls. The results suggest that describing an other-race face elicits a response bias more similar to that for own-race faces.

**(63) Response bias as a stable cognitive trait in recognition memory and beyond**

Kantner, Justin

Lindsay, D. Stephen

Response bias in recognition memory is typically assessed at the group level, but substantial individual differences in bias can often underlie group means. From a signal detection theory perspective, these individual differences suggest that some people require more evidence of "oldness" than others before they will endorse a test probe as old. We investigated the within-person stability of bias over time and whether the direction and magnitude of one's bias predicts performance in other tasks in which an evidence criterion might guide judgments. Results characterize response bias as consistent within an individual and potentially relevant to cognitive processes beyond recognition.

**(64) The role of faces and emotion in item-method directed forgetting**

Quinlan, Chelsea

Taylor, Tracy

Since negative stimuli tend to increase item memorability, our study used the item-method directed forgetting paradigm to determine whether faces expressing negative emotion were more difficult to intentionally forget than faces expressing positive or neutral emotion. During study, angry, happy, or neutral faces were presented one at a time, each followed by an instruction to Remember or Forget. Following the presentation of all faces, participants completed a yes-no recognition test. Although there was a directed forgetting effect for happy and neutral faces, there was no directed forgetting effect for angry faces. These findings suggest that a negative facial expression may make faces particularly difficult to intentionally forget.

### **XIII Music and/or Emotion (Abstracts 65-69)**

#### **(65) Does body expression affect infants' recognition of vocal expressions of emotion? Intermodal perception of emotion during infancy**

Tsang, Christine D.

Goldhar, Talia S.

Longfield, Danielle

For pre-linguistic infants, emotional body cues may be a critically important source of emotional communication with caregivers. However, little research has examined infants' ability to discriminate emotional body language, and whether body language affects infants' perception of emotion in other modalities. In the present study, 6-month-old infants were tested using a head-turn preference procedure. The time infants spent looking at congruent trials (match between body and voice expression) and incongruent trials (mismatch between body and voice emotional expression) was measured. The results show that infants looked significantly longer to congruent trials compared to incongruent trials ( $F=12.26$ ,  $p=0.025$ ). This result suggests that infants' perception of vocal expressions of emotion is influenced by bodily expressions of emotion.

#### **(66) Colour and Emotion Associations in Elders**

Humphrey, Diane Elizabeth

Vandewiel, Tonia

Elderly adults and young adults were asked to make drawings of situations representing the social emotions (Lewis, 2000) of love, pride, guilt, and embarrassment. Drawings by the elderly showed less use of space, fewer objects and fewer colours used. Colour-emotion associations when calculated by using averages of CIE readings of the colours and in a naming task were similar for elderly and younger adults, and were similar to previous findings (Carey, 2008). In general love and embarrassment were depicted in reds and pinks while guilt and pride were associated with yellows and greens.

#### **(67) Different kinds of yuck? Examining the nature and alleviation of disgust**

McEachern, Justine

Skye, Aimee

Simpson, Carter, Anthony, & Overton (2006) argued that core and sociomoral disgust are distinctive because they are associated with different emotional profiles. We investigated whether these subtypes respond differently to interventions to alleviate disgust. Core or sociomoral disgust was induced, and participants then engaged in hand washing, making moral judgments or doing a word search. Pre- and post-emotion ratings suggested the non-cathartic word search was the most effective at alleviating disgust, for both disgust types. Though emotional profiles differed expectedly for core and sociomoral disgust, similar response to interventions might suggest these two types of disgust are not distinct constructs.

#### **(68) Non-native acquisition of lyrics and melody of an unfamiliar song**

McIver, Alexis J.

Lamarche, Anick M-J.

Cohen, Annabel J.

Native Chinese and Canadian university students were presented with a short battery of tests of singing and language abilities. It was proposed that singing performance might reflect non-native articulation difficulties, for example, when retaining information of music and words of a novel song. However cognitive load might also come into play. Preliminary data analysis revealed a significant interaction between cultural background, serial position in a song, and words vs. melody. Melodic memory declined linearly for Chinese and Canadian participants until the last of 5 lines when Canadian decline stopped and Chinese continued; however, for words, separation of trajectory pattern began earlier. The greater cognitive load of foreign words as opposed to unfamiliar music help to account for this pattern.

**(69) Both music and video contribute to the parsing of a short motion picture animation.**

Hamon-Hill, Cindy  
Cohen, Annabel J.  
Klein, Ray

The current study investigated how music modulates the interpretation of animation (Heider & Simmel, 1944) by analyzing the parsing of visual and musical stimuli when processed individually and together. Forty-eight participants (mean age = 21(3.6) years) segmented the animation (92 sec), independent orchestral music (92 sec), and the animation and music combined. Temporal patterns of segmentation for the music and combined conditions were strongly correlated,  $r(93) = .454$ ,  $p < .001$ . However, a significantly stronger correlation was obtained between the segmentation patterns for the animation and combined conditions,  $r(93) = .846$ ,  $p < .001$ . Information from both modalities contributed to the parsing of the film, with greater dominance of the visual information.

**(70) A Holographic Memory Model of Human Strategy Acquisition**

Mouck, Andrew Howes

Artificial intelligence approaches for chess and other games with large problem spaces have traditionally relied on computational strategies that are implausible for human players despite the skillful abilities of humans in playing these games. In my current model, I exploit holographic approaches to human memory modeling (Murdock, 1982; Jones & Mewhort, 2007) in an attempt to more plausibly capture the mechanisms of human performance in playing these games. The result is a strategy acquisition model which is able to learn through experience, both through the success of its own strategies, and through mimicking opponents' strategies that have been more successful.

**(71) Adults conceptual understanding of arithmetic: An eye movement study**

Robinson, Katherine Macleod  
LeFevre, Jo-Anne

Twenty-seven adults solved inversion (e.g.,  $3+24-24$  and  $3 \times 24 \div 24$ ) and standard problems (e.g.,  $3+24-20$  and  $3 \times 24 \div 8$ ) to assess understanding of the inversion concept (that addition and subtraction as well as multiplication and division are pairs of inverse operations) and of the

associativity concept (that addition and subtraction as well as multiplication and division are pairs of operations that can be solved in any order). Reaction time, accuracy, strategy report, and eye movement data showed that participants use conceptually-based shortcuts. Implications of the findings and the use of eye movements in the investigation of mathematical cognition will be discussed.

**(72) Are Pessimists Immune to the Undoing Effect?**

Tanner, Angie  
Furrow, David  
Birt, Angie

According to the undoing hypothesis, the narrowing of attention and thought-action repertoires caused by negative emotion can be "undone" by positive emotion. Physiological data support this hypothesis; however, few studies have investigated whether it applies to cognitive tasks. In this study, scores on a divergent thinking task were compared after experiencing negative, then positive and neutral emotion. The trait pessimism/ optimism was measured as it is related to emotional processing. Results indicated performance decreased from baseline after negative emotion, but pessimists' scores decreased significantly more after positive emotion was induced. Thus, pessimists appear to be immune to the undoing effect.

**(73) An Investigation of the Relative Position Priming Constraint**

Stinchcombe, Eric J.

Three experiments are reported investigating the role of letter order in subset priming (e.g., grdn-GARDEN) using both the standard masked priming technique as well as the sandwich priming technique (Lupker & Davis, 2009) in a lexical decision task. In all three experiments, there was significant, and essentially equivalent, priming from transposed (e.g., gdrn-GARDEN) and non-transposed internal letter primes. The results with transposed letter subset primes contradict Peressotti and Grainger's (1999) claim that the letters in subset primes must be in the same order as in the target word for them to be effective primes (the "relative position priming constraint");

**(74) Are you looking at me? The role of eye gaze in eliciting changes to spatial attention as a reaction to facial expressions.**

Benarroch, Miriam

This study examines modulations in spatial attention as a result of viewing emotional stimuli. Previous studies have discovered that viewing positive or negative facial expressions prior to performing a spatial task can influence a subject's speeded response to the global or local features of the stimuli. In this experiment, facial expressions with direct or averted gaze preceded a hierarchical figure on which subjects were required to make a global or local number identification. Results will be reviewed in terms of global versus local advantage for emotional faces (happy, angry) as compared to neutral faces. The role of eye gaze in communicating emotion and eliciting this effect will be discussed.

**(75)\* Attentional control can be transferred to new members of social categories**

Cañadas, Elena

Rogriguez-Bailón, Rosa

Milliken, Bruce

Lupiáñez, Juan

The role of context on attentional control has been implicated in recent studies of the context-specific proportion congruent effect. In the present study, our goal was to examine whether gender of a face might be used as a contextual cue to control attention. Results showed a context (i.e., gender of face) specific proportion congruency effect, which under some conditions generalized to new group members. These results link attentional processes with the perception of social categories (e.g., gender) and suggest specifically that attentional control can be allocated flexibly as a function of the consistency of an individual with a social category.

**(76) Can You Think of a Reason Why Fred Needs to Buy a Hammer?: The Effects of Strategies Use on Source Monitoring in 4-year-old Children**

McKay, Lee-Ann

Research into the development of source monitoring typically focuses on retrieval processes. In contrast, in our research we explore factors that

might affect source monitoring at encoding. Specifically, we examined the role of strategy use in facilitating binding processes - linking an item with a source. Our previous research has found that, when prompted, elaboration strategies, but not rehearsal strategies, lead to superior source accuracy in 6-year-olds. In the current research we ask two primary questions: whether even younger children (4-year-olds) will produce elaboration, and whether such elaboration facilitates source accuracy.

**(77) Base Rate Neglect: Now You See It, Now You Don't**

Pennycook, Gordon

Thompson, Valerie

Sixty-two participants judged the probability that a hypothetical person belonged to one of two categories (e.g., nurse/doctor) based on a personality description; half of the participants were also provided with the base rate probability of membership. When the personality description and base rate matched, participants integrated them by adjusting their probability estimate toward the base rate. This disconfirms the idea that base rates are only used if a conflict with the personality description is detected (De Neys, 2009). Instead, the presence of conflict caused a failure to integrate; provoking a tendency to choose one source of information or the other.

**(78) Can they see me?: Cues of observation on trustworthy behavior**

Harvey, Evan A.

Shedden, Judith M.

Our ability to judge how trustworthy an individual is has important implications for decision making in social interactions. Concepts such as generosity are influenced by subtle social cues, specifically cues of being observed, in anonymous social interactions. Our goal was to extend these previous findings to non-facial cues of observation by using a web camera. Participants played decision making games with fictitious partners in the presence of a web camera or not. Our results suggest that cues of observation extend beyond facial stimuli. In addition, these cues influence our decisions by altering our behavior to appear more trustworthy.

### **(79) Cognitive Health Screening in General Aviation**

Van Benthem, Kathy

The goal of this research is to relate cognitive health to flight safety and performance in general aviation pilots. Licensed general aviation pilots ranging in age from 21 to 69 years completed a series of flight protocols in a Cessna simulator and a battery of cognitive tests. Preliminary analyses related working memory, and in particular, executive function to simulated flight performance, situation awareness and pilots' ability to handle high-workload situations.

### **(80) Come dance with me (and then we'll build a house)**

Honey, Lynne

Spencer, Jason

Several theories attempt to describe the adaptive nature of music and music-related behaviour, including evolutionary theories that argue music facilitates behavioural synchrony, and may underlie aspects of cooperative behaviour. We tested the hypothesis that synchrony (facilitated by a musical task) leads to greater productivity in a subsequent cooperative task. Participant dyads played either a dancing game or a tennis game (using a video-game system) prior to constructing a model together. Our results demonstrated that although there was no main effect of the game played, skilled 'dancers' were more successful in the building task. No such relationship existed among 'tennis players'.

### **(81) Conditional control of flavour avoidance and flavour aversion by contextual cues**

Brown, Adam R.

Penney, Alexander M.

Skinner, Darlene M.

Martin, Gerard M.

Rats were trained on a conditional discrimination in which access to saccharin in context 1 was followed by an injection of LiCl but access to saccharin in context 2 was followed by an injection of saline. Saccharin consumption and taste reactivity responses were measured in parallel. The contextual cues gained control over fluid consumption, and these changes in fluid consumption were correlated with aversive and appetitive behavioural changes. Moreover, the taste reactivity responses occurred in anticipation of

fluid delivery. These findings suggest that environmental cues can gain control over anticipatory nausea and may prove helpful in the control of nausea in clinical settings.

### **(82) Dance to the music: The effect of free movement on emotional engagement**

McGarry, Lucy

Russo, Frank

Many studies have demonstrated that mimicry of emotional gestures aids in their recognition. In the context of music, mimicry of performance occurs automatically and has been hypothesized to mediate musical understanding (Livingstone, Thompson & Russo, 2009). In the current study, we predicted that emotional engagement with music would be enhanced when participants were asked to move hands freely compared to when participants were asked to sit still or move in a constrained manner. Results supported our predictions: Skin conductance levels polarized after the free movement condition, with high arousal music becoming more arousing and low-arousal music becoming less arousing.

### **(83)\* Detection of changes in driving environments: Effects of task relevance and size**

Mueller, Alexandra

On the road, drivers need to be aware of a variety of different objects, including vehicles, cyclists, signs, bus stops, etc. Drivers may detect changes in some of these more easily than in others. Which visual characteristics influence a driver's ability to detect changes in the driving environment? This study used a change-blindness task to investigate the impact of size and driving task-relevance on drivers' ability to detect changes. Results indicate effects of task relevance and size, and an interaction between them. Findings are discussed in terms of recent theories of attention as they relate to driving safety.

### **(84)\* Discriminability Matters: On Form and Colour Differences in Memory**

Monkman, Helen

Brown, Matthew

Herdman, Chris

Form has been shown to play a dominant role in object recognition (Biederman, 1987). Similarly, research has shown that memory is better for

object form than colour (Brown et al., 2007). The present research examined whether these findings might be due to the relative discriminability of form vs. colour. Experiment 1 developed a set of equally discriminable forms and colours. Using these stimuli, Experiment 2 showed that memory for form and colour was equivalent. The results emphasize the importance of equating inter-dimensional discriminability and challenge prior conclusions concerning the dominant role of form in object recognition and memory research.

### **(85) Does the level of processing of background context help memory?**

Kelly, Harm Kenneth

Fernandes, Myra

Levels of Processing (LoP) manipulations during encoding increase memory for words, pictures, and faces. We examined whether a shallow (indoor/outdoor) or deep (pleasant/unpleasant) LoP of unrelated visual context scenes, paired with target words at encoding, conferred similar memory benefits to later word recognition, and whether instructions to bind context-word pairs (match/no-match decision) further improved word memory, in two Experiments. LoP of context did not reliably improve target word recognition, though instructions to bind context-word pairs produced robust improvements to word memory.

### **(86) EEG Coherence and Executive Functions in Young and Older Adults**

Davies, Stephannie

Johns, Erin K.

Phillips, Natalie A.

The neuronal mechanisms underlying executive functions (EF) in young adults (YA) and older adults (OA) remain unclear. We used electroencephalogram coherence to examine the neural correlates supporting EF in 10 YA and 10 OA while performing executive tasks. A neuropsychological battery revealed several group differences. On experimental measures, OA performed similarly to YA, but with slower reaction times. Coherence between electrode pairs of interest was larger during task performance than control conditions, with no group differences. Correlations between coherence and behavioural performance were also explored. Results support the distributed network theory of EF, but not functional compensatory mechanisms in aging.

### **(87) Electrophysiological Correlates of Eyewitness Identification**

Friesen, Krista B.

Tanaka, James W.

Lindsay, D. Stephen

We used event-related potentials (ERPs) to examine electrophysiological correlates of eyewitness memory, using a live mock-crime. After participants unexpectedly witnessed a theft, they were asked to identify the culprit from a photo line-up while we recorded ERPs. We found that participants who correctly identified the culprit showed a faster, but smaller P300 for the target than did the participants who incorrectly accused a foil. We also found that the real culprit's face elicited both a marginally larger P300 and N250 than did other rejected foils, suggesting some subtle recognition of the culprit, even in the absence of an explicit accusation.

### **(88) Emotional Narratives are Resistant to Directed Forgetting**

Kowal, Carla

Smith, Stephen D.

Di Nella, Michelle S.

The current research utilized a directed-forgetting paradigm to determine if emotional information is more resistant to forgetting than neutral information. Two hundred thirty participants read two short narratives containing both emotional and neutral information. After reading each narrative, participants were asked to remember (R) or forget (F) the narrative; participants were divided into four conditions based on the post-story instructions: R-R, R-F, F-R, and F-F. The results indicated that on measures of explicit but not implicit memory, a directed-forgetting effect occurred for neutral but not for emotional information. These findings suggest that emotional information is resistant to instructions to forget.

### **(89) Evaluating the Word Superiority Effect With Visual Noise**

Anderson, Nicole

Bird, Gordon

The word superiority effect (WSE) demonstrates that observers are more accurate when identifying letters presented in the context of words as opposed to non-words. We evaluated whether or not the WSE reflects a perceptual or cognitive process using a signal-in-noise paradigm, where

identification thresholds for individual letters embedded in words vs. non-words were measured. Identification thresholds were significantly lower for letters presented in words. Moreover, thresholds were also lower for letters in the middle of the word than at the outer letter positions in the word. These findings are consistent with a perceptual account of the WSE.

**(90) Examining the Role of Dissociation and Need for Cognition in the Deese-Roediger-McDermott Paradigm.**

Cann, David R.

Techentin, Cheryl

Two individual difference variables, dissociation and need for cognition, were examined in relation to false memories in the Deese-Roediger-McDermott paradigm (DRM). Participants were presented with DRM word lists to study and their memory was assessed on both recall and recognition tasks. The results indicated that dissociation was positively related to false memories on both recall and recognition tasks. Further, a positive relation was found between dissociation and the phenomenological experience of reliving a false memory as assessed by remember/know judgments on the recognition task. Need for cognition was negatively related to recognition measures of false memory.

**(91)\* Exploring the differential withdrawal of attention from F and R items in directed forgetting.**

Thompson, Kate M.

Hamm, Jeff

Taylor, Tracy L.

In item-method directed forgetting, there is a greater magnitude of IOR after F than R items. The present experiments test the hypothesis that this difference occurs only when the target localization response is made specifically to the location of the previous word. There were four locations at which words and targets could appear. Participants localized the target with either two responses (i.e. general localization) or four responses (specific localization). The F>R IOR difference emerged only when participants made a specific response. These results suggest that the F>R IOR difference represents a reluctance to respond to the source of unreliable information.

**(92)\* Gender differences on a computerized Mental Rotations Test**

Doyle, Randi Alison

Voyer, Daniel

The present study examined how different item types (mirror and structural; occluded and non-occluded) affect gender differences in accuracy and response time on a computerized Mental Rotations Test in a sample of 60 males and 68 females. Although no gender differences were found on response time, occluded and mirror items produced slower responses than non-occluded and structural items, respectively. On accuracy, the male advantage was significantly larger on mirror than on structural items, and somewhat larger on occluded than on non-occluded items. The discussion emphasizes the influence of processing strategies, speed of processing, and test format on the results.

**(93) Horizontal-Vertical length comparison and the perceptual symmetry law in left visual neglect**

Charras, Pom

Lupiáñez, Juan

Bartolomeo, Paolo

Neglect patients usually deviate rightward when bisecting lines. An underestimation of the left portion of the line and/or a right overestimation could explain this effect. We aimed at dissociating their contribution by using a comparison task in which participants compared vertical to horizontal lines. Moreover, as normals underestimate lines symmetrically bisected, this study also aimed at testing whether this symmetry law was preserved in neglect. Our results support the ideas that left unilateral neglect might reflect a deficit in attentional orienting to the left coupled with a disengagement deficit from right-sided stimuli, and that the symmetry law is driven by pre-attentive mechanisms.

**(94) How rapid is rapid averaging?**

Whiting, Brittany

Oriet, Chris

Claims that the average size of a set of circles can be extracted within 50 ms rest on null effects of manipulations of exposure duration of unmasked displays. Using masked displays, marked improvement was observed with increases in display-mask onset asynchrony. Further,



performance at the shortest exposure durations was fully accounted for by assuming that observers reference previously-seen displays rather than computing the average of the current set. The results suggest that computing average size requires at least 100 ms; at shorter durations, observers resort to basing responses on a global representation of the average size of all previously-seen displays.

**(95)\* Improvements in Executive Function: Effects of Age and Lifestyle**  
Gadke, Amanda

Though executive function declines with age, the effect of cognitive aging can be moderated by physical activity. Younger adults performed more quickly on tests of executive function compared to older adults. A linear relationship between physical activity and executive functioning was not found in younger adults, suggesting that this sample was homogenous and highly active, but was found in the older adult sample, with higher activity scores predicting faster response times on executive function tasks. It appears that adding physical activity to one's life benefits executive functioning for older adults, but does not provide such a benefit for University students.

**(96) In situ examination of protease activity in the visual system**

Duffy, Kevin Richard  
Duffy, Michael Sean

Brain proteases are involved in a multitude of cellular processes that are critical for the maintenance of normal neuron function. We have developed a method for the investigation of protease activity in thin brain tissue slices that provides far superior spatial resolution than alternatives. We revealed proteolysis by observing fluorescence signal produced by fragmentation of a casein substrate. The resolution of this technique permits ready examination of protease activity between adjacent neurons in the same tissue section. We have used this method to measure the activity of a calcium-dependent cysteine protease, calpain, within neurons of the lateral geniculate nucleus.

**(97) Intentionally forgetting a video segment is more effortful than remembering it: A probe study**

Fawcett, Jonathan Matthew  
Taylor, Tracy L.  
Nadel, Lynn

Instructions to Remember (R) or Forget (F) were presented following discrete video segments forming a series of continuous visual events; reaction time (RT) was measured in response to a visual detection probe presented 1400 ms following each memory instruction. Participants responded more accurately to true or false statements (E1-2) and cued-recall questions (E3) regarding R segments than F segments. Responses were also slower following F than R instructions. These findings suggest that intentional forgetting is an active cognitive process and that this process may be applied to continuous visual events.

**(98) Interference of action-relevant space with selective visual attention**

Gozli, Davood Ghara  
Brown, Liana E.  
Reynolds, Michael

Is target detection affected by the sheer possibility that a nearby cursor will move? To address this question, we used a variant of the whole-report task. The movement potential of the cursor was manipulated by placing participants' hand on or off the mouse. Targets (uppercase letters followed by mask) appeared near or far from the cursor. We found that report accuracy was reduced for targets appearing near the cursor, but only when the hand was placed on the mouse. Hand-association did not affect far-target report accuracy. This spatially specific decline may be due to the action-relevance of near-cursor space.

**(99) Laterality of Phonological, Orthographic, and Semantic Processing: One or both hemispheres?**

Mathesius, Jeffrey Robert  
Rutherford, Barbara J.

To date, research investigating asymmetry in phonological, orthographic, and semantic processing has focused primarily on implicit processing. We expand the research and investigate explicit processing. Three experiments used a lexical decision task and conscious priming of sound, shape, or meaning of successive strings.

Our findings suggest priming context provokes the hemispheres to use different strategies: The strategy of the left hemisphere is advantaged for phonological and semantic processing of unfamiliar strings, while the strategy of the right hemisphere is advantaged for orthographic processing of familiar and unfamiliar strings as well as semantic processing of familiar strings.

### **(100) Morphological Processes in Elementary School Children**

Bourassa, Derrick Charles

Beaupre, Jennilee

MacGregor, Krista

An important aspect of spelling development involves the child's ability to use morphological context to deal with one-to-many sound-spelling mappings for word endings. One case involves /z/ endings that follow long vowels; an "s"; spelling is required in the case of inflected noun and verb contexts, but an "se"; or "ze"; spelling is required in the case of noninflected noun and verb contexts. We examined the ability of good and poor spellers in Grade 4 to capture these morphological distinctions in a pseudoword spelling task. Overall, the good spellers outperformed the poor spellers, and both groups were more sensitive to the inflected-noninflected noun distinction than the inflected-noninflected verb distinction. Poor spellers did not exhibit reliable sensitivity to the inflected-noninflected verb distinction. The theoretical and practical implications of these findings are discussed.

### **(101)\* Motor priming and the Chameleon effect: Evidence for a common mechanism**

Hogeveen, Jeremy P.

Social psychologists and cognitive neuroscientists have argued that motor resonance mechanisms underlie automatic imitation. Previous work showed that priming interdependent self-construal (ISC) enhanced behavioural mimicry. Here, we asked whether priming ISC increases the degree of motor priming in an action observation task. Results showed that when an observed movement was incongruent with a cued response, RT was slowed and EMG activity was modulated in the direction of the incongruence. Critically, this effect was significantly greater when the cues themselves were ISC prime words. Such identical ISC priming

effects on behavioural mimicry and motor priming are suggestive of a common mechanism.

### **(102)\* Neurovascular architecture following monocular deprivation in monkey primary visual cortex**

Wilson, Edward N.

Duffy, Kevin R.

Monocular deprivation can dramatically alter the structure and function of neurons within the mammalian primary visual pathway. Neurons composing deprived-eye ocular dominance columns exhibit a reduction in metabolic capacity, and brain imaging data have shown lowered blood oxygen consumption within deprived regions. These findings led us to examine the possibility of a compensatory response to the vascularity of deprived cortical regions. We assessed blood vessel characteristics within sections of monkey primary visual cortex after a period of monocular deprivation in order to examine the possibility that changes in blood flow originate from alterations to the vascular architecture in deprived regions.

### **(103)\* Noise complicates everything: biological motion, attention and dual task performance.**

Roddy, Gabrielle

Saunders, Daniel

Troje, Nikolaus

Gurnsey, Rick

Thornton et al. (2002, Perception) showed that detection of point-light walkers (biological motion) embedded in noise is impaired in the presence of a competing change detection task (dual-task). Gurnsey et al. (2010, Journal of Vision) argued that the presence of masking noise dots was critical to this effect. Therefore, we measured walker direction discrimination thresholds with variable noise levels under single- and dual task conditions (change detection). For most subjects-as predicted--direction thresholds were identical under single- and dual-task conditions in the absence of noise, but thresholds increased with noise in the dual task condition.

**(104)\* Non-Parametric test to describe response time distributions within a visual search paradigm**

Richard, Bruno  
Ellemberg, Dave  
Johnson, Aaron

Psychophysically measured response times have allowed us to measure regularities in visual search, and further our understanding of attention. In complex searches, efficiency has been assessed from slopes of response times according to number of distractors. However, an issue arises when discussing the statistics used to evaluate slopes (Regression, ANOVA). Response time distributions are not normally distributed, and consequently violate the assumptions of parametric tests. We propose the Kolmogorov-Smirnov statistic to test the entire distribution versus simply using means. The KS test gives similar results to previous findings; target absent response times increased quickly compared to target present.

**(105) Now you see it, now you don't! Differences in contingency learning as a function of evidence construal**

Skye, Aimee

Researchers studying human contingency learning (HCL) debate whether it involves associative mechanisms or cognitive processes. Interestingly, typical HCL tasks may not be ideal for engaging non-associative, top-down processes because learning trials convey limited information expressed rather homogeneously. Using a novel task with more complex, heterogeneous stimuli, the current research demonstrated sensitivity to a strong contingency was drastically reduced when evidence was likely construed as an unrelated set and thus not processed comparatively. Poor learning persisted even with explicit instructions naming the related variables. These results suggest non-associative processes are involved in HCL, and demonstrate the utility of non-standard HCL tasks.

**(106)\* Olfactory discrimination following selective damage to the entorhinal cortex**

Gervais, Nicole  
Cole, Emily  
Mumby, Dave G.

Olfactory discrimination involves learning to differentiate one odor from another via consistent

pairing with reward. The present study was designed to investigate the role of the entorhinal cortex (EC) in acquisition and retention of four concurrent olfactory discrimination problems. Following either sham or bilateral neurotoxic lesions, rats were trained to criterion. EC-lesioned rats demonstrated enhanced learning relative to the sham group, as evidenced by fewer trials required to reach criterion. Performance during the test phase suggests that EC lesions do not impair consolidation of olfactory discrimination. Results are not entirely inconsistent with previous investigations and highlight directions for future research.

**(107) Orthographic knowledge in adults with childhood histories of reading difficulties: Strength or weakness?**

Conrad, Nicole J.  
Campbell, Jocelyn  
Parrila, Rauno

Approximately one fourth of children with dyslexia achieve a level of reading proficiency that enables them to participate in post-secondary education. Given the persistent problems with phonological skills reported in this population of high-functioning adults with dyslexia, of interest are the compensatory mechanisms that enable this relatively high level of reading skill. Theoretical models suggest that orthographic skills may be one mechanism through which compensation may occur. Empirical evidence is mixed regarding the role of orthographic skills in this population. This study compared orthographic knowledge between adults with and without histories of reading difficulties. Consistent with previous research, adults with histories of reading difficulties showed impairments on various reading measures, including orthographic knowledge.

**(108) Parallel Response Selection in Dual Task Situations via Automatic Category-to-Response Translation**

Thomson, Sandra Jean  
Watter, Scott

In contrast to the response selection bottleneck theory of dual task performance, recent studies have suggested that response information for two tasks may be generated in parallel. We examined the nature of Task2 response activation in parallel with Task1 using a PRP paradigm. Evidence of Task2 to Task1 response priming when each Task2

stimulus was unique indicated that automatic parallel generation of response information occurred for Task2 via abstract semantic category-to-response translation processes, independent of any direct S-R influences. These findings have implications for the classical conception of response selection, as well as theories of dual task performance.

### **(I 09) Parallels Between Absolute Identification and Function Learning Tasks**

Brown, Mark Andrew  
Neath, Ian

Both absolute identification and function learning involve learning relationships between items. Two experiments begin to examine commonalities between these tasks. Experiment 1 examined interpolation: Participants learned 7 stimuli in Phase I, and in Phase II, new stimuli were presented between each of the previously learned items. Experiment 2 examined extrapolation: Participants learned 7 stimuli in Phase I, and in Phase II, 6 new stimuli outside of the learned range were assessed. We fit the data with SIMPLE, and discuss implications for both models of memory and theoretical accounts of function learning.

### **(I 10) Phantom eye loss and related illusions in asymmetric dark adaptation**

Cassidy, Benjamin Nicholas  
Schawerna, Franca Louise  
Wilkinson, Frances

Wolfe (2007) described a novel cross-sensory illusion in which asymmetric eyelid droop (proprioceptive illusion) was induced by asymmetric dark adaptation. We have extended her findings using a larger interocular difference in adaptation level in 10 undergraduate participants. Following 25 min monocular occlusion, the patch was removed in the dark and participants gave oral ratings every 3 min to a series of statements describing possible sensory phenomenology. The initial illusion for all observers was that the non-dark-adapted eye was completely missing; over time this was replaced by weaker somatosensory and proprioceptive effects. This demonstrates the complexity of multi-sensory interactions.

### **(I 11) Presence and Immersion: Transportation into a Narrative World**

Douglas, Shawn  
Keefer, Kateryna V.  
Chan-Reynolds, Michael

Research suggests that being transported into a narrative world affects the development of mental models and personal beliefs (e.g., Green & Brock, 2000). Although a number of transportation measures exist, a systematic analysis of the underlying factor structure has not been conducted. This study used exploratory factor analysis to examine the factor structure of a new Transportation Inventory designed to assess two core dimensions: immersion and presence. The results supported a four-factor solution, with two Immersion factors (Engagement and Distraction) and two Presence factors (Action and Observation). Implications are discussed for studies involving transportation as a measure of subjective experience.

### **(I 12)\* Priming Modulates Bias in Deductive Reasoning**

Solcz, Stephanie  
Fugelsang, Jonathan

The belief bias effect is the tendency for people to endorse believable conclusions when reasoning deductively, regardless of the actual validity of the conclusion. In the current study, we examined the degree to which belief-bias could be mitigated via priming. Participants were presented with word search puzzles containing words related to belief- or logic-based responding prior to solving syllogisms. Participants primed with logical words showed significantly less bias than those primed with belief-based words. We discuss these findings in terms of the impact of unconscious priming on modulating reliance on heuristic versus analytic thinking.

### **(I 13) Producing Benefits Learning: The Production Effect Endures and Improves Memory for Text**

Ozubko, Jason David  
Hourihan, Kathleen L.

The production effect is the superior retention of material read aloud relative to read silently. This study assessed the efficacy of production as a study strategy, addressing whether production benefits memory: (a) beyond a short session, and (b) for

text material. In Experiment 1, a production effect was observed following a one-week delay. In Experiment 2, subjects studied text material by reading some paragraphs aloud and others silently. Memory was superior for information read aloud relative to read silently. We conclude that the production benefit endures and generalizes to text, indicating that production can be applied as a study strategy.

**(I 14)\* Rapid averaging: Two means cannot be computed in parallel without cost**

Brand, John  
Oriet, Chris  
Sykes Tottenham, Laurie

Chong and Treisman (2005) instructed observers to determine which of two circles corresponded to the mean size of a set of circles in either a precued or a postcued colour. No precue advantage was observed, suggesting the mean of both sets was computed in parallel without cost. However, on 80% of trials, the average size of the cued set and whole set were similar, making it possible to choose the correct probe without computing separate averages. Here, eliminating this confound reveals a precue advantage for both size and emotion averaging, suggesting two sets cannot be averaged concurrently without cost.

**(I 15)\* Rat's Ultrasonic vocalizations as indices of affect in conditioned cue preference and conditioned cue avoidance**

Hamdani, Selma  
White, Norman M.

The conditioned affect of rats was estimated as a ratio of their high and low ultrasonic vocalizations (USVs) during conditioned cue preference (CCP) testing. Compared to saline controls, rats conditioned with LiCl (25mg/kg) had low call ratios, suggesting negative affect while avoiding their paired compartments. Rats conditioned with sugar pellets, morphine (5, mg/kg) or amphetamine (3 mg/Kg) had higher call ratios, suggesting positive affect, while exhibiting preferences for their paired compartments. Rats conditioned with 15 mg/kg morphine exhibited CCPs but no evidence of positive affect, suggesting that the CCP may be learned in different ways at different doses of morphine.

**(I 16) Science, Missing Data, Secrecy, and Public Policy: What Is Ethical?**

Uttl, Bob  
Smibert, Dylan  
Morin, Alain  
Wells, Gregory

The Avaluator Avalanche Accident Prevention Card was to reduce the number of avalanche accidents in Canada. However, the number of accidents has increased instead; the data behind the Avaluator are held in secrecy; and independent studies failed to replicate the findings published in the Avaluator. The Canadian Avalanche Association printed a new edition of the Avaluator with a disclaimer stating that the Avaluator is not suitable for anything but continues to mandate its use in all avalanche safety training courses. Our research reveals that the public views the failure to disclose the data and to recall the Avaluator as very unethical.

**(I 17)\* Selective Control of Attention to Emotionally Salient Stimuli**

Hudson, Amanda  
Jacques, Sophie

Selective attention is believed to be an effective strategy for regulating emotions. The current study measured selective attention to positive, negative, and neutral pictures. Participants saw pictures on the right or left side of a screen, followed by target words on the same or opposite side. Two groups participated: A suppress group had to avoid looking at pictures, whereas an attend group had to look at them. Both groups categorized targets as indoor or outdoor words. A subsequent recognition test of pictures and words was administered. Task performance was assessed by picture valence, revealing decreased inhibitory control to negative pictures.

**(I 18)\* Selective lesions of the thalamic reuniens in rats increase impulsive responses in the 5-Choice Reaction Time Task**

Prasad, Judy Ann  
MacGregor, Emily Marilyn  
Chudasama, Yogita

Rats with excitotoxic lesions localised to the nucleus reuniens (NRe) of the thalamus (n=16), or sham control surgery (n=9) were tested in the 5-Choice Reaction Time Task (5CRTT). All rats were highly accurate in detecting brief visual stimuli in

the 5CRTT, but rats with NRe lesions showed a propensity to respond impulsively under baseline testing conditions (mean premature responses  $\pm$  SEM: NRe  $33.5 \pm 2.0$ ; Sham  $20.0 \pm 1.8$ ;  $F_{1,23} = 3.44$ ,  $P = 0.076$ ), and when the temporal predictability of the visual targets was varied ( $F_{1,23} = 5.14$ ,  $P < 0.05$ ). These results implicate the NRe in mechanisms of inhibitory control.

### **(I19) Self-relevant semantic learning does not alter physical face perception**

LeBarr, A. Nicole

Heisz, Jennifer J.

Shedden, Judith M.

One's own face is more difficult to identify when morphed with a physically similar face than a dissimilar face, suggesting representational overlap. We examined whether there is representation overlap for faces associated with similar semantic information. Participants were introduced to individuals with similar and dissimilar personalities to the participant. These faces were morphed with that of the participant, who when shown them determined whether each image portrayed their own face or not. In contrast with findings for physical similarity, participants did not have more difficulty identifying their own face if it was morphed with the face associated with self-similar information.

### **(I20) Semantic interference in a colour matching task**

Cheesman, Jim

A colour-word matching task was used to evaluate two word types; colour word names (e.g., BLUE or GREEN) and semantic associates (e.g., SKY or PLANT). Semantic associates were used to minimize response effects and reveal semantic interactions between words and colours. The results showed that for both colour words and colour associates, a congruent relationship between the ink colour of a conflicting word-colour stimulus and the colour of a second colour patch speeded matching performance, while an incongruent relationship slowed matching performance.

### **(I21) State and Trait Differences in Attention and Memory for Emotional Images**

Sears, Christopher Roy

Newman, Kristin

Ference, Jennifer

Thomas, Charmaine

Participants viewed sets of four images (depression-related, anxiety-related, positive, and neutral) while their eye fixations were tracked and recorded. A surprise recognition memory test was administered seven days later. There were clear state and trait differences in the allocation of attention to emotional images. State dysphoria and trait dysphoria were both associated with unique attentional biases that differed from the bias of control participants. Recognition memory was superior for images with emotional content but there were no dysphoria-related memory biases. Our results are discussed in terms of the interactions between cognition, emotion, attention, and memory.

### **(I22) Subjective auditory components of sarcasm**

Voyer, Daniel

Techentin, Cheryl

This study examined auditory features relevant to the perception of sarcasm. One-hundred and fifty-one students identified the tone of voice in neutral, sincere, and sarcastic utterances. Participants also rated these statements on seven dimensions (clarity, intensity, intensity variation, pitch, pitch variation, resonance, tempo). Results showed differences in identification performance with the following order of accuracy: sarcastic > sincere > neutral. Ratings also revealed significant differences among the tones of voice on all dimensions. Finally, factor analysis produced six factors reflecting the rated dimensions. These results support the conclusion that sarcastic speech is perceived through the integration of multiple auditory features.

**(123) Taking a look at the effect of reading speed during shared book reading: An eye movement monitoring study**

Turgeon, Krystle-Lee  
Roy-Charland, Annie  
Beaudry, Olivia  
Saint-Aubin, Jean

Eye movements of 24 first and 15 second graders were monitored while they were being read storybooks, at either a normal adult reading speed or an artificially slow speed. Overall, results revealed that children spent more time looking at print elements at the slowest reading speed. At the adult typical reading speed, children spent more time on print elements on the easiest book, than on the more difficult books. Results also revealed that first graders spent less time on the text than second graders at the adult reading speed but not at the slower reading speed.

**(124)\* The bivalency effect and generalized response slowing triggered by unexpected stimulus features**

Grundy, John  
Benarroch, Miriam  
Shedden, Judith

During task-switching, if we occasionally encounter stimuli that cue more than one task (i.e. bivalent stimuli), response slowing is observed on all trials within that block. This observation is known as the bivalency effect (1,2,3). Previous studies have assumed that this response slowing is triggered by the bivalent nature (i.e. the cueing of two tasks) of the stimuli themselves (3, 4). In a series of four experiments however, we support the conclusion that the occasional encounter with unexpected, task-irrelevant features produces a block-wise slowing on all trials, and that the bivalency effect may be part of this more general mechanism.

**(125)\* The cognitive locus of memory impairment in the Irrelevant Sound Effect: Rehearsal isn't everything.**

Stokes, Kirk A.  
Arnell, Karen M.  
Goldhawk, Matthew P.

The finding that serial recall performance for visually presented items is impaired by concurrently presented task-irrelevant speech or sounds is referred to as the irrelevant speech/

sound effect (ISE). The foremost explanation for the effect is based on disruptions of serial order information and rehearsal processes. The present series of experiments demonstrates that a) neither rehearsal nor maintenance of order information is necessary to observe the ISE and b) task parameters known to eliminate the ISE in serial recall do not eliminate the effect in surprise non-serial recognition. Results are discussed in terms of interference with encoding of the to-be-remembered material.

**(126) The effect of arousal level on driving: Narrow pupils make for sloppy drivers**

Yanko, Matt Ryan  
Spalek, Thomas M.

We have shown that, as drivers become more familiar with a route, they respond less promptly to sudden events, such as a dog running onto the road. We hypothesize that, with increasing familiarity, drivers become more relaxed and allow their minds to wander. We tested this relaxation hypothesis by monitoring pupil diameter while manipulating route familiarity. Consistent with this hypothesis, pupil diameter decreased with route familiarity. There was a tendency for this trend to be reversed upon switching to an unfamiliar route.

**(127) The Effect of Emotional Valence and Arousal on Time Perception: Evidence from a Temporal-Bisection Task**

Smith, Stephen D.  
McIver, Theresa A.  
Di Nella, Michelle S.  
Crease, Michelle L.

In a temporal-bisection task, participants are trained to distinguish between two different exposure durations. Participants are then shown stimuli that are presented at a number of different durations that fall between the two learned times. In the current research, this task was used to examine the effects of emotional valence and arousal on time perception. At brief durations (100-300msec), arousing and non-arousing negative images were judged to have been shown for shorter durations than they actually were. At longer durations, the display time of negative arousing images was over-estimated, suggesting that different mechanisms influence rapid and slower time judgments.

**(128)\* The effect of juvenile pretraining on cognitive performance after NMDAR blockade**

Smith, Catherine  
Wartman, Brianne C.  
Holahan, Matthew R.

Hippocampal CA3 mossy fibres undergo extensive synaptic remodelling between postnatal day 18 (p18) and p22. These morphological adjustments coincide with a dramatic improvement in cognitive spatial function. Training during this period results in enhanced cognitive spatial function later in life indicating that manipulations during this time have long-lasting cognitive effects. Given the involvement of NMDA receptor (NMDAR) function in hippocampal development and cognition, the current study reports on 1) NMDAR blockade from p18 to p22 and the effect on later spatial function and 2) training during this period under NMDAR blockade on later spatial function.

**(129) The effects of brief daily binocular vision on the anatomical changes induced in the lateral geniculate nucleus (LGN) by daily periods of monocular deprivation.**

Dingle, Rachel N.

Short periods of daily binocular vision are enough to prevent the development of deprivation amblyopia in the deprived eye of kittens that experience longer daily periods of monocular deprivation, and further, are sufficient to maintain normal cortical patterns of ocular dominance. Here, we report on the extent to which daily regimens of binocular experience provide corresponding protection from deprivation-induced anatomical changes in the LGN by comparing: 1) The mean cross-sectional area of Nissl-stained cells and 2) counts of cells immunoreactive for SMI-32 (that labels neurofilament) in deprived versus non-deprived laminae of the LGN.

**(130) The Effects of Conversation on Working Memory and Situation Awareness in Simulated Driving**

Heenan, Adam  
Johannsdottir, Kamilla  
Brown, Matt  
Herdman, Chris

The proliferation of in-vehicle cell phone use has motivated much research on conversation-induced driving impairment; however, there is little consensus on the cognitive mechanisms through which conversation has its effects. The present research examined the effects of conversation on drivers' working memory and situation awareness (SA). Conversation resulted in significant SA impairment for the location of other vehicles in a simulated driving task. Specifically, participants recalled cars in the wrong lane, cars that were not in the scenario, and failed to recall cars that were in the scenario.

**(131) The effects of reverse occlusion on neuron structure and neurofilament labeling in the lateral geniculate nucleus.**

O'Leary, Timothy P.  
Kutcher, Matthew R.  
Mitchell, Donald E.  
Duffy, Kevin R.

Monocular deprivation (MD) provokes considerable change to the structure of neurons. This is most conspicuous in the deprived layers of the lateral geniculate nucleus where neurons are rendered smaller than non-deprived counterparts, and where labeling for neurofilament is reduced. We wished to determine whether structural recovery from MD was accompanied by an increase in neurofilament. Cats were reared with MD and then a period of reverse occlusion. Deprived neurons recovered near normal size and neurofilament level after 8 days of reverse occlusion. The linkage between structural recovery and increased neurofilament implicates the cytoskeleton as a substrate for recovery from deprivation.



### **(I32) The Embodied Insult Detection Effect**

Wellsby, Michele  
Siakaluk, Paul D.  
Pexman, Penny M.  
Pickett, Sarah  
Newcombe, P. Ian  
Owen, William J.

We presented embodied insults (e.g., asswipe), non-embodied insults (e.g., cheapskate), and either non-insults (e.g., armband) or compliments (e.g., eyeful) in three insult detection task experiments ('is the stimulus an insult or not?'). After each experiment, participants were given a surprise recall task. In all three experiments, a facilitatory embodiment effect was observed, such that the embodied insults were responded to more rapidly and accurately, and were recalled more often than the non-embodied insults. We propose that knowledge gained through bodily experience is an integral component of the conceptual knowledge people have for insults.

### **(I33) The impact of semantic similarity on action production and action identification**

Macdonald, Scott  
Desmarais, Geneviève

To assess how semantic information impacts action production and identification, participants learned to associate eight novel actions with abstract labels through sequences of learning trials and test trials. Crucially, half the labels referred to semantically similar concepts and half referred to distinct concepts. Generally, actions associated with similar labels were confused more often than actions associated with distinct labels. Furthermore, participants who imitated the experimenter during learning trials completed the experiment in fewer blocks than participants who watched the experimenter. The results suggest that semantic similarity can impact action production and identification, and that imitation can facilitate learning.

### **(I34) The Influence of Context at Study on Memory for Repeated Items**

Bancroft, Tyler  
Hockley, William

We examined the role of context at encoding on recall and recognition by presenting items in a

visual context at study but not at test. Study items were presented twice either massed or spaced. Context produced both costs and benefits for memory. Accuracy was greater for items shown in unique contexts compared to shared contexts, and was greater when the two presentations of an item were shown in different contexts rather than the same context. These effects were greater for massed compared to spaced items, and were also seen in the proportion of remember responses for tests of item recognition.

### **(I35) The influence of training on flanker interference**

Lin, Olivia Ying-Hsin  
MacLeod, Colin M.

This study investigated the influence of training on interference. Experiment 1 used the Eriksen flanker task where subjects were instructed to focus their attention to identify the central target while ignoring the peripheral distracters. Interference was robust and unchanging over five days of practice. Experiment 2 used the same stimuli in a modified task where subjects were instructed to spread their attention to judge whether the flankers and target were the same or different. Interference was robust initially but was eliminated by the third day of practice. Unlike in the standard focused flanker task, interference in the modified spread task apparently can be brought under strategic control.

### **(I36) The Oblique Effect in the Horse**

Carey, Andrea Danielle  
Barnfield, Anne Mary Clare  
Timney, Brian

We investigated the Oblique Effect in the horse. Using a two-choice discrimination task, in which they were rewarded for approaching particular orientations, eight female horses were trained to discriminate between a variety of orientation combinations, including horizontal, vertical and two obliques. We used trials to criterion as a measure of the difficulty of the task. The data showed that overall the horses took significantly longer to discriminate the oblique than the cardinal orientations. These results suggest that, like several other species, horses show a Class 2 Oblique Effect (Essock, 1980) that reflects a reduced capacity in processing of oblique orientations.

**(I37) The relationship between neurofilament content and soma size in the cat Lateral Geniculate Nucleus**

Crowder, Nathan A.  
Duffy, Kevin R.

Neurofilaments are cytoskeletal proteins that help to maintain the gross structure of neurons. Neurofilaments comprise three protein subunits: light (NF-L), medium (NF-M), and heavy (NF-H). Labeling for NF-H has been linked to the large Y-cell neurons of the cat lateral geniculate nucleus (LGN). However, it is unclear whether NF-L and NF-M also correlate with cell size in the LGN. We measured the soma size of cells that were labeled for either NF-L, NF-M, or NF-H, and found little difference in the size of neurons labeled for each neurofilament subunit, suggesting that NF-H may not uniquely identify Y-cells.

**(I38) The Rivermead Behavioral Memory Test: Does It Measure Prospective Memory?**

Uttl, Bob  
Siegenthaler, Amy L.

Several subtests of the Rivermead Behavioral Memory Test (RBMT) are purported measures of prospective memory (ProM), namely the Belonging, Appointment, and Message tasks. We examined this claim using a large sample of patients with mild traumatic brain injury who completed the RBMT as part of a standard clinical neuropsychological assessment. Our results show that the performance on these tasks is unfortunately confounded by retrospective memory performance. Thus, performance on the RBMT's "prospective" memory tasks should not be interpreted as reflecting prospective memory ability.

**(I39)\* The Role of an Intervening Event in a 2afc Task**

Spadaro, Adam  
Milliken, Bruce

The repetition priming effect has long been a pillar of cognitive psychology. Spadaro, He, & Milliken (2008) described a subtle change to a two alternative forced choice (2afc) procedure that turns repetition benefits into repetition costs. The experiments presented in this poster address the role that the intervening event plays in producing repetition costs. The general strategy was to

examine the degree to which stimulus or response overlap between the intervening event and the prime/target stimuli is necessary to see this reversal of the repetition priming effect.

**(I40) The role of initial light adaptation in the phantom eye loss illusion**

Schawerna, Franca Louise  
Cassidy, Benjamin Nicholas  
Wilkinson, Frances

The illusion that an eye is missing can be induced by asymmetric dark adaptation (Cassidy et al., CSBBCS 2010). We examine the strength of this phenomenon as a function of the initial light adaptation level and the time course of its dissipation in the dark. Eight participants underwent 25 min of monocular occlusion followed by testing in the dark with both eyes open. Three light adaptation levels for the non-occluded eye were tested. The strength of the illusion (magnitude estimation) dissipated over a time-course parallel to normal dark adaptation demonstrating a quantitative relationship between low-level vision and somatosensory/proprioceptive function.

**(I41) The silhouette illusion: Evidence for a viewing-from-above bias**

McAdam, Matthew  
Troje, Nikolaus F.

The silhouette illusion depicts a rotating dancer. Published online (Kayahara, 2003) it has since travelled the internet. As any silhouette, the display is depth-ambiguous. Consequently, the direction of rotation is ambiguous as well. The online community has noticed that perceived rotation direction is biased toward one direction, and a number of hypotheses have been provided to explain this. Here, we systematically test the hypothesis that our visual system prefers to see the silhouette from above rather than from below. We varied camera elevation and show that the resulting biases do indeed account for the ones observed in the original illusion.

**(I42) The study of social networks in cognitive psychology: the organization of dream reports**

Viau-Quesnel, Charles  
Schweickert, Richard  
Fortin, Claudette

Many practical uses for the study of networks exist in psychology. An example based on the study of dreams is presented to illustrate functions and metrics that can be used to characterize networks. The objective is to describe the organization of characters in dream reports. In this analysis, dreams are coded using the Hall and Van de Castle system (1966) and associations between characters are analyzed using Pajek. Results show that representations of characters in dreams are organized in a manner coherent with real-world social networks. The usefulness of analyzing such networks in cognitive psychology is discussed.

**(I43)\* The Triple Test: A New Approach Using Old Tests to Measure Emotionality in Mice**

Fraser, Leanne M.  
Brown, Richard E.  
Holmes, Andrew  
Ramos, Andre

Purpose: Validate a new behavioural test of emotionality consisting of the physical integration of three tests: open-field, elevated plus maze (EPM) and light/dark box. Animals: Four different mouse strains (CD-1, BALB/c, DBA/2J, C57BL/6J). Results: CD-1 mice thoroughly explored all three components of the triple test during one testing session. Significant behavioural differences were found among the three inbred strains. Diazepam (4mg/kg) and alprazolam (2mg/kg) increased percentage of entries and reduced risk assessment towards EPM open arms. Conclusion: The triple test is sensitive to genetic differences and anxiolytic drug effects and provides a quasi-simultaneous picture of behaviour in three different apparatus.

**(I44) Time-Of-Day Preference and Mind-Wandering**

Vinski, Melena  
Fenske, Mark  
Watter, Scott

Individuals often display preferences for the morning or evening. These preferences are

classified as chronotypes and show distinct physiological and behavioural fluctuations. Whereas prior work suggests a time of day modulation for executive functioning, the current study investigates an individual's tendency to mind-wander during chronotype match vs. mismatch conditions. Results suggest that chronotype-match conditions are associated with increased positive mood and attentional performance. This includes the ability to inhibit inappropriate responses and resist mind-wandering to maintain attentional vigilance. These results suggest that basic attentional mechanisms and affective functioning are influenced by individual time of day preference and the external environment.

**(I45) To what extent do proportion congruent and conflict adaptation effects reflect a single common mechanism?**

Torres-Quesada, Maryem  
Funes, María Jesús  
Lupiáñez, Juan

Previous studies have shown that the proportion of congruency effect and conflict adaptation effect differ in their generalizability across different types of conflict. In this study we show how this is modulated by changes in the stimuli contextual display. Our results show that while the conflict adaptation effect does not generalize from one conflict type to the other under any condition, the proportion congruent effect does transfer across blocks of trials with different stimuli features, independently of the conflict type. In addition, this transfer seems to depend on the saliency of different contextual features (e.g. length of the different blocks).

**(I46) Transient cognitive deficits in young-adult rats following a mini-stroke in the hippocampus**

Booker, Ashley Marie  
McLeod, Amy  
Lehmann, Hugo

We examined whether a minor insult to the hippocampus in young adult rats (90-d), caused by a mini-stroke, would promote age-related cognitive decline. Rats received sham surgery or endothelin-1 injections into the hippocampus to cause a temporary disruption of blood flow (stroke). They were then tested every 6-8 weeks for 18 months on two hippocampal-dependent

memory tasks: the Morris Water Task and an object-context mismatch task. The stroke rats only displayed a deficit in the Morris Water task, which dissipated with repeated testing. The findings suggest that practice effects can mitigate the effects of mini-stroke in young-adult rats.

**(I47) Trapped: Assessing Attractiveness of Potential Food Sources to Bumblebees**

Hudon, Tamara

Plowright, Catherine

Unrewarding artificial flowers that trapped approaching bumblebees were used to assess the effects of floral characteristics on floral attractiveness. Size had no effect. Mint scent, which had been provided previously to the colony in a feeder, did not attract the bees, though rose scent was avoided. In a comparison between two colours (white and blue) and two shapes (radial and square), choice proportions for blue radial flowers were significantly greater than chance. Prior training, with food associated either with visual or olfactory stimuli, is unnecessary to obtain floral preferences by free-flying bumblebees exploring potential food sources.

**(I48) Unlearned Visual Pattern Preferences in Bumblebees (*Bombus impatiens*)**

Orbán, Levente

Plowright, Catherine

The purpose of the experiment was to explore the visual pattern preferences of bumblebees (*Bombus impatiens*). Untrained, flower-naïve, bumblebees were presented with an artificial flower pattern. The patterns were radial or concentric lines presented either on the periphery or center of the flower. Every individual in a colony received a 1x1mm radio-identification (RFID) tag, and choices were tracked through RFID readers built into the artificial flowers. The first choice of each exploring bumblebee was recorded as its initial preference. Contrary to previous findings, we found non-significant preference for radial patterns. More importantly, central location of any pattern on the flower was significantly preferred over peripheral patterns.

**(I49) What do early environment and sex-influenced differences in Yucatan miniature pigs (*Sus scrofa*) really reflect?**

Walsh, Carolyn J.

Mian, Riana

Kouwenberg, Amy-Lee

Martin, Gerard M.

Sibling groups of pigs were maternally-deprived or sow-reared and placed on a control or a high fat/sodium diet. Sex and rearing condition affected pig behavior in the open field and on learning tasks, but did not affect spatial discrimination or reversal learning performance. Pigs did not habituate over trials in the open field. Long-term memory tests revealed that males explored novel objects, relative to familiar objects, significantly longer than did females. These findings indicate that sex, diet and rearing may interact to influence pig behaviour and cognition, and also highlight challenges in using laboratory tasks, devised for rodents, with pigs.

**(I50) What do people talk to themselves about?**

Morin, Alain

Uttl, Bob

Past research on inner speech has mostly focused on its self-regulatory and mnemonic functions. Little is known about the actual content of self-talk. Using an open-format questionnaire, we asked participants to list as many things they talk to themselves about. Content analysis was performed and data are discussed in terms of reported inner speech categories (e.g., about self and others), functions (e.g., planning, problem solving) and themes frequency. These results provide a new and unique window into people's inner dialogue.

**XIV Symposium: Quantitative Methods in Cognitive Science: Recent Advances and Case Studies (Abstracts I51-I54)**

Organizers: John Christie, Aaron Newman, Michael Lawrence

Abstract: The quantitative quandaries posed by the study of mind has a long history of influence on innovation in statistical methods. However, despite the continued development of increasingly nuanced and powerful statistical tools, current statistical curricula in cognitive science often consist of comparatively outdated approaches to the analysis of experimental data. This symposium seeks to provide attendees with an overview of several

recent advances in quantitative methods for cognitive science and convey case studies in the benefits of their application.

### **(151) Bayesian Information Criterion as a Practical Alternative to Null-Hypothesis Testing**

Masson, Michael E.J.

Null-hypothesis significance testing remains the standard interpretive tool in cognitive science despite its serious disadvantages. Primary among these is the fact that the resulting probability value does not tell the researcher what he or she most wants to know: how probable is a hypothesis given the obtained data? Inspired by developments presented by Wagemakers (2007) and Dixon (2003), I describe a Bayesian model-selection approach that requires only a simple transformation of sum of squares values generated by the standard analysis of variance. This method readily identifies which model (e.g., effect present vs. absent) is more strongly supported by the data.

### **(152) Assessing Response Time Mixture Distributions**

Dixon, Peter

It is common knowledge that response time distributions are mixtures. For example, across trials, subjects have different levels of preparation, generate different expectations about the upcoming stimulus, adopt different criteria, or use different decision strategies. Moreover, experimental manipulations may have their effect on mean response time precisely because they affect the nature of the response time mixture. In the present talk, I describe a straightforward, nonparametric approach to assessing evidence for response time mixtures with relatively small samples. I present some Monte Carlo simulations to demonstrate the efficacy of the approach and describe several applications.

### **(153) How to Make Speed and Accuracy Your Friends**

Christie, John

In many types of experimental designs the speed of a response (time to respond) and accuracy of response are both available to be measured. Several proposals have been made in the past to deal with the fact that an individual encountering a stimulus is somewhat free to trade speed for accuracy. Sometimes they may respond faster but

with less accuracy while at other times they may respond more slowly with more accuracy (speed-accuracy tradeoff &ndash; SAT). This talk presents a brief history of this topic accompanied by a new proposal to address both speed and accuracy simultaneously. By using modern statistical techniques and a small methodological modification one can overcome many of the previous pitfalls associated with combining the two measures and also greatly reduce the work required in estimating an SAT curve.

### **(154) Modeling linguistic components of evoked response potentials with generalized additive models**

Baayen, Harold

Tremblay, Antoine

Hendrix, Peter

The ERP signal in response to language stimuli is analyzed with generalized additive modeling (GAM, Wood, 2006). Oscillations in the theta range emerge, coupled to distributional properties of the linguistic stimuli. Typically, such oscillations are present not only in the dimension of time, but also, simultaneously, in the dimensions of linguistic predictors (frequency, length, neighborhood size). Oscillations tend to be temporally restricted with consistent distributions across the scalp. GAMs allow us to infer not only when a predictor is active in the signal and what its spatial distribution is, they also offer us more fine-grained information in terms of the amplitude and frequency of the oscillations associated with a given predictor. The localization of the minima and maxima of the oscillations on the scale of the predictor helps guide interpretation.

## **XV Attention III (Abstracts 155-160)**

### **(155) Optimizing integration of task and response rules in goal representation**

Pandey, Mamata

Oriet, Chris

In two experiments, subjects switched between tasks and switched between responding hands, identifying the task (or hand) and the hand (or task) before categorizing the target. Task cues, response cues, and targets were presented simultaneously or sequentially. With simultaneous rather than sequential presentation, identifying the task prior to the hand yielded a near-perfect trade-off between time lost in task identification and time

gained in target categorization. Identifying the hand prior to the task, however, yielded net gains. Smaller task switch costs in target categorization suggest lost time reflects costs of integrating task and response information into a common goal representation.

### **(I56) Does Task Switching Involve Endogenous Self-Control Processes?**

Arbuthnott, Katherine Diane

Task switching is widely used to study intentional control processes, but it is unclear which components of switch cost reflect intentional control. The exercise of self-control has been shown to impair performance on a subsequent task requiring control, an effect termed self-regulation depletion. This study examined which components of switch cost were influenced by self-regulation depletion, thus indicating intentional control. The results indicated that self-regulation depletion did not influence any component of switch cost (global switch cost, mixing cost, local switch cost, or backward inhibition), providing support for models of task switching that involve only automatic or exogenous control processes.

### **(I57) Social Incentives Affect Joint-Attention Performance**

Pottruff, Molly M.

Abu-Zeidan, Rami

Krupp, Daniel Brian

Shedden, Judith M.

The present study explores how incentives to cooperate or compete affect group performance in a joint-attention task. Working alongside a partner, participants reported the presence or absence of a target in briefly presented search displays. We compared group search performance when the participants were induced to cooperate or compete with their partners. Pairs were more sensitive to the presence of the target and more likely to correctly identify its presence or absence when cooperating than competing, suggesting that top-down factors encouraging cooperation may yield higher group productivity than those encouraging competition within groups.

### **(I58) The representation of the second target during the attentional blink**

Jannati, Ali

Spalek, Thomas M.

Di Lollo, Vincent

Report of a second target (T2) is impaired when presented within about 500 ms of the first (T1). During this attentional blink (AB), processing of T2 is delayed and its representation is stored in a labile memory buffer. We explored the buffer's characteristics, and its possible locus, using different types of masks after T2 (pattern, metacontrast, four-dot; with both sequential and common-onset presentation, COM). Masking was mediated by the onset transient of the trailing mask. No AB occurred with COM, confirming the critical role of the mask's onset transients, and ruling out a high-level locus for the labile memory buffer.

### **(I59)\* Personality predicts temporal attention costs in the attentional blink paradigm**

MacLean, Mary H.

Arnell, Karen M.

Second target accuracy is reduced when it is presented within 500-ms of a first target &ndash; an attentional blink (AB). Affective traits have been shown to influence the AB, purportedly by influencing the amount of attentional investment and flexibility. In the current study personality traits related to individual differences in trait affect and cognitive flexibility were used to predict AB magnitude. As hypothesized, greater extraversion and openness predicted smaller ABs. Greater neuroticism predicted larger ABs. Conscientiousness predicted lower overall target accuracy. Personality may modulate the AB by influencing overinvestment via dispositional tendencies toward more or less stringent or capable cognitive control.

### **(I60) Stimulus-response compatibility in a simulated "real-world" driving task**

Ryan, Matthew Paul

The performance advantage when stimulus and response locations correspond in non-spatial discrimination tasks (the Simon effect) occurs for horizontal, vertical and diagonal orientations. Extending this effect to a real world task participants drove a ship through a virtual course

while responding to targets, requiring a colour-discrimination response by pressing designated buttons under their thumbs. Steering and target placement allowed the relative distance between targets and responses to vary in 45 deg steps from 0 to 180. Reflecting the operation of the Simon effect in this "real world" navigation task, performance varied with relative S-R orientation.

## **XVI Semantic Knowledge and Categorization (Abstracts 161-166)**

### **(161)\* Tracking the Timecourse of Conceptual Knowledge Activation**

Amsel, Ben D.  
Cree, George S.

We take a feature-based approach to conceptual representation whereby participant-listed features categorized into different types of knowledge (e.g., functional, auditory) are assumed to partially capture the underlying knowledge structure. Mixed effects modeling of single-trial ERPs and decision latencies is used to assess the timecourse of influence, and predictive capacity, of several such knowledge types during single word reading. We assess the timecourse of activation of several knowledge types, and demonstrate action-related knowledge types are especially salient. We also illustrate that the neural basis of speeded decision making in lexical tasks depends in part on the depth of semantic processing.

### **(162)\* Differential access to causal versus associative relations in semantic memory**

Barr, Nathaniel  
Fugelsang, Jonathan  
Stolz, Jennifer

Various types of asymmetrical relations exist within semantic memory, including those due to unidirectional associative strength, and causal relations. By manipulating the stimulus onset asynchrony (SOA) in a relation recognition task, we controlled the degree to which expectancy was operational, thus testing the level of processing affected by such asymmetries. A directional effect was present for causal relations at both long (1000ms) and short (150ms) SOAs, whereas for unidirectional associates, an effect of order was only observed at long SOAs. These data will be discussed in terms of how they speak to the low-level nature of causal representation.

### **(163) Automaticity of Basic-Level Categorization Accounts for Naming Effects in Recognition Memory**

Richler, Jennifer J.  
Gauthier, Isabel  
Palmeri, Thomas J.

What is the consequence of calling objects by their names? Lupyan (2008) suggests that overtly naming objects at the basic-level impairs subsequent recognition memory because naming shifts the memory representation towards the category prototype. We show that 1) processing objects at the basic-level without categorization or naming responses produces equivalent memory effects as overt naming and 2) simple depth of processing can explain this effect. These results suggest that naming does not influence memory by changing the representation, but rather that naming is a shallow processing task as an automatic instantiation of basic-level categorization.

### **(164) Modeling the episodic basis of feature representation in categorization**

Hannah, Samuel  
Mewhort, Douglas

Brooks and Hannah have underscored the importance of multiple representations of the same feature (representation breadth) in categorization. We applied three formal accounts of categorization to representative experiments. Hintzman's Minerva 2 performed well on all simulations, whereas Nosofsky's GCM and a multiplicative prototype model both failed in one simulation. All failed without both informational and instantiated features. Combined with simulations of Shephard, Hovland and Jenkins' classic findings, we show that Minerva's episodic memory principles can explain conceptual processing, and are required for a full understanding of representational breadth. Categorization is a function of memory.

### **(165) Comparison between family resemblance-based and rule-based categorization by mean of neural network modeling and behavioral study**

Morissette, Laurence C.

Following Ashby and al. papers regarding the existence of two different systems of perceptual category learning, namely an explicit (verbal) system and an implicit system, we compared the learning of categories for a 2 attributes conjunctive

rule-based, 2 attributes disjunctive rule-based and family resemblance categorization tasks through a behavioral study and a self-learning neural network (FEBAM) modeling. We found an effect of familiarity, as supported by previous studies, but found a trade off effect between the success rate and response times for the family resemblance and rule-bases disjunctive tasks, probably denoting two different approach to task completion.

### **(166) Is the whole more typical than the sum of its parts?**

Dumesnil, Etienne  
Cousineau, Denis

People have the ability to form categories. The possibility that these categories might be represented by prototypes has been studied many times. Most of these used the mean as the prototypical measure. This choice has not been challenged up till now, the categories in these studies being distributed normally - all central tendency measures having the same value. The study presented here used asymmetric distributions to create the exemplars within each category - distinguishing the mean from the mode. These categories were then used in two types of learning task (classification vs. inference). Results show that the context of learning influences typicality.

## **XVII Cognitive Processes III (Abstracts 167-171)**

### **(167) Time Flies Sometimes: Estimation Accuracy of 2-6 minute Durations**

Fergusson, Janel  
Graf, Peter

Keeping track of time is extremely important in our day to day lives. Previous work on time perception has focused almost exclusively on very short intervals (<30 seconds). The current group of studies examined our ability to estimate longer durations (2-6 minutes) while occupied by a secondary task. Participants made a series of duration judgments while completing a secondary tone-judgment task that varied in difficulty and type (pitch vs. duration). Results indicate that time-keeping of longer intervals may rely on processing by attentional resources shared across task types, rather than a specific time-keeping mechanism or attentional store.

### **(168) Dynamic neural field model of saccade initiation**

Trappenberg, Thomas  
Marino, Robert  
Coe, Brian  
Munoz, Douglas

The study of eye movements has provided a wealth of knowledge that links behavior to the underlying neural machinery. We have previously shown how the interactions and dynamics within a model of the superior colliculus (SC) can explain variations in saccade reaction times (SRTs) across a variety of experimental conditions. Here we report on how the surprising turning points in SRTs across varying target intensities or number of spatial target locations can be explained by SC activities. Furthermore, we study the interactions of signals from many cortical and subcortical areas and show how their variation can explain differences in SRTs resulting from clinical disorders.

### **(169) Mental Ability and Rule Extraction without Focused Attention**

Houlihan, Michael

It has long been known that mental ability is related to simple discrimination. Invariably, tests of discrimination require focused attention. However, the mismatch negativity (MMN) is an automatic preattentive reflection of discrimination. MMN was recorded in conditions in which the standard stimuli followed an abstract rule "higher intensity is related to higher frequency" while deviant stimuli are opposite to this abstract rule. MMN amplitude was larger for the high ability than low ability participants in the easiest discrimination conditions. The relation between discrimination ability and mental ability has been somewhat replicated without the requirement of focused attention.

### **(170)\* Topological Changes in the Electrophysiological Response to Infrequent Targets Implicate the Locus Coeruleus' Norepinephrine System**

Warren, Christopher M.  
Tanaka, Jim W.  
Holroyd, Clay B.

It has been suggested that infrequent targets elicit response conflict due to habituation of the non-target response. An electrophysiological signature of brain activity known as the N2 has been linked



to the detection of conflict in the anterior cingulate. We presented subjects with male and female faces, tinted either yellow or blue. Subjects discriminated faces by color or by sex, silently counting targets. When subjects attended to colour, infrequent targets elicited a N2 maximal at central-parietal sites. When they attended to sex, the N2 was maximal over lateral-occipital areas, demonstrating that the frequency effect is not topologically specific.

**(171) Generalization of the proportion congruency effect across conflict types. How general is it?**

Funes, Maria Jesús  
Montoro-membila, Nuria  
Torres, Maryem  
Lupiáñez, Juan

Previous studies have shown that Proportion Congruent effects can be context specific, but also able to transfer from one conflict type to another under certain conditions. Here we present some additional research that shows how the ability to generalize proportion congruent effects across conflict types may depend on the instructions given to participants to focus or not on the different features of the stimuli conforming the two types of conflict. We have also found that such an effect seems to be modulated by individual differences in the general ability to focus on the global vs. local aspects of compound stimuli.

**XVIII Perception II (Abstracts 172-177)**

**(172) The Time Course of Category Congruence Effects: Determining the Extent to Which Subliminally Presented Stimuli are Processed**

Perry, Jason R.  
Lupker, Stephen J.

The issue investigated in the present research is the nature of the information activated by a masked prime, specifically the nature of the information that is responsible for producing masked priming effects (i.e., semantic information or S-R associations). This issue was addressed by assessing both the magnitude of the category congruence (priming) effect and the nature of the (prime-target) semantic distance effect across trials in a variety of number classification tasks using both single- and double-digit targets. The failure to observe an increase in the size of the category

congruence effect along with the presence of a semantic distance effect in every experiment indicate that, despite extensive opportunity to form and make use of S-R associations, masked priming effects were being driven primarily, if not completely, by semantic activation.

**(173) Long-term priming for repeated subliminally presented words**

Breuer, Andreas T.  
Masson, Michael E. J.  
Bodner, Glen E.

We investigated whether subliminally presented words can have an effect lasting longer than a few seconds. Word and nonword targets in a lexical decision task were preceded by masked word primes. When word primes later appeared as visible targets, responses were faster if the target had previously been a prime preceding a word target. A second experiment, in which response mappings were reversed after the training trials, suggests that masked primes became associated with the motor response made to the target. These results support the notion that learning can occur for stimuli that are perceived without awareness.

**(174) Interference from unimodal and multimodal information in a Stroop-like task**

Saunders, Carla  
Desmarais, Geneviève

We used a Stroop-like task to investigate how conflicting unimodal and multimodal information impacts stimulus identification. Participants learned to associate shape/label pairs with colours (unimodal condition) or sounds (multimodal condition) through sequences of learning and test trials. In a subsequent naming task, participants focused on identifying the stimuli by shape or by sound / colour - 25% of the trials presented incongruent information. In the unimodal condition, interference was observed in all conditions. However, in the multimodal condition interference was only observed when participants were asked to identify stimuli by their sound, showing a predominance of visual information over sound information.

**(175)\* Does audiovisual interaction depend on context?**

Sarmiento, Beatriz R.

Milliken, Bruce

Shore, David I.

Lade, Sarah

Sanabria, Daniel

Observers can be sensitive to the proportion of congruent trials in a conflict situation. Context can provide a powerful cue to the proportion manipulation, which results in judicious deployment of cognitive control. We investigated the ability of observers to exert this control in a multisensory context where duration was the critical dimension for judgment. Observers reported the duration of a flash (short or long), while ignoring a simultaneously presented short or long white noise burst. Stimuli were presented above or below the fixation point defining two different context (high and low proportion of congruent trials). Results demonstrated an attentional modulation of the audiovisual interaction.

**(176)\* Perceptual versus motoric attention: An fMRI investigation of the speed-accuracy tradeoff in decision-making**

Blagdon, Ryan

Bowen, Chris

Rusak, Benjamin

Ivanoff, Jason

Abstract: Selectively preparing to attend to either the perceptual discrimination or the response required by a task can modulate the speed and accuracy of performance. Here we used event-related fMRI to investigate the impact of speed-accuracy demands on preparatory neural activation. Visual and lateral-frontal regions demonstrated greater activation following instructions to focus on accuracy rather than speed. Conversely, activation of medial-frontal areas was greater following instructions to focus on speed. These results suggest that trading speed for accuracy involves shifting the balance of neural activation between systems that prepare for action and those that prepare for perception.

**(177)\* Differences in White Matter Connectivity in Bilaterally Deaf Individuals vs. Normally Hearing Controls**

Chevalier, Therese M.

Newman, Aaron J.

In the event of sensory deprivation, cross modal plasticity may occur. Previous studies have reported both functional and structural differences between individuals with sensory impairments and controls (Finney et al., 2001; Shu et al., 2009). Varied white matter connectivity is expected between persons with long standing deafness, and normally hearing participants. The ongoing research project employs Diffusion Tensor Imaging (DTI) to infer the integrity and orientation of white matter tracts noninvasively and in vivo. In deaf individuals compared to controls, we predict reduced connectivity between areas implicated in auditory processing and stronger connections between association regions.

**XIX Symposium: Numerical Cognition: Function, Process, Structure (Abstracts 178-183)**

Organizer: Joanne Lefevre

Abstract: In this symposium, participants will explore various issues related to numerical cognition. The topics cover a range of mathematical operations (comparison, subtraction, fractions, inversion). Common themes across the presentations include (a) how presentation format or context influences access to relevant knowledge structures and (b) the form those knowledge structures take for specific kinds of numerical information.

**(178) Semantic Alignment and Number Comparison**

Campbell, Jamie

Sacher, Sean G.

A horizontal word pair (either "less more" or "few many") appeared for 500 ms to prime either relative magnitude (less more) or absolute quantity (few many). Then a horizontal pair of single digits that were either successors (near) or differed by at least four (far) appeared below the word pair. Participants indicated verbally whether or not the word and digit pairs were spatially aligned with respect to relative magnitude. The RT advantage for far number pairs compared to near pairs (i.e., the

distance effect) was greater with magnitude primes (81 ms) than quantity primes (17 ms), demonstrating a semantic alignment effect in number comparison.

**(179) Effects of Numerical Surface Format on the Size-Congruity Effect: Digits, Number Words, and Pseudohomophones**

Barnum, Geoffrey

Automatic activation of numerical information with different surface formats was examined by comparing performance on numerical comparison and physical comparison tasks. The size congruity effect occurs when participants are slower to judge relative size when physical and numerical size conflict. Undergraduates ( $N=28$ ) judged numerical size or physical size on pairs of numbers (digits, words, or pseudohomophones) that varied in physical size and numerical magnitude. Results indicated that the effect of congruency (interference vs. facilitation) varied across format and across the numerical and physical comparison tasks. The results are discussed in terms of models of numerical representation and magnitude comparison.

**(180) When negative is not so negative: Adults' performance on simple subtraction problems.**

Robert, Nicole D.

LeFevre, Jo-Anne

In contrast to addition and multiplication, the order of the operands matters for subtraction (e.g.,  $4-2=2$  whereas  $2-4=-2$ ). However, research on the cognitive processes involved in solving subtraction problems has focused exclusively on problems yielding positive answers. In two experiments with adults ( $ns = 40, 26$ ), problems with negative answers required more time to solve than problems with positive answers. However, answer valence did not interact with problem size. These results suggest a componential model in which solvers use the same procedures on both types of problems, and adjust valence in a separate step.

**(181) Wun, tue, thrie: Solution strategies in arithmetic with pseudo-homophones, words, and digits**

LeFevre, Jo-Anne

Robert, Nicole

Barnum, Geoffrey

Pyke, Aryn

Adults ( $n=40$ ) solved arithmetic problems and reported their solution procedures. Compared to digits (e.g.,  $2 + 7$ ), solvers were slower on number words (e.g., two + seven), showed larger effects of problem size, and reported less memory retrieval. Number words appear to affect retrieval efficiency, possibly by disrupting access processes that are fluent when problems are presented as digits. Pseudo-homophones (e.g., tue + sevin) were solved even more slowly, but showed attenuated problem size effects, suggesting that they have different effects on activation processes than number words. In part, these effects reflect different patterns of solution choice across formats.

**(182) The Roles of Phonological and Visuo-spatial Working Memory Resources in Simple Fraction Strategies**

Faulkenberry, Thomas

The current study investigated the roles of visuo-spatial and phonological working memory in simple fraction strategies. The choice / no-choice methodology was used to independently analyze the selection and execution of these strategies. Whereas phonological and visuo-spatial resources were needed across all conditions, participants who solved fraction comparison problems under concurrent visuo-spatial load were found to make significantly more errors than participants who were under a phonological load. In addition, an interaction between working memory load and strategy type indicated that procedural strategies were more prone to working memory load effects than were conceptual strategies.

**(183) The relations between non-symbolic and symbolic processing in whole numbers and fractions**

Hallett, Darcy

Research in mathematical cognition makes a distinction between non-symbolic processing (i.e., the ability to estimate quantities, like the number of dots on a screen) and symbolic numerical processing (i.e., knowing that the numeral "3"; is a

symbol that represents threeness, and can be added to “2”; to get “5”);). To investigate how these two kinds of understanding are related in both whole numbers and fractions, a sample of 100 undergraduate students were tested on a variety of measures. Results demonstrate many interesting relations between symbolic and non-symbolic understanding of fraction and whole numbers.

## **XX Attention IV (Abstracts 184-189)I**

### **(184) Using inhibition of return to illustrate the psychological scientist's challenge to avoid unreality and uncontrol**

Klein, Raymond M.  
Hilchey, Matthew D.

The task of reducing human thought and behavior "to a mechanical process of cause and effect" is, according to Hebb, the most difficult task in science. One reason is the conflict between the goals to achieve a useful degree of ecological validity AND to control irrelevant variables and make precise measurements. Like the sailor in Greek mythology, who must navigate between two terrible hazards, Scylla and Charybdis, the psychological scientist must navigate between uncontrol and unreality. Research on inhibition of return will be used to illustrate these hazards and to provide some guidance for safe and fruitful navigation between them.

### **(185) Adaptive Qualities of Inhibition of Return**

Snyder, Janice J.  
Schmidt, William C.  
Chatterjee, Anjan

Recently, greater inhibitions of return (IOR) effects were reported when successive cues were presented in the same versus different locations (Visser & Barnes; 2009), suggesting that each cue event is treated similarly regardless of its history. Although we replicated these results initially (E1), a stronger test revealed that cumulative effects varied as a function of when the location was recued - cue history matter (E3). Furthermore, we found that cumulative-looking IOR effects could be found whether one, two, or three cues occurred in the same location (E3). We discuss the likelihood that several causes may underlie <sup>3</sup>cumulative-looking<sup>2</sup> IOR effects.

### **(186) Are there Anisotropies in Covert and Overt Visual Orienting?**

Harris, Jonathan

Past research suggests that inhibition of return (IOR) comes in two distinct "flavours" (Taylor & Klein, 2000). IOR appears to primarily affect either perceptual/attentional or motoric processes depending on whether it is generated using overt or covert shifts of visual attention. Using variations on a standard Posnerian orienting task, we examined the potential for anisotropies in the IOR effect and explored how such anisotropies may differ between overtly and covertly-generated IOR. Results are interpreted in the context of the "two flavours" view proposed by Taylor and Klein.

### **(187) Looking for Habituation in an Attentional Paradigm**

Dukewich, Kristie R.  
Enns, James T.

Animals reflexively orient toward unexpected stimuli. If a stimulus has no consequence, there is a decrement in orienting as the stimulus is repeatedly presented - an effect called habituation. Several researchers have argued that some attentional phenomena can be thought of in terms of habituation (Dukewich 2009; Huber, 2008). To examine the role of habituation in inhibition of return (IOR) and non-spatial forms of IOR, we conducted several experiments using a spatial cueing paradigm, and an adaptation the same paradigm to exploit non-spatial dimensions (stimulus color and identity). A comparison of the results with traditional studies of habituation will be discussed.

### **(188)\* What's Your Next Move? Directional Biases for Sequential Limb and Eye Movements**

Cowper-Smith, Chris  
Eskes, Gail  
Westwood, David

Here we aimed to determine if consecutive eye or arm movements reveal directional reaction time biases for the second (relative to first) movement. In experiment 1, two target locations were shown during each trial. Here, movements were faster when offset by 90 or 180 degrees from the first movement. In experiment 2, we presented four possible target locations. Here we found that eye and arm movements were faster only when offset

by 90 degrees from the initial movement. Our results reveal an effect of target set size on the spatial gradient of RTs for consecutive movements.

### **(189) Why are return saccades slow?**

Wang, Zhiguo  
Satel, Jason  
Trappenberg, Thomas P.  
Klein, Raymond M.

When viewing a scene or searching for a target, the observer usually makes a series of saccadic eye movements that place potentially pertinent scene components onto the sensitive fovea for detailed processing. During such inspections, return saccades are preceded by longer fixations than those which continue their trajectories, an effect that has been variously, but incorrectly, attributed to inhibition of return (IOR) and saccadic momentum. Using a simple, yet computationally explicit and physiologically plausible dynamic neural field model of the superior colliculus we demonstrated that the spatio-temporal dynamics of collicular remapping explains why return saccades are delayed.

## **XXI Language and Literacy II (Abstracts 190-195)**

### **(190) Reading Aloud: Is Interactive Activation Necessary?**

Robidoux, Serje  
Besner, Derek

McClelland and Rumelhart's (1982) idea that processing is best characterized by interactive activation (IA) between special purpose modules is currently the received view, despite the fact there is little evidence that models with IA performance better relative to the same models without feedback. We report a large series of simulations with a leading computational model that address this important issue. We conclude that the role of feedback is limited in these models.

### **(191) Basic Processes in Reading Aloud: Where Computational Models Fail, and How to Fix Them**

Besner, Derek  
O'Malley, Shannon  
Robidoux, Serje

We report a new experiment (and replicate it) on the joint effects of stimulus quality and regularity when reading aloud. None of the computational

models on the table, as currently formulated, simulate the data. We invoke a new mechanism to explain these data and provide a simulation proof.

### **(192)\* Chimaera Neural Networks for Self-Organizing Grammar Acquisition**

Jansen, Peter A.  
Watter, Scott  
Humphreys, Karin R.

Although many neural network models of word and grammar acquisition have been proposed, these models tend to make use of supervised neural architectures such as the simple recurrent network, and as such, have difficulty modeling developmentally plausible acquisition. This work examines the use of the Chimaera architecture, a novel neural network architecture combining a self-organizing Kohonen map with a Hebbian associative network, in unsupervised grammar acquisition from a corpus of natural language. Similar to recent psycholinguistic models, the Chimaera uses an alternative dual-representational system approach separating conceptual and grammatical content. Here, words are represented explicitly, whereas sequential grammar knowledge is stored implicitly through time-delayed Hebbian association. Although a single-layer Chimaera network can generate predictions for the next part of speech in a sentence for a known grammar, we show how these predictions can be ambiguous, and how multiple layers offer a route for complex ambiguities to be resolved with instance-specific information.

### **(193) Flipping the Cost/Benefit Coin: Reconsidering of "Automatic" Phonological Recoding When Reading Aloud**

Robidoux, Serje  
Besner, Derek

Skilled readers are slower to read aloud exception words (e.g., PINT) relative to regular words (e.g., MINT). This performance cost is thought to arise from competition between lexical and sublexical processes, the latter of which is providing an incorrect response to words like PINT, leading researchers to assume that subjects are unable to suppress the sublexical process and eliminate the cost. In other words, that sublexical processing is automatic. We offer a different account of why subjects might choose to allow sublexical processes to operate. More broadly, we argue that

appeals to automaticity limit our theorizing in unhelpful ways.

**(194) Context Dependent Lexical Processing: Evidence from the Task Choice Paradigm**

O'Malley, Shannon  
Derek, Besner

Results from the task choice paradigm (Paulitzki, Risko, O'Malley, Stolz & Besner, 2009; Besner & Care, 2003) suggest that TASK SET plays a role PRIOR to lexical processes involved in reading aloud. The present work examines whether the ability to process the task cue and the target stimulus in parallel is driven by the specific combinations of tasks.

**(195) Testing the specificity of the attentional beam in reading with the missing-color effect**

Saint-Aubin, Jean  
Klein, Raymond M.  
Deacon, Helene  
Thompson, Celina

When searching for a target letter while reading, people miss more letters embedded in frequent function words than in less frequent content words. Explanations of this "missing-letter effect"; (MLE) link it to reading-related psycholinguistic and attentional processes. We tested the specificity of the attentional beam involved in reading by asking readers to search for a specific color in a text in which letters were printed in various colors. A missing-color effect analogous to the missing-letter effect was observed, suggesting that the beam, postulated by the attentional disengagement model of the MLE, applies equally to reading relevant and irrelevant features.

**XXII Cognitive Processes IV  
(Abstracts 196-201)**

**(196) Visual concealment: What factors do people use to choose hiding places?**

Malcolmson, Kelly A.  
van der Werf, Dan  
Smilek, Daniel

Two experiments extended our previous work showing that when hiding objects, people consider (1) the visual characteristics of objects (e.g., colour), (2) embodiment (e.g., line-of-sight) and (3) schemata. In Experiment 1, participants placed

objects in an office to make them easy or hard to find. Examination of the chosen locations revealed that people used the three types of factors we identified before to manipulate difficulty. In Experiment 2, factors were put in competition with each other to examine their relative importance. Preliminary results suggest that colour trumps line-of-sight in some contexts and that schemata trump colour in other contexts.

**(197) Sex differences in wayfinding: evidence from a real world environment.**

Corbin, Ilona  
St. John, Robert

If any gender effects are observed in wayfinding tasks the trend is for males to slightly out-perform females. In this study using a real world environment, landmark based, cardinal direction based, and free-form wayfinding were tested. Errors in direction & hesitation, and time to finish data were collected. Significant gender differences only appeared when the cardinal direction based task, (i.e., go north, south, east, west), was used and hesitation errors were measured. Males had significantly fewer hesitation errors. No other gender effects were found. Perhaps in some situations females really do pause to ask for directions more often than males.

**(198) The contribution of a head-based reference system for updating spatial relations**

Teeter, Christopher  
Latif, Nida  
Sun, Hongjin

We examined whether observers use a head-based or body-based egocentric reference system to represent spatial relations. Participants learned a room-sized spatial layout, were then blindfolded and asked to assume a body orientation that was aligned or misaligned with the learning orientation. They then imagined facing a direction different from their body and turned their head to match this imagined orientation. Directional judgements made with reference to the head/imagined orientation were impaired, however this impairment was significantly less than a condition wherein the head and body orientations were the same but differed from the imagined orientation used when making directional judgements.

**(199) Observer Locomotion Facilitates Scene Recognition Across a Wide Range of Viewpoint Shifts**

Wade, Mark A.

Sun, Hongjin

Teeter, Christopher

Scene recognition performance typically decreases when an observer undergoes a viewpoint shift, but the cost is less for shifts caused by observer locomotion compared to scene rotation. In two experiments, we examined whether the facilitative effect of locomotion exists at a wide range of viewpoint shifts. Participants learned a spatial arrangement of objects, and then identified a change to the scene after undergoing a viewpoint shift of various magnitudes caused by either locomotion or scene rotation. In contrast to previous findings, our results showed that locomotion significantly facilitated performance compared to scene rotation across both small and large viewpoint shifts.

**(200) Does Object Manipulability really matter in Object Recognition: The role of both Grasping and Functional Knowledge of Object Use in Visual Recognition**

Salmon, Joshua Paul

McMullen, Patricia A.

Tougas, Michelle

How is object information organized in the brain? Why is it that a visual agnostic can lose the ability to discriminate animals, but still recognize individual tools? Until recently, semantic organization in the brain has focused on the difference between recognition of manmade artifacts versus living things (inanimate versus animate). The current research found support that motor properties of an object (manipulability) can also influence object recognition in healthy participants; properties such as whether or not an object can be picked up, and the number of functional uses of an object. These results have important implications for future models of object recognition and patient rehabilitation.

**XXIII Animal Neuroscience  
(Abstracts 202-206)**

**(201) Two versions of the win-stay task identified by lesions and outcome devaluation**

Nahas, Elia

White, Norman M.

Performance on the win-stay task on the 8-arm radial maze is impaired by lesions of the dorsolateral striatum and is unaffected by reinforcer devaluation, suggesting it is an instance of Stimulus-Response (habit) learning. Experiments using an automated radial maze have identified a version of the task that is impaired by lesions of dorsomedial, but not dorsolateral striatum and by reinforcer devaluation, suggesting it is mediated by action-outcome rather than habit learning. Identifying features of the two versions of the task that change the nature of the information learned will provide useful information about the properties of both kinds of memory.

**(202) The Effects of Maternal Care on Offspring Fitness in the Zebra Finch (*Taeniopygia guttata*)**

Phelan, Heather L.

Phillimore, Leslie S.

Variations in maternal care can cause adverse effects later in life for humans and rats (Liu et al., 1997). This study examined the role of single mother vs. biparental care on offspring fitness in the zebra finch (*Taeniopygia guttata*), a species that provides biparental care to their offspring (Zann, 1996). Parent and offspring behaviour was assessed; behaviourally, single mothers compensated for the missing father in most measures. Assessment of physiological stress responsivity provided inconclusive data. Discussion of results focuses on improving data collection to provide a better picture of parenting behaviour and offspring outcome in the zebra finch.

**(203) Analysing mouse behavior in a social setting in IntelliCages**

Mohammed, Abdul Kadir

Codita, Alina

Winblad, Bengt

Lipp, Hans-Peter

The IntelliCage is an automated system in which behaviour of up to 16 group housed mice can be

studied. The cages contain learning corners permitting assessment of cognitive abilities. In a study involving 4 labs in Europe we studied exploratory behavior and learning in the IntelliCage using 3 mice strains. We also examined cognitive behavior of transgenic mice in the IntelliCage. Our results show basic behavioral and learning measures of the 3 mice strains proved to be highly consistent in different labs. Alzheimer disease transgenic mice displayed behavioural deficits such as perseveration in an extinction test in the IntelliCage.

**(204) Seasonal variation in gene expression in response to playback of vocalizations by black-capped chickadees (*Poecile atricapillus*)**

Roach, Sean

Veysey, Andrew

Cormier, Jacquelyn

Phillmore, Leslie S.

Songbirds exhibit dramatic seasonal changes both in terms of brain (e.g. volume changes in the song system) and behaviour (vocalizations produced). We examined gene expression changes in the black-capped chickadee (*Poecile atricapillus*) by catching individuals when they were in breeding condition (spring) and non-breeding condition (fall/winter) and exposing them to conspecific and heterospecific auditory stimuli. Season seemed to play a role in ZENK expression in NCM and CMM especially in response to playback of heterospecific song. Additionally, we compared expression of FoxP2 levels throughout the brain related to season, stimulus heard, and vocalizations produced during playback.

**(205) Neural Correlates of Contextual Fear Conditioning in the Absence of the Hippocampus**

Sparks, Daniel William

Lehmann, Hugo

We examined the neural structures supporting context memories in the absence of the hippocampus. Following a contextual fear conditioning test, control and hippocampal-damaged rats were euthanized and their brains processed for c-Fos, a marker of neuronal activity. The control and hippocampal-damaged rats that received the conditioning had more c-fos expression in the amygdala than rats that only received context exposure. Greater c-fos

expression was also found in the perirhinal and cingulate cortices of the hippocampal-damaged, but not the control, rats. Combined these findings suggest that the perirhinal and cingulate cortices are regions supporting context memories in absence of the hippocampus.

**(206) 'Volitional' and 'Reflexive' Orienting: On Psychometric Properties and Individual Differences**

Waechter, Stephanie

Risko, Evan F.

Stolz, Jennifer A.

The orienting effect is a common index of spatial attention; however, little is known about its psychometric properties. We report two experiments examining the split-half reliability of orienting effects with predictive (80% valid) cues, two SOA conditions (100/900 ms) and three cue types (peripheral onset, arrow, and shape cues). Results indicate that peripheral and arrow cueing are somewhat reliable at the level of the individual, whereas shape cueing is not reliable. We also examine the correlations between cueing effects under different conditions. Implications for the reliability of effects that depend on reflexive versus strategic processes are discussed.

**(207) Adapting to simulated blindness**

Mahon, Andrew

Taylor, Jessica

Brown, Liana

The goal of this study was to characterize how healthy people adapt both their visual exploration and reaching behaviour to homonymous hemianopia. We simulated hemianopia using gaze-contingent displays: display items were drawn only to the left or right of the currently-sampled gaze position to invoke right and left hemianopia, respectively (Schuett et al., 2008). We timed participants' performance on a conjunction search task, and we measured the number, duration, and locations of their fixations. In a second experiment, we asked participants to respond by pointing to the target. Participants adapted their eye-movement patterns to reduce search times.



**(208) Are static and dynamic facial expressions processed by separate neural networks?**

Ouellette, Nicole  
Hamon-Hill, Cindy  
Barresi, John

We tested for a differential effect of interference with facial mimicry on emotion recognition in static or dynamic facial displays. Ninety-six participants (mean age = 21.2 (2.6) years) experienced a mimicry manipulation while observing either dynamic or static facial stimuli. The manipulation interacted with valence differentially between the static and dynamic groups,  $p = .004$ . Interference with mimicry resulted in slower processing of positive faces in static but not dynamic facial stimuli,  $p = .003$ . Our results provide a behavioral correlate to neurological studies (Kiltz et al., 2003) revealing separable neural activation during observation of static and dynamic facial expressions.

**(209) Are People's Attitudes About Risk Really So Inconsistent? Not If You Ask Them.**

Tombu, Mike  
Duncan, Matthew  
Mandel, David

Risk tolerance is often inferred from problems where participants choose between two courses of action, one with a sure and one with a probabilistic outcome. Preference for the former indicates risk avoidance, while risk seeking is inferred from the latter. Interestingly, attitudes are sensitive to problem framing. Negative frames promote risk seeking; positive frames risk avoidance. This inconsistency across equivalent problems is troublesome for rational views of decision-making. Here we test whether participants believe their attitudes are inconsistent by also collecting risk assessments. Contrary to classifications based on outcome variance, using perceived risk reveals relatively stable risk tolerance across frames.

**(210) Are there memory biases in alcohol consumption?**

Flesch, Corie Ann  
Roy-Charland, Annie  
Homeniuk, Andrew

Previous studies have found empirical evidence that, individuals that consume higher amounts of

alcohol show selective attention biases towards alcohol related stimuli. Several studies have found results supporting this but there has been little research done on the effect of alcohol consumption to memory biases. In attempts to add to this research field, individuals' ability to discriminate between new images and ones they have previously seen are explored while observing their eye movements. The number of correct discriminations between alcohol related (e.g., individuals drinking wine) and neutral images are measured as a function of eye movements to observe if alcohol consumption is a contributing factor in memory biases.

**(211) Assessing the effect of familiarity on change blindness for two classes of stimuli**

Tovey, Mark

The impact of object familiarity on change blindness was assessed. Familiarity was operationalized by presenting upright vs. inverted stimuli (Pashler, 1988) in a flicker paradigm (Richards, 2002). Main effects of familiarity were exhibited for both letter and face stimuli. The relationship between set size and familiarity was additive for both stimuli suggesting that object familiarity has its effects at a different locus than serial search.

**(212) Attentional load does not modulate the early visual-evoked gamma oscillation**

Ghorashi, Shahab  
McCarley, Robert  
Spencer, Kevin

Previous research has shown that the early visual-evoked gamma oscillation (VGI) of the EEG is reduced in schizophrenia patients (SZ) compared with healthy controls (HC) in visual discrimination tasks. We investigated whether attentional load modulates the VGI deficit in schizophrenia. The VGI deficit was not found, questioning the generality of the deficit; but a later visual-evoked gamma deficit was observed. Neither oscillation was modulated by attentional load. Instead, attentional effects were manifested in HC as beta activity over cortical areas involved in attentional control. This beta activity was absent in SZ, consistent with the attentional control deficits in this disorder.

### **(213) Attentional Set and Hemispheric Priming in a Dichotic Word/Emotion Task**

Techentin, Cheryl  
Voyer, Daniel

The present study investigated the influence of hemispheric priming on auditory asymmetries. Participants were presented dichotically with words pronounced in emotional tones and asked to identify a target word or emotion under 1 of 2 conditions. The blocked condition required detection of a word or emotional target in separate blocks. In the randomized condition, the target was changed across trials by means of a postcue. Although a REA for words was found in both conditions, a LEA for emotions was only found in the blocked condition suggesting that blocking the target increases laterality effects by priming the appropriate hemisphere.

### **(214) Auditory perceptual organization by location modulates serial short-term memory**

Chamberland, Cindy  
Tremblay, Sebastien  
Hughes, Robert W.  
Macken, Bill J.  
Jones, Dylan M.

The present study sought to examine whether perceptual organization influences auditory-verbal serial short-term memory. Lists of to-be-remembered digits were spoken from a single location or from multiple spatial locations. Our results showed that spatial variability impaired serial recall when the digits were spoken alternately via left-right loudspeakers (Experiment 1), but not when they were presented via seven speakers surrounding the participants (Experiment 2). Our findings provide further evidence that serial memory is influenced by the perceptual organization of the to-be-remembered sequence.

### **(215) Automatic versus controlled temporal preparation**

Capizzi, Mariagrazia  
Correa, Ángel  
Sanabria, Daniel

We investigated the nature of temporal preparation processes. If temporal preparation involves controlled rather than automatic processing, it should be impaired by the addition of

a secondary task. This hypothesis was tested by comparing three temporal preparation effects (foreperiod, temporal orienting, and sequential effects) between a single-task and a dual-task condition. Results showed that the foreperiod, but not sequential effects, was modulated by dual-task interference. Temporal orienting was impaired when temporal cues were manipulated in a within-block but not in a between-block design. These dissociations suggest that temporal preparation involves multiple processes ranging from controlled to automatic ones.

### **(216) If I keep on winning I am going to go broke: Physiological Responses to Slot Machine Outcomes**

Sandhu, Rajwant

Slot machine wins are accompanied by reinforcing sights and sounds. However, these reinforcements can also appear when the "win" is less than the wager. We predicted that arousal to these "losses disguised as wins" (LDWs) would be the same as to actual wins. Forty-six novice slot machine players' skin conductance response (SCR) and heart rate changes were recorded following wins, LDWs and losses. SCR amplitudes were the same for wins and LDWs, both of which were significantly larger than for losses. Problem gambling is linked to arousal; slot machines with LDWs trigger arousal more frequently than traditional two outcome machines.

### **(217) Bilingualism and language-specific attention control**

Duncan, Hilary D.  
Karpowicz, Lila  
Segalowitz, Norman  
Phillips, Natalie A.

We examined the effect of bilingualism on language-specific attention control using a switching task with an AABB design, wherein every other trial necessitated a switch of task set. Participants either indicated the distance (A:near/far) or position (B:above/below) of an object from a location (Relational condition) or the object's size (A:big/small) or category (B:living/nonliving; Semantic condition). Attention control was operationalized as shift-costs (Switch minus Repeat RT). Relational condition switch costs were significantly larger than semantic condition switch costs for monolinguals but not bilinguals, suggest

the bilingual advantages in executive function are also seen in specific language control abilities.

**(218) Challenging the reliability and validity of cognitive measures: the case of the numerical distance effect**

Maloney, Erin Anne  
Risko, Evan F  
Preston, Frank  
Ansari, Daniel  
Fugelsang, Jonathan A.

The numerical distance effect (NDE) is one of the most robust effects in the study of numerical cognition. However, the validity and reliability of the NDE across formats and paradigms has not been assessed. Here, we examine the reliability and validity of four frequently employed variants: two symbolic comparison and two nonsymbolic comparison variants. The results demonstrate that measures of the NDE that use nonsymbolic stimuli are more reliable than measures of the NDE that use symbolic stimuli. Furthermore, we find evidence that the NDE that arises using symbolic stimuli is uncorrelated with the NDE elicited by using nonsymbolic stimuli.

**(219) Change Blindness Across Glances**

Theus, Alex  
Brown, Matt  
Herdman, Chris

Change blindness research often uses a flicker paradigm in which observers fixate on alternating displays at a single location. Change blindness in non-laboratory settings is assumed to occur when an observer shifts their gaze between two (or more) locations, such as when a driver moves their eyes away from the road to examine their instruments or check their rear-view mirror. The present research examined change blindness under single-gaze (standard flicker) and dual-gaze conditions. Performance was measured for a single changing letter among a varying number of distractors. Evidence for change blindness was found in both single-gaze and dual-gaze conditions.

**(220) Change Detection and Confidence**

Fitzgerald, Ryan  
Oriet, Chris  
Price, Heather

Two studies explored how awareness of change in visual scenes influences confidence in a subsequent task. In Experiment 1, participants were instructed

to compare two arrays of faces and localize the one face that changed between them. In Experiment 2, participants watched a car theft video featuring a change between an innocent person and the thief. After viewing, participants in both studies completed a recognition task and provided a confidence rating. Although recognition accuracy was unaffected by awareness of change, confidence ratings were higher for those who detected the change in comparison to those who failed to detect the change.

**(221) Coda-deletion strategies in young children**

Penney, Catherine G.

An experiment was performed to identify strategies that young children employ in a coda-deletion task, strategies which produce responses that might sound correct to the untrained ear. However, when analyzed acoustically and behaviourally, these responses are not absolutely correct. Twelve such strategies were identified. Children who used these strategies were at an intermediate developmental stage for phoneme awareness, understanding the task but not quite being able to execute the response. A second finding was that children had alphabetic representations for codas before they could use the coda-deletion strategies or complete the coda-deletion task correctly.

**(222) Correlates of Psychophysiological and Experiential Measures of Emotion**

Birt, Angie

Individual differences in emotional responsiveness and regulation were examined in relation to psychophysiological and self-report measures of emotion. Participants watched three short (2 min.) videos depicting either positive, negative, or neutral events matched for level of detail and content. Heart rate and skin conductance were recorded as well as participant ratings of emotional experience. Individual difference measures of emotional intensity, empathetic tendencies, emotion regulation abilities, emotional intelligence, and sensation seeking were collected. Results indicate that most of the individual difference scores were related to either physiological reaction or self-reported experience, but not both. Implications for measuring emotion are discussed.

**(223) Developing the reverse association in children's multiplication and factoring**

Robinson, Katherine M.  
Campbell, Jamie I.D.

Adult research has shown that bidirectional facilitation of multiplication and factoring skills occurs when both operations are practiced but not when each operation is practiced singly (Campbell & Robert, 2008). Schools typically focus on children learning and practicing multiplication and factoring separately. Students in Grades 4, 5, and 6 solved both multiplication (e.g.,  $6 \times 8 = ?$ ) and factoring problems (e.g.,  $27 = ? \times ?$ ) to determine if performance at test in either multiplication or factoring would improve. Grades 5 and 6, but not 4, showed bidirectional facilitation for factoring whereas the converse pattern held for multiplication. Implications for mathematical cognition and education will be discussed.

**(224) Development of a paradigm for testing olfactory reversal learning in mice**

Wright, Lisa Dawn  
Schellinck, Heather

Using operant conditioning, water-deprived mice can be trained to discriminate between odours for reward. The present experiment assessed reversal learning following acquisition of criterion task performance. When the reward contingency was switched immediately, few mice learned to lick only for the newly rewarded odour, although some I29S6/SvEvTac mice did. CDI and I29S6/SvEvTac mice showed sex differences in response to reversal, whereby CDI males licked indiscriminately and females stopped licking altogether, but I29S6/SvEvTac mice showed the opposite. The tendency of I29S6/SvEvTac females to lick perseveratively may be relevant for the use of this strain as a mouse model of anxiety.

**(225) Direction, but not distance, cues support memory retrieval in texture discrimination**

Wright, Sandra  
Slade, Loni  
Skinner, Darlene  
Martin, Gerard

Both distance and direction are represented in the entorhinal cortex and may contribute to the differential encoding of memories. Rats can use

direction to determine which of two conflicting responses is correct in a left-right discrimination reversal problem. The current research demonstrates that: 1) directional control of texture discrimination reversals is limited to situations where the room also changes; 2) changes in both direction and distance walked do not facilitate texture discrimination reversal learning; 3) rats can learn discriminations based on direction but not distance walked. Thus direction, but not distance, cues are important to the encoding of learned events.

**(226) Direction, but Not Visual Cue, Changes Support Response Reversal Learning**

Tomlin, Julian R.  
Wright, Sandra L.  
Skinner, Darlene M.  
Martin, Gerard M.

Rats were trained on a response problem followed by four reversals using a T-maze within a curtained enclosure. Changes in orientation between reversals facilitated response reversal learning. Rats exposed to changes in the color and shape of the curtained enclosure between reversals performed no better than a control group that did not experience any changes. This experiment demonstrates that the facilitation of reversal learning that results from changing rooms cannot be due solely to a change in distal visual cues.

**(227) Do intervening distractors matter in the attentional blink? A test of two theories**

Lagroix, Hayley E.P.

Report of a second target (T2) is impaired when presented within about 500 ms of the first (T1). This second-target deficit is known as the attentional blink (AB). We used the following types of intervening events between T1 and T2 to test predictions from input-control (IC) models and delayed-attentional-engagement (DAE) models: (a) distractors, (b) long T1, (c) blanks, (d) blanks plus one distractor before T2. All produced an AB, with the magnitude being greatest in (a). ABs of comparable magnitudes were obtained in (b), (c), and (d), confirming predictions from DAE models but disconfirming predictions from IC models.

### **(228) Effects of Learning Latin on English Spelling**

Crawford, Nathanael Andrew  
Beall, Michael  
Deacon, Hélène

We examined the effects of learning Latin on spelling in English. We compared two groups of university students: 12 with an academic background in Latin and 12 without. These groups had similar general English spelling abilities ( $p = 1.00$ ). However, participants with a background in Latin were more accurate than those without such a background in spelling words with Latin origins, and also in spelling words with Greek origins ( $p < .001$ ). It seems that learning Latin has a general effect on the ability to spell morphologically-complex words in English, regardless of the specific etymology of the words.

### **(229) Effects of Spatial Separation on the Integration of Conflicting Multisensory Information**

Rasmussen, Sean A.  
Desmarais, Geneviève

Participants learned to identify shape/sound pairs with specific nonword names. In a subsequent experimental phase, participants 'named' shapes or sounds presented simultaneously with congruent or incongruent secondary-modality stimuli. Shapes were presented in one of five locations on a computer screen, and sounds occurred at equivalent or contralateral locations. Incongruent stimuli caused interference, with visual information interfering more than auditory information. Spatial separation further inhibited the naming of sounds presented entirely to the left ear when incongruent shape information was presented in the right visual field. These results suggest a lateralization of visual dominance modulated by left-hemisphere dominance for object naming.

### **(230) Effects of task specificity on error related brain activity: An electrophysiological study**

Cohen, Jessica E.  
Shedden, Judith M.

The error-related negativity (ERN) is an event-related potential indexing error related activity. Previous research has established that generalized anxiety affects overall error-processing, however it has not been established whether specific anxieties

affect error-processing. We investigated ERN amplitudes for math-anxious versus control individuals while performing anxiety-related (arithmetic task) and anxiety-unrelated (digit Stroop) tasks. Results from the arithmetic experiment showed ERN amplitude differences related to errors and task difficulty for the math-anxious group, but not for the control group. Critically, there were no group differences in the anxiety-unrelated digit Stroop experiment. These results suggest error processing may be sensitive to specific anxieties when the anxiety provoking stimulus is task relevant.

### **(231) Emotion enhances temporal resolution and augments the effect of covert spatial attention on temporal resolution**

Nicol, Jeffrey R.  
MacIsaac, Amy E.  
Murphy, Dana R.

Spatial resolution is enhanced by exposure to an emotional stimulus, and it is enhanced further when an emotional stimulus serves as a valid attentional cue. These benefits are likely caused by neural projections from the amygdala to visual cortex. Because these projections are putatively magnocellular, we wondered what effect emotion would have on temporal resolution. Our results show that the mere presence of an emotional stimulus enhances performance in a temporal gap-detection task, and that emotion augments the detrimental effect of attention on temporal resolution. These results represent the first behavioural investigation of the relation between emotion and temporal sensitivity.

### **(232) Endocannabinoid Signaling in the Rodent Anterior Cingulate Cortex Mediate the Neuroendocrine Response to Acute Stress**

McLaughlin, Ryan  
Hill, Matthew  
Lee, Tiffany  
Gorzalka, Boris

Endocannabinoid signaling is known to negatively regulate activation of the hypothalamic-pituitary-adrenal stress axis; however, the role of this system in the anterior cingulate cortex (ACg) has yet to be functionally characterized. We demonstrate that local administration of a CB1 receptor antagonist into the ACg significantly enhances corticosterone

secretion following exposure to acute restraint stress. Consistent with this finding, exposure to acute restraint stress significantly decreased content of the endocannabinoid anandamide in the ACg at these same time points. Collectively, these data argue that stress-induced mobilization of AEA/CBI signaling in the ACg contributes to the neuroendocrine stress response in rodents.

### **(233) Examining the Time-Course of Implicit Learning of Tip-of-Tongue States**

D'Angelo, Maria C.  
Humphreys, Karin R.

According to a two-stage model of language production, Tip-of-Tongue (TOT) states occur when the lemma of a word has been activated, but the phonology is only partially activated. It has been demonstrated that the longer an individual stays in a TOT state for a word initially, the more likely they are to TOT on that word 48 hours later. We measured this learning effect when two tests occurred on the same day, and when presented 1 week apart. Results demonstrate that implicit learning of TOT states can occur quickly and can still be measured after a delay of one week.

### **(234) Goal priming and resource harvesting decisions**

Arbuthnott, Katherine Diane  
Lawrie, Tricia  
Shearer, Rana

Goal representations are hypothesized to influence self-control behaviour, such that particular focal goals (Lindenberg & Steg, 2007), or goal construal (Trope & Liberman, 2003) either facilitate or impair delay of gratification. Two goal priming studies tested these hypotheses, measuring constraint on a resource-management task (Knapp & Clark, 1991). In Study 1 abstract and concrete goal construals were primed, and in Study 2 hedonic, gain, or normative goals were primed, followed in both cases by the harvesting task. Results indicated that both types of goal priming influenced harvesting choices, but contrary to the manner hypothesized in the literature.

### **(235) Graduate School Admission Requirements and Their Presentation on Schools' Websites**

Uttl, Bob  
McDouall, Joanna  
Stevens, Brittney

In two studies, we examined graduate school admission requirements (e.g., type of degree, GPA, GRE) by program (e.g., clinical), degree type (e.g., PhD), and other school characteristics. In Study 1, we examined graduate school admission requirements as listed in CPA Graduate Guide and APA Graduate Study in Psychology Guide. In Study 2, we examined graduate school admission requirements as presented on graduate program websites, as well as the organization and ease of information retrieval from these websites. Our findings dispel some misconceptions, show considerable variations in admission requirements, and reveal that the relevant information is difficult to find or absent on the majority of the program websites.

### **(236) Hemispheric asymmetries in the visual perception of emotions**

Brodersen, Etta Marie  
Voyer, Daniel

The present experiment tested current hypotheses concerning the lateralization of facial emotion processing. Fifty-two right-handed participants were presented bilaterally with faces expressing the emotions of anger, sadness, and happiness with either low or high intensity. On each trial, participants were asked to detect the presence of a specific target emotion. Results showed a left visual field advantage only for high intensity emotions. In addition, low intensity emotions were identified faster than high intensity emotions. The findings generally support the right hemisphere hypothesis of emotion processing. However, they also have possible ramifications for evolutionary explanations.

**(237) Heteronormativity and the Mismatch effect: The Role of Context in the Processing of Schema Incongruent Information**

Shilhan, Julie  
Young, Melissa  
Dickinson, Joel

When reading a text that has information that is incongruent with gender and sexuality schemas, there is a slowdown effect which is reflected in longer reading times and longer fixations. Discourse context has been shown to influence this slowdown effect. Two models attempt to account for this phenomenon: the lexical re-interpretation model and the two stage bonding and resolution model. The present research assesses these two models by examining the influence of context on the processing of information that is incongruent with existing sexuality schemas (i.e. wife in relation to a woman) using eye tracking measures.

**(238) Hippocampal-prefrontal cortical circuits subserve inhibitory response control in the rat**

Liu, Yuchen  
Doobay, Victoria Melissa  
Chudasama, Yogita

Rats with disconnection lesions of the ventral hippocampus (HCv) and ventral prefrontal cortex (PFv) in contralateral hemispheres (n=11), or sham control surgery (n=8) were tested in the 5-Choice Reaction Time Task (5CRTT). Both groups of rats showed high accuracy in detecting the visual target. However, only rats with HCv-PFv disconnection lesions were highly perseverative during the standard schedule of the task ( $F_{1,17} = 5.55$ ,  $P < 0.05$ ), and when the duration of the visual target was reduced ( $F_{1,17} = 7.45$ ,  $P < 0.05$ ). These results provide preliminary evidence that a hippocampal-prefrontal disconnection induces behavioural disinhibition in a continuous performance type of attentional task.

**(239) How forgetting one thought could lead to another: The control of working memory resources in intentional forgetting**

Fawcett, Jonathan Matthew  
Taylor, Tracy L.

We combined an item-method directed forgetting paradigm with a secondary task requiring a response to discriminate the color of probe words presented 1400 ms, 1800 ms or 2600 ms following each study phase memory instruction. Discrimination responses were slower following F than R instructions at the two longest intervals. Critically, at the 1800 ms interval, incidental probe word recognition was worse following F than R instructions, particularly when the study word was successfully forgotten (as opposed to unintentionally remembered). We suggest that intentional forgetting is an active cognitive process associated with establishing control over the contents of working memory.

**(240) Independence of graphomotor programs for print and cursive writing in a case of acquired dysgraphia**

Ingles, Janet  
Fisk, John  
Fleetwood, Ian  
Darvesh, Sultan

We report a patient with an acquired dysgraphia (DA) who was impaired at writing in lower- and upper-case print (with errors consisting of letter omissions, substitutions and misformed letters) but whose cursive writing was relatively intact. This pattern was consistent across a series of letter, word and non-word writing tasks. DA was unimpaired on tasks assessing visual recognition and imagery of these stimuli. Writing of digits, oral spelling and typing of words were also preserved. DA's unique pattern of deficits supports the neural independence of graphomotor programs for print and cursive letter styles, as well as for letters and numbers.

**(241) Influence of Feature-based Cues on Spatial Resolution**

Rajsic, Jason Daniel  
Wilson, Daryl Edward

A growing body of research has shown that spatial attention alters low-level perceptual processing. Here we explored whether feature-based attention

would also influence perceived spatial resolution. Each trial began with a brief presentation of a coloured cue in order to direct feature-based attention to that cue's colour. Following the cue, participants judged which of two differently-coloured Landolt squares possessed the larger gap. Our results suggest that the effect of feature-based attention on spatial resolution may differ from that of spatial attention.

**(242) Influence of Memory-Relevant and Memory-Irrelevant Features on Attentional Allocation**

Wilson, Daryl Edward  
Cheung, Tracy

On each trial, either the colour (colour-relevant condition) or the shape (colour-irrelevant condition) of a stimulus was held in memory. During the retention interval, a visual search task was completed on uniquely coloured letters. For the colour-relevant condition, there was a search benefit when the target letter was the same colour as the memory shape, and there was a search cost when one of the distractor letters was the same colour. For the colour-irrelevant condition, the benefit was eliminated and the cost was reduced. These results have implications for the extent to which working memory contents automatically influence attentional allocation.

**(243) Is illness-induced anorexia part of an energy conservation and predator avoidance strategy during immune challenge in the field cricket *Gryllus texensis*?**

Fairn, Evan R.  
Adamo, Shelley A.

Hart (1988) postulates that illness-induced anorexia is adaptive because it reduces foraging activity and thus contributes to a general strategy of energy conservation and reduced exposure to predators when immune challenged. If this hypothesis is correct, we predicted that individuals would: (1) exhibit illness-induced anorexia regardless of whether the immune challenge was primarily humoral or cellular because both are energetically expensive, (2) spend more time in shelter after an immune challenge, and (3) exhibit a greater latency to explore a novel environment after an immune challenge. We found little support for these predictions in the field cricket *Gryllus texensis*.

**(244) Is it a poem? How handheld devices affect cognitive processing of literary language**

Riegel, Christian  
Robinson, Katherine M.  
LeFevre, Jo-Anne  
Herdman, Chris M.

How do participants process poetic qualities of text when presented conventionally or when presented on handheld devices? Are visual cues integral in identifying poetic language? Participants were presented with 20 brief passages (half poems, half prose). Half were presented in full screen mode and half across several small screens (to mimic scrolling through a text message or email on a handheld device). Recall, reading speed, and comprehension were measured. Participants were asked to identify passages as poems or prose and asked to provide rationales for their decisions. How the results impact current knowledge in cognitive poetics will be discussed.

**(245) Is the performance of persons with autism “data driven”? The case of contingency use and higher order processing**

Hayward, Dana A.  
Burack, Jacob A.  
Shore, David I.  
Kovshoff, Hanna  
Iarocci, Grace  
Motttron, Laurent

The ability to use implicit or explicit contingency biases was examined among 16 high-functioning persons with autism and 15 typically developing individuals with a global-local task. Selective (SA) and divided (DA) attention were tested with hierarchical stimuli that were congruent (same shape at both levels), neutral (included target shape and circle), or incongruent (different shapes at each level). Target level rate for DA task was varied to test sensitivity to changes. Findings were consistent with Plaisted et al (1999) for SA, and with Ristic et al (2005) for contingencies in DA. Findings are discussed in relation to the EPF model.



**(246) Judging the authenticity of smiles: A study of the perceptual processes and the explicit knowledge that contribute to the appreciation of micro-expressions**

Bleach, Carolyn

Perron, Mélanie

Roy-Charland, Annie

Participants judging the authenticity of a smile, rarely have results surpassing that of chance. Smiles that express genuine happiness contain certain characteristics that indicate its authenticity. Smiles that mask a negative emotion although similar to the genuine smile, often contain micro-expressions of that negative emotion. This study is the first to utilize an implicit measure (eye movements) to examine how the perceptual system influences the ability to detect micro-expressions. Measures include the number of fixations in the zone containing the micro-expression and the time lapse before that zone is fixated. Furthermore, implicit measures are compared with explicit knowledge of micro-expressions.

**(247) Lesions of Basolateral and Central Amygdala Differentiate Conditioned Cue Preference Learning With and Without Unreinforced Pre-Exposure**

Naeem, Maliha

In the Conditioned Cue Preference (CCP) task rats learn to discriminate between separated radial maze arms while confined in one arm with food and in another empty arm (1 training trial (TT)). With no unreinforced pre-exposure (PE) rats acquired a CCP with 2 (impaired by central amygdala lesions) but not 1, 3 or 4 TT; with one PE session they acquired a CCP with 1, 3 and 4 (impaired by basolateral lesions) but not 2 TT. The double dissociation of lesion effects suggests that different types of learning underlie the discrimination acquired with each set of parameters

**(248) Levels of processing versus transfer-appropriate processing after two study trials**

Burnett, A. Nicole

Bodner, Glen E.

Studies of levels-of-processing and transfer-appropriate processing typically provide only one study trial per item, whereas studies of encoding variability provide multiple study trials. We

compared recognition on semantic- or rhyme-based 2AFC tests after targets were studied on one or two trials, each of which required either semantic or rhyme processing. Levels-of-processing predicts highest accuracy on both tests when both study trials were semantic. Transfer-appropriate processing predicts highest accuracy when both study trials match the test type. Encoding variability predicts highest accuracy when one study trial was semantic and the other was rhyme. Our findings support the levels-of-processing prediction.

**(249) Local vs. global processing in the search for a change**

Mullin, Conor

Richards, Eric

Previous research has shown that humans are incredibly poor at detecting changes to visual scenes, a phenomenon known as change blindness. The current studies examined how observers integrated low-level featural and more global shape visual information. Using a visual search task embedded within a change detection paradigm, observers' ability to detect feature, shape, and feature & shape changes (e.g., conjunctions) was assessed. The results are discussed in terms of the observers' reliance on featural-information (both local and global) and/or object-level information.

**(250) Manual and saccadic inhibition of return in visual neglect**

Bourgeois, Alexia

Chica, Ana

Bartolomeo, Paolo

When two events appear at the same location, responses to the second event are slower than when they occur at different locations. This effect, known as Inhibition Of Return (IOR), has been proposed to serve visual search. Here we investigated the IOR phenomenon for manual and saccadic responses in neglect patients. For manual responses, an abnormal facilitation was found, instead of IOR, for repeated right-sided events. However, saccadic IOR for the same stimuli was preserved. Manual and saccadic IOR might involve distinct neural substrates, with parieto-frontal networks implicated in manual IOR and subcortical structures in saccadic IOR.

### **(251) Measuring the Components of Attention**

Butler, Beverly C.  
Eskes, Gail A.  
Klein, Raymond M.

The measurement of attention is important in clinical and developmental studies aimed at understanding mechanisms and rehabilitating and/or enhancing function. We have developed a theoretically-driven computerized battery of tests of attention: the Dalhousie Computerized Attention Assessment Battery (DalCAB). Reaction time (RT) and accuracy data from healthy young adults have been analyzed at three time points on measures including simple RT, go/no-go, choice RT, a dual task, a flanker task, verbal and spatial memory span tasks, and a visual search task. The validity, reliability and applicability of the attention measures will be discussed.

### **(252) Metamemory for Faces, Names, and Words**

Watier, Nicholas  
Collin, Charles

Traditionally, researchers have relied on verbal stimuli to probe metamemory processes. Relatively few studies have used visual stimuli. We compared metamemory accuracy between face-name pairs and noun-noun pairs in order to determine if metamemory functions differently depending on the domain of stimuli. The relative accuracy of prospective monitoring judgements was similar between both domains, whereas the relative accuracy of retrospective monitoring judgements was superior for verbal compared with visual stimuli. These results support a domain-general characterization of prospective metamemory and a domain-specific characterization of retrospective metamemory. Additionally, we found that participants can accurately monitor their memory for face-name links.

### **(253) Modulation of Inhibition of Return by target duration and reorienting events (Cue-back)**

Martín-Arévalo, Elisa  
Lupiáñez, Juan

Inhibition of Return (IOR) consists on slower reaction times responding to stimuli appearing at locations where attention has been involuntarily captured previously as compared to new locations.

Despite IOR is a well known effect, the exact mechanisms underlying the effect and its task dependency have not been determined yet. In the present work, we found that in discrimination tasks IOR depends on the presentation of a reorienting event between the cue and the target (i.e., "cueback") as well as on target duration. The possible mechanisms for these effects are discussed.

### **(254) Novel-View Scene Recognition is Enhanced by Active Compared to Passive Scene Rotation**

Wade, Mark A.  
Sun, Hongjin  
Dzebic, Vedran

Viewpoint shifts reduce an observer's ability to detect changes to a spatial scene - an effect that is mitigated when the shift is achieved through observer locomotion. The present study aimed to examine whether active control over the viewpoint shift can account for this facilitative effect of locomotion. Participants learned an arrangement of objects, and then identified a change to the scene following a viewpoint shift that they actively controlled or passively experienced. Active control resulted in superior change detection accuracy, suggesting that the facilitative effect of locomotion may partially be attributed to active control over the viewpoint shift.

### **(255) On the move: The role of prediction in maintaining object-based inhibition of return**

Krueger, Hannah Marie  
Kwasnicka, Dominika  
Hunt, Amelia

For efficient search of dynamic environments, attention needs to be maintained on objects when they move in the environment. We measured inhibition of return (IOR) to cued objects when the scene shifted in the same direction on every trial, relative to when the scene shifted in an unpredictable direction. IOR was maintained on a moving cued object only when the scene moved predictably. Unpredictable motion attenuated IOR. The results suggest that object-based IOR in part depends on the ability to anticipate or track the motion path of the object.

### **(256) Pitch Contour Detection and Embodied Cognition**

Reimchen, Melissa  
Granzow, John Edward  
Vokey, John Richard

Tone pairs consisting of overtones that move in opposition to their implied, yet absent fundamental frequencies, were used in a pitch contour detection task. Prior to reporting whether a given pair went up or down in pitch, participants were asked to match the tones vocally. Within subject interactions between vocal production and perceptual reports were explored. Furthermore, measures of musical experience and the autism spectrum were acquired through post test interviews and considered as potential factors in performance differences.

### **(257) Quantitative and Research Methods Requirements for Undergraduate Major and Honours**

Uttl, Bob  
Mitchell, Christina

Research methods including research design, data analysis, and data interpretation play a pivotal role in psychology. We examined university calendars and websites to discover the relevant course requirements for undergraduate major and honours degrees in psychology. Specifically, we examined (1) statistics and research methods requirements, (2) mathematics and computer science requirements, and (3) quantitative, research methods, and research experience course offerings (both elective and required). Our findings reveal considerable variability in undergraduate quantitative and research methods requirements and preparation of today's undergraduate students.

### **(258) Rats orientation at the start point is important for place and direction learning in a water T-maze.**

Skinner, Darlene  
Peckford, Genieve  
Martin, Gerard

Rats appear to solve place problems by learning a conditional discrimination based on start point orientation. To determine if other spatial problems are solved using this conditional strategy we trained rats on a direction task in a water T-maze positioned at two locations. After acquisition the maze was moved to two new locations. Rats

trained to make the same response, relative to start point orientation, performed better than rats trained to make the opposite response, suggesting that start point orientation is important.

### **(259) Re-examining Dissociations of Remembering and Knowing: Orthogonal Judgments vs. Independent Ratings**

Brown, Aaron A.  
Bodner, Glen E.

Repetition priming on a recognition test increases knowing but does not affect remembering. This dissociation could be an artifact of collecting orthogonal remember/know judgments. Consistent with this possibility, when participants rate both recollection and familiarity priming increases both ratings. However, this latter result could be an artifact of participants not making both ratings independently. We had separate groups make remember/know judgments, rate either recollection or familiarity, or rate both. Priming affected familiarity more than recollection except when participants made both ratings. We conclude that the dissociation is valid and that participants asked to make both ratings often conflate them.

### **(260) Reading and understanding complex words: Are children aware of the morphological structure of words?**

Francis, Kathryn  
Deacon, Helene

This study investigated children's use of morphological structure when reading and understanding derived words. We asked children in grades 3 and 5 to read and to indicate the meaning of low frequency derived words. Children were more accurate when reading and understanding words with high than with low frequency bases. Children were also faster in reading words with high rather than low base frequencies. These findings suggest that grade 3 and 5 children use morphological structure to read and understand unfamiliar complex words. They are the first to directly evaluate this impact on children's understanding of individual words.

**(261) Reexamining the Relationship between Diffusion/Focus of Attention and the Attentional Blink**

Dale, Gillian

Arnell, Karen M.

When identifying two targets in RSVP, accuracy for the second target is reduced if presented shortly after the first -- an attentional blink (AB). Studies suggest that when a broadened/diffused attentional state is induced, the AB is attenuated. Our study examined whether inducing a diffused or focused state within subjects via a global/local task manipulation could influence AB magnitude. While the global/local manipulation of attention had no effect on AB magnitude, dispositional diffusion/focus predicted performance on the AB, such that individuals who were globally biased had smaller ABs. This is discussed in terms of the stability of diffusion/focus of attention.

**(262) Repetition and distinctiveness in item memory**

Fazaluddin, Anjum

Singer, Murray

Andrew, Kathy M.

Signal detection analysis of Singer's (Memory & Cognition, 2009) category-word recognition data suggested surprisingly high memorability for unrepeated items from one category relative to repeated items from another. We asked whether this stemmed from the distinctiveness of the unrepeated items. Experiment 1 confirmed higher signal-detection strength for unrepeated items from a category DISTINCT from the repeated items than for ones from the same category. The latter outcome does not accrue from the confounding of distinctiveness and number of studied categories (Experiment 2). It is concluded that memory weakness due to lack of repetition may be somewhat offset by the distinctiveness of unrepeated items.

**(263) Self-control effort as a function of Stroop congruence probability**

Cote, Leonard

Arbuthnott, Katherine Diane

Self-control is the ability to direct one's thoughts and behaviours in the face of competing motivations. Exercising self-control appears to require a limited resource that is reduced with use (Muraven & Baumeister, 2000), including for

cognitive control such as the Stroop task (Wallace & Baumeister, 2002). A pilot study was designed to examine whether the probability of incongruent colour-word trials influences self-control effort as indexed by self-control depletion on a subsequent control task and whether this depletion decays over time. Results suggested that self-control effort was greater with a higher probability of incongruent trials despite faster performance in this condition.

**(264) Short-term spatial memory in fetal alcohol spectrum disorder: an fMRI study**

Hall, Jonathan George

Bolster, Richard Bruce

Malisza, Krisztina L.

Chudley, Albert E.

Longstaffe, Sally

Clancy, Christine

Shiloff, Deborah

Gervai, Patricia

Children with fetal alcohol spectrum disorder (FASD), age-matched child controls, and neurologically intact adults performed a spatial working memory task while undergoing functional MRI. A control task used the same stimuli and responses without the memory component. In subtractive contrasts, adult controls showed significant activation in the postcentral gyrus, dorsolateral frontal cortex, basal ganglia and medial occipital regions. Activation in child controls was similar, but the dorsolateral frontal activation was absent. Activation in FASD participants was confined to the postcentral region. Results are discussed in terms of the contribution of postcentral regions to movement planning, and the development and function of the dorsolateral frontal cortex.

**(265) Solving Speed-Accuracy Space**

Lawrence, Michael A.

Speeded discrimination tasks yield two variables of interest: response time (RT) and error rate (ER). Researchers have long known the importance of inspecting both RT and ER to differentiate variables that cause a true improvement in performance versus those that simply elicit a trade-off between speed and accuracy. However, separate analysis of RT and ER risks losing power to detect the true nature of a variable's effect on performance, including the detection of speed-accuracy

tradeoffs. A solution is achieved by analysis within speed-accuracy space itself using a combination of mixed effects analysis and bootstrap resampling.

**(266) Source and Destination Memory: Active and Passive Engagement**

Graf, Peter

Does being an active participant in sending and receiving information affect source memory -- our ability to remember the origin of events, and destination memory -- our ability to remember the destination of events. Subjects participated in a group setting, where one participant was the recipient or sender and others served as sources or destinations. Memory performance showed the expected benefit due to being an active participant rather than a passive observer.

**(267) Source Monitoring and Prospective Memory in Younger and Older Adults**

Hutchings, Veronica

The influence of source monitoring (SM) ability on prospective memory (PM) was examined in two studies designed as analogous to a natural situation. In each study, younger and older adults were exposed to two sources which provided consistent and inconsistent information about music and were instructed to listen to the music recommended by one of the sources. Participants' SM ability and PM performance were measured a week later. Age differences favouring younger adults were found in both studies in the SM and PM retrospective data. Regression analyses indicated that SM partly predicted PM performance at session 2.

**(268) Strategies in Single-Digit Addition: How Do You Know " $2 + 1 = 3$ "?**

Barnum, Geoffrey

Smith-Chant, Brenda

This study explored the role of problem-size and arithmetic skill in strategy-selection in single-digit addition using a traditional self-report methodology and shifts in the ex-Gaussian distribution parameter estimates. Forty-three undergraduates solved single-digit addition questions and following each trial reported which strategy they used to solve the problem. Traditional measures were examined and response latencies were fitted to the ex-Gaussian distribution. The pattern of strategy reports and shifts in the ex-Gaussian distributions indicated that these parameter estimates provide a unique method of

quantifying strategy selection. Results are discussed in terms of theoretical models of arithmetic fact retrieval and individual differences.

**(269) Testing the embodied view of object recognition**

Matheson, Heath

McMullen, Patricia

Mounting evidence from behavioral research demonstrates that images of tools potentiate motor responses. We sought further evidence for this in an object naming task while observers squeezed a ball with their right hand. The objects were oriented to the right or to the left. It was hypothesized that this arbitrary motor act would prime object naming, especially for categories that are associated with motor acts (e.g. a hammer but not a lion); further, we hypothesized that this priming effect would be salient for objects oriented towards the right hand. Preliminary evidence supports these predictions.

**(270) Testing the habituation hypothesis: The effects of stimulus intensity on inhibition of return**

Dukewich, Kristie R.

Lawrence, Michael A.

Klein, Raymond M.

Dukewich (2009) argued that the IOR effect is a product of habituation based on repetitive stimulation of a location in space. This argument yields several predictions that have so far not been tested. In the current study we sought to test one of the more counter-intuitive predictions: IOR should be elicited faster and/or to a greater degree using less intense stimuli than more intense stimuli. We conducted experiments aimed at determining the effects of cue and target intensity on the IOR effect. Using a Posner cuing task and a methodology refined across 3 experiments, we eventually find effects consistent with the classic characteristic of habituation. We argue that this is further evidence that IOR is a space-based manifestation of habituation.

**(271) The Attentional Disengagement Model of the Missing-Letter Effect: A Test of the Attentional Beam**

Lalande, Amanda

Roy-Charland, Annie

When reading, participants miss more target letters in frequent function compared to rare

content words. The Attentional Disengagement model proposes that the missing-letter effect is due to the precise timing of attentional disengagement. This study constitutes the first systematic exam of the attentional beam within the context of the missing-letter effect. Transforming division signs into minus signs within the beam should yield differential rates of omission as a function of probe delay and word type. Attention should disengage more rapidly from regions associated with frequent function compared to rare content words, for processing should be homogenous within the attentional beam.

**(272) The effect of attention style on intentionally forgetting among high anxiety sensitive individuals**

Noel, Melanie  
Taylor, Tracy L.  
Stewart, Sherry H.  
Quinlan, Chelsea K.

We examined the impact of attention style on intentional forgetting in individuals with anxiety sensitivity (AS). By incorporating an inhibition of return (IOR) task within the study phase of an item-method directed forgetting paradigm, we were able to categorize high, moderate, and low AS individuals according to attention style: 'attenders' (small IOR effect) and 'avoiders' (large IOR effect). The directed forgetting effect was larger for 'avoiders' than 'attenders' but only for anxiety-related words and in high AS individuals. These findings demonstrate the importance of attention style in moderating the effect of AS on the ability to intentionally forget anxiety-related words.

**(273) The effect of immune system activation on aggressive behavior in the male cricket *Gryllus texensis***

Simpson, Alexander G.  
Fairn, Evan R.  
LeDue, Emily E.  
Adamo, Shelley A.

Animals have finite resources. Assuming that mounting an immune response to bacteria redirects resources towards immunity; animals may reorganize behavior to best suit current resource demands. Aggressive behavior is important for male reproductive behavior. Male crickets decrease male-male aggressive behavior 90 minutes after an immune challenge with heat-killed bacteria. No

effect was seen 5 minutes, 15 minutes or several days after challenge. Immune activity appears to impair aggressive behavior, due to a trade-off between the resources needed for both activities.

**(274) The effect of ventral hippocampal lesions on discrimination and reversal learning**

Abela, Andrew Robert  
Hill, Carolyn  
Chudasama, Yogita

In rats, lesions to the ventral hippocampus (HCv) increase impulsive behaviour (Dougherty, Fagen, Chudasama, 2008, SFN #876.6). To explore the selectivity of this inhibitory deficit, we compared rats with HCv lesions (n=14) with sham controls (n=8) on a discrimination and reversal learning task. Our preliminary results showed that both groups of rats successfully acquired the visual discrimination (mean accuracy  $\pm$  SEM: HCv, 67.2%  $\pm$  1.6; Sham, 67.7%  $\pm$  1.7). Furthermore, when the stimulus-reward contingencies were reversed, the HCv lesion had no effect on perseverative responses. Together, these results implicate a role for HCv in selective aspects of inhibitory control.

**(275) The Effect of Word Frequency and Regularity on BOLD activation during Go No-Go Naming**

Cummine, Jacqueline  
Esopenko, Carrie  
Sarty, Gordon E.  
Borowsky, Ron

Word frequency and regularity were examined during an fMRI study using a Go No-Go Naming task (i.e., name words but not the nonwords, forcing lexical access). Participants named high frequency (HF) and low frequency (LF) regular words (REGs) and exception words (EXCs). The effect of regularity was small for HF stimuli, whereby REGs and EXCs produced shared activation in the left temporal and inferior frontal regions. The effect of regularity was greater for LF stimuli, whereby REGs and EXCs produced unique activation in the temporal and inferior frontal regions. As expected, forcing lexical access primarily activated the ventral visual processing stream.

**(276) The effects of faces, emotion, and context on the mere exposure effect**

Quinlan, Chelsea  
Johnson, Shannon  
Filliter, Jillian

We examined the effect of emotional faces and context on the mere exposure effect (MEE), the finding that repeated exposure to a stimulus results in enhanced preference for that stimulus. We employed a between-subjects design to test the factorial combination of the emotion presented during the exposure phase (happy, angry) and the rating phase (happy, angry). There was no MEE for emotion, but there was an effect of context. A MEE was present for context match (happy-happy, angry-angry), but not context mismatch (happy-angry, angry-happy). Findings will be discussed in terms of both a cognitive and affective perspective of the MEE.

**(277) The Effects of Trait Mindfulness on Multiple Components of Attention: Evidence from an Emotional Attention Networks Test**

Ganaden, Rachel  
Smith, Stephen D.

Previous research has demonstrated that mindfulness improves performance on the executive control component, but not the alerting or orienting components, of the Attention Networks Test (ANT). The current research extends this work by examining the role of mindfulness on the emotional modulation of attention. Participants who were high or low on trait mindfulness completed emotional variants of the ANT in which stimuli were either identical to the original ANT (asterisks and arrows) or were emotional faces. The results demonstrated that high-mindful individuals were less affected by negative emotional cues (orienting) and incongruent emotional flankers (executive-control) than were low-mindful individuals.

**(278) The Function of Aggression in Orphaned Worker Bumblebees (*Bombus impatiens*): A Tool of Reproductive Suppression?**

Sibbald, Emily D.  
Plowright, C.M.S.

Aggression is interpreted as a tool of reproductive suppression in orphaned worker bumblebees

because it is positively associated with ovarian development. This does not exclude the possibility that aggression is merely a byproduct of ovarian development and is not useful in reproductive competition. Workers were categorized on levels of sociality and paired into the following; high-high, high-low, low-low or low-male conspecific. If aggression is used in reproductive suppression it should be reduced when a worker is placed with a male. Aggressive frequency and ovarian mass were measured. Pronounced group differences were observed but the trend was not linear.

**(279) The Impact of Training on Object Naming and Action Production**

Dinan, Randal  
Desmarais, Geneviève

We investigated how the strength of associations between novel objects, actions and nonword labels changes. Participants were presented daily with interleaved learning and test trials to associate object/action/label triads. On days 1 and 5, they were also asked to name objects, name labels, gesture to objects and gesture to labels. All tasks were performed faster on day five, and labels were named consistently faster than objects. Importantly, on Day 1 participants produced actions faster in response to labels, an advantage that disappeared by day five. This suggests that repeated exposure is needed to establish strong links between objects and actions.

**(280) The importance of form and action congruence in novel object identification**

Hudson, Pamela Lynn  
Desmarais, Geneviève

We examined the effect of incongruent pre-existing knowledge on novel visual object identification. Participants learned to associate novel objects with specific names and actions through interleaved learning and naming trials. Object names were either congruent or incongruent with the objects' visual or action characteristics. Participants who learned incongruent associations produced more naming errors than participants who learned congruent associations. Importantly, the interference caused by incongruent visual knowledge was greater than that caused by incongruent action knowledge. This study suggests that both visual and action information attached to the labels used to identify

the objects interfered with learning the new associations.

**(281) The influence of neighbourhood size on recall performance of short and long nonwords**

Jalbert, Annie

Neath, Ian

Surprenant, Aimée

Most previous studies on the word length effect (WLE; better recall of short than long words) have confounded length with orthographic neighborhood size. An orthographic neighbour is a word that differs by exactly one letter from the target nonword. Because long English words do not have many orthographic neighbours, we have not yet examined recall of long items from large neighbourhoods. In three experiments, we use nonwords which allow a systematic manipulation of both size and length. The results add to the growing literature showing problems for theories of memory that include decay offset by rehearsal as a central feature.

**(282) The temporal parameters of visual-proprioceptive intermodal perception in adults**

Collins, Stephanie

Yuill, Kathryn

Moore, Chris

This study investigated the effect of different movement types on the temporal parameters of visual-proprioceptive integration. Participants performed either a discrete or continuous movement with one hand while simultaneously viewing a video of this action that was either live or delayed by 33, 66, 99, 132, or 165 milliseconds (ms). At the end of each 5-second trial, participants were asked to report whether the video was live or delayed. Results indicated that the temporal threshold for delay detection when performing a discrete movement was 81.29ms; this was significantly lower than the threshold for continuous movement which was 113.10ms.

**(283) Using change detection to explore the role of features and context in object recognition**

LaPointe, Mitchell

Vokey, John R.

Wu, Wen

Tangen, Jason

Using a change-detection paradigm, we evaluated the speed and accuracy of object detection for five categories: animals, people, plants, fixed, and moveable. We manipulated both the placement of the object and the contextual appropriateness of the background by presenting the objects in a variety of locations and scenes. Further, we blurred the objects, removing the higher-level category specific features. Across manipulations, the people object category was consistently detected fastest. When the high-level features of the object were removed, detection was quickest when presented on a contextually appropriate background, suggesting successful detection relies on more than just the object.

**(284) Visual Search in Autism: a consistent islet of ability?**

MacLeod, Jeffrey W.

Bryson, Susan E.

Klein, Raymond M.

Four published empirical studies have demonstrated that children and adults with Autism Spectrum Disorder (ASD) perform more efficiently than typical controls on difficult visual search tasks. Recently we (MacLeod, Bryson, & Klein, unpublished) attempted to replicate this result while investigating whether greater inhibition of return (IOR) in the aftermath of visual search can explain enhanced visual search efficiency in people with ASD. No differences in visual search efficiency or amount of IOR were detected between the ASD and control groups. Potential reasons for this non-replication of previous results are discussed.

**(285) When Does the Cognate Advantage Arise in Masked Translation Priming?**

Nakayama, Mariko

Hino, Yasushi

Sears, Christopher R.

Lupker, Stephen J.

In previous research using the lexical decision task with L2 targets and masked L1 primes, a larger



translation priming effect has typically been reported for cognates than for noncognates (e.g., Dunabeitia et al, 2009), although some studies have reported no cognate advantage (e.g., Kim & Davis, 2003). Because target frequency and L2 proficiency varied across studies, we re-examined masked translation priming effects by manipulating these variables using Japanese-English bilinguals. In our experiments, the cognate advantage disappeared when the L2 targets were high-frequency words and the bilinguals were very proficient in L2. The results are discussed in terms of “lexical integrity”; in L2.

### **(286) Why Teaching Quantitative Courses Is Hazardous to Your Career**

Uttl, Bob

Smibert, Dylan

Student evaluations of teaching (SETs) are used by universities worldwide. Although numerous studies have found that SETs correlate with teaching effectiveness irrelevant factors (TEIFs) such as subject and easiness, it is often argued that the effects of TEIFs are small. These conclusions, however, are based on analyses that have ignored ceiling effects and used inappropriate effect size measures. We analyzed over 10,000 SETs and demonstrate that the effects of TEIFs are large. To illustrate, in comparison to other subjects, professors teaching quantitative courses are far more likely to be labeled “unsatisfactory”; and less likely to receive teaching awards.

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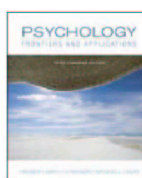


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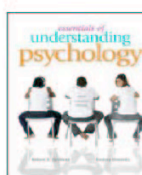
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