

Friday June 20

1.1 Language and memory

9:00 - 10:30, Somerville 3345

Chair: M. Singer

9:00 Brendan Johns¹ (johns4@indiana.edu), Micheal Jones¹, Elizabeth Johns², Douglas Mewhort²
*(1) ¹Indiana University, ²Queen's University

Using a contextual co-occurrence learning model to predict item-specific retrieval and recognition effects.

What sources of statistical information do humans leverage to organize the mental lexicon? Classic accounts of learning based on repetition have recently been challenged by rational theories of “likely need” for memory organization from environmental structure. We evaluate both theories by building and testing computational models of memory organization based on a co-occurrence learning mechanism, and by quantitatively fitting the models to human data. We will also discuss the application of a simple processing model of recognition memory, based on the Iterative Resonance Model (Mewhort & Johns, E., 2005, Memory), which uses the representation attained from the learning model to simulate a range of results from recognition experiments.

9:15 Ben Bauer¹ (benbauer@trentu.ca), Jennifer Finbow¹, Lori Holt²
(2) ¹Trent University, ²CMU

Mean words prime.

The results of many studies suggest that human observers represent the gist of a scene or objects using the average (arithmetic mean) of relevant properties (e.g., Ariely, Psych. Sci. 2001; Haberman & Whitney, Cur. Biol. 2007; Holt, J. Acoust. Soc. Am. 2006). The present experiments reveal that speech significantly over-represents the signal needed to access semantics by demonstrating cross-modal semantic priming using unintelligible, spectrally band-averaged auditory primes. The mean matters.

9:30 Cara Tsang (cara.tsang@utoronto.ca), Craig Chambers
(3) University of Toronto

Appearances aren't everything: When perceptual and linguistic cues diverge during online language processing.

Recent research has argued that perceptually-rich representations are used during real-time language processing. Chinese classifiers (words that denote coarse noun categories based on object shape/size) provide a unique case where perceptual information can potentially conflict with abstract grammatical rules governing classifier-noun combinations. Results from offline tasks and visual-world studies showed Chinese listeners were strikingly insensitive to perceptual features of scene objects, and attended only to objects that could potentially combine grammatically with the classifier as a classifier+noun sequence was heard. These outcomes indicate that grammatical constraints take precedence over perceptual information when processing the semantics of sentence units.

9:45 Barbara Rutherford (barbara.rutherford@ubc.ca)
(4) UBC Okanagan

Reading context and laterality: Symmetry to asymmetry.

Two lexical decision experiments manipulated the context within which one, other, or both hemispheres processed high familiarity word targets. One experiment restricted word targets to high familiarity words; the other included low familiarity words. In both experiments, accuracy of response to high familiarity words was close to ceiling and did not differ across the hemispheres or between one and both hemispheres. In contrast, a lack of laterality in response time shifted to a left hemisphere advantage when the same high familiarity words were embedded with low, suggesting that reading context is a unique contributor to laterality effects.

Friday June 20

10:00 Todd Ferretti¹ (tferrett@wlu.ca), Murray Singer², Courtney Patterson¹
(5) ¹Wilfrid Laurier University, ²University of Manitoba

Electrophysiological evidence for the time-course of verifying text ideas.

We used ERP methodology to examine how verb factivity influences the ability of readers to detect and resolve the mismatch of receiving false referents in discourse contexts. Factive verbs (e.g., know), but not nonfactive verbs (believe), entail the truth of their complements. Our results suggest that readers have greater difficulty integrating false nouns than true nouns following factive than nonfactive verbs, and that detection of this mismatch occurs earlier following factive verbs. These findings provide insight into the time-course of the processes that underlie the verification of text ideas and extend neurocognitive research on anaphoric resolution.

10:15 Murray Singer (m_singer@umanitoba.ca)
(6) University of Manitoba

Strength-based criterion shifts in recognition memory for texts and categories.

My previous research has documented that people apply more liberal answering criteria to temporally-remote than recent test items that appear within a list. New experiments document analogous criterion shifts when test items have been encountered once (weak) as compared with twice (strong). This result obtains both for texts and category lists. The category-list result differs from others documented in the literature. The discrepancy may be due to blocked-category study in these experiments as compared with random category study in the others. Criterion shifts may be enabled by conspicuous familiarity differences between less- versus more-memorable items.

1.2 Symposium Children's Mathematical Cognition

9:00 - 10:30 Somerville 2355

Chair: K. Robinson

9:00 Alba Agostino¹ (agostino@uoguelph.ca), Alice Klein², Prentice Starkey², Marcia Barnes¹
(7) ¹University of Guelph, ²University of California, Berkeley

Informal math abilities in low-income preschoolers: An investigation of performance patterns and strategy use.

Informal math skills were examined in a sample of 479 low-income preschoolers (mean 3.85 years). Although low-income young children have been found to perform worse than middle-class children on informal math tasks, few studies have investigated both preschooler's abilities and strategy use. Children use more sophisticated strategies as they get older, and this is assumed to reflect development in conceptual knowledge. The relationships between strategy use, competence, and age will be examined. In addition, confirmatory factor analysis will be used to determine the relationships among the various informal math skills, such as counting, number knowledge, quantity discrimination, and non-verbal calculation.

9:15 Adam Dubé¹ (dubeadam@hotmail.com), Katherine Robinson²
*(8) ¹University of Regina, ²Campion College, University of Regina

Skills underlying inversion shortcut use: The role of analogical reasoning and working memory.

Across Grades 2 to 4, there is a relationship between children's mathematical and analogical reasoning (English, 2004). In this study, children from Grades 6 (n = 39) and 8 (n = 41) solved inversion ($d \times e \div e$) and analogy problems. The children's conceptual understanding of mathematics was indexed by their frequency of inversion shortcut use (e.g., $d \times e \div e$; Bizans & LeFevre, 1990). Children who possessed high analogical reasoning ability used the inversion shortcut more frequently than children who possessed low analogical reasoning ability. This study indicates that the relationship between these two domains persists into early adolescents.

Friday June 20

9:30 Bert De Smedt¹ (Bert.DeSmedt@ped.kuleuven.be), Ann Swillen², Lieven Verschaffel², Pol
(9) Ghesquiere²

¹University of Leuven, Belgium/University of Western Ontario, ²University of Leuven

Basic number processing and single-digit arithmetic in dyscalculia: Evidence from children with chromosome 22q11 deletion syndrome.

It has been proposed that dyscalculia emerges due to impairments in basic number processing. We examined this hypothesis in 22q11 deletion syndrome (22q11DS), a genetic disorder with a high prevalence of dyscalculia. Twenty-five children with 22q11DS and 25 individually matched controls participated. Children with 22q11DS showed a consistent pattern of deficits in number comparison, large addition/subtraction and the use of procedural back-up strategies, indicating an impaired quantity subsystem and intraparietal dysfunction. However, the verbal subsystem (number reading, multiplication and fact retrieval) was preserved. Correlational data showed that basic number processing skills directly accounted for single-digit arithmetic performance and strategy use.

9:45 Brenda Smith-Chant¹ (bresmith@trentu.ca), Lisa Fast², Jo-Anne LeFevre², Jeff Bisanz³, Marcie
(10) Penner-Wilger², Sheri-Lynn Skwarchuck⁴, Deepthi Kamawar²

¹Trent University, ²Carleton University, ³University of Alberta, ⁴University of Manitoba

That's about the size of it: Children's performance on a Stroop style numerical magnitude comparison task.

Developmental theories of mathematical cognition are frequently based on the idea that numerical magnitude understanding is a core foundational skill upon which other numeracy skills are based. Accordingly, children who have difficulties processing numerical magnitude are at risk of having problems developing other mathematical concepts. Two-hundred and seventy nine children in grades 1 to 5 from the Count me in, too! longitudinal study completed a modified numerical Stroop task (Landerl, 2004) where the numerical magnitude of single digits was confounded with physical appearance on 50% of trials (incongruent condition). On the other 50%, numerical magnitude and physical size was congruent. A substantial portion of children used unexpected strategies to complete the task, which created unusual patterns of errors and reaction times across trials. The impact of strategy use on the pattern of numerical magnitude comparison for high and low-skilled children will be discussed.

10:00 Lucia Van Eimeren (lvaneime@uwo.ca)

*(11) University of Western Ontario

What gets counting off the ground? The role of small number enumeration in children's understanding of the meaning of counting.

Recent research suggests that infants rely on different systems for the representation of small and large numerosities. To date, it is unclear how these representations constrain the acquisition of verbal counting. Here we measured children's (age 2-4 years) understanding of the meaning of counting ('cardinality principle'), the ability to enumerate small (1-3) and large sets (4-5), large numerosity comparison skills and performance on standardized tests of verbal and visuo-spatial competence. The data strongly suggest that small number enumeration ('subitizing') provides a powerful tool enabling children to construct an understanding of the cardinality principle for both small and large number words.

Friday June 20

1.3 Animal Behavior

9:00 - 10:30 Somerville 3315

Chair: M. Cole

9:00 Travis Todd (travis-todd@hotmail.com)

(12) *University of Winnipeg*

Overshadowing of responding by a “filler” stimulus.

Groups of food-restricted rats underwent appetitive conditioning trials in which a single food pellet unconditioned stimulus (US) was delivered either 10 s before (embedded), 10 s after (trace), or at the termination (delay) of a 120 s white noise conditioned stimulus (CS1). All rats received four probabilistically scheduled USs during the intertrial interval (ITI). A filler CS (Exp 1: light; Exp 2: tone) was presented 10s prior to US delivery for half of the animals in each group. For the other half of the animals, the filler CS was presented randomly during CS1. Our results show that responding to CS1 is overshadowed by the filler CS. These findings are best explained by real-time theories of associative learning that assume a competitive learning rule.

9:15 Neil McMillan (nmcmill2@uwo.ca), William Roberts

*(13) *University of Western Ontario*

Overshadowing effects on interval timing in pigeons.

An experiment will be presented in which the effect of cue competition on timing is studied in an overshadowing operant procedure. A white center key delivered reward when pecked 30 s after a red side key presentation, and 10 s after presentation of the green side key on the other side. For overshadow-condition pigeons, key presentations were concurrent during training trials, while for control birds, side key presentations were separated across trials. Peak time curves are compared between overshadowing and control conditions to determine if either cue interfered with timing based on the other cue.

9:30 Michele Moscicki¹ (mmoscick@ualberta.ca), Kenneth Otter², Chris Sturdy¹

(14) ¹*University of Alberta*, ²*University of Northern British Columbia*

Female black-capped chickadees use song to discriminate male social status.

Chickadees, oscine songbirds that learn their vocalizations, live in flocks with dominance hierarchies where dominant males have preferential access to females for mating. Bioacoustic analysis of song has shown that during song bouts dominant male birds are able to maintain the frequency interval between the two notes of the species typical ‘fee bee’ song with more fidelity than subordinate birds. In spite of this it remains unknown whether females can assess male dominance status on the basis of song alone. We will show results suggesting that female chickadees can discriminate the social status of unfamiliar males using only the ‘fee bee’ song as a guide.

9:45 Mark Cole (mcole@uwo.ca), Laura Gibson, Adam Pollock

(15) *Huron University College at Western*

Knowing all the angles: Visual and geometric cues as predictors of food location in a foraging task.

In Experiment 1, rats searched for food buried in one geometrically-unique 90° corner in a kite-shaped box, a corner always surrounded by black walls, shape + colour (S+C) or, randomly, black or white walls shape-only (SO). During all-walls-black-no-food probe trials, S+C, but not SO rats, spent more time in the “correct corner”. In Experiment 2, black and white striped walls replaced the black walls during training. On all-walls-black-no-food probe trials, SO, but not S+C rats spent more time in the correct corner. The results replicate and extend recent work by Graham et al. (2006) and Miller and Shettleworth (2007).

Friday June 20

10:00 Nicklaus Csuzdi (ncsuzdi237@community.nipissingu.ca), Amy Stillar, Aimee Laronde, Sheila
(16) MacIntosh, Matti Saari
Nipissing University

Isolation increases social behaviour and decreases exploration.

Varlinskaya et al. (1999) found that social isolation increases subsequent social behaviour in the dyad test. We, and others, have reported that isolated housing tends to decrease exploratory behaviour. In this experiment rats were housed in "Enriched" or "Isolated" conditions followed by an assessment of social behaviour as well as exploratory behaviour. Like Varlinskaya et al. we found increased social behaviour following isolation as well as reduced exploratory behaviour as we had previously found. These results suggest that housing conditions may differentially alter the frequency of social and exploratory behaviour. (Approved by the Nipissing University Animal Care Committee).

10:15 Lisa Wright¹ (Lisa.Wright@dal.ca), Katherine Muir², Tara Perrot-Sinal¹
***(17)** ¹Dalhousie University, ²University of Toronto

Social behaviour mediates effects of repeated adolescent stressor exposure in rats.

Hypothalamic-pituitary-adrenal (HPA) function can be 'programmed' by external factors during early life in rats. Prefrontal brain regions mature during adolescence and modulate adult HPA activity. Thus, adolescence may represent another sensitive timeframe, during which features of the environment interact with individual attributes in guiding development of cognitive aspects of adult stress response regulation. We investigated short- and long-term effects of repeated adolescent stressor exposure on physiological and behavioural measures of stress responding in rats, and compared outcomes with those following identical manipulations administered in early adulthood. Results indicate that social behaviour mediates adolescent development of adult defense strategies.

1.4 Attention I

9:00 - 10:30 Somerville 3317

Chair: V. Di Lollo

9:00 Evan Risko (efrisko@watarts.uwaterloo.ca), Jennifer Stolz, Derek Besner
(18) *University of Waterloo*

Spatial attention influences early processing in visual word recognition.

Understanding the role of spatial attention in visual word recognition represents an important step in understanding how we read. In the present series of experiments, we manipulated various factors thought to influence different stages in the course of visual word recognition in addition to a manipulation of spatial attention. We use the conjoint effects of these factors to isolate the role of spatial attention in reading. Results suggest that spatial attention is best thought of as influencing feature or feature to letter level processing in the context of reading aloud.

9:15 Craig Leth-Steensen (craig_leth_steensen@carleton.ca)
(19) *Carleton University*

Fixed foreperiods and RT distributional shift.

In this study, the effect of lengthening fixed foreperiod duration (i.e., 2 vs 8 s) on choice RT distributions obtained for simple numerical magnitude judgements were examined. Results indicate that RT distributions become shifted upwards as foreperiod increases with relatively smaller increases in the sizes of their tails. I will argue mainly that such a finding is incompatible with time estimation views of the fixed foreperiod duration effect.

Friday June 20

9:30 John Christie (jc@or.psychology.dal.ca), Ana Chica
(20) *Dalhousie University*

Spatial attention improves temporal resolution.

It has recently been stated that exogenous attention impairs temporal resolution tasks (Hein, Rolke, & Ulrich, 2006; Rolke, Dinkelbach, Hein, & Ulrich, 2006; Yeshurun, 2004; Yeshurun & Levy, 2003). In the present experiments we aimed at studying the effect of spatial attention in temporal resolution while controlling for speed-accuracy trade-off effects. We reach an opposite conclusion to the prevailing literature. Spatial attention does help temporal resolution.

9:45 Yoko Ishigami (ishigami@dal.ca), Raymond Klein
*(21) *Dalhousie University*

What happens to measures of alerting, orienting and executive control after 10 administrations of two versions of the attention network test?

The attentional network test (ANT) measures the efficacy of the alerting, orienting, and executive networks. Ten sessions of two ANTs (Fan et al. and Callejas et al.) were administered to nine participants. Participants indicated the direction of a target arrow, accompanied by congruent or incongruent distractors. The arrows were preceded by visual or auditory cues. Although there were practice effects with all three network scores (mostly reflecting participants' improvements in their ability to ignore conflicting or irrelevant properties of stimuli) all network scores remained highly significant even after nine previous sessions performing the same tasks.

10:00 Shahab Ghorashi¹ (ghorashi@psych.ubc.ca), James Enns¹, Vincent Di Lollo²
*(22) ¹*University of British Columbia*, ²*Simon Fraser University*

Impaired identification but intact spatial orienting in the attentional blink.

Identification of the second of two targets is impaired in a rapid stream of images (Raymond et al., 1992). Surprisingly, a spatial cue can effectively guide attention to the location of the second target, even during this attentional blink (Ghorashi et al., 2007), though, ostensibly, not immediately following it (Nieuwenstein et al., 2005). The present experiment tested whether the failure of effective cuing following the blink was caused by an experimentally-imposed ceiling in Nieuwenstein et al. We removed this ceiling by using a different dependent variable, and found effective spatial cuing beyond the period of the attentional blink as well.

10:15 Vincent Di Lollo (enzo@sfu.ca)
(23) *Simon Fraser University*

The attentional blink: A new perspective and direction.

Identification of the second of two targets (T2) is impaired when presented shortly after the first (T1). This attentional blink (AB) has two characteristics: (a) T2-processing is delayed (Psychological Refractory Period, PRP); (b) while delayed, T2 is stored in a maskable buffer. AB theories focus on (a) but don't explain why no AB occurs unless T2 is masked. I suggest that we have been addressing the wrong issue: extant AB theories are really theories of PRP. Further, I suggest that the second-target deficit can be used as a tool of convenience to study the characteristics of the labile memory buffer.

Friday June 20

2.1 Memory

11:00 - 12:30 Somerville 3345

Chair: D. Mewhort

11:00 Nigel Gopie (ngopie@uwaterloo.ca), Colin MacLeod
*(24) *University of Waterloo*

Did I tell you this before?

Most people have recounted a story or joke to someone only to realize part of the way through that they have already told this person. Remembering to whom we tell what, a process we term "destination memory," has important social ramifications. In a series of experiments using a novel paradigm, we have begun to delineate the core features of destination memory, including that destination memory is more fallible than source memory. Here, we present a theoretical framework that explains relative deficiencies in terms of poor environmental integration of outgoing information.

11:15 Bob Uttl (uttlbob@gmail.com), Kimberly Baltimore, Dylan Smibert
(25) *Red Deer College*

Does aging spare prospective memory with focal cues?

It has been argued that aging spares prospective memory (ProM) with focal cues (McDaniel & Einstein, 2007). In Study 1, we examined the small selective review of age declines with focal vs. non-focal cues by McDaniel and Einstein (Table 7.4) and found large age declines with both types of cues. In Study 2, we reviewed hundreds of age-contrasts in published research and found large age declines with both focal and non-focal cues. The origins of the claim that aging spares ProM with focal cues can be traced to misinterpretations of ceiling limited data in previous studies (Uttl, 2008).

11:30 Cody Tousignant (catousig@ucalgary.ca), Rehman Mulji, Glen Bodner
(26) *University of Calgary*

Test-list context affects remembering, not bias.

Mixing items of different memorability in a test list (a context manipulation) influences remember/know recognition judgments. An expectancy-heuristic account predicts that context influences response bias (changing both hits and false alarms), whereas a functional account suggests context can also affect discrimination (changing only hits). In our investigation, different words were studied in shallow, medium, and deep level-of-processing tasks. One week later, medium words were tested in the context of either shallow or deep words. Medium words received more remember judgments in the shallow context. Signal-detection analysis revealed that the test-list context affected discrimination rather than bias, supporting the functional account.

11:45 Glen Bodner¹ (bodner@ucalgary.ca), Raymond Gunter¹, Tanjeem Azad², Geoffrey Matthews¹
(27) ¹*University of Calgary*, ²*University of Victoria*

A distinctiveness heuristic, not global memory strength, dampens the DRM illusion.

Distinctive encoding dampens the DRM illusion. We suggest that subjects achieve this dampening by applying a distinctiveness heuristic at test (e.g., "did I solve an anagram for this item?"). Experiment 1 reports a distinctiveness-heuristic pattern: the DRM illusion in a within-list group was as low for distinctive anagram and distinctive self lists as for non-distinctive read lists, and all three were reduced relative to a pure-read-list group. Using the same within-group design, Experiment 2 reports that subjects could distinguish between anagram and self lists when making source judgments, suggesting their recognition judgments were based on more than global memory strength.

Friday June 20

12:00 Randy Jamieson¹ (randy_jamieson@umanitoba.ca), Matthew Crump², Samuel Hannah³
(28) ¹University of Manitoba, ²Vanderbilt University, ³McMaster University

Modelling retrospective reevaluation with a theory of human memory.

We present a multiple-trace model of memory to explain classical conditioning. The model supposes that cue-outcome events are stored on each trial, that cues retrieve similar cue-outcome events from memory, that learning is evaluated by the match between retrieved and presented outcomes, and that encoding is modulated by the difference between retrieved and presented outcomes. We will present applications of the model to complex examples of classical conditioning including backward blocking, recovery from blocking, and second-order conditioning.

12:15 Douglas Mewhort (mewhortd@post.queensu.ca), Donald Franklin, Nathan Sklair
(29) *Queen's University*

How one idea leads to another.

We present a model for the control of rehearsal and of order of report from memory. In the model, control is exercised by an active storage system; the activation of all current items changes whenever an item or association is added to the store; the change in activation is proportional to each item's similarity to the item added. Rehearsal is treated as implicit recall. We illustrate the model's behaviour by tracking rehearsal in immediate serial recall, and we apply the model to Hebb's (1961) repeating-list task.

2.2 Symposium Avian Biocognition: Understanding the Biological Basis of Cognition in Birds

11:00 - 12:30 Somerville 2355

Chair: C. Sturdy

11:00 Debbie Kelly (debbie.kelly@usask.ca), Izabela Szelest
(30) *University of Saskatchewan*

Visuospatial bias in pigeons and Clark's nutcrackers.

Humans routinely show a slight left-sided visuospatial bias, over-selecting for objects on their left in comparison to their right, when engaging in cancellation tasks. This asymmetry has been explained by reference to the superiority of the right hemisphere for spatially guided tasks. Recent research has suggested that birds, like humans, may show a similar left-sided visuospatial bias. This finding has put into question the role of the corpus callosum in the emergence of spatial asymmetries. Our study examines whether a left-sided visuospatial bias is evident in two species of bird, the pigeon and the Clark's nutcracker.

11:15 David Sherry (sherry@uwo.ca), Jennifer Hoshoooley
(31) *University of Western Ontario*

The seasonal hippocampus of black-capped chickadees.

A seasonal pattern in hippocampal neurogenesis accompanies seasonal change in food-storing behaviour in black-capped chickadees. High rates of hippocampal neuronal recruitment found at some times of year in chickadees are not found in birds that do not store food. The seasonal pattern in neurogenesis in chickadees is highly variable, however, and does not appear to be controlled by photoperiod. Food-storing behaviour is influenced by many factors, including energy balance, food availability, and flock dominance structure. Annual variation in hippocampal neurogenesis may indicate that hippocampal neuroplasticity is a response to variation in the intensity of food-storing behaviour.

11:30 Ronald Weisman¹ (rweisman@post.queensu.ca), Laura-Lee Balkwill¹, Marisa Hoeschele²,
(32) Michele Moscicki², Christopher Sturdy²
¹Queen's University, ²University of Alberta

Absolute pitch in birds and humans: Homology or analogy?

Friday June 20

We developed auditory discriminations that measure absolute pitch (AP) across species of birds and mammals. In a difficult version of the task, avian species accurately discriminated all eight frequency ranges, whereas two mammalian species (humans and rats) acquired only crude discriminations of the highest and lowest ranges. Here, we tested human AP possessors in eight-range discriminations; they discriminated more accurately than other musicians. The results suggest that human AP possessors discriminate ranges using their ability to name musical notes not by memorizing frequencies as songbirds do. Accurate AP in birds and human AP possessors is likely biological analogy not homology

11:45 Scott MacDougall-Shackleton (smacdou2@uwo.ca)
(33) *University of Western Ontario*

The mating bird mind: Sexual selection and avian cognition.

Birdsong is the best studied system of animal communication. Male songbirds learn their songs early in life, and song is used to defend territories and attract mates. There is ample evidence that the best-learned songs are the most effective signals. As such, birdsong is an example of a sexually selected cognitive trait. I will review data indicating that developmental conditions affect both the development of song and other traits. Thus, by attending to song, receivers may gain information about a signaler including physiological condition and other cognitive abilities.

12:00 Leslie Phillmore (Leslie.Phillmore@dal.ca), Sean Roach, Laura Robblee
(34) *Dalhousie University*

To everything there is a season: Behavioural response to playback of vocalizations by black-capped chickadees.

In chickadees, production of vocalization types varies with season: song is heard primarily in spring (Phillmore et al 2007), whereas calls are heard most in fall/winter (Avey et al 2008). We compared the seasonality of behavioural responses of chickadees captured in either fall/winter or spring to playback of fee bee song, chick-a-dee calls, and heterospecific (Song Sparrow, *Melospiza melodia*) song. Overall, fall/winter birds were more active than spring birds, but vocalized less to playback. Other behavioural measures were affected by season, observation period, and vocalization type. Results are discussed in terms of implications for neural processes underlying perception of vocalizations.

12:15 Christopher Sturdy (csturdy@ualberta.ca)
(35) *University of Alberta*

Songbird biocognition: Putting it all together.

I will highlight acoustic communication in black-capped chickadees and our efforts to understand this system by examining vocal production and usage, examining perception of vocal signals through operant discrimination experiments, artificial neural network modeling of this operant data, as well as developmental and neurobiological studies. We have gained an incredible understanding of chickadee communication by uniting behavioural, cognitive, modeling, developmental and neurobiological approaches in order to approach our research question. Our hope in this talk is that we will convey our excitement and also to encourage other researchers to embrace this integrative approach in their own research programs.

2.3 Reading Aloud

11:00 - 12:30 Somerville 3315
Chair: D. Besner

11:00 Derek Besner (dbesner@uwaterloo.ca), Shannon O'Malley, Serje Robidoux
(36) *University of Waterloo*

Computational models of reading aloud: New challenges.

A major assumption in research on visible language is that processing is cascaded (and often engaged in interactive-activation). Certainly, two of the major computational accounts of visual

Friday June 20

word recognition (DRC and CDP+) make both these assumptions. Nonetheless, two reading aloud experiments that cross stimulus quality and spelling-sound regularity yield results that are not seen in the simulation data from these models. We speculate that successful simulation will require the action of a control process that does not currently exist in either of these models.

11:15 Shannon O'Malley (somalley@artsmail.uwaterloo.ca), Derek Besner
(37) *University of Waterloo*

Reading aloud: On the joint effects of repetition, word frequency and stimulus quality.

Blais and Besner (2007) reported that, in the context of reading aloud, stimulus quality and word repetition interacted in the presence of nonword fillers. In contrast, O'Malley and Besner (in press) reported that stimulus quality and word frequency have additive effects in the presence of nonword fillers. These two sets of results are surprising when taken together, given that the effect of word frequency surely emerges as a function of repetitions. This puzzle is addressed experimentally and theoretically.

11:30 Erin Maloney (eamalone@artsmail.uwaterloo.ca), Shannon O'Malley, Evan Risko, Derek Besner
(38) *University of Waterloo*

Repetition reduces the effect of letter length when reading nonwords aloud: Implications for dual route models of reading and accounts of learning to read.

Participants repeatedly read aloud a set of nonwords that varied in length. Replicating previous research, the time to initiate a response increases as letter length increases. Interestingly, this letter length effect decreases with repetitions. One argument states the letter length effect arises because nonwords can only be read aloud correctly applying sublexical spelling-correspondences rules serially across the letter string. The reduction of the letter length effect implies that these nonwords are not always being read via this sublexical process. This suggests new lexical entries have been created and these nonwords are now read, at least sometimes, by the lexical route.

11:45 Stephanie Waechter (swaechte@uwaterloo.ca), Evan Risko, Derek Besner, Jennifer Stolz
***(39)** *University of Waterloo*

You can count on it: Individual differences in repetition priming are systematic.

The repetition priming effect is one of the most robust phenomena in cognitive psychology. However, participants vary substantially on the amount of priming that they produce. The purpose of the current experiments is to test the split-half reliability of repetition priming effects. The results suggest that observed differences in the size of the repetition priming effect across subjects are reliable and result from systematic processes.

12:00 James Schmidt¹ (j4schmid@watarts.uwaterloo.ca), Jim Cheesman², Derek Besner¹
***(40)** ¹*University of Waterloo*, ²*University of Saskatchewan*

You can't stroop a lexical decision: Combating the communication breakdown in cognitive psychology with a general model of semantics.

Associated primes facilitate response times in lexical decision (DOCTOR facilitates NURSE), but interfere in the Stroop task (BLUE interferes with RED). In three experiments, we explore the reason for these differences. When all the stimuli were novel, colour associates facilitated lexical decisions and identification to incongruent colour words (BANANA-GREEN). With a small set of repeatedly-presented stimuli, colour words facilitated lexical decision of incongruent colour words (RED-GREEN). We interpret these findings as indicating that semantic connections are solely facilitative and that response competition only occurs with a small stimulus set and identification response. We also discuss the problem of research fragmentation.

Friday June 20

12:15 Derek Besner¹ (dbesner@uwaterloo.ca), Michael Reynolds², Shannon O'Malley¹
(41) ¹University of Waterloo, ²Trent University

Reading aloud in the PRP paradigm: What underadditivity doesn't mean.

Subjects are presented with a stimulus (Task 1), and either close on its heels another stimulus for Task 2 (short SOA) or after some delay (long SOA). Subjects are asked to respond to Task 1 before Task 2. Interest centres on RTs in Task 2. In the context of this Psychological Refractory Period paradigm, under-additivity of factor effects on RT (responses at the short SOA are slower than at the long SOA, but less affected by a second factor than at the long SOA) has a standard interpretation: Some process in Task 2 is taking place in parallel with processing on Task 1. In contrast, our analysis shows that under-additivity of factor effects means that processing on Task 2 is blocked and we illustrate this by reference to the spelling-sound regularity effect when reading aloud in Task 2. We conclude that non-lexical processing requires capacity, and can be stopped, contrary to the received view that phonological processing is "automatic".

2.4 Vision

11:00 - 12:30 Somerville 3317

Chair: H. R. Wilson

11:00 Richard Murray (rfm@yorku.ca), Yaniv Morgenstern
(42) York University

The light-from-above prior overrides contextual lighting cues.

How does the human visual system's assumption that light comes from above interact with visual cues indicating that light does not come from above in a particular scene? Following Sun and Perona (1998), we used visual search for a bump among dents to infer observers' implicit beliefs about direction of illumination. Our search stimuli were embedded in realistically rendered 3D scenes, with different simulated lighting directions in different conditions. Regardless of lighting direction, search performance indicated that observers always assumed that illumination came from above. That is, the light-from-above prior completely overrode contextual information about direction of illumination.

11:15 Thomas Spalek (tspalek@sfu.ca), Jun-ichiro Kawahara, Vincent Di Lollo
(43) Simon Fraser University

Flicker is a primitive visual attribute.

At the earliest processing stages, visual stimuli are decomposed by a set of filters tuned to specific values of such attributes as colour, orientation, and motion. These filters have been characterized both neurophysiologically and behaviourally. The single exception is the attribute of flicker which has been characterized neurophysiologically but not behaviourally. Using a visual search paradigm we provide the first behavioural demonstration that flicker is indeed a primitive attribute used by the visual system in stimulus encoding. Consistent with the temporal contrast-sensitivity function, sensitivity to flicker was highest at 10Hz and decreased as flicker rate was either increased or decreased.

11:30 Chris Striener¹ (chris.striener@gmail.com), James Danckert²
(44) ¹University of Western Ontario, ²University of Waterloo

Dissociating perceptual and motor effects of prism adaptation in spatial neglect.

We examined the influence of prism adaptation on perceptual and motor aspects of neglect using manual line bisection and the landmark task. Prior to prisms, our neglect patient demonstrated a rightward bias in manual bisection and a leftward bias – indicative of a perceptual bias – on the landmark task. Following exposure to prisms, the patient's rightward bias in manual bisection was dramatically reduced whereas their leftward bias on the landmark task remained unaltered. These data provide further evidence that prisms influence dorsal stream functioning, but leave unchanged the perceptual biases evident in neglect.

Friday June 20

11:45 Asmaa Dabbagh (adabbagh@ahsmail.uwaterloo.ca), Genevieve Desmarais, Eric Roy, Mike
*(45) Dixon

University of Waterloo

The impact of action similarity on visual object identification – The effect of task order.

Action similarity influences visual object identification: participants confuse objects associated with similar actions more often than objects associated with dissimilar actions. We evaluated how object and action similarity impact visual object identification by asking participants to learn associations between novel objects and actions, and varied whether participants first named objects or performed their associated action. We observed an interaction between visual similarity and action similarity: only dissimilar objects were confused more often when associated with similar actions than when associated with dissimilar actions. The first task did not affect results, suggesting a maximal impact of action information on visual tasks.

12:00 Paul Szego (szegopa@mcmaster.ca), M.D. Rutherford

(46) *McMaster University*

Evidence for a directional anisotropy in the perception of speed and animacy associated with reading-related habitual eye movements.

Monolingual English readers and bilingual readers who also read a language read from right-to-left (e.g., Farsi) viewed pairs of dots travelling leftwards and rightwards at the same speed, distance, and duration. Judgments of which dot in a pair appeared faster (a direct measure of speed perception) and alive (a percept associated with speed perception) revealed that monolinguals were biased to judge the rightwards-moving dots as faster and alive more often than the leftwards-moving dots. Conversely, bilinguals exhibited no bias for speed or animacy, suggesting that the perceptual anisotropy results from eye movements habituated during reading.

12:15 Hugh Wilson (hrwilson@yorku.ca), Marwan Daar, Richard Thibeault, Shirin Mohsenzadeh,
(47) Frances Wilkinson

York University

Cortical representation of left/right and up/down head orientations.

A principal component (PC) analysis of head shapes defined relative to the bridge of the nose suggests that just three components can encode head shape across $\pm 40^\circ$ horizontally and $\pm 20^\circ$ vertically. Furthermore, these PCs predict that horizontal and vertical head orientations may be represented orthogonally. To test this hypothesis, discrimination thresholds for head orientation were measured for left/right discrimination among head shapes that were either oriented up, frontal, or down in the vertical dimension. Thresholds were found to be independent of vertical orientation. A control experiment randomized the vertical orientation from trial to trial and showed that left/right orientation discrimination was unaffected. An analogous result was obtained for discrimination of head orientation in the up/down direction with randomization across left/right orientations. Thus, discrimination of vertical head orientations is independent of horizontal head orientation, a result consistent with the PC analysis. A second series of experiments employed head orientation aftereffects following adaptation (Fang & He, *Neuron*, 45, 7930800, 2005) but generalized these to include both left/right and up/down head orientations. Adaptation to up or down produced a significant aftereffect, but only in the up/down direction. Similarly, the left/right adaptation effect did not transfer to up/down orientations. These results imply that the visual system can estimate head orientation independently in two dimensions, which could greatly simplify the process of individual face encoding and recognition.

Friday June 20

Poster Session 1 (12:30 – 2:30)
The Great Hall, Somerville

(48)

Dwayne Pare (dpare@psychexperiments.com),
George Cree

University of Toronto Scarborough

**Laboratory versus web-based research:
Can we trust data collected online?**

The internet affords researchers many opportunities, including continuous data collection and coding, and a large, heterogeneous sample. But it also brings a loss of control. Lab-based results can be replicated online (Birnbaum, 2004; Krantz & Dalal, 2000), but questions remain as to what types of research can be replicated, and where potential limitations may exist. We examined effects of location (laboratory vs. web) on object familiarity ratings, looking closely at variability in dependent measures, including response latencies. Our results suggest web-based data collection is reliable, and we provide suggestions for maximizing this reliability.

(49)

Ester Moher (estermoher@hotmail.com), Derek Koehler

University of Waterloo

Cognitive capacity, framing and risk tolerance.

This study examines how cognitive capacity mediates choice under risk. Previous research has suggested that enhanced cognitive capacity (in particular, deliberative or rule-based ability) allows for more inclusive decision-making, which may lend itself to more risk tolerance in a gambling task. Additionally, a broad bracketing frame was employed to manipulate context of the gamble task to encourage risk-tolerance relative to a narrow-bracket frame. A cognitive load was introduced on half of the gamble trials to impair deliberative decision-making performance, thereby reducing risk tolerance. Three experiments examine these effects using variations in both the gamble task and the bracketing manipulation.

(50)*

Sarah Devantier¹ (sdevanti@uwo.ca), Wael Haddara², Mark Goldszmidt², John Paul Minda¹

¹*University of Western Ontario*, ²*Schulich School of Medicine & Dentistry*

Using goal-oriented categories to group patients: The effects of expertise.

While medical diagnostic reasoning has been studied extensively, there has been little inquiry into how physicians think about patient management. We developed a forced-choice triad task that contrasted deep-feature similarity (how the patients would be cared for) with surface-feature similarity (demographic information or disease characteristics) to various groups of medical professionals.

(51)

Stephanie Solcz¹ (ssolcz@uwaterloo.ca), Jonathan Fugelsang¹, Valerie Thompson²

¹*University of Waterloo*, ²*University of Saskatchewan*

Ironic effects of premise believability in deductive reasoning.

The belief bias effect, where people are more likely to endorse believable conclusions regardless of their actual validity, is one of the most robust effects widely studied in deductive reasoning. The effects of the believability of the premises, however, have not been widely studied. A series of experiments was conducted to examine the role of premise believability in deductive reasoning. For valid conclusions, participants were more likely to endorse conclusions supported by believable premises than by unbelievable premises. However, for invalid conclusions, ironic effects of premise believability were found: Participants were more likely to endorse conclusions supported by unbelievable premises.

(52)

Katherine Robinson
(katherine.robinson@uregina.ca), Adam Dubé
University of Regina

Children's development of the addition and subtraction inversion concept.

This study examined school children's use of the inversion concept on $a + b - b$ problems and of the associativity concept on $a + b - c$ problems. Children also evaluated the inversion and associativity strategies and were assessed on factual knowledge of simple addition and subtraction. Inversion use was 48%, 47%, and 39% for Grades 2, 3, and 4 – consistent with Bisanz and LeFevre (1990). However, the

Friday June 20

number of children who used inversion at least once was 82%, 76%, and 51% for Grades 2, 3, and 4. Results pertaining to the other measures and how the measures relate to one another will be presented and discussed.

(53)

Jennifer Orr¹, Christine Tsang¹
(ctsang33@huron.uwo.ca), Nicole Conrad²
¹Huron University College at Western, ²Saint Mary's University

Is the message in the pitch? Infant pitch preferences and the role of affective context.

Playsongs and lullabies are both popular types of songs used by caregivers to communicate affective states to infants. Recently, it was demonstrated that 6- and 7-month-old infants prefer to listen to lullabies sung in a lower pitch (Volkova, Trehub & Schellenberg, 2006), possibly because lower pitches are more soothing and appropriate to the affective state that lullabies attempt to communicate. The present study examined whether pitch preferences during infancy are context dependent. Using a head-turn preference procedure, 6- and 7-month-old infants preferred low pitch lullabies and high pitch playsongs, indicating that infants are sensitive to the communicative nature of music.

(54)

Blaine Mullins (bmullins@ualberta.ca)
University of Alberta

Repetition effects in speech production.

In four experiments, we examined repetition effects in speech production. Subjects saw three animals on a computer and had to compare the size of the centrally presented animal to one of two others. Subjects could repeat the animal (e.g. bird-bird), the adjective (e.g. bigger-bigger), or could randomly vary their descriptions. Large repetition effects were found, however, whether they repeated the animal or the adjective depended on whether the size of the centrally presented animal was known in advance. I will argue that the planning that goes into creating a message can influence repetition effects in speech.

(55)

Adriana Lopez, Annabel Cohen
(acohen@upei.ca)
University of Prince Edward Island

Is there a sensitive period for recognition of non-native phonologies?

To examine whether a sensitive period exists for recognition of foreign words, 120 participants (7 to 16 years) listened to two lists each comprised of words in English, Spanish, and Chinese and English non-words. In Task 1, participants determined if each item was an English word. All ages performed well. Task 2, a surprise recognition test, presented both old and new words. English recognition scores increased more dramatically with age than did recognition of foreign words (hovering at chance). The significant interaction of age and language-type is discussed with respect to a sensitive period for phonemic acquisition.

(56)

Blair Armstrong (blairarm@andrew.cmu.edu),
David Plaut
Carnegie Mellon University

Semantic coding can account for task differences in semantic ambiguity effects: Evidence from lexical decision experiments.

Accounting for semantic ambiguity (i.e., selecting a contextually correct meaning of a word with multiple meanings; e.g., BANK) is challenging because different effects of relatedness of meaning are observed across tasks. Hino, Pexman, and Lupker (2006) proposed that these differences cannot be due to the semantic coding process, and must therefore be caused by differences in the decision making system. We argue that these effects can be accounted for by the settling dynamics of the semantic coding process, and support our position with lexical decision experiments in which within-task difficulty manipulations produce results similar to those observed across tasks.

(57)

Kazunaga Matsuki¹ (kmatsuki@uwo.ca), Ken McRae¹, Mary Hare², Jeffrey Elman³
¹University of Western Ontario, ²Bowling Green State University, ³University of California San Diego

On-line dynamic combination of concepts during language comprehension.

There is a growing interest in psycholinguistics regarding the role of expectancy generation in on-line sentence processing. We investigated how conceptual expectations are rapidly

Friday June 20

generated and integrated from people's generalized knowledge about everyday events and situations. We used self-paced reading to show how instruments and actions ("Susan used the saw/scissors to cut") are combined to produce expectations for different classes of patients (paper vs. wood). We predicted faster reading time at the patient when it was contextually expected, which is what we found. We conclude that conceptual event-based expectations are computed rapidly and dynamically during on-line language comprehension.

(58)

Annabel Cohen (acohen@upei.ca), Vickie Armstrong, Robert Drew, Grant Johnson, Mark Leggott

University of Prince Edward Island,

The airs digital library for research on the acquisition of singing.

Singing like speaking is a universal cognitive articulatory syntactic ability. Unlike the acquisition of speaking, however, it has received little attention from cognitive science. We introduce a digital library (DL) in development as part of the international AIRS project (Advancing Interdisciplinary Research in Singing, <http://vre.upei.ca/airs>). In its proposed research function, the AIRS DL is analagous to the CHILDES database of Brian MacWhinney (1995) that revolutionized research in language acquisition since 1984(<http://childes.psy.cmu.edu>). Exploiting FEDORA open source architecture, the AIRS DL architecture will ultimately permit ingestion from and analysis by researchers worldwide using shared protocols and tools.

(59)

Johanna Lake (lakejk@mcmaster.ca), Karin Humphreys

McMaster University

Listener vs. speaker-oriented speech: Studying the language of individuals with autism.

There are several tendencies that speakers show (that listeners utilize) which are controversial as to whether they serve speaker- or listener-oriented functions. For example, speakers frequently produce disfluencies such as "um or "uh", which also appear to be helpful to listeners, indicating that the speaker is not finished. In addition, speakers tend to place animate actors in subject position. Since individuals with autism are unlikely to engage in

listener oriented behaviour, they represent an ideal group to differentiate these functions. Results showed that individuals with autism used significantly fewer disfluencies and more empty-pauses than controls, but used animacy similarly.

(60)

Annie Roy-Charland

(aroycharland@laurentian.ca), Christine Lebeau
Laurentian University

Does reading your own text influence the differential omission rates of the missing-letter effect?

In the missing-letter effect, while reading and searching, subjects miss more letters in frequent function words than in content words. Previous findings in this field are based on text generated by the experimenter. However, reading our own texts might imply processes not reflected by these data. In the current study, the typical missing-letter effect is maintained in both a text created by the participant and by another. Most importantly, results showed faster reading times and an overall lower omission rate when participants read their own text. These results provide innovative data not yet included in the prominent models of the effect.

(61)

Brenda Hannon (bhannon@utsa.edu)

The University of Texas at San Antonio

Reading comprehension: The relative contributions of its sources.

Everyone knows that measures of lower-level word processes, higher-level processes, and working memory predict comprehension ability. Further, a number of comprehension theories suggest how some of these sources might relate. Yet, many of these relationships have gone untested and so it is unclear whether one or all of the sources make separate and important contributions to comprehension performance. The present study focuses on this issue. The results replicated a number of previous findings; however they also revealed that although the three sources made unique contributions to comprehension performance, lower-level and higher-level processes were the most important contributors.

(62)

Bob Uttl¹ (uttlbob@gmail.com), Meaghan Henry^{1,2}, Jan Uttl³

Friday June 20

¹Red Deer College, ²University of Calgary, ³Avidata

Pitfalls in analyses of accident records: The evaluator example.

Analyses of accident yield valuable information about conditions leading to accidents as well as behavior of victims prior, during, and after accidents. The records are often used to estimate relative risk reduction if conditions and behavior that led to historical accidents is avoided. Using the Evaluator Avalanche Accident Prevention Card (Haegeli & McCammon, 2006; Canadian Avalanche Association) and modeling techniques, we demonstrate that assumptions and choices made in analysis of historical records may severely bias calculated relative risk reduction. Our modeling results show that the Evaluator gives users false sense of security by claiming higher than likely relative risk reduction values.

(63)

Kirk Stokes (kirkstokes@gmail.com), Karen Arnell
Brock University

Deviant irrelevant stimuli impair surprise recognition memory: Not just serial recall.

The present work examines the impact of irrelevant auditory tones on visual performance (reaction time, accuracy, recognition memory) in a lexical decision task. Research has shown that deviant irrelevant items capture attention and impair memory for serially ordered word lists. Memory models have suggested that interference occurs with order memory, rehearsal processes, or phonological encoding. Using a non-serial surprise recognition memory task where no rehearsal process is required, reaction time and memory performance costs were observed for irrelevant oddballs. The memory deficit for deviant trials will be examined in light of working memory capacity (OSPAN).

(64)

Julia Mitroi (jmitroi@connect.carleton.ca), Matthew Brown, Chris Herdman
Carleton University

Getting the whole picture: The effects of landmarks on memory for novel environments.

Evidence supports the claim that objects are represented as separate features rather than unified wholes when experienced in novel environments (Brown & Herdman, 2007). This

contrasts with the subjective experience of perceiving objects as bound entities. One explanation for this discrepancy is that landmarks (not used in the aforementioned research), influence mental representations. It was hypothesized that landmarks facilitate encoding and retrieval and therefore promote feature binding. This hypothesis was tested using an object location memory paradigm in environments with and without landmarks. Landmarks enhanced memory for object location and resulted in objects being stored as bound entities.

(65)*

Rehman Mulji (reh@ucalgary.ca), Glen Bodner
University of Calgary

Wiping out memories in the directed forgetting paradigm.

In list-based directed forgetting, a forget instruction after list 1 impairs list 1 recall (costs) but improves list 2 recall (benefits). We asked one group to forget list 1 and another to remember it. Both were then unexpectedly asked to clean the computer screen and their hands. Both groups showed costs relative to a control group, contrary to the claim that the forget instruction causes inhibition. We attribute the "costs of wiping" to a surprise-induced mental-context shift across lists. However, only the forget-instructed group showed benefits, which we attribute their adopting of an improved encoding strategy for list 2.

(66)

Ronak Patel¹ (ronak.patel@psych.ryerson.ca), Todd Girard¹, Robin Green²
¹Ryerson University, ²University of Toronto

Emotional enhancement of conscious recollection is suppressed by direct vs indirect encoding of faces.

We investigated the emotional enhancement of memory (EEM) phenomenon in healthy adult participants under indirect and direct encoding conditions: gender discrimination vs. discrimination of facial emotions (happy, fearful, angry, and neutral). Facial recognition was tested using the Remember-Know paradigm. Preliminary findings (current n=17) revealed that fearful faces increased correct "Remember" responses in the indirect task, but not the direct task. There were no emotion-related effects on "Know" responses. These results are consistent with enhanced activation of amygdala and

Friday June 20

sympathetic systems known to mediate the EEM under conditions of implicit processing.

(67)

Renante Rondina II, Ada Le, Ben Amsel, George Cree (george.cree@utoronto.ca)
University of Toronto Scarborough

Exploring reasons for the primacy of sensory knowledge in semantic computation.

Conflicting evidence exists on whether sensory or functional properties of concepts are computed fastest during word processing. It is important to know which is view correct, and why, to help discriminate among competing models of semantic memory. We report evidence of a processing advantage for sensory features when relevant variables are controlled. We also report feature imageability and age of acquisition data that help shed light on why we observe a benefit for sensory features, and use these data to design new experiments that probe beyond the limited living/nonliving, and sensory/functional, dichotomies, the results of which will be presented.

(68)

Josée Turcotte (jturcotte@laurentienne.ca),
Josée Paul, Christine Baker, Sylvie Séguin,
Bruce Oddson
Université Laurentienne

Hebb repetition effect with verbal and visuo-spatial dimensions: Integrated representations?

Participants performing immediate serial recall of short lists of items can demonstrate long term learning. We use the Hebb repetition effect to study the long term memory representation of sequences that are defined both by words and by locations. We compare the Hebb effect for repeated lists of words presented at a variety of locations against lists in which the words but not locations were repeated, both against baseline performance on lists in which neither words nor locations could be predicted. Results suggest that the representation of the learned sequence does not totally integrate the verbal and visuo-spatial dimensions.

(69)

Terresa Polehoykie¹, Joel Dickinson²
(jdickinson@laurentian.ca)
¹Laurentian University, ²University of New Brunswick

The effects of Kurzweil on memory on students without learning disabilities.

The purpose of the study was to explore the effect of Kurzweil (computer program that presents verse in visual and auditory modality) on memory. Three presentation conditions were compared: paper, typical computer, and Kurzweil. Eighty six university students participated in the study that revealed a significant main effect of presentation on recall. Consistent with previous research, the paper condition outperformed the typical computer condition. However, recall in the Kurzweil condition was not significantly higher than the paper presentation. Results are discussed in relation to previous research.

(70)*

Erin Skinner (eiskinne@watarts.uwaterloo.ca),
Myra Fernandes
University of Waterloo

Boosting recollection in younger and older adults.

We examined how context presented at study, but absent at retrieval, affected recollection and familiarity memory in younger and older adults. Experiment 1 showed recollection was higher for words studied with faces (context-rich condition) than words studied with rectangles (context-weak condition) in younger, but not older, adults. Experiment 2 showed that recollection for words was higher in both age groups when participants were instructed to process the word-context relationship at study. Findings suggest that recollection can benefit when rich contextual detail is presented at study, but older adults do not spontaneously engage in the processes required to produce such benefits.

(71)

Lin Li^{1,2} (lilin.psy@gmail.com), Peter Graf²
¹East China Normal University, ²University of British Columbia

Time production in a short-term prospective memory task.

While engaged in an ongoing task, participants completed a time-based prospective memory task: Ensuring that a virtual bathtub did not overflow. Participants could check the bathtub fill-level by pressing a designated key. By means of a mask, we covered the bathtub for a period of time (eg. 3 minutes) and informed participants that during this period fill-level checks would be useless. To manipulate the need for fill-level information, we placed the mask at the beginning, middle or end of the filling period. The results showed that participants' mask-

Friday June 20

duration estimates were affected by their need for fill-level information.

(72)

Katherine Arbuthnott
(katherine.arbuthnott@uregina.ca), Aaron Brown
Campion College, University of Regina

The use of autobiographical knowledge in age estimation.

Event dates are not directly associated with memories, so the processes by which we maintain a sense of time and sequence in our autobiographical memories is of considerable interest. The present study examined participants' reported age estimation strategies for childhood memories retrieved using a Galton cuing technique. Results indicate that all three categories of autobiographical knowledge in Conway and Pleydell-Pearce's (2000) self-memory system model (lifetime periods, general events, and event-specific details) support temporal inferences. Participants most frequently used lifetime period knowledge to provide an initial age range, and event-specific knowledge to confirm or narrow the range of their estimated age.

(73)

Katherine Arbuthnott
(katherine.arbuthnott@uregina.ca), Aaron Brown
Campion College, University of Regina

Flexible control of emotional expression: Individual differences in effort or working memory?

Research suggests that our ability to voluntarily self-regulate emotions differs between individuals (Bonanno et al., 2004). The present study examined whether flexible self-regulation is associated with individual differences in effort or working memory. Participants viewed and rated negative and positive pictures of high and low intensity under three expression conditions (natural, exaggeration, suppression). Working memory capacity was assessed using the list span task. The results replicated the finding that emotional experience does not change under differing expression conditions despite changes in outward expression, but flexible expression regulation was not correlated with either effort ratings or working memory span.

(74)

Carrie Cuttler (cuttler@psych.ubc.ca), Peter Graf
University of British Columbia

Prospective memory deficits in pregnant women.

"Baby brain" is a label pregnant women use to describe the cognitive impairments they experience. Many studies have examined pregnant women's retrospective memory but few have examined their prospective memory; their ability to remember to perform tasks. As part of a larger battery of neuropsychological tests pregnant and non-pregnant women were asked to complete four prospective memory tests. Participants also completed questionnaires designed to assess everyday life prospective memory. Pregnant women reported experiencing more problems with prospective memory and they performed worse on a field measure of prospective memory that required them to post a letter on a specific day.

(75)

Szymon Wartak (swartak@uwaterloo.ca), Evan Risko, Derek Besner
University of Waterloo

Determinants of object persistence: The role of cue type, duration and strength.

The present experiments investigated object persistence in conscious awareness as a function of the nature of the cues that permit the object to be segregated from the background, and identified. A number of factors were manipulated (cue type, cue duration after object recognition and cue strength). Performance was fractionated into the qualitatively different stages of identification, maintenance and persistence. A distinction between dorsal and ventral visual pathways as used to segregate the object from the background provides one way to organize the data.

(76)

Giles Holland (hollandgh@cogeco.ca), Nikolaus Troje, Shilpa Mody
Queen's University

Person identification across actions from biological motion.

We used a same/different paradigm to compare observers' ability to identify point light displays within and across walking and running activities under conditions of structural only, kinematic only, and full information. For all information conditions for stimulus pairing of matching activities subjects performed significantly better than chance. For the walker/runner pairing subjects performed significantly better than chance for full information only. The main effect

Friday June 20

of pairing was significant, with the walker/runner pairing being the most difficult. There was a significant interaction between pairing and information. Results are discussed in light of a principal components linear associator model.

(77)

Samuel Hannah (hannahsd@mcmaster.ca),
Jennifer Beneteau
McMaster University

Just tell me what to do: The command performance procedure and cue density effects in judgments of control.

Conventional judgment of control tasks themselves lack rigorous control over key experimental variables (Hannah, Allan & Siegel, 200). Hannah et al. suggested telling participants when to respond could correct this. We show that such a "command performance procedure" provides the desired rigour while still producing reliable discrimination of response-outcome contingency and the conventional outcome density effect. Further, we demonstrate that the command performance procedure allows the manipulation of different levels of participant responding, and this in turn yields the first demonstration of cue density effects in an active contingency task.

(78)

Simona Monaco¹ (smonaco2@uwo.ca), Derek Quinlan¹, Patrizia Fattori², Claudio Galletti², Melvyn Goodale¹, Jody Culham¹

¹*University of Western Ontario*, ²*University of Bologna*

How do vision and proprioception contribute to the precision of reaching?

We examined how the precision of reaches was affected by the availability of visual and proprioceptive information. Subjects reached with their right hand to an external visual target (LED) or to their own left fingertip. Participants either performed the action immediately after the target was presented or after a 1-s delay. In the immediate actions, the external and body target conditions had comparable variability; whereas, in the delayed actions, the body target conditions were significantly more accurate than the external target condition. This suggests that the addition of somatosensory information helps only when the visual information is poor.

(79)

Keri Locheed, Glenda Prkachin (gcp@unbc.ca)
UNBC

Anxiety enhances sensitivity to faces expressing anger: The impact of gender and direction of gaze.

This study supports the notion of anxiety produced hyper-vigilance to negative emotions, by using a paradigm sensitive to difficulties in decoding facial expressions of emotion and signal detection analysis (Prkachin, 2003, 2006). Enhanced perception of angry faces was found for individuals with high scores on the Spielberger's STAI. Apparent direction of gaze influenced the perception of anger (Prkachin, 1999). Direction of gaze was manipulated on male and female faces that expressed emotions. An examination of individuals with anxiety problems supports the suggestion that these stimuli can be perceived as locations of threatening stimuli with high or lower threat value.

(80)

Taucha Gretzinger, Dan Meegan
(dmeegan@uoguelph.ca)
University of Guelph

Sensorimotor synchronization applied to gait.

When finger-tapping responses are synchronized to auditory rhythm, responses typically precede stimuli by tens of milliseconds. This negative asynchrony is attributed to differences in transmission time between the somatosensory and auditory systems, a finding which has been supported by studies using stationary lower-limb responses. Using a pressure-sensitive walkway, we investigated whether gait, which requires whole body movement and posture control, would result in the same synchronization pattern as stationary responses. Differences between stationary and walking conditions are discussed with reference to a model that takes into account the contributions of other sensory systems that are activated in locomotion.

(81)*

Adrian Snihur (asnihur@uwo.ca), Elizabeth Hampson
University of Western Ontario

Defeminization of otoacoustic emission patterns associated with oral contraceptive use in women.

Otoacoustic emissions (OAEs) are a natural by-product of a cochlear mechanism designed to amplify low-intensity sounds. Sex differences in

Friday June 20

the number and intensity of OAEs have been reported and are thought to be established through the organizational effects of prenatal androgens on the auditory system. The present study looked at OAE production in relation to oral contraceptive use (OC) in women. OCs reliably suppress both estrogen and bioavailable androgen levels. Women using OCs (lower circulating hormonal levels) showed reduced OAE production compared to women not using OCs, offering preliminary support for an activational influence of sex steroids on OAE production.

(82)*

Chris McNorgan (cmcnorga@uwo.ca), Ken McRae

University of Western Ontario

Within- and cross-modal feature knowledge integration in semantic memory.

A growing body of research supports the contention that people's conceptual knowledge is distributed across functionally and anatomically distinct regions specialized for processing information from different sensorimotor modalities. Such a distributed system requires a mechanism through which multiple information stores are integrated into unified concepts, though there is disagreement about whether this integration is managed by a central integration hub, or in a deep hierarchy of specialized convergence zones with successively wider receptive fields. The pattern of results for three timed behavioural experiments supports the assumption of a deep integration hierarchy.

(83)

Olave Krigolson¹ (krigolson@psych.ubc.ca), Clay Holroyd¹, Todd Handy¹, Courtney Kent²

¹University of British Columbia, ²University of Victoria

Electroencephalographic correlates of implicit learning: The p300.

While recent neuroimaging studies suggest that medial-frontal cortex plays a key role in explicit learning (e.g., reinforcement learning), the neural substrates that underlie implicit learning are not as clear. Here, we recorded event-related brain potentials as participants learned to classify presented stimuli as being either infrequent or frequent without the benefit of performance feedback. Our results demonstrate that trial to trial changes in the amplitude of

P300 potential reflected learning of the stimulus probabilities. In sum, these data suggest that parietal cortex plays a key role in implicit learning.

(84)

Christine Gagnon

(christine.gagnon@gmail.com), Maxime Lussier, Louis Bherer

Université du Québec à Montréal

Lifetime participation in cognitively stimulating activities can modulate the effect of education on cognitive performances in older adults.

School education and participation in cognitively stimulating activities (CSAs) have been independently associated to better cognitive performances in older adults (Wilson et al., 2003). Recent evidence suggests that CSAs could modulate the relationship between education and cognition (Kliegl et al., 2004). We assessed cognition (neuropsychological battery) in 42 older adults (M=67.8years) and administered the Lifetime cognitive activities questionnaire (Wilson et al., 2003). We observed a significant interaction between education and CSAs lifelong for processing speed performances, and a trend for working memory performances: education effect is reduced in seniors that engage more frequently in CSAs.

(85)

Jordan Schoenherr

(psychophysics.lab@gmail.com), Craig Leth-Steensen, William Petrusic

Carleton University

Confidant: An oscillator-based model of confidence processing.

A model of confidence processing is explored which associates accumulated evidence with a time-dependent learning-context signal. The model is referred to as a CONFIDENCE Associative NeTwork (CONFIDANT). This model is based on the OSCillator-based Associative Recall (OSCAR) network developed by Brown, Preece & Hulme (2000) with appropriate modifications made to accommodate the architecture of confidence processing. By varying the attentional resource available to during evidence accumulation and distinctiveness of the learning-context signal, replications of experimental findings such as the hard-easy effect were obtained. This model also

Friday June 20

provides an explanation for differences in perceptual and general knowledge tasks.

(86)

Molly Pottruff (molybdenum@gmail.com), David Shore
McMaster University

What makes a set? Category recognition and degrees of similarity.

In order to investigate the effect of shared features on recognition, we taught participants to identify featural relationships between novel cards using a complex grouping rule. In both a visual search task and a categorization task, we found a consistent negative correlation between recognition time and the number of shared features on the cards. Interestingly, participants also required less time to identify card combinations that violated this rule. Individual feature analysis suggested that colour was particularly significant—speeding up recognition when it violated the grouping rule, slowing down performance when it conformed and was a shared feature across the cards.

(87)

Steve Joordens (joordens@utsc.utoronto.ca), Iliia Bernstein, Renante Rondina
University of Toronto Scarborough

Examining the links between emotion, memory sensitivity and memory bias: Manipulating emotion extrinsically is a scream.

Previous examinations of the link between emotion and memory have almost exclusively contrasted emotionally evocative versus neutral stimuli. These studies have sometimes shown enhancements of memory sensitivity but other studies show only memory bias effects. We argue that when the stimulus intrinsically contains emotionality there is the potential that any memory differences observed across the stimulus classes could also be due to some other difference confounded with emotionality. We describe a new procedure that allows us to impart emotional extrinsically on otherwise neutral stimuli by simultaneously presenting auditory screams with words or pictures. This manipulation allows us to randomly assign stimuli to emotional or neutral conditions. Across 3 experiments we show that this procedure shows consistent bias effects, with participants responding “old” more to any item accompanied by a scream at test. No evidence of memory enhancement was observed.

(88)

Aaron Trachtenberg
(aaron_trachtenberg@hotmail.com), Stephen Smith
University of Winnipeg

Hemispheric asymmetries for emotional judgments of neutral stimuli.

Previous research has demonstrated that the right hemisphere (RH) preferentially processes negative information. However, no studies have examined whether this hemisphere is biased to interpret neutral information in a negative manner. To address this issue, photographs of neutral faces were cropped so that only the eyes were visible. These stimuli were presented for 150ms to the right visual field, the left visual field, or the centre of the screen, and participants rated the faces as positive or negative. Surprisingly, stimuli presented to the right hemisphere were rated positively ($p < 0.01$), suggesting that the absence of negative information may influence RH responses.

(89)

Daryl Wilson (daryl.wilson@queensu.ca), Catherine Charbonneau
Queen's University

Impact of working memory on a visual search task.

This study examined the impact of working memory on perceptual processing. On each trial, a colour was encoded. During the retention interval, a letter search task was completed. The encoded colour was either the same as the target letter, a distractor letter, or none of the letters. There was a benefit of having a target letter be the same colour with this benefit increasing with set size. There was also a constant cost of having a distractor letter be the same colour. These results suggest that working memory can bias perception towards items that share a perceptual feature.

(90)

Bob Uttl (uttlbob@gmail.com), Gregory Dale, Mekale Kibreab
Red Deer College

Ceiling and floor effects: What your textbook did not tell you.

Several systematic reviews (Uttl, 2005a, 2005b, 2008) reveal that ceiling and floor effects are prevalent in published research and suggest that clinicians and researchers do not understand what ceiling and floor effects are and what their

Friday June 20

impact on data interpretation is. We searched methods and statistics textbooks to determine if they educate future clinicians and researchers about ceiling and floor effects and their undesirable consequences. Surprisingly, majority of textbooks did not mention these artifacts and those that did rarely explained how to detect ceiling and floor effects, consequences of these artifacts, and how to interpret ceiling or floor limited data.

(91)

Kamilla Johannsdottir^{1,2} (kamillarj@gmail.com),
Chris Herdman²

¹University of Akureyri, ²Carleton University

The role of working memory in tracking.

The present research examined the role of working memory (WM) in object tracking. Participants tracked a moving object on a computer screen while concurrently performing one of four WM tasks (i.e., verbal, visual, spatial and central executive). The tracked object would periodically disappear and then reappear in a different location. Prior to disappearing, a colour cue appearing on the tracked object indicated whether the object would reappear in a predefined location or in a random location that required visual search. Tracking and searching for an object involves spatial WM whereas predicting an object's location primarily involves the phonological loop.

(92)

Elizabeth Cawley¹ (ecawl082@uottawa.ca),
Cary Kogan¹, Isabelle Boutet¹, Elizabeth Berry-Kravis²

¹University of Ottawa, ²Rush University Medical Center

Test-retest reliability of novel non-verbal associative learning tasks.

The test-retest validity of six comparative neuropsychological (CN) tasks administered in a modified Wisconsin General Test Apparatus was evaluated. Although the test battery has been demonstrated to be useful in differentiating forms of intellectual disability, types of dementia, and developmental stages, the test-retest reliability of the measures remains unknown. Fifteen participants with Fragile X Syndrome were included in the study. Participants completed the tasks at two time points separated by six months. Establishing adequate reliability of these measures will help support the use of the CN approach to track cognitive change in individuals with intellectual disability.

(93)

Sophie Lanthier (snlanthi@uwaterloo.ca), Evan Risko, Jenifer Stolz, Derek Besner

University of Waterloo

Not all features are created equal: Early processing in visual word recognition.

The present work deepens our understanding of feature processing in the context of letter and word identification. We report a series of experiments demonstrating that deleting vertices is more detrimental to letter and word identification than deleting mid-segments of features. Implications for early processing in reading are discussed.

(94)

Mylène Blier (mylene.blier.1@ulaval.ca),
Claudette Fortin, Rémi Gaudreault

Université Laval

Preparatory processes, uncertainty and timing.

The role of uncertainty in preparatory processes was examined in two experiments. In Experiment 1, the foreperiod in a reaction time task was varied in low- and high-uncertainty conditions, in which the foreperiod could take 5 and 50 values respectively. Similarly, in Experiment 2, locations of interruptions in time interval production could take 5 or 50 values. RTs decreased with increasing foreperiod in Experiment 1 and productions were longer with increasing location value in Experiment 2, both effects being more pronounced in the low-uncertainty condition. In both experiments, results are interpreted as showing better preparation under conditions of low uncertainty.

(95)

Charles Viau-Quesnel (charles.viau-quesnel.¹@ulaval.ca), Claudette Fortin,

Sébastien Tremblay

Université Laval

Two types of errors in time discrimination.

Participants were asked to classify one of two tones as being long or short with a reaction time response. The short tone (ST) was always 2000 ms and was compared to long tones (LTs) of 2250, 2500, 2750, 3000 or 12000 ms. As the value of LT increased, RTs to the ST decreased whereas RTs to the LT lengthened. Two types of errors were clearly distinguished. Early responses revealed a bias in responding to the ST such that participants tended to classify systematically the ST as an LT. In contrast,

Friday June 20

errors in late responses showed a tendency to respond randomly.

(96)

Noriyeh Rahbari
(nrahbari@connect.carleton.ca), Monique
Sénéchal
Carleton University

The skilled reading and spelling of persian: Do the same processes underlie skilled reading and spelling?

The objective was to examine the contribution of lexical and nonlexical processes to skilled reading and spelling in Persian. 61 high-school students (mean age =17; 8) attending schools in Iran were tested on reading and spelling of words and nonwords. The word differed in terms of reading transparency (transparent vs. opaque) and spelling polygraphy (nonpolygraphic vs. polygraphic phonemes). The reading results showed that both transparent and opaque words were read faster than nonwords. Moreover, both transparent and opaque words were affected by word frequency. These findings suggest that skilled readers of Persian relied on lexical processes to read words. In contrast, the spelling results failed to show a word-advantage effect suggesting that skilled spellers of Persian rely on nonlexical processes to spell words.

(97)

Tao Li, Amelie Yak, Regina Henry, Hong-Jin Sun (sunhong@mcmaster.ca)
McMaster University

New tests of useful field of view in driving related scenarios.

Useful Field of View (UFOV) is an index of an individual's ability to extract information from a scene in a single glance. The conventional tasks for measuring an individual's UFOV require him to recognize or detect a target flashed in the observer's central, peripheral, or both of these visual fields. To provide driving relevant UFOV tests, we used a driving simulator to create two new testing conditions. While participants performed the recognition and detection tasks similar to that in conventional tasks, they either passively viewed optic flow pattern typically experienced during driving or actively drove to follow a lead vehicle.

(98)

John Brand (brand20j@uregina.ca), Chris Oriet
University of Regina

Irrelevant attributes influence statistical representation of sets.

Statistical properties (e.g., the mean) of a set of items are extracted rapidly and remembered better than individual elements (Ariely, 2001). Typically, set research has focused on examining a single property (e.g., diameter) but real objects have many properties. Here, we examined whether the visual system summarizes multiple attributes of a set or only those relevant to the task at hand. Participants discriminated either the mean height or width of a set of rectangles from a test rectangle. Results indicated that the irrelevant attribute influenced perception of the mean, suggesting task-irrelevant properties of the set were encoded without intention.

(99)

Janice Snyder (janice.snyder@ubc.ca)
University of British Columbia Okanagan

Cognitive flexibility in aging: Evidence from multiple location inhibition of return.

Inhibition of return (IOR) purportedly increases search efficiency by biasing attention against previously examined locations/objects. Although IOR is an automatic or reflexive process (i.e., bottom-up), volitional processes (i.e., top-down) are invoked if a reorienting cue does not disengage attention from the cued location and under conditions of uncertainty when the number of cued locations varies across trials. Older adults often lack the cognitive flexibility to negotiate such variability of behavioural demands. This study explored the effect of volitional disengagement and uncertainty on multiple location IOR in older versus younger adults and found no deficits in top-down processing for older adults.

(100)

Timothy Graham, Elizabeth Olds (eolds@wlu.ca), Jeffery Jones
Wilfrid Laurier University

Within-trial feature priming in conjunction search.

A red horizontal target can be distinguished from green horizontal and red vertical distractors, based on the combination (conjunction) of colour and orientation. Olds and Fockler (2004) developed a modified conjunction search paradigm, in which items' colours were previewed for 1 second, immediately before a conjunction search display appeared. That is,

Friday June 20

each red search item was preceded by a red square, and each green search item was preceded by a green square. After 1 second, each coloured square lost sides and became a coloured horizontal or vertical rectangle. Another condition previewed items' orientations. When the search display was preceded by two single-feature preview displays, observers' performance was better if the colour preview appeared before the orientation preview than if the orientation preview appeared first. The present stimuli were roughly equated for orientation versus colour feature-search difficulty. Each had a small T or L drawn in the center, for the search display. Observers identified whether the horizontal red target (present on every trial) featured a T or L. We manipulated preview duration, for single-feature previews. Despite balancing colour vs. orientation feature difficulty, we found clearer development over time for preview assistance of search, for colour than for orientation.

(101)

David Gilbert, Daryl Wilson
(daryl.wilson@queensu.ca)
Queen's University

Independence of attentional control and response control

To explore the relation between attentional control and response control, we manipulated perceptual difficulty and examined the impact on response control. In two experiments, perceptual difficulty on a search task was manipulated via set size. The colour of a target letter determined the response with one colour requiring a congruent motor response, and one colour requiring an incongruent response. As expected, response times increased with set size, and were longer for incongruent than congruent responses. Critically, there was no interaction of perceptual load and response control suggesting that the perceptual difficulty of the task had no impact on response control.

(102)

Man Ching Lee (leemc@mcmaster.ca), Scott Watter
McMaster University

Impaired driving while conversing: A temporal profile of performance.

While previous studies have shown a range of adverse effects of conversation on driving, these studies focused primarily on macroscopic, broader-scale decrements in driving

performance. In contrast, we examined more closely the temporal dynamics of performing a driving analogue task while simultaneously maintaining a naturalistic conversation. Subjects were engaged in a two-way conversation with a confederate while performing a manual tracking task. Event-related fluctuations in manual performance were assessed across short temporal intervals relative to onset and offset speech events in both production and comprehension. This temporal performance profile may illuminate when driving is most impaired within regular conversation.

(103)

Matt Yanko¹ (myanko@sfu.ca), Thomas Spalek¹, Paola Poiese², Vincent Di Lollo¹
¹*Simon Fraser University*, ²*University of Trento*

Separating exogenous from endogenous factors in attentional capture.

Attentional capture occurs when a task-irrelevant stimulus involuntarily receives attentional priority. Two mutually-exclusive sources of capture have been proposed: exogenous (stimulus-bound) and endogenous (goal-oriented). We show that both sources can act concurrently. RSVP streams of differently-coloured letters contained a target-letter of a specific colour. Irrelevant singletons surrounded either one RSVP item (Experiment 1) or all items (Experiment 2). Experiment 1 revealed both exogenous and endogenous sources of capture. Experiment 2 removed exogenous sources by eliminating the suddenness of distractor-onset. Experiments 3-5 ruled out masking as a major factor in Experiment 2. Results are consistent with dual-pathway accounts of attentional control.

(104)

Aimee Skye (skyeal@mcmaster.ca), Bruce Milliken, Ellen MacLellan
McMaster University

Ignoring and the automatic/strategic distinction: A qualitative difference finding.

According to the two-process framework developed in the 1970's (e.g., Posner & Snyder, 1975), ignored stimuli are associated with automatic activation of corresponding mental representations, but not with conscious, strategic control. This inference does not square well with findings from studies of selective attention in which ignored primes produce negative (rather than positive) priming.

Friday June 20

We report a study that measured priming effects as a function of participants' subjective report of strategy use. The results reconcile the contradiction noted above; in particular, qualitative shifts in priming effects as a function of prime strategy use were readily interpretable within the two-process framework.

(105)

Sandra Thomson (thomsosj@mcmaster.ca),
Scott Watter
McMaster University

Information continuity across the response selection bottleneck.

While many studies of dual-task performance suggest that response selection processes of two concurrent tasks must be performed serially, recent work has shown that this central response selection bottleneck may be incomplete. We demonstrate that the response to Task2 can prime the response to Task1, providing evidence for parallel response selection. Further, we show that R2 information generated in parallel with response selection for Task1 is not lost when overt attention turns to Task2, but contributes to the eventual selection of a response for this second task. These results have important implications for theories of divided attention and dual-task performance.

(106)

Cindy Chamberland
(cindy.chamberland.1@ulaval.ca), Sebastien
Tremblay
Université Laval

Is the cost of switching between tasks universal?

Most of the research on task-switching has so far focused on the impact of switching task-set between categorization tasks that require very little memory load. The question remains as to whether the switching cost can be extended to memory tasks. In the present study, we manipulate the nature of switching across tasks and their memory load. The pattern of results is unequivocal in revealing the absence of switching costs with memory tasks. Such a finding challenges the widely accepted assumption that task-alternation comes with a considerable cost in performance regardless of the cognitive tasks undertaken.

(107)*

James Karle (karlejw@mcmaster.ca), Scott
Watter, Judith Shedden

McMaster University

A 'mindless' activity that changes the mind: Differential ERPs in videogame players and non-video game players during a working memory task.

The process by which action videogame players obtain superior levels of performance on a diversity of visuospatial tasks, compared to their non-video game playing contemporaries, remains to be determined. Control at the level of central executive mechanisms and related modules may be important for successful game play. Using a memory updating task, we recorded event-related potentials to test spatial and verbal working memory. There were temporal and topographical distinctions between gamers and non-gamers at parietal and frontal regions for both tasks. These results suggest underlying processing differences between the gamer and non-gamer groups.

(108)*

Marie Arsalidou^{1,2} (marsalid@yorku.ca), Juan Pascual-Leone¹, Janice Johnson¹, Margot Taylor²
¹*York University*, ²*Hospital for Sick Children*

Neural responses to a visuospatial task with six levels of mental demand

Neuroimaging studies show that prefrontal cortex (PFC) mediates cognitive control processes, yet the nature of PFC involvement in tasks with increasing mental demand remains unclear. By controlling for executive demands and adjusting characteristics of the stimuli, six levels of mental demand were introduced in a 1-back visuospatial paradigm. Mental demand levels are related to number of colours present on the stimuli. Using functional magnetic resonance imaging, neural correlates of mental demand were examined in ten adults. Trend analysis showed that activation in middle and inferior frontal cortices and the dorsal and ventral pathways increased as a function of mental demand.

(109)

Kate Lockwood (4kpl@queensu.ca)
Queen's University

Preference conditioning in healthy individuals: The role of family history and recreational drug use.

Preliminary evidence from our lab suggests that participants who report a positive family history of addiction or recreational drug use do not exhibit a preference for cues previously paired

Friday June 20

with reward. The present study investigated this finding further using more sophisticated measures of drug use and family history of drug abuse. 92 undergraduate students completed a series of psychometric measures and were tested on the Conditioned Pattern Preference task. Individuals who reported illicit drug use and a family history of substance abuse demonstrated preference conditioning with no deficit in explicit learning. Those who reported hazardous drinking and negative incidences related to alcohol use exhibited enhanced preference conditioning. This enhancement may represent sensitization of dopaminergic systems in individuals with excessive drug use.

(110)*

Peter Jansen (jansenpa@mcmaster.ca)
McMaster University

Chimaera networks: Temporal self-organizing artificial neural networks for sequence learning.

This study develops a Chimaera Network -- a novel temporal cellular-automation architecture that blends a self-organizing map (SOM) with a Hebbian-learning based association map to perform experiential learning over time. Similar to Simple Recurrent Networks, which have been extensively used to model language, the Chimaera network is able to learn simple temporally presented sequences, with several differences: (a) The Chimaera learns both data vectors representing what is being sequenced, as well as the specific sequence (b) Both semantic and temporal sequence representations are learned experientially, rather than using a supervised learning algorithm (c) The Chimera is a single layer network.

(111)*

Edward O'Neil¹ (edoneil@gmail.com), Anthony Cate², Stefan Köhler¹
¹*University of Western Ontario*, ²*VA Research Service*

Accuracy related activation in the perirhinal cortex in recognition memory and perceptual discriminations.

Recent evidence suggests the perirhinal cortex (PRc), a medial temporal lobe structure involved in memory, may also be involved in visual perception. We conducted an event-related fMRI experiment to compare the role of PRc in perceptual discrimination and recognition memory decisions. When matched for task difficulty, no significant differences in PRc

activation for memory and perception conditions were found. Instead, a conjunction analysis revealed a region in right PRc whose activity was related to accuracy of both recognition memory and perceptual discriminations. These findings show that the functional role of PRc is not limited to long-term declarative memory.

(112)*

Soaleha Shams (sshams2@uwo.ca)
University of Western Ontario

Effects of intraperitoneal administration of propionic acid on social interaction in juvenile rats: A model for autism.

Recent studies have shown that central administration of Propionic (PPA) in adult rats, results in behavior and neuropathology, characteristic of autistic patients. Here we examined the effects of intraperitoneal (i.p.) administration of PPA on social behavior in juvenile male Long-Evans rats. Locomotor activity, play behavior and other social interactions were recorded, immediately after each peripheral injection of PPA or PBS control vehicle. Rats treated with PPA display hyperactivity and reduced social interaction, consistent with human autistic symptoms. Findings from this study support establishment of peripheral administration of PPA in juvenile rats as an animal model of Autism.

(113)*

Erin Rock¹ (erock@uoguelph.ca), Cheryl Limebeer¹, Raphael Mechoulam², Daniele Piomelli³, Linda Parker¹
¹*University of Guelph*, ²*Hebrew University of Jerusalem*, ³*University of California at Irvine*

Effects of ondansetron, cannabidiol and URB597 on lithium-induced conditioned gaping (a model of AN) in rats.

Anticipatory nausea (AN) experienced by chemotherapy patients is resistant to current anti-nausea treatments. Although rats cannot vomit, they display conditioned gaping to a context, previously paired with lithium-induced sickness—serving as a rodent model of AN. URB597 prolongs the action of the endogenous cannabinoid anandamide (AEA) by inhibiting fatty acid amide hydrolase (FAAH), which rapidly deactivates AEA. Here, we present evidence that OND was ineffective in reducing the expression of conditioned gaping (Experiment 1), while CBD (1 and 5 mg/kg) (Experiment 2) and URB597 (0.3 mg/kg) (Experiment 3)

Friday June 20

suppressed conditioned gaping to a context, previously paired with lithium-induced sickness.

(114)*

Min-Ching Kuo (7mk1@queensu.ca), Hans Dringenberg
Queen's University

Dark exposure lowers the induction threshold for long-term potentiation in the adult primary visual cortex of anesthetized rats.

The ability of synapses to express plastic changes is influenced by the history of averaged activity of that synapses ("metaplasticity"). We used dark exposure (2-5 h) to influence activity levels in the retinal-lateral geniculate nucleus (LGN)-primary visual cortex (V1) pathway of adult rats. After dark exposure, high frequency light flashes to the retina, or theta-burst stimulation of the LGN resulted in synaptic potentiation of field evoked potentials in V1, while rats kept in continuous light did not show potentiation. Thus, synaptic plasticity in the adult visual cortex is profoundly modulated by the history of prior visual experience.

(115)*

Katharine Tuerke (ktuerke@uoguelph.ca), Cheryl Limebeer, Linda Parker
University of Guelph

Nausea-induced effects of paroxetine on conditioned gaping in rats.

Although rats do not vomit, they display conditioned gaping reactions when re-exposed to a flavor previously paired with a nauseating treatment. Paroxetine (Paxil) is the most potent Serotonin Selective Reuptake Inhibitor prescribed to treat depression; however, it produces the unpleasant side effect of nausea. To investigate paroxetine's ability to produce conditioned gaping (4 conditioning/testing trials) rats were intraorally infused with 0.1% saccharin solution that was immediately followed by an ip injection of paroxetine (0, 3, 10 and 30 mg/kg). The 30 mg/kg dose of paroxetine produced conditioned gaping after 3 conditioning trials, indicating that the highest dose produced nausea.

(116)

Jennifer Forsyth (4jf12@queensu.ca), James Reynolds, Richard Beninger
Queen's University

Effects of combined isolation rearing and subchronic MK-801 on sensory

gating, locomotor activity and discrimination learning in rats.

Biological and environmental interactions are implicated in schizophrenia; animal models offer insight into the underlying pathology. This study investigated behavioural effects of combined environmental and neurological insult, using isolation (SI) or group (GH) rearing and subchronic MK-801 or saline (MK or Sal, respectively; 0.5 mg/kg or 1.0 ml/kg twice daily for 7 days, respectively). SI-MK rats appeared to show the greatest deficits but did not significantly differ from SI-Sal rats. Injected SI, compared to GH rats, showed robust abnormalities; subchronic injections alone may exacerbate SI. Future studies should further characterise behavioral and neurochemical differences between MK-801 and saline on SI.

(117)

Randelle Hewitt, Roelof Eikelboom
(reikelboom@wlu.ca)
Wilfrid Laurier University

Access schedule and sugar addiction.

Addiction is partly characterized by excessive and uncontrolled substance consumption, but the precipitating factors are unclear. Access schedule may be important in determining consumption. Providing sugar (4% solution) discontinuously to rats for 24 h once every 3 days caused elevated intake over days relative to rats given ad lib sugar access, suggesting access schedule is important when assessing 'food addiction'. This differential consumption was maintained upon moving all rats to alternate day access. The effect was concentration-dependent, as lower and higher sucrose concentrations did not cause elevated consumption. High-resolution analyses of lick patterns confirmed that discontinuous access produces bingeing.

(118)

Jean-Francois Nankoo (jeanfran@yorku.ca), Suzanne Macdonald
York University

Maternal behaviour in captive Vancouver island marmots (Marmota vancouverensis).

Maternal behaviour can have important implications for the success of captive-breeding and reintroduction programs of endangered species. In this study, we investigated maternal behaviour in captive Vancouver Island marmots (VIM), one of North America's most endangered

Friday June 20

mammals. Nestbox cameras allowed for continuous monitoring of the behaviors of the animals. Using a focal sampling method we analyzed the duration and frequencies of all maternal behaviours, obtaining data on individual differences between three nursing females prior to weaning of pups. These data provide a unique insight into this species, and will be used to enhance VIM breeding and recovery efforts.

(119)

Leslie Phillmore (Leslie.Phillmore@dal.ca),
Haralambos Lavranos, Simon Gadbois
Dalhousie University

**Characterization of
electrocommunicative signals of
elephant nose fish (*Gnathonemus
petersii*).**

Elephant nose fish use weak electric signals for both electrolocation and electrocommunication. In this study, we sought to characterize electrocommunicative signals in two ways: how they change over distance and in response to conspecifics. The signals follow the inverse square law and fall off in maximum, minimum, and root mean square amplitude. The size of the fish was not related to signal power. Small sample size and low signal resolution prevented us from concluding that individual fish discriminate between familiar and non-familiar conspecifics, however there is preliminary evidence that the fish discriminate between an environment with or without conspecifics.

(120)

Meagan Munro, Allison Boyd, Ayesha Salleh,
Leslie Kerr (lkerr@trentu.ca)
Trent University

**Risk assessment and fear behaviours in
adult female balb/c mice are modulated
by maternal separation.**

Investigating the effects of brief (H) and protracted (MS) maternal separation on elevated plus maze behaviours, demonstrated that mice not subjected to maternal separation procedures (TR), entered the unprotected arms more frequently than either H or MS mice (p 's<0.001). Also, head dipping and flat-back approach were observed more in TR than in MS mice (p 's<0.05), whereas MS mice froze more often than did H (p =0.064) or TR (p <0.05) mice. Results indicate that TR female Balb/c mice in estrus are more active and vigilant but less fearful, and that MS females exhibit reduced risk assessment and increased fear behaviours.

President's Symposium

Frontiers of Neuroimaging: Emotion, Communication and the Arts

2:30 - 4:00, Somerville 3345

Chair: tba

(121) Adam K. Anderson (anderson@psych.toronto.edu)
University of Toronto

Friday June 20

The hungry eye: Neural and psychological mechanisms underlying emotional encoding.

We do not register everything in our perceptual field or remember every waking moment of our lives; rather, the encoding, storage and retrieval of information is modulated by its importance to the observer. Emotions may provide a basic mechanism for this sifting of the wheat from the chaff of subjective experience, as they are associated with the diverting of resources in the body as well as the brain. Neuroimaging and behavioural data will demonstrate how the neural and psychological components supporting emotional experience are related to information processing. Together these data suggest that emotional states alter the attentional lens, and associated cortical processing, through which experience is filtered.

(122) Steven Brown (stebro@sfu.ca)
Simon Fraser University

The cortical control of vocalization in humans.

Human beings are among a handful of animal groups that have the capacity for vocal learning. Vocal imitation provides a basis for both the developmental acquisition and cultural evolution of languages and musical systems. I will discuss neuroimaging studies that have sought to identify the major vocal centres of the human brain, as well as ongoing functional MRI and tractography studies of vocal imitation. Finally, I'll make mention not only of the evolution of human vocalization but of the use of vocal forms, such as singing styles and phonemic repertoires, to study the history of human evolutionary migrations.

3.1 Perception

4:15 - 5:45 Somerville 3345

Chair: J. Culham

4:15 Walter Bischof (wfb@ualberta.ca), Xingdong Yang, Pierre Boulanger
(123) *University of Alberta*

Perception of haptic forces.

Haptic interfaces are used increasingly in medical systems, for example in surgery support and training systems. Unfortunately, very little is known about how to provide efficient haptic feedback. More specifically, little is known about perception of haptic feedback forces are perceived during hand movements. In a series of experiments, we determined discrimination threshold for the perception of haptic force direction and haptic force magnitude while observers are making making hand movements. Results indicate that the perception of haptic force magnitude is affected by hand movement and by the direction of the haptic force. In contrast, the perception of haptic force direction is not affected by hand movement. The results are interpreted with respect to the design of more effective haptic feedback devices.

4:30 Emma Guild¹ (emma.guild@utoronto.ca), Myra Fernandes²
(124) ¹*University of Toronto*, ²*University of Waterloo*

Process-specific interference effects during recognition of spatial patterns and words.

Recognition memory for words or visuo-spatial patterns was examined under full or dual-task conditions with a distracting task requiring either phonological (rhyme) or visuo-spatial (curved-line) processing of letters. We found an interaction such that the curved-line distracting task had a more detrimental effect on memory for spatial patterns than did the rhyme task, whereas the rhyme distracting task had a more detrimental effect on memory for words than did the curved-line task. Results suggest that similarities in processing requirements, between the memory and distracting task, determine the magnitude of memory interference under dual-task conditions during retrieval.

Friday June 20

4:45 Jennifer Campos, Hong-Jin Sun (sunhong@mcmaster.ca)
(125) *McMaster University*

Body-based cues trump vision when estimating walked distance.

Typically, optic flow is studied in the absence of body-based cues and thus, little is known about its influence during natural locomotor behaviours. This study employed two novel techniques to dissociate optic flow from body-based cues when estimating distance travelled through a natural environment. First, a cue-incongruency was created using lenses that magnified/minimized visual information. Second, a walked distance was presented twice and optic flow was either available or absent during each presentation; the two distances were either identical or offset by 20%. Convergent cue-weighting values indicate that body-based cues are weighted about twice as much as optic flow.

5:00 Dorita Chang (5dc16@queensu.ca), Nikolaus Troje
*(126) *Queen's University*

Acceleration underlies the local inversion effect in biological motion perception.

We tested direction discrimination from biological motion stimuli that display only fragments of full foot trajectories at upright or inverted orientations. Results from observers presented with displays derived from counterphase fragments of different types of foot motions showed an inversion effect that was largest for stimuli derived from the human runner which exhibit pronounced vertical accelerations. Results from new observers presented with veridical human walker stimuli and stimuli that were identical but had accelerations removed showed an inversion effect for the veridical stimuli only. These findings suggest that the local inversion effect is carried by acceleration cues in foot motions.

5:15 Kristina Neely (kneely4@uwo.ca), Simisola Caxton-Idowu, Louis Kour, Matthew Heath
(127) *University of Western Ontario*

Direct and mirror-symmetrical pointing responses are mediated by separate visuomotor and visuo-perceptual networks.

We sought to determine whether the perceptual over- and underestimation of a veridical target characteristic (i.e., distance) in respective left and right visual fields impacts the endpoint characteristics of direct (pro-pointing) and mirror-symmetrical (anti-pointing) responses. To that end, participants completed pro-pointing and anti-pointing responses to mediolateral targets oriented left and right of midline. Importantly, endpoint accuracy in the anti-pointing, but not the pro-pointing, condition elicited a pattern of under- and overshooting in respective left and right visual fields. These results suggest that pro- and anti-pointing movements rely on distinct visuomotor and visuo-perceptual networks.

5:30 Jody Culham¹ (jculham@uwo.ca), Marla Wolf¹, Rob Whitwell¹, Liana Brown², Sarah Khan¹,
(128) Jonathan Cant¹, Simona Monaco¹, Gordon Dutton³, Melvyn Goodale¹

¹*University of Western Ontario*, ²*Trent University*, ³*Royal Hospital for Sick Children, Glasgow*

Fmri and behavioral testing reveal preserved motion processing and visuomotor control in a patient with extensive occipitotemporal lesions.

We report a new patient, MC, with large bilateral lesions of occipitotemporal cortex. Despite severely impaired visual processing, MC can nevertheless perceive visual motion and accurately perform actions such as reaching and grasping even though she cannot recognize the target objects. Consistently, functional magnetic resonance imaging revealed robust activation for moving (vs. static) stimuli and for grasping (vs. reaching) but no object-selective activation. These combined results suggest that spared input to the dorsal stream accounts for MC's residual abilities, reinforcing and extending the proposed dissociation between perception and action drawn from a classic patient, DF (Goodale & Milner, 1992).

3.2 Symposium

Friday June 20

Meaning in Mind: Clues from Semantic Richness Effects in Word Recognition

4:15 - 5:15 Somerville 2355

Chair: P. Pexman

4:15 Ben Amsel (benamsel@gmail.com), George Cree
(129) *University of Toronto, Scarborough*

How does amount of semantic visual knowledge influence word meaning computation? An electrophysiological study of knowledge representation.

Past studies suggest amount of semantic information (i.e., semantic richness) affects online language comprehension. Concepts with richer representations were computed faster, and produced less neural activity, than comparatively impoverished representations. To further explore this phenomenon in real-time, we created high and low number-of-verbally-generated visual feature conditions within animal and non-living concepts. Participants performed abstract/concrete decisions during EEG recording. We found multiple effects of semantic richness, including larger N400 amplitudes for concepts possessing few versus many visual semantic features, which appear to corroborate Pexman et al's (2007) fMRI results. We discuss implications for current neurocognitive theories of knowledge representation.

4:30 Ian Hargreaves (ishargre@ucalgary.ca)
(130) *University of Calgary*

Tolerating ambiguity: Ambiguous words recruit the left inferior frontal gyrus in absence of a behavioral effect.

Recent evidence suggests that behavioral effects of ambiguity in semantic categorization tasks (SCT), often attributed to the meaning activation phase, disappear when biases in the decision-making phase are controlled (Pexman, Hino & Lupker, 2004). In absence of significant behavioral ambiguity effects, however, is there any evidence that ambiguous words are generating ambiguity-related activity? We used event-related functional magnetic resonance imaging to examine the neural correlates of ambiguity in a SCT. Despite producing no behavioral effect of ambiguity, ambiguous words recruited cortical structures implicated in top-down modulation of noisy activity. Results support the influence of decision-phase processing in lexical ambiguity effects.

4:45 Daniel Mirman (daniel.mirman@uconn.edu)
(131) *University of Connecticut*

Attractor dynamics account for contrasting effects of near and distant semantic neighbors.

Theories disagree on the proposed mechanism underlying activation of semantically similar words during word recognition. Attractor-based views uniquely predict that the effect of semantically similar words will depend on the topology of semantic space. Consistent with attractor-based models and challenging traditional accounts, words with many distant neighbors (moderately similar meanings) were processed faster, but words with many near neighbors (highly similar meanings) were processed slower. Eye-tracking data suggest that near neighbors show a transient peak in activation, but distant neighbors show relatively constant activation. These patterns are consistent with attractor dynamics and challenge traditional views of semantic structure and processing.

5:00 Paul Siakaluk (siakaluk@unbc.ca), William Owen, Josh Rash
(132) *University of Northern British Columbia*

The body-object interaction effect: Does response modality play a role?

High body-object interaction (BOI) words are processed faster than low BOI words in lexical decision and semantic categorization tasks using button presses (Siakaluk et al., 2008; Siakaluk et al, in press). One possible explanation for this finding is that high BOI words more easily prime

Friday June 20

the manual motor system, resulting in faster button presses. In other words, specific motor information encoded during physical interactions with objects is not what is being activated during processing. We examined this proposed explanation in three tasks requiring a response modality less likely to be used during physical interactions with objects, namely verbal responses.

Face Representation
5:15 – 5:45 Somerville 2355
Chair: P. Pexman

5:15 Jennifer Heisz (heiszj@mcmaster.ca), Judith Shedden
***(133)** *McMaster University*

Testing our reliance on holistic face representations.

Using event-related potentials we investigated the extent to which face processing relies on holistic representations and whether this reliance varies depending on the processing stage. Composite faces were created by aligning top and bottom halves of two different famous faces to form a stimulus set with familiar parts but a novel whole. Original and composite faces elicited similar responses at ERP components N170 and N400 but were differentiated at N250. These results suggest that the N250 is sensitive to holistic properties that are disrupted by composite faces, whereas the N170 and N400 reflect processing not affected by these same manipulations.

5:30 Lisa Betts (lbetts@yorku.ca), Hugh Wilson
(134) *York University*

Heterogeneous structure in face-sensitive visual areas revealed by functional MRI adaptation.

Several regions in the human visual cortex, including the fusiform face area (FFA) and the occipital face area (OFA), produce robust BOLD activation to synthetic face stimuli. We used an event-related fMRI adaptation paradigm to measure the responses to full faces, features, and head outlines after adaptation to full faces, features, and head outlines. The observed pattern of BOLD adaptation is consistent with a model in which independent populations of full face-, feature-, and head outline-tuned neurons exist within face-sensitive regions of the human occipitotemporal cortex, rather than a single homogeneous population of face-encoding cells.

3.3 Emotion

4:15 - 5:45 Somerville 3315
Chair: tba

4:15 Jennifer Burkitt Hiebert (jab814@mail.usask.ca), Lorin Elias
(135) *University of Saskatchewan*

Gazing at attractiveness.

Greebles were initially designed to serve as control stimuli for faces, but people do not always process these objects as they do faces. People spend more time looking at objects that they find attractive. 29 participants viewed pairs of faces and objects and were asked to select the more attractive image. Participants spent significantly more time looking at the face, geon, chair and string object they preferred. However, preferred Greebles were not looked at longer than the non-preferred Greebles. The current results indicate that Greebles may not serve as adequate control stimuli in tasks of facial attractiveness.

4:30 Jenna Cheal (chealj@mcmaster.ca), M. Rutherford
***(136)** *McMaster University*

Surprise! Context dependent categorical perception of emotion.

Surprise has not consistently been found to be perceived categorically when paired with other basic emotions. We reasoned that if the inherent ambiguity of surprise (it can be positive or

Friday June 20

negative) prevents categorical perception, then introducing a context for surprise might facilitate categorical perception. Participants identified or discriminated images that were intermediate between surprise, fear, and happiness. Half were given a context for the surprise expressions (a short description of a surprising situation). Both groups had typical identification curves, but discrimination performance was better predicted by identification in the context condition for some continua, suggesting categorical perception for those stimuli.

4:45 Florin Dolcos¹ (fdolcos@ualberta.ca), Roberto Cabeza², Gregory McCarthy³
(137) ¹University of Alberta, ²Duke University, ³Yale University

Neural correlates of opposing modulation of emotion on cognition: An event-related fMRI investigation.

A major question in the emotional memory literature is why in some conditions emotion enhances, while in others it impairs memory. My presentation will focus on fMRI evidence from a study directly comparing the neural correlates of these opposing effects, within the same participants. The findings will be discussed in the context of their relevance for understanding affective disorders, in which the impairing and enhancing effects of emotion cooccur - impaired cognitive abilities in these clinical conditions may be linked to enhanced susceptibility to emotional distraction, which in turn may be due to enhanced recollection of memories for distressing events.

5:00 Cindy Hamon-Hill (cindy.hamon-hill@dal.ca), John Barresi
(138) *Dalhousie University*

I remember your smile: Recognizing facial emotions from a brief acquaintance.

Does familiarity with a person's emotional responses in particular situations enhance an observer's ability to correctly recognize that person's responses in other situations? Dynamic facial displays of two people were individually paired with images to which they were responses, or paired with other images. For each display, the observer's task was to judge whether a person was looking at the accompanying picture or not. Observers were exposed to a pre-test 'acquaintance' period for one of the stimulus faces. Acquaintance improved performance on paired displays previously seen. Surprisingly, performance on previously unseen expressions did not differ from those for a complete stranger.

5:15 Glenda Prkachin (gcp@unbc.ca)
(139) *University of Northern British Columbia*

Infant perception of facial expressions of emotion.

Faces that convey different emotions are differentiated and even treated as special by infants around 6 months of age. They appear to be capable of perceiving some of these important expressions before 6 month of age but, the research evidence is mixed and findings often contrary.

We used split screen video presentations of six different emotion expressions (EE) on one side of the screen and a nonsense expression (NE) presentation on the other side of the screen. A 15 year old girl was trained to make the six facial EE and the NE contained facial movement similar to that of emotions but does not convey affective information. These are morphed movements of different facial movements by the same 15 year old girl. Infants responses were video taped and amount of time spent looking at the NE and EE or away were evaluated by researchers unfamiliar with the hypothesis. The infants spent the majority of their time examining the facial expressions of emotion $F(1, 9) = 9.73, p < .01$. They spent significantly larger amount of time examining the fear expression compared to the other expressions of emotion $t(9) = 3.3, p < .01$. The sample size is small; however, the results are consistent. With some modification the technique could be useful for younger infants.

5:30 Meredith Young (youngme2@mcmaster.ca), Lee Brooks, Geoffrey Norman
*(140) *McMaster University*

On being sane in insane places: The role of psychiatric context on interpretation of non-clinical behaviour.

Friday June 20

There is evidence indicating that the context in which an individual is presented can alter the perceptions of normal behaviour as psychopathological (Rosenhan 1973). Participants learned four pseudopsychiatric disorders, and were trained to competence. At test, participants diagnosed case vignettes, each containing one familiar symptom description (from practice) supporting one diagnosis, and 2 new symptom descriptions supporting another. Embedded in each case were two additional behavioural descriptions that were identified as 'normal behaviour' in a control study. When these 'quirky' behaviours were presented in the context of a psychiatric case, participants identified these features as indicative of psychiatric illness. These data support previous research on patient context, and may indicate co-selection of features and diagnostic hypotheses.

3.4 Reasoning

4:15 - 5:45 Somerville 3317

Chair: V. Thompson

4:15 Sophie Callies (sophie.callies@umontreal.ca)

*(141) *University of Montreal*

How do experts organize their knowledge? Use of a complex function learning paradigm.

Proposed in 2002 by Lewandowsky et al., the theory of knowledge partitioning refers to the context-dependent aspect of knowledge. The more complex is the learning process, the more likely knowledge will be organized in separate parcels, each matching with a specific context. Nonetheless, we found several limitations in the authors' methodology. We chose therefore to resume their experiment after controlling problematic variables. As the aim of this study was to understand expertise in complex learning, we categorized learners based on performance. As surprising as it may seem, knowledge partitioning occurred only for low-performing learners, whereas experts (i.e., high-performing learners) integrated their knowledge in a single entity.

4:30 Matthew Crump (matt.crump@vanderbilt.edu), Gordon Logan

(142) *Vanderbilt University*

Instance-based contributions to serial-ordering during online performance: Insight from skilled typing.

Serially ordering events during performance is a hallmark ability inherent to everyday movement sequences and highly skilled performance domains such as playing music and typewriting. Although serial ordering processes are ubiquitous in performance, they are not well understood. Current theorizing places more emphasis on the role of control processes (feed-forward inhibition, schemas, frames) than on the role of representations (associative chains, memory for instances) in mediating serial ordering. The present set of experiments investigates skilled typewriting behaviour as a convenient arena for understanding the contribution of instance-based memory representations to online performance of rapid movement sequences.

4:45 Mike Yeomans (my.yeomans@gmail.com), Jason Chin, Jonathan Schooler

(143) *University of Waterloo*

Mind-altering figures: Insight problem solving and transfer inappropriate processing shifts.

Insight problem solving, characterized by sudden "aha" moments at the time of solution, presents an important paradigm for studying the mechanisms of unconscious thinking. Previous work has suggested that insight represents cognitive processing on a more abstract level than typical analytical process. The current study shows that by using Navon figures to prime subjects into holistic or featural states of mind (called transfer inappropriate processing), insight performance is significantly affected. Mediation analysis shows that this effect is the result of hemispheric asymmetry (measured by line bisection) whereby holistic priming increases right hemisphere dominance, facilitating performance on insight problems.

Friday June 20

5:00 Erin Beatty (erin.beatty@usask.ca), Valerie Thompson
(144) *University of Saskatchewan*

Can thinking from another's point of view improve scientific reasoning?

Asking reasoners to adopt the perspective of another can increase the proportion of logically valid inferences (Thompson, Evans, & Handley, 2005). One explanation for this is that shifting perspective promotes analytic reasoning. If this is the case, then shifting perspectives should also reduce the belief-bias effect. To test this hypothesis, participants read twenty-four descriptions of hypothetical research data that varied the quality of evidence and the believability of the conclusions provided. Participants were asked to indicate whether the data presented supported the researcher's hypotheses. Individual difference measures in thinking styles and IQ were also measured.

5:15 Nadia Martin¹ (n6martin@artsmail.uwaterloo.ca), Jonathan Fugelsang¹, Valerie Thompson²
***(145)** ¹*University of Waterloo*, ²*University of Saskatchewan*

Individual differences in the effects of beliefs, logic, and confidence across two domains of reasoning.

In two experiments, we examined the degree to which beliefs and logic differentially influence judgments and confidence in deductive and causal reasoning. Whereas the use of beliefs in the causal task was predictive of belief use in the deductive task, the use of logic was uncorrelated between the two tasks. In a second study we examined the degree to which individual differences in thinking dispositions and cognitive abilities predict reasoning behaviours across these two reasoning domains. These findings will be discussed in terms of current dual-process models of reasoning.

5:30 Valerie Thompson (valerie.thompson@usask.ca)
(146) *University of Saskatchewan*

Dual process theories, metacognition, and the control of system 2 reasoning.

According to Dual Process Theories (DPT), automatic System 1 (S1) processes give rise to contextualised representations and attendant judgments that are seldom analysed extensively by deliberate, decontextualised System 2 (S2) processes. A crucial issue for DPT's is to identify the circumstances under which S2 does intervene. In this talk, I will outline a framework for predicting S2 intervention that is based on the metacognitive experiences associated with S1 processes, termed the Feeling of Rightness (FOR). Finally, I will present some preliminary data to demonstrate how the FOR can be measured and used to predict reasoning outcomes.

Friday June 20

Poster Session 2
5:45 - 7:45 The Great Hall, Somerville

(147)

Craig Scott (craigeducation@gmail.com), Chris Oriet

University of Regina

Inhibition of return and affective devaluation.

Attentional allocation is known to influence later affective evaluations of objects. Specifically, objects viewed under conditions of attentional inhibition are emotionally devalued. In this study, attention was manipulated using the inhibition of return paradigm. Identical faces were judged as less trustworthy when viewed under conditions of attentional inhibition than when viewed under attentional facilitation. The strength of inhibition positively correlated with the magnitude of affective devaluation of the faces across participants, suggesting participants who most strongly inhibited the faces also devalued them the most. Individual differences in sex, prenatal testosterone exposure, and emotion recognition were also examined.

(148)

Biljana Stevanovski¹ (bstevano@unb.ca), John Christie², Raymond Klein²

¹*University of New Brunswick*, ²*Dalhousie University*

The role of context in vector averaging of inhibition of return.

Using uninformative single or multiple simultaneous cues, Klein, Christie, and Morris (2005) found a gradient of inhibition of return (IOR) that was maximum in the direction of the net vector of the cue. When cues had no net vector, the IOR effect was not observed. The generality of this "vector averaging" finding was explored by focusing on trials with two simultaneous cues. In blocks with only 2 cues, some aspects of the vector averaging pattern were absent. The role of context in mediating the original finding was explored by mixing 2-cues with either a 1-cue or a 4-cue condition.

(149)

Stephen Smith (s.smith@uwinnipeg.ca), Aaron Trachtenberg, Samuel Rumak, John Webb
University of Winnipeg

Hot wheels: Neutral items paired with an arousing image capture attention in an emotional-blink task.

The current study examines whether neutral stimuli paired with emotionally arousing images modulate attention. Participants completed a conditioning phase in which images from a particular class of items (e.g., cars or birds) were paired with emotionally arousing images. Following conditioning, participants completed a task in which they searched for a target embedded within a series of 17 rapidly presented images. Critically, a conditioned or neutral item from the initial phase appeared 200-ms or 800-ms before the target. At 200ms, stimuli paired with arousing images impaired target detection relative to the other distractors, suggesting that conditioned stimuli are prioritized by attention.

(150)*

Lisa Hagen (lhagen@rogers.com), Chris Herdman, Matthew Brown

Carleton University

The performance costs of digital head-up displays.

Head-Up Displays (HUDs) project information such as vehicle speed onto the windshield to assist drivers in monitoring their speed while allowing them to spend more time looking at the external scene. In the present research, a driving simulator was used to examine costs and benefits of HUDs. Participants were better at maintaining vehicle speed when a HUD was used relative to a standard Head-Down Display (HDD). However, lane position monitoring was worse when a digital HUD was used than when either an analogue speed HUD or a HDD were used.

(151)

Meghan McConnell (mconn@mcmaster.ca), David Shore

McMaster University

Effects of musical mode and tempo on attentional processes.

The present study examined the effects of music on different attentional components. Participants listened to one of four versions of a Mozart Sonata that varied in tempo (fast or slow) and mode (major or minor). Attention was

Friday June 20

measured in three domains—alerting, orienting, and executive functioning. Musical mode and tempo had no effect on alerting and orienting. However, greater executive control was found for participants who listened to sad music relative to those who listened to happy music, and this difference was greatest at fast tempos. These findings provide further evidence that happier moods promote global processing whereas sadder moods promote local processing.

(152)

Christopher Sears (sears@ucalgary.ca), Jessica LeHuquet, Charmaine Thomas, Jeremy Johnson
University of Calgary

Individual differences in the allocation and disengagement of attention to emotional images.

Participants studied four types of images (depression-related, anxiety-related, positive, and neutral) for a recognition memory test while their eye fixations were tracked and recorded. On each trial a set of four images was studied simultaneously or sequentially and the allocation of attention to each image was measured. A probe procedure was used to measure the speed with which participants could disengage their attention from each image type. Our results are discussed in terms of mood-congruent processing biases and interactions between cognition, emotion, and attention.

(153)

Amanda McIntyre, Katherine Arbutnott (katherine.arbutnott@uregina.ca)
Campion College, University of Regina

Self-regulation depletion: An examination of underlying mechanisms.

We tested the hypothesis that self-regulation (SR) depletion results from opposing automatic responses using moral reasoning problems that elicit conflict between automatic emotional and controlled cognitive judgments. Moral problems were framed either personally or impersonally assuming that personal framing would elicit stronger emotional reactions, resulting in greater SR depletion when rational moral judgments were given. SR depletion was measured using verbal and non-verbal fluency tasks. The results indicated negative correlations between the number of cognitive moral judgments and fluency performance, especially for personally framed problems. This provides preliminary

evidence that counteracting automatic responses is one source of SR depletion.

(154)*

Molly Pottruff1 (pottrumm@mcmaster.ca), Jonathan Fugelsang², Daniel Smilek²
¹*McMaster University*, ²*University of Waterloo*

Game, set and match: The role of implicit and explicit attention in a novel card game.

In this experiment we collected eye-fixation data to investigate whether an attentional bias existed before overt recognition in a novel pattern search task. Participants were taught a complex grouping rule, then searched sixteen 3 x 3 arrays each containing three items that conformed to this newly learned rule. Analyses indicated a significant attentional bias with target items receiving proportionately more fixations, as well as longer fixations, up to 15 seconds before an overt response. These results suggest that there may be implicit awareness of the relations among target items well before explicit awareness of those relations.

(155)

Wafa Saoud, Jason Ivanoff (J.Ivanoff@smu.ca)
Saint Mary's University

Non-attentional effects of non-predictive central cues.

Central non-predictive arrow and gaze cues elicit shifts of attention automatically. Here we address whether non-informative central cues also influence the response criterion in a go/no-go task. Central, non-predictive gaze and hand cues pointed toward or away from the location of a subsequent target. Responses to the go targets were faster, and false alarm errors to no-go targets were more frequent, when cues pointed toward the target than when they were directed away from it. While a similar pattern was observed with central, non-predictive arrow cues, it was not seen with non-predictive peripheral cues. These results suggest that central, non-predictive cues not only bias attentional processes, they also lower the response criterion.

(156)

Michelle Jarick¹ (michelle_jarick@hotmail.com), Jutta Peterburs², Mike Dixon¹
¹*University of Waterloo*, ²*Ruhr-University Bochum*

Friday June 20

Reading between the masks: Synaesthetic colours alleviate masking in a grapheme-colour synaesthete.

Grapheme-colour synaesthesia is a fascinating condition whereby black graphemes elicit colour experiences. There is debate concerning whether the grapheme must be consciously perceived before the colour can be experienced. We masked either digits (that triggered colours) or symbols (that did not). For the synaesthete (C) normal masking (poor identification) occurred for symbols, but for digits her synaesthetic colours appeared to alleviate masking (relative to control participants). Controls performed poorly for both digits and symbols. Our findings indicate that for some synaesthetes, photisms can occur prior to awareness of the grapheme, and can even aid in grapheme identification under masking.

(157)

John Granzow (granje@uleth.ca), Shelley Gross, John Vokey
University of Lethbridge

Musical expertise and other influences on the fundamental frequency illusion.

The fundamental frequency (F0) illusion refers to the report of hearing the fundamental of a complex tone when in fact it is absent. Musical expertise has been shown to influence the illusion. Such results have led some theorists to postulate that musical expertise results in differences in perceptual experience. Yet other research suggests that the missing fundamental illusion is ubiquitous. The current research explores potential experimental confounds (e.g., variability in the comprehension of the concept of "pitch") in the previous work as the source of these effects of musical expertise.

(158)

Angela Vavassis (vavassis@alcor.concordia.ca), Michael Von Grünau
Concordia University

Transfer-appropriate processing (TAP) under conditions of perceptual uncertainty.

TAP refers to the phenomenon whereby a correspondence between encoding and retrieval typically leads to enhanced memory performance. We assessed TAP for target-identification under conditions of perceptual uncertainty in stable visual scenes. Perceptual uncertainty was achieved through the use of trials with a very brief stimulus presentation.

During training, such trials were randomly embedded amongst trials with a range of longer stimulus presentations. Subsequent testing consisted of trials with brief stimulus presentations only, and all performance improvements acquired during training for such trials were lost. Generalization to other visual tasks is currently being explored to help uncover possible underlying mechanisms.

(159)*

Nicholas Watier (nwati078@uottawa.ca), Charles Collin, Isabelle Boutet
University of Ottawa

The effects of configural and featural processing on spatial frequency thresholds for faces.

Face recognition relies more on the relative positions of face features (configural information) than on the appearance of the individual face parts (featural information). It also seems to rely on a specific band of spatial frequencies (SFs). Our study measured the range of SFs needed for processing

(160)

Jordan Schoenherr (psychophysics.lab@gmail.com), Craig Leth-Steensen, William Petrusic
Carleton University

Toward the independence of confidence and decision processing.

Metacognitive faculties are thought to reside on a continuum based on when they are solicited relative to a decision or a memory task (Nelson & Narens, 1990). In this conceptual framework, confidence processing is thought to reflect a postdecisional evaluation of performance. However, this characterization of confidence processing stands in opposition to many recent studies in both general knowledge and perceptual tasks that demonstrate that confidence processing occurs both during and after the primary decision. A series of three experiments demonstrates that confidence level can be affected independently of the primary decision.

(161)

Craig Leth-Steensen (craig_leth_steensen@carleton.ca), Joey Theberge
Carleton University

Distributional analysis of mental rotation rts.

Friday June 20

In this study, 20 participants made same-different judgments to capital letter stimuli presented in either standard or mirror-image form, that were rotated from upright in 30 deg. increments (from 0 to 180 deg.). An ex-Gaussian distributional analysis of the obtained reaction times indicated that the increases in mean reaction times with increasing rotation angles were accompanied mainly by shifts of the reaction time distributions as a whole. Moreover, differences between groups of slower and faster participants were reflected mainly in the size of the tail on the slow end of the reaction time distributions.

(162)

Ruby Nadler (rnadler@uwo.ca), Lily Lin, John Paul Minda

University of Western Ontario

The effect of regulatory fit on the learning of complex rule-based categories.

The fit-flexibility hypothesis was tested using a non-linearly separable category set, where cognitive flexibility was hypothesized to be advantageous for learning. A promotion or prevention focus was induced and subjects performed the task with a gains or losses reward structure, creating two regulatory fit conditions (promotion/gain, prevention/loss) and two regulatory mismatch conditions (promotion/loss, prevention/gain). It was expected that regulatory fit subjects would be more likely to learn a complex rule, while regulatory mismatch subjects would be more likely to use a suboptimal rule. A regulatory fit advantage was found in the gains but not the losses version of the task.

(163)

Paule Ellefsen-Gauthier, Rémi Gaudreault (remi.gaudreault.1@ulaval.ca), Charles Viau-Quesnel, Claudette Fortin

Université Laval

Dissociation between activation and attention in time production with breaks.

Results from a previous study using a dual-task paradigm suggested a dissociation between effects of activation and attention in timing (Burle & Casini, 2001). In the present experiment, a time production task with breaks was used to test this dissociation. Three different levels of activation were induced by varying the frequency of click trains during timing while break location was varied to manipulate

attention sharing. Productions shortened with increasing value of click frequency and lengthened with increasing location value, but this lengthening was similar for all levels of activation. Results support the hypothesis of a dissociation between activation and attention.

(164)

Imran Ansari (iransari@uwaterloo.ca), Blais, Jennifer Stolz

University of Waterloo

Taking a longer look: The effect of soa on gaze cues.

Recent studies have demonstrated that subjects are quicker to respond to a target when it appears in a location cued by eye gaze than they are to respond to targets that appear at a non-cued location. This cueing effect is often described as a fast and reflexive response, in line with the patterns seen when using more traditional peripheral cues in a Posner paradigm. Our results suggest that shifts of attention elicited by gaze follow a qualitatively different time course than those elicited by standard peripheral cues. This suggests further study is needed to understand gaze cues and whether or not they are truly reflexive.

(165)

Rémi Gaudreault (remi.gaudreault.1@ulaval.ca), Paule Ellefsen-Gauthier, Claudette Fortin

Laval University

Chronometric counting in reaction time tasks.

In reaction time (RT) tasks, the foreperiod preceding the reaction stimulus is used for response preparation. Temporal cues during the foreperiod may influence RT by facilitating timing. Two experiments examine the effect of counting in a RT task, in which the foreperiod was varied both within and between blocks of trials. As in previous studies, RTs decreased with longer foreperiods when varied within blocks, but increased when varied between blocks. RTs were longer in the counting than in the no-counting condition and the foreperiod interacted with the counting conditions. Results are interpreted as showing better preparation in the counting condition.

(166)

Megan Therrien (mther091@uottawa.ca), Charles Collin, Ashley Smith, Isabelle Boutet

University of Ottawa

Friday June 20

The effect of pose on the face inversion effect.

Almost all research on the face inversion effect (FIE) has used front view stimuli, leaving the ecological validity of this phenomenon in question. We examined the effect of varying face poses on the FIE. 36 participants completed an old-new recognition paradigm, with half viewing upright faces and objects and half viewing inverted ones. Stimuli were presented at out-of-plane rotations of 0°, 45°, and 90° (i.e., front, 3/4, and profile poses). We found that the FIE was the same for all poses, suggesting that there is no effect of rotation out of the plane on the FIE.

(167)

Lisa Fast¹ (lisa@hume.ca), Jo-Anne LeFevre¹,
Brenda Smith-Chant², Marcie Penner-Wilger¹
¹Carleton University, ²Trent University

Adults count too: Subitizing and arithmetic fluency in adults.

Subitizing has recently been shown to be linked to mathematics performance in children. We hypothesized that a similar relation between subitizing and arithmetic performance exists in adults. 48 adults completed an arithmetic fluency test and computerized tests of dot counting, spatial memory, single digit addition and processing speed. Multiple regression analyses were performed to predict Arithmetic Fluency, controlling for processing speed. Consistent with the pattern seen in children, single digit addition latency predicts a significant unique portion of the variance in Arithmetic Fluency. Further consistent with the children's pattern, the contribution of subitizing is mediated by addition latency.

(168)

Cheryl Techentin¹ (ctechent@unb.ca), Daniel Voyer¹, Raymond Klein²
¹University of New Brunswick, ²Dalhousie University

Between- and within-ear congruency and laterality effects in an auditory word/emotion conflict task.

The present study investigated the influence of within- and between-ear congruency on interference and laterality effects in an auditory word/emotion conflict task. Participants were presented dichotically with words pronounced in either congruent or incongruent emotional tones and identified a target word or emotion under one of two conditions. In the within-ear condition

“fad” in a neutral tone was presented to one ear while “glad”, “mad”, or “sad” in its congruent or incongruent tone was presented to the other ear. In the between-ear condition, “fad” pronounced in one of the emotional tones was presented to one ear, while one of the other words in a neutral tone was presented to the other ear. Findings indicated interference in both conditions. However, the expected right ear advantage (EA) for words and left EA for emotions were obtained only in the between-ear condition. Factors involved in producing interference and laterality effects in dichotic listening tasks are discussed.

(169)

Meredith Young (youngme2@mcmaster.ca),
Karin Humphreys
McMaster University

The impact of medical language on the understanding of illness.

This study investigated the impact of medical terminology on perceptions of disease, examining two possible reasons for differential perceptions of synonymous terminology. Participants rated medical or lay labels for recently medicalized disorders (e.g. erectile dysfunction disorder vs. impotence), and established medical conditions (e.g. myocardial infarction vs. heart attack). The medical label of the recently medicalized disease was judged to be more serious, more representative of a disease, and less prevalent than the equivalent lay label. The established conditions showed no such pattern, even controlling for severity. We conclude that terminology has a dramatic effect on the understanding of disease.

(170)

Maxime Lussier (lussier.maxime@gmail.com),
Christine Gagnon, Louis Bherer
Université du Québec à Montréal

Transfer effects following dual-task training: An age-related comparison.

Divided attention, required for activities such as driving (Levy et al., 2006), can be improved following dual-task [DT] training (Kramer et al., 2001). The present study aims to determine if benefits arising from the training of a specific DT can be transferred to non-trained DTs diverging from the trained one, on input [stimulus], output [response modality], or both. After five training sessions, preliminary results show significant transfer of training benefits in each DTs for the trained group (7 elders - 12 young adults) but

Friday June 20

not for the control group (3 elders - 4 young adults).

(171)

John Vokey (vokey@uleth.ca)
University of Lethbridge

Intra- and inter-item similarity in fingerprint matching.

The matching of latent fingerprints to either their patent or other latent counterparts typically occurs in one of two contexts of item similarity: (1) following a search of a computer data-base for the most similar print images to the to-be-matched or target print, or (2) matching a target print to a set of likely matches (suspect and elimination prints). In the former context, hits are unlikely and the likelihood of false-positives is presumably high, whereas in the latter context, hits are quite likely with little expectation of false-positives (at least as a function of similarity). The role of such intra- and inter-item similarity is explored in a fingerprint matching task using both human observers and an autoassociative neural-net simulation.

(172)

Andrea Burnett (pratta@unbc.ca), Paul Siakaluk, Jonathan Fugelsang, William Owen
University of Northern British Columbia

Can the belief-bias effect be attenuated through the manipulation of content?

This study investigated whether type of content reduces the belief-bias effect in causal reasoning. It was hypothesized that the impact of pre-existing beliefs would be attenuated for the problems with negative versus positive content, and specific versus general content, because problems with negative or specific content are assumed to restrict the automatic recruitment of beliefs. This hypothesis was not supported. A follow-up study is being conducted to investigate whether negative or specific content problems actually do generate fewer alternative causes than positive or general content problems. Several alternatives for these results will be discussed.

(173)

Maria D'Angelo¹, Meredith Young¹
(youngme2@mcmaster.ca), Jason Tangen², Kevin Eva¹

¹*McMaster University*, ²*University of Queensland*
Expectation and working memory: Examining age-related differences in covariation judgments.

Effective functioning in the world depends on detection of relations. Age-related differences in judgments of covariation have been previously demonstrated. Young and senior adults predicted plant growth in response to an amount of chemical, receiving feedback after each prediction. Between trials, young adults counted tones to strain working memory. The plant-chemical relation changed halfway through the experiment (e.g. from a positive to negative correlation). Early exposure to a positive relation led to a preservative pattern in senior adults and young adults with the working memory task. Expectation may drive performance when previous trials are less likely to be maintained in working memory.

(174)

William Petrusic¹ (bill_petrusic@carleton.ca),
Joel Lucas¹, Joseph Baranski²
¹*Carleton University*, ²*Defence Research and Development Canada-Toronto*

Scaling confidence categories: Equal spacing?

On each trial in a psychophysical comparison experiment, participants used the confidence categories "50", "60", "70", "80", "90", and "100" to indicate how certain they were that they had made a correct decision. We applied Case D of Torgerson's (1957) Law of Categorical Judgment (LCJ) to estimate the mean locations of the confidence category boundaries. Scale values for the confidence category boundaries were equally spaced on the underlying subjective probability scale and were identical in the speed and the accuracy stress conditions of the experiment. Excellent goodness of fit of the LCJ to the data was obtained in each condition.

(175)

Nicole Robert (nrobert@connect.carleton.ca),
Matthew Brown, Neal Leblanc, Chris Herdman
Carleton University

Game on: Using 20 questions to assess the impact of cell phone use on driving performance.

Many tasks have been used to assess the impact of cell phone use on driving performance. These tasks typically do not resemble conversations (solving math problems) or mimic the natural progression of conversation (answering unrelated questions). In the present research a "20 Questions" task was used to simulate conversation. Large speed deviations and probe detection impairments were observed

Friday June 20

in the 20 Questions condition relative to no conversation. It is argued that the working memory demands in the 20 Questions condition are similar to those associated with natural conversation, therefore providing a better estimate of the impact of cell phone use on driving.

(176)

Michael Lawrence (Mike.Lawrence@DAL.CA)
Dalhousie University

Disattenuation by simulation: An estimation and inferential tool for correlation amidst estimable measurement error.

A general purpose tool is presented for calculating correlation estimates and corresponding inferential intervals in the context of estimable measurement error. The new method, dubbed disattenuation by simulation (DS), is founded on a simple simulation method that lends a combination of flexibility of application and inferential capacity heretofore unknown in traditional correction procedures. Monte Carlo simulation reveals that DS outperforms traditional approaches to correlation estimation and inference.

(177)

Robyn Lotter (rx_lotter@laurentian.ca), Joël Dickinson
Laurentian University

The effects of contextual ambiguity and absent letters on graphemic restoration and language fluency.

Previous research has shown words can still be understood with up to 50% of its letters distorted (Jordan, 1999). The present study evaluates the impact of letter distortion (0, 1, 2, or 3) on disfluency, substitution error, and reading rate in two sentence types (normal and ambiguous). Results indicate a significant interaction of distortion and sentence type on disfluency production, independent main effects impacting reading rate, and letter distortion on substitution. These results suggest that cognitive processes involved with reading vary in their dependency on different sources of context such as letters and sentences for fluent comprehension of materials.

(178)

Kevin Durda (durda1@uwindsor.ca), Lori Buchanan
University of Windsor

Word frequency effects in latent semantic analysis.

Word frequency, a well known predictor in many psycholinguistic tasks, has a strong effect on the number of times that pairs of words occur together in written text: High frequency words more likely to occur together by chance than low frequency words. This poses a problem for lexical co-occurrence models of semantic memory, which construct representations of word-meaning by analyzing word usage in text. We examine the presence of frequency effects in the latent semantic analysis (LSA) model and show how techniques from computational linguistics can be applied to remove these influences of frequency while retaining the semantic content of the resulting values.

(179)

Quratulain Khan, Lori Buchanan
(buchanan@uwindsor.ca)
University of Windsor

The role of script in the cognate facilitation effect: Evidence from Urdu-English bilinguals.

Cognate words are those with shared pronunciations and meanings in two languages. They have long been used to study the functional architecture of the bilingual lexicon. The cognate facilitation effect refers to the recognition and production advantage of cognate words over noncognates. The majority of studies on the cognate facilitation effect have been carried out in same-script languages and the relationship between orthographically dissimilar cognates is unclear. Our study uses a simple lexical decision task to test for the cognate facilitation effect for two languages with highly dissimilar scripts in Urdu-English bilinguals.

(180)

Chris Domen (domen@uwindsor.ca), Lori Buchanan
University of Windsor

The effect of shared orthographic neighbors on masked pseudohomophone priming.

Masked pseudohomophone priming has been offered as evidence that phonology plays a leading role in visual word recognition. However, a review of the literature shows the tenuousness with which masked pseudohomophone priming is obtained. While several factors have previously been shown to attenuate masked

Friday June 20

pseudohomophone priming (e.g., increased vowel complexity), we hypothesize that masked pseudohomophone priming is also dependent upon prime-target shared orthographic neighborhood size. In a test of this hypothesis, masked pseudohomophone priming was obtained for prime-target pairs that do not share orthographic neighbors, but was absent for prime-target pairs that share one or more orthographic neighbors.

(181)

Nicholas Harris (nicholas.harris@smu.ca),
Nicole Conrad
Saint Mary's University

Which skills do children depend on to read and spell?

A strong relation exists between reading and spelling. Numerous component skills have been identified as contributing to reading and spelling independently. Few studies have examined the relative contributions of these cognitive and linguistic skills to reading and spelling skills concurrently. This study aimed to identify the shared and unique contributors to reading and spelling ability across children of different skill levels. Children in Grades 1, 2, and 3 completed measures of reading, spelling, and component skills (e.g., phonological awareness, orthographic knowledge). Results indicated that many of these component skills contributed to both reading and spelling ability, yet the relative contribution of each differed.

(182)

Christopher Schwint¹, Todd Ferretti¹
(tferrett@wlu.ca), Marta Kutas²
¹*Wilfrid Laurier University*, ²*University of California, San Diego*

Electrophysiological evidence for expectancies for active and passive verb morphology from nouns.

We investigated how people use event knowledge associated with nouns to generate expectations for verb morphology and found that they do. People read sentences (word by word) with nouns that were either related (janitor) or unrelated (guard) agents for active and passive verbs (was scrubbing/was scrubbed) as their event related brain potentials (ERPs) time-locked to the main verbs were recorded. Sensitivity to agent relatedness was manifested in early and late ERP components for active verbs (reflecting greater ease of processing with

related agents) but only late components for passive verbs.

(183)

Michael Woloszyn¹ (mwoloszyn@tru.ca), Peter Gubler², Simon Schürch²
¹*Thompson Rivers University*, ²*Fachhochschule Nordwestschweiz*

Incidental false recognition in english-first and english-second language speakers.

English as a first language (L1) and English as a second language (L2) speakers participated in a standard incidental memory DRM task. Participants saw 12 lists of 10 conceptually related words, and were asked to indicate whether they knew the meaning of each. Following this, a surprise memory test occurred. Hit and false alarm rates for "old" and "unrelated new" items were nearly identical for the two groups (mean H=.71, FA=.04 for both), however the false alarm rates for related non-presented critical lures was significantly higher for L1 (mean=.62) relative to L2 (mean=.26). These results support the notion that false recognition in a DRM task is a result of semantically driven processes that occur during study.

(184)

Michele Wellsby (mwellsby@gmail.com), Anne-Marie Selzler, Josh Rash, Keri Locheed, Paul Siakaluk, William Owen
University of Northern British Columbia

Is the body-object interaction effect attributable to the type of motor response?

Interacting with a word's referential object allows one to gain further semantic knowledge and richness of meaning. In two studies, we demonstrate that the more we interact with objects the faster we recognize words; this result is known as the body-object interaction (BOI) effect (Siakaluk et al., 2008; Siakaluk et al., in press). We replicated the BOI effect found in a button-press version of the semantic categorization task (SCT) and extended the BOI effect to a vocal SCT. These results clearly indicate that the BOI effect is due to semantic processing, not mode of responding.

(185)

Katherine Robinson
(katherine.robinson@uregina.ca), Christian Riegel, Katherine Arbuthnott

Friday June 20

Campion College, University of Regina

Elements of literary language and their cognitive effects.

Literary language developed to enable humans to remember and communicate complex poems and stories, combining language and cognitive functions. Few studies have examined how elements in literary language affect cognitive factors such as text processing speed and recall (Fischer, Carminati, Stubler, & Roberts, 2003). In a pilot study, a brief passage with alliterative sentences was read faster than a passage without, and a brief passage was recalled better in poetic form than in paragraph form. The current study examined the same literary elements as well as image pattern and consonance. Implications of the results for both cognition and literature will be discussed.

(186)*

Christopher Teeter (teetercj@mcmaster.ca)
McMaster University

The effect of imagined movement and knowledge of body orientation on spatial updating.

Observers continuously monitor relations between themselves and their environment. In this study, participants learned a room-sized spatial layout, were blindfolded and relocated to the room's center, where they assumed a body orientation that was aligned or misaligned with learning orientation (E1); or were disoriented but informed of their body orientation (E2). Directional judgements to learned spatial features were impaired when participants had to imagine an incongruent orientation. The extent of this impairment was significantly greater in E1, suggesting the difficulty in mentally overriding body-based information; however the impairment observed in E2 demonstrates the residual effect of merely knowing body orientation.

(187)

Jeffrey Shaw (jshaw32@uwo.ca), Raj Rajakumar, Peter Cain
University of Western Ontario

Bilateral injections of cyclosporin-a into the hippocampus of rats facilitate spatial learning and memory in a morris water maze.

It is generally believed that synaptic changes associated with long term memory storage are caused by Ca²⁺-dependent cellular signalling cascades that rely on a harmonious interplay

between protein kinases and phosphatases. Transgenic alterations of the phosphatase Calcineurin (CN) in the hippocampus of mice have demonstrated that CN negatively regulates learning, memory and plasticity (Mansuy et al. 1998, Malleret et al. 2001). Here, we report preliminary evidence that pharmacologically blocking CN in the hippocampus through bilateral injections of Cyclosporine-A prior to a Morris Water Maze Task increases learning and memory of a spatial location, hence supporting the above notion.

(188)*

Ben Bowles (ben.bowles@gmail.com), Melissa Gordon, Stefan Köhler
University of Western Ontario

Using receiver operating characteristics to test the assumption that familiarity for known people is supported by an all-or-none process.

Models of person recognition postulate that familiarity for names occurs in an all-or-none manner when activation passes threshold at the Person Identification Node (PIN). Using receiver operating characteristics, we tested this assumption by examining whether the discrimination of famous from fictional names occurs in an all-or-none manner. The results support this assumption for famous names from domains of the media which subjects have had low exposure. Recognition of high-exposure names is supported by both signal-detection and all-or-none processes. For both degrees of exposure, we found subjects only offered occupational information or a personal recollection about names accompanied by high-confidence recognition.

(189)

Jonathan Fawcett (jmfawcett@dal.ca), Tracy Taylor
Dalhousie University

Inhibitory processes in item-method directed forgetting.

By combining an item-method directed forgetting paradigm with stop-signal (E1 and E2) and inhibition of return (IOR; E2) tasks, the current study explored commonalities between directed forgetting and these inhibitory cognitive mechanisms. Although stop-signal reaction times were not affected by the preceding memory instruction in either experiment, the F instructions did facilitate stopping by delaying responses (E1 and E2). Furthermore, IOR was

Friday June 20

observed following F but not R instructions (E2). The finding that F instructions interact with stop-signal inhibition and IOR to slow subsequent responses provides support for the view that intentional forgetting is an active cognitive process.

(190)

Rehman Mulji (reh@ucalgary.ca), Glen Bodner
University of Calgary

The prime-proportion made me do it: Masked priming of fixed and free choices.

We conducted a masked priming experiment with 30-ms arrow primes (>> or <<). On fixed trials the targets were also arrows (>> or <<) and the proportion of congruent trials was .8 or .2. On free trials the target was ambiguous (<>) and subjects simply made a free choice. The .8 group showed more priming on fixed trials, and on free trials they chose the primed response faster and more often than chance. Consistent with a memory-recruitment account of priming, subjects relied on the masked primes more in the .8 context, on both fixed and free trials.

(191)*

Hanah Chapman (hanah@aclab.ca), Kristen Johannes, Adam Anderson
University of Toronto

Attentional and mnemonic effects of disgust and fear.

Most previous research on the mnemonic effects of emotion has adopted a simple dimensional framework, focusing on the memory-enhancing effects of emotional arousal. However, the effects of different basic emotions on memory remain largely unexplored. We therefore investigated the of impact disgust and fear on memory, while simultaneously examining their role in modulating attention. Results suggest that disgust and fear had similar effects on memory, but different effects on attention. Thus, a dimensional model may best capture the mnemonic effects of different emotions, while a basic emotions model may best account for their attentional effects.

(192)

Bob Uttl (uttlbob@gmail.com), Kelly Kisinger, Meaghan Henry, Breanna Odegard
Red Deer College

Meta-analysis of meta-analysis: Transparency matters.

A traditional meta-analysis summarizes the results of many studies in a single number -- a mean effect size -- and reader either believes in this number or not. Using examples from memory research (explicit memory, prospective memory), we demonstrate that graphical methods increase transparency of meta-analysis and help avoid biased and erroneous conclusions. Surprisingly, our examination of meta-analyses published in medical and psychology journals reveals that graphical methods were often used in medical journals but only rarely in psychology journals. Moreover, the most transparent and informative graphical methods were rarely used in either field.

(193)

Helen Monkman
(hmonkman@connect.carleton.ca), Matthew Brown, Chris Herdman
Carleton University

Memory for form persists but colour fades: An exploration in relative discriminability.

When both form and colour are equally diagnostic of an object's identity (e.g., blue cube vs. yellow sphere), memory is better for form than for colour (Brown & Herdman, 2007). One explanation for this finding is that form is often more reliably diagnostic of an object's identity than its colour (see Biederman, 1987) and is therefore preferentially encoded. Alternatively, forms may be inherently more discriminable than colours, and are therefore more accurately encoded. This alternative hypothesis was evaluated using perceptual identification where participants made a speeded same/different response to sequentially presented intra-dimensional geon/colour pairs.

(194)*

Elham Satvat, Paul Mallet (pmallet@wlu.ca)
Wilfrid Laurier University

Chronic administration of a ginkgo biloba leaf extract facilitates acquisition but not performance of a working memory task.

Chronic administration of Ginkgo biloba leaf extract (EGb761) has been shown to improve learning and memory. However, the influence of EGb761 on learning and memory without prior chronic treatment is less clear. We report that rats treated with EGb761 (13.75 mg/kg) 30 min prior to training in a food-reinforced two-arm discrimination task in a double Y-maze reached

Friday June 20

the training criteria faster, and made significantly fewer errors. We also assessed the influence of EGb761 on memory per se, assessed by post-training administration of the extract, and found that post-training acute and chronic EGb761 exposure does not enhance spatial and working memories.

(195)*

Jordan Poppenk¹ (j.poppenk@utoronto.ca), Stefan Köhler², Morris Moscovitch¹
¹University of Toronto, ²University of Western Ontario

Revisiting the novelty effect: Familiarity enhances the meaning-based encoding of experiences.

Studies investigating superior memory for novel relative to familiar material, i.e., a novelty effect, have been confounded by priming and source confusion. Two experiments measured recognition memory for familiar and novel linguistic materials (proverbs) or pictorial materials (logos) to determine whether a novelty effect would persist after correcting for these confounds. Stimuli were familiar from in-lab pre-familiarization or from prior world experience. Consistent with notions that knowledge supports encoding processes, our findings indicate that familiarity, not novelty, improves memory for details of studied items, regardless of whether the familiarity is based on episodic or semantic memory.

(196)

Shahnaz Koji (sm.koji@gmail.com), Myra Fernandes
University of Waterloo

Memory for faces in emotional contexts.

In Experiment 1 faces with neutral expressions were overlaid in the centre of a positive, negative or neutral scene during study. Later recognition for faces presented alone was significantly higher if overlaid on a negative compared to neutral scene at study. In Experiment 2, however, faces were remembered best when overlaid in the peripheral portion of a positive compared to neutral or negative scene at study. Results indicate that emotional valence of the background in which a face is encoded influences memory, and that this effect interacts with the spotlight of attention induced by the valence of the background scene.

(197)

Dave Thomson (thomsodr@mcmaster.ca), Bruce Milliken, Daniel Smilek
McMaster University

Conceptual long-term implicit memory: A decade of evidence

There are numerous demonstrations of a single experience with a stimulus affecting behavior and memory performance after a significant delay. These priming effects are limited largely to perceptual tasks in which there is a physical feature overlap between the studied and target stimuli at test. In the present experiment, a low frequency U.S. state name was presented verbally to participants embedded within the context of a memory course lecture, and the influence of that experience was measured indirectly 4 to 8 weeks later using a state name generation task. Participants were significantly more likely to generate the critical state name when it was presented in an earlier lecture than when it was not presented in an earlier lecture, a novel demonstration of long-term conceptual priming after a single stimulus exposure.

(198)

Jie Gao (jie@psych.ubc.ca), Peter Graf
University of British Columbia

Deseasing processing speed produces a discrepancy reaction

Discrepancy-attribution theory suggests that the unexpectedly fluent processing of an event produces a discrepancy reaction which is channeled into the dominant ongoing activity. The present study examined whether other perceptual manipulations (ie. decreases in processing fluency) would produce the same or different discrepancy reactions. We decreased the fluency of processing by manipulating physical factors, such as the background against which stimuli were presented. The results showed discrepancy reactions which were interpreted in line with the ongoing task, thus suggesting that discrepancy reactions are not uniquely linked to increases in processing fluency.

(199)

Amy Siegenthaler¹ (amysieg@gmail.com), Bob Uttl²
¹Lifemark Health, ²Red Deer College

Rey-osterrieth complex figure: Scoring, reliability, and validity.

The Rey-Osterrieth Complex Figure (RCF) is one of the most widely-used clinical measure of visuospatial perception and memory requiring

Friday June 20

examinees to copy and later reproduce (recall) a complex figure. We administered the RCF to over a large sample of normal healthy adults and to a large clinical sample to examine scoring methods and psychometric properties including distribution, reliability, validity, and usefulness of the RCF scores. We caution against over-interpretation of the ceiling limited copy scores and provide guidance on proper interpretation of both the copy and recall scores in research and clinical practice.

(200)

Jennifer Mullane¹ (jcmullan@dal.ca), Michael Lawrence¹, Penny Corkum¹, Raymond Klein¹, Elizabeth McLaughlin²
¹Dalhousie University, ²IWK Health Centre

The development of alerting, orienting, and executive attention in childhood.

Using the Callejas, et al. (2002) ANT-I task, this study sought to elucidate the development of attention networks in a cross sectional sample of children in middle and late childhood. Ninety-six children without attention, learning, or cognitive problems in grades one through six were recruited, representing eight pairs of age-matched males and females per grade. Results indicate that the Executive and Alerting networks continue to manifest changes across late childhood, while the Orienting network does not. The results also suggest gender differences in the operation and development of attention networks.

(201)

Alexandra Hatry (alex_hatry@rocketmail.com), Catherine Mondloch
Brock University

The development of opposing aftereffects: A novel method.

We are developing a novel method to study the development of opposing aftereffects. We adapted adults to Caucasian and Chinese children's faces that were distorted in opposite directions (compressed/expanded) by reading a storybook about a birthday party. Surprisingly, ratings of all distortions increased following adaptation (i.e., post-adaptation ratings were not specific to the adapting stimuli). Perhaps opposing aftereffects were absent because we presented Caucasian and Chinese faces on the same page, thus reducing the perception of distinct race categories. We are testing adults and 8-year-olds with a new storybook in which only one race of face is presented per page.

(202)

Mark Vida (mv04oc@brocku.ca), Catherine Mondloch
Brock University

How your frown makes the world a happier place: The effect of adaptation on emotion perception in adults and 7-year-olds.

We created continua of facial expressions (happy-sad; fear-anger) in which contiguous faces differed by 5%. Adults and 7-year-olds categorized each expression in a baseline (no-adapt) condition and after being adapted to an intense expression (e.g., happy/sad) posed by the same or a different facial identity. Adults perceived the happy-sad but not fear-anger faces categorically. They showed aftereffects for both continua in the same-identity condition; aftereffects were mitigated for anger-fear and absent for happy-sad in the different-identity condition. Seven-year-olds were adult-like for happy-sad except they showed a small aftereffect in the different-identity condition; we are currently testing 7-year-olds on anger-fear.

(203)

Amy Siegenthaler (amysieg@gmail.com), Bob Uttl¹, Braxton Suffield²
¹Red Deer College, ²Private Practice

Factors predicting vocational outcome from mild traumatic brain injury.

Conventional wisdom holds that many factors contribute to a poor recovery from mild traumatic brain injury (MTBI) including compensation/litigation status, severity of injury, age, education, psychiatric history, previous head injury, and life stress. Recently, we showed that many of these factors do not successfully predict time to return to work whereas other factors, such as poor effort on cognitive testing and comorbid injuries, do. Here, we extend our previous work by looking at the role of pre-injury job stress in more than 200 workers, and discuss the role of other "conventional wisdom" factors in predicting outcome from MTBI.

(204)

Meera Paleja¹ (mpaleja@psych.ryerson.ca), Todd Girard¹, Bruce Christensen², Julia Spaniol¹
¹Ryerson University, ²McMaster University & St. Joseph's Healthcare Hamilton

Diffusion model analysis of episodic memory retrieval in schizophrenia.

Friday June 20

We applied diffusion model analyses to investigate episodic old/new recognition in Schizophrenia. This method incorporates accuracy and response-time distributions fully and simultaneously to estimate parameters reflecting cognitive processes underlying binary decisions. Schizophrenia results revealed a lower quality of decision-driving information (lower drift rate) during retrieval of old items as compared to a healthy sample. We also observed a trend towards a Schizophrenia-related increase in conservative criterion setting (higher boundary separation). There were no group differences in drift for new words, response bias, or non-decisional reaction time. These data provide unique insight into decisional processes underlying memory deficits in Schizophrenia.

(205)

Darren Schmidt (schmida@uwindsor.ca), Lori Buchanan
University of Windsor

Brands and the mental lexicon.

Findings in word recognition research indicate that the mental lexicon contains words and their attributes (e.g., orthography, morphology) along such parameters as word length and frequency. The intrinsic nature of word length may affect the visual processing (e.g., lexical status) of certain words and non-words, and thus may aid in item retrieval. Typically, words are less sensitive to these effects compared to non-words. In this study, correlations revealed that brand names are particularly sensitive to word length: some acted more like real words, while others like non-words. Implications support the notion of limited resources for activation of certain brand names.

(206)*

Matthew Waxer (mwaxer@uwo.ca), Andrew Wong, J. Bruce Morton
University of Western Ontario

Dissociable components and dynamics of cognitive control: An electrophysiological investigation.

We investigated potentially dissociable and dynamic aspects of cognitive control using event-related potentials (ERP's). Twenty adult participants performed a deductive rule-switching task with distinct preparatory and response-related trial periods. Participants were slower and more error-prone on switch, conflict, and conflict trials preceded by non-conflict trials

than repeat, non-conflict, and conflict trials preceded by conflict trials respectively. Analysis of preparatory period ERP's revealed a late frontal negativity that was greater for switch than repeat trials. Analysis of the response period revealed a fronto-central N2 that was greater for conflict trials than non-conflict trials, and was modulated by preceding trial conflict.

(207)

Jessica Cohen (cohenj3@mcmaster.ca), Peter Stewart, Judith Shedden
McMaster University

Error processing in math anxious individuals.

We investigated electrophysiological correlates of error processing (ERN: error-related negativity, and Pe: error positivity) in math anxious versus control individuals. Compared to controls, math anxious participants produced larger Pe amplitudes on error trials during an arithmetic task and a digit Stroop task. Activity indexed by the ERN showed greater sensitivity to congruency for math anxious participants in the digit Stroop task. These results suggest that math anxious individuals have differential neural responses to errors than controls for both anxiety-specific arithmetic and general digit tasks.

(208)*

Megan Therrien (mther091@uottawa.ca), Charles Collin, Jeffrey Manley, Lauren Sculthorpe, Kenneth Campbell
University of Ottawa

The effect of spatial filtering on the N170 of faces.

In these studies, we examined the effect of 8 spatial filtering levels on the N170 response of faces and objects. We were interested in whether there is a point in the filtering process where faces are responded to more like objects. We found that faces resemble objects in the N170 response below 2 cycles per face (cpf) and above 32 cpf. While these levels are very similar to those found in single cell recording studies in monkeys, they are somewhat broader than the SF threshold values typically reported in human behavioural studies.

(209)

Brian Dunn¹, Kent Conover¹, Gilles Plourde², David Munro¹, Robert Kilgour³, Peter Shizgal¹
(peter.shizgal@concordia.ca)

Friday June 20

¹Psychology Department, Concordia University,
²Montreal Neurological Institute and Hospital,
McGill University, ³Department of Exercise
Science, Concordia University

Neural correlates of thermal comfort and discomfort in humans: Functional magnetic resonance imaging.

Hedonic responses steer behavior to correct deviations from physiological set points. Stimuli that reduce deviations are pleasant whereas those that exacerbate deviations are aversive. Skin temperature was cycled between 2.25-minute epochs of hot and cold four times during two fMRI scans, performed under hyperthermic and hypothermic conditions, respectively. The hedonic sequences (good/bad) were the same under hyperthermia and hypothermia, but the sensory sequences (hot/cold) were reversed. BOLD signals that were congruent in the two scans were thus interpreted as hedonic correlates. Such congruent signals were seen in multiple regions, including the orbito-frontal cortex and amygdala.

(210)

Michelle Di Nella¹, Bruce Bolster¹
(b.bolster@uwinnipeg.ca), Krisztina Maliszka²,
Derek Foreman², Patricia Gervai²
¹University of Winnipeg, ²National Research
Council of Canada

Searching for features and their combinations: A functional MRI study of visual search performance.

Participants responded to coloured (red or green) letter (X or O) targets in arrays requiring either feature or conjunction search. Targets in feature-search arrays were distinct on one or both features, while targets in conjunction-search arrays were distinct only in their combination of features. Using a fast event-related design, task-related regional brain activation was extracted from whole-brain BOLD signals collected in a 3T imaging magnet. Activation in some brain regions was related to task difficulty and feature combination, while activation in other brain regions was related only to the total number of features in the search array.

(211)

Daniel Wood (danielkentwood@gmail.com),
Melvyn Goodale
University of Western Ontario

The selection of grip posture.

We employed optoelectronic recording of hand postures and reach trajectories of subjects who were asked to pick up an elongated object at various orientations. While most of these orientations consistently elicited one of two hand postures, there were some orientations that, due to biomechanical constraints, elicited both hand postures to varying degrees. We found a clear spike in overall movement time as object orientations approached the center of this 'ambiguous' region. There is also evidence that grip selection in the 'ambiguous' region was largely determined by the last two to three grip postures used by the subject in previous trials.

(212)

Darryl Bannon (darrylbannon@gmail.com),
Cheryl Limebeer, Elena Choleris
University of Guelph

Social recognition is specifically enhanced by the indirect cannabinoid agonist URB597 in CD-1 male mice.

The indirect cannabinoid agonist URB597 has been shown to affect a number of behaviours in rodents. We assessed its (0.05, 0.1, 0.4 mg/kg and vehicle) effects in a social recognition and a sociability tests. When given, in home cage, a choice between a familiar and an unfamiliar mouse, URB597 treated mice (0.1 mg/kg) showed enhanced preferential investigation for the unfamiliar conspecific. Conversely, URB597 did not affect the mice preferential investigation of an unfamiliar conspecific versus a familiar object in a 3 chamber sociability test. URB597 appears to specifically affect social recognition but not sociability in a forced-choice social preference paradigm.

(213)

Joanna Slusar (jn254570@dal.ca), Kevin Duffy
Dalhousie University

Brief monocular deprivation provokes modification of the neuronal cytoskeleton.

Monocular deprivation early in development alters the organization of connections within the visual system. The soma, dendrites, and axon terminal field of deprived cells are considerably smaller than their non-deprived counterparts. We have examined the possibility that subcellular events enabling structural modification of deprived neurons include modification to proteins composing the neuronal cytoskeleton. Using immunohistochemical methods we examined the integrity of the

Friday June 20

cytoskeleton by measuring the response of its proteins to varying durations of unilateral deprivation. A loss of all three neurofilament proteins was observed to correlate in space and time with changes to neuron structure.

(214)

Stacey Kimball, Jennifer Bloomfield, Amy Stillar, Christopher Langan, Matti Saari (mattis@nipissingu.ca)
Nipissing University

Taste aversion is acquired under isoflurane anesthesia.

In this experiment water deprived rats were exposed to two separate flavours of Kool Aid with one followed by an injection of lithium chloride, and the other by a saline injection on the following day. The rats were either awake or under isoflurane anesthesia during training. Analysis revealed that the rats preferred to consume the neutral taste over the aversion taste with no significant differences between the anesthetized versus non-anesthetized groups. These results provide further evidence for our previous reports that learning can occur in fully anesthetized rats. (All procedures were approved by Nipissing University Animal Care Committee).

(215)*

Diala Habib¹ (diala.habib@gmail.com), Hans Dringenberg²
McGill University

Nmda-dependent synaptic enhancement by low-frequency stimulation of converging septal and hippocampal fibers: A novel form of hippocampal synaptic plasticity.

Studies examining hippocampal plasticity typically utilize high frequency stimulation protocols to induce long-term potentiation (LTP). Recently, we have demonstrated an LTP-like enhancement of excitatory postsynaptic potentials in CA1 induced by alternating, single pulse stimulation of the medial septum and area CA3 (MS-H LTP) in vivo. Analyses of paired-pulse ratios (an indicator of changes in presynaptic transmitter release) show no change during the initial (0-2 h) phase of MS-H LTP, followed by a subsequent decline (2-4 h). Thus, MS-H LTP is comprised of temporally distinct mechanisms, an initial postsynaptic enhancement, followed by a delayed, presynaptic facilitation of transmitter release.

(216)*

Graham Parfeniuk (parf0860@wlu.ca)
Wilfrid Laurier University

The effects of chlorpromazine on the wheel induced feeding suppression: An acute preparation.

Three hour daytime wheel access suppresses rat's feeding over the subsequent night. This acute wheel induced feeding suppression (AWIFS), can be induced reliably when animals are given a one-time limited wheel access exposure during the light cycle (Adam & Eikelboom, unpublished). Chronic chlorpromazine can minimize the severity of the related activity anorexia procedure (Routtenberg, 1968). We tested the effects of chlorpromazine (2 mg/kg IP) on the AWIFS in 40 adult male rats and found that while acute chlorpromazine did not attenuate feeding or wheel running it blocked the AWIFS. Similar experiments with the atypical antipsychotic clozapine (0.3 and 3 mg/kg IP) were ineffective in preventing the AWIFS.

(217)

Ali Gheidi (ghei3956@wlu.ca), Roelof Eikelboom
Wilfrid Laurier University

Transition to excessive wheel running in male rats: Access conditions.

Increased duration of daily access in rats to both drugs of abuse (Ahmed, 2005) and wheel running (Eikelboom and Lattanzio, 2003) results in a transition to excessive levels of consumption. 2 or 4 h of nighttime wheel access over 24 days results in a pronounced increase in wheel running. To determine if the increase in wheel running represents a gradient or dichotomist phenomenon, rats (N=24) were given 30, 90 or 180 minutes of nighttime wheel access. Rats given 90 or 180 minutes of access showed an increase in running over days, while rats in the 30 minute group did not.

(218)*

Krista Macpherson (kmacphe3@uwo.ca), William Roberts
University of Western Ontario

Studies of spatial memory in domestic dogs using a radial maze.

Spatial memory in dogs was studied using a radial maze. When choosing among all 8 arms in Experiment 1, dogs learned to enter all arms with fewer arm visits across trials. In Experiment 2, arms were baited with 0, 1, 3, and 6 pieces of food. Dogs learned to go to the

Friday June 20

arms with larger amounts of food first. Experiment 3 forced dogs to visit 4 random arms, and then tested memory for these arms using a win/shift or win/stay rule. Data suggest that spatial memory in dogs is inferior to that of species previously tested on the radial maze.

(219)

Emily Hawken¹ (erhawken@gmail.com),
Nicholas Delva², Richard Beninger¹
¹Queen's University, ²Dalhousie University

Polydipsia in schizophrenia: The effects of sub-chronic MK-801 and social isolation on schedule-induced polydipsia in the rat.

Primary polydipsia, excessive fluid intake not explained by medical causes, has been reported in over 20% of chronically ill psychiatric inpatients and is especially common in schizophrenic populations. Two animal models of schizophrenic symptoms (rearing in socially isolation and sub-chronic injections of MK-801) were used to examine the effects on acquisition of schedule-induced polydipsia. Schedule-induced polydipsia was acquired when rats were food restricted and placed on a non-contingent fixed-time 1-min food schedule. Preliminary results indicate that each animal model affects

the acquisition of schedule-induced polydipsia but in a different manner.

(220)

Evanya Musolino¹ (emusoli@uwo.ca), William Roberts², Mark Cole¹
¹Huron University College at Western,
²University of Western Ontario

Meta-memory in rats?

Meta-memory refers to an awareness of the contents of one's own memory. We asked if rats would show evidence of meta-memory by seeking out appropriate information that would lead to a correct choice in a visual discrimination. After five rats had learned to turn right or left in a T-maze based on the presence of a black or white panel at the choice point, a barrier was gradually raised in front of the visual cue. Data will be reported indicating whether or not rats showed meta-memory by looking over the barrier to see the cue before making a choice.

Saturday June 21

Saturday June 21

4.1 Symposium Mathematical Cognition of Adults: Representation, Process and Acquisition

9:00 - 10:30 Somerville 3345

Chair: J.-A. Lefevre

9 :00 Jamie Campbell (jamie.campbell@usask.ca), Nicole Alberts
(221) *University of Saskatchewan*

Subtraction by addition.

University students' self reports indicate that they often solve basic subtraction problems ($13-6=?$) by reference to the corresponding addition problem ($6+7=13$ therefore $13-6=7$). If so, solution latency should be faster with subtraction problems presented in addition format ($6+_?=13$) than in standard subtraction format ($13-6=_$). There was a latency advantage for large problems (minuend >10) in addition format ($13=6+_$) relative to subtraction format ($13-6=_$), whereas performance of small subtractions was faster in standard ($5-3=_$) than in addition format ($5=3+_$). Educated adults use addition reference to solve large simple subtraction problems but rely on direct memory retrieval for small subtractions.

9:15 Ian Holloway (idholloway@gmail.com), Daniel Ansari
*(222) *University of Western Ontario*

Format-specific neural correlates for symbolic and nonsymbolic numerical processing.

Little is known about the brain regions underlying the specific processing of symbolic and nonsymbolic numerical quantities. Using functional Magnetic Resonance Imaging, we examined neural activation during symbolic (Arabic numerals) and nonsymbolic (arrays of squares) numerical comparison. Consistent with previous research, both formats activated inferior parietal regions. A direct contrast of stimulus format revealed greater activation in several areas including the left angular and superior temporal gyri during symbolic comparison. In contrast, nonsymbolic numerical processing was characterized by bilateral activation in posterior parietal regions. The potential roles of these regions in the differential processing of numerical stimulus format are discussed.

9:30 Ineke Imbo¹ (ineke.imbo@ugent.be), Jo-Anne LeFevre²
(223) ¹*Ghent University*, ²*Carleton University*

Cultural differences in complex addition

The complex-arithmetic performance of three different cultures was tested: Flemish-speaking Belgians; English-speaking Canadians; and Chinese-speaking Chinese participants currently living in Canada. All participants solved complex addition problems, half of which included a carry operation. The choice/no-choice method was implemented to obtain unbiased measures of strategy selection and strategy efficiency, and the selective interference paradigm was implemented to test the role of phonological and executive working-memory components. Cultural differences were observed in (a) the involvement of phonological and executive working-memory resources, (b) strategy selection, strategy efficiency, and strategy adaptivity, and (c) the implementation of the carry operation.

9 :45 Arron Metcalfe (Arron.Metcalfe@usask.ca), Jamie Campbell
(224) *University of Saskatchewan*

Arithmetic and the operand recognition paradigm: Strategic complexity or problem size and switch costs?

Saturday June 21

In Thevenot et al. (2007) participants performed addition or comparison on two sequential operands followed by a speeded operand-recognition task. Recognition time increased with problem size for addition only. They argued addition strategy complexity increased with problem size creating more distracters in working memory. However, because difficulty increased with problem size also for addition only, their findings could be due to difficulty-related switch-costs. To test this we added a letter-comparison control. We replicated their recognition results but found no effect of addition problem size on letter-comparison, reinforcing the conclusion that recognition provides a valid measure of strategic complexity in arithmetic.

10:00 Aryn Pyke (aryn.pyke@gmail.com)
(225) *Carleton University*

The impact of calculator use on adult's acquisition of arithmetic facts.

Do calculators impact the acquisition of arithmetic facts? Answer production may be faster after practice without versus with a calculator (generation effect). Does mental practice better facilitate fact memorization, or does it promote streamlined computation? Thirty-two adults practiced 6 addition problems 36 times each, with or without a calculator. In the test phase, participants solved practiced and novel problems, without calculators. No-calculator practice yielded faster, more accurate test responses than calculator practice. The speed advantage was due to frequent fact retrieval rather than optimized computation. Interestingly, participants subjectively reported a comparable proportion of facts memorized during calculator and no-calculator practice.

4.2 The Production Effect

9:00 - 10:30 Somerville 3315
Chair: C. MacLeod

9:00 Colin MacLeod (cmacleod@uwaterloo.ca)
(226) *University of Waterloo*

The production effect: Delineation of a phenomenon.

It is well known that generating material leads to better memory than does simply reading the same material—the generation effect. For example, retrieving the target word “baby” for the clue “the tiny infant that rocks in a cradle – b” results in better recall and recognition than does simply reading the word “baby.” We introduce and explore an even simpler mnemonic benefit from just saying a word aloud as opposed to saying it silently—the production effect. The effect is large and reliable. To begin, we will outline the phenomenon and describe some of its boundary conditions related to design, type of response, uniqueness of response, and encoding task. We will also consider possible explanations for the benefit of production, including distinctiveness and strength accounts.

9:15 Jennifer Major¹ (majo1929@wlu.ca), Jason Ozubko²
(227) ¹*Wilfrid Laurier University*, ²*University of Waterloo*

The production effect: Strength and distinctiveness.

A strength-based account of the production effect suggests that saying words aloud at study simply leads to better encoding of those items. One piece of evidence that undermines the strength account is that production does not work between subjects. However, in the initial studies, study time was not equated for all items. We equated study times and obtained a between subjects production effect. In a subsequent experiment however, when the strength of aloud and silent items were equated participants were still able to identify the modality of studied items. We conclude that strength-based accounts cannot account for these data.

9:30 Kathleen Hourihan (klhourih@watarts.uwaterloo.ca)
(228) *University of Waterloo*

The production effect: The situation with respect to implicit memory.

Saturday June 21

The production effect relies on distinctiveness: The additional information of having read the word aloud at the time of study serves as a discriminative cue at the time of test. A standard feature of distinctiveness effects is that they do not influence implicit memory, where discrimination of old from new is not required. Does production affect implicit memory? The present experiment examined both a perceptual implicit test (speeded reading) and a conceptual implicit test (speeded associating). Despite all studied words producing reliable priming, Aloud and Silent words did not differ in their magnitude of priming. This indicates that production does not affect implicit memory, and thus is consistent with the distinctiveness account.

9:45 Jason Ozubko (ozubkoj@hotmail.com)
(229) *University of Waterloo*

The production effect: Eliminating the benefit by eliminating distinctiveness.

The distinctiveness account of the production effect assumes that words studied aloud have an extra "said-aloud" feature that can be used to identify them at test. Both silently studied and foil items lack this feature and so must be differentiated at test solely on the basis of familiarity. If this account is correct, then foils that were pre-exposed and said aloud would also have "said-aloud" traces. Remembering that an item was said aloud would now no longer differentiate old from new items and so the production effect should be undermined. Across three experiments we find consistent support for this account.

10:00 Nigel Gopie (ngopie@uwaterloo.ca)
(230) *University of Waterloo*

The production effect: The pivotal role of recollection.

Is the production effect recollection-based? In Experiment 1, participants decided whether test words were read aloud, read silently, or not seen during study. Participants were better at remembering which words they had read aloud than which words they had read silently. In Experiment 2, the R/K procedure was implemented, with participants asked to make recollect, know, or new judgments for each test item. Participants had more recollections for words they had read aloud than for words they had read silently; importantly, the production effect was restricted to the recollect responses. These experiments support our view that distinctiveness drives the production effect.

4.3 Animal Neuroscience

9:00 - 10:30 Somerville 3317
Chair: R. Brown

9:00 Audrey Hager (audrey.hager@gmail.com), Hans Dringenberg
***(231)** *Queen's University*

Training-induced plasticity in the visual cortex of adult rats following visual discrimination learning.

We examined neural correlates of perceptual learning in rats receiving visual discrimination training in a Y-shaped water maze. Rats learned to discriminate visual cues to navigate to a hidden escape platform. In trained rats, visual stimuli encountered during training elicited larger evoked potentials in V1 than novel stimuli, regardless of whether stimuli served as CS+ (platform) or CS- (no platform) during training. Training also resulted in facilitation of synaptic plasticity (long-term potentiation) induced by high-frequency stimulation of thalamic afferents to V1. Thus, perceptual learning might involve stimulus-selective facilitation and changes in the plasticity properties ("metaplasticity") of primary sensory cortices.

9:15 Kevin Duffy (kevin.duffy@dal.ca)
(232) *Dalhousie University*

Dark adaptation of neurons in the monkey visual cortex.

Saturday June 21

Knowledge of the physiology of primate visual cortex comes mostly from studies done in photopic conditions, in which retinal rods play little or no part. Conflicting results have come from research into the effects of dark adaptation on receptive field organization in the retina and the lateral geniculate nucleus. Studies claim either that the effect of the surround disappears with dark adaptation or that it does not. The current study examined responses of cortical cells in awake monkeys under conditions of light and dark adaptation. Our results indicate that dark adaptation does not alter basic cortical receptive field characteristics.

9:30 Laurie Manwell¹ (lmanwell@uoguelph.ca), Elham Satvat², Linda Parker¹
*(233) ¹University of Guelph, ²Wilfrid Laurier University

Manipulation of the cannabinoid CB1 receptor in the extinction of conditioned cue preference and aversion learning.

The potential of CB1 receptor inverse agonists, AM251 and SR141716, and URB597, which blocks deactivation of CB1 ligands, to potentiate extinction learning of a either morphine-induced or amphetamine-induced conditioned cue preference (CCP) was evaluated in comparison with extinction of naloxone-precipitated morphine withdrawal-induced aversion (CCA). In CCP experiments, neither AM251 nor URB597 modified extinction rates. In the CCA experiment, after acute morphine exposure, naloxone was paired with a cue then extinguished in the presence of URB597 or SR141716. URB597 promoted extinction of the CCA, whereas SR141716 significantly impaired extinction. Indirect CB1 agonism appears to facilitate extinction of aversive, not rewarding, memory.

9:45 Christine Tenk (ctenk222@uwo.ca), Martin Kavaliers, K.-P. Ossenkopp
(234) *University of Western Ontario*

Neonatal immune system activation with lipopolysaccharide alters the pattern of drinking of a novel sucrose solution in adult male and female rats.

Possible sex differences in the effects of neonatal lipopolysaccharide (LPS) on adult anxiety-related behaviour were examined. Male and female rats were treated with LPS (50µg/kg) or saline on postnatal days 3 & 5. Anxiety-related behaviour was evaluated in adulthood (day 91) by assessing neophobia to a novel sucrose solution and indexing intake and patterns of drinking. Neonatal LPS altered the pattern of drinking, but not intake, of sucrose. These effects showed no evidence of sexual dimorphism. These alterations in drinking behaviour suggest decreased anxiety and/or a shift in hedonic value such that neonatal LPS increased the incentive value of the sucrose.

10:00 Hugo Lehmann (hugolehmann@trentu.ca), Kathryn Clysdale Mcnamara, Meaghan Low
(235) *Trent University*

Repeated memory reactivation supports long-term consolidation.

We examined whether repeated memory reactivation would strengthen a context memory in non-hippocampal networks and prevent the typical amnesic effects of post-training hippocampal damage. Rats were given a single contextual fear conditioning session followed by 10 memory reactivations (brief context re-exposures). Subsequently, the rats either received sham or lesions of the hippocampus (HPC). On the retention test, the HPC group did not freeze as much as the sham control group, but showed significantly more freezing than hippocampal-damaged rats that had not received the reactivation protocol. The findings suggest that memory reactivation may support long-term memory consolidation.

10:15 Richard Brown (rebrown@dal.ca)
(236) *Dalhousie University*

Epigenetics: The future of psychology.

One of the most enduring dichotomies in psychology is the "nature vs. nurture" debate. The human gene project allows us to identify every gene in the human (and mouse, rat, fruitfly, etc) and to understand the contributions of genes to neural and behavioural development. We are also able to identify the physical, social and chemical factors which influence neuro-behavioural development. Epigenetics is the study of how environmental variables regulate gene expression.

Saturday June 21

The action of environmental factors on neurochemical systems and intracellular transduction pathways of neural cells modify the structure of histone proteins in the chromatin of the cell nucleus and these histone proteins regulate gene expression. Thus epigenetic processes provide the mechanism for environmental regulation of gene expression and the solution to the nature-nurture problem. This talk gives a brief outline of epigenetics and describes epigenetic approaches to the study of behavioural development, aging, learning, memory, social behaviour and neuropsychiatric disorders.

5.1 Attention II

11:00 - 12:30 Somerville 3345

Chair: B. Milliken

11:00 Michael Lawrence (Mike.Lawrence@DAL.CA), Raymond Klein
*(237) *Dalhousie University*

Disentangling exogenous and endogenous temporal attention.

The allocation of information processing resources over time, otherwise known as temporal attention, may be achieved by relatively automatic or controlled mechanisms. Loud noises, for example, may automatically elicit attention whilst learned strategies may be used to prepare resource allocation to impending important events based on previously detected temporal contingencies. With analogy to systems of allocation in spatial attention, these theorized mechanisms are termed exogenous and endogenous temporal attention, respectively. Where past research has confounded these theoretically distinct dimensions of temporal attention, the present work seeks to ameliorate this oversight, including a novel application of Rescorla's "truly-random control" procedure.

11:15 Chris Oriet¹ (chris.oriet@uregina.ca), Jennifer Corbett²
(238) ¹University of Regina, ²New York University

No targets, no blink.

Reporting one stimulus in an RSVP sequence is easy but temporarily impairs identification of other stimuli presented within ~500 ms (attentional blink). This suggests that a task that requires extracting information from an entire RSVP sequence (5-11 items, 100 ms/item) would be extremely difficult. Contrary to this prediction, we find the mean diameter of an RSVP sequence of circles can be calculated accurately and without attention, even though reporting a single circle interferes with processing a later shape. This extends findings with static displays to the temporal domain, and underscores the task-specificity of lag-dependent impairments in reporting from RSVP sequences.

11:30 Lisa Jefferies¹ (ljefferi@gmail.com), Vincent Di Lollo²
*(239) ¹University of British Columbia, ²Simon Fraser University

Controlling the spotlight of attention: One beam or two? It depends on the task.

Mutually-exclusive theories posit that spatial attention is allocated either as single focus or as multiple foci. We show instead that the mode of attentional deployment changes based on task demands. We used two RSVP-streams and two target pairs (T1-pair, T2-pair) to probe whether a single focus or dual foci were employed. In Experiment1, the T1-pair appeared predictably within the streams (encouraging separate-foci strategy); in Experiment2, it appeared unpredictably on-stream or between the streams (encouraging single-focus strategy). When the T2-pair appeared between the streams, performance was poor in Experiment1 (consistent with a dual-focus) and accurate in Experiment2 (consistent with a single focus).

11:45 Katherine Arbuthnott (katherine.arbuthnott@uregina.ca)
(240) *Campion College, University of Regina*

Cues and backward inhibition.

Saturday June 21

Backward inhibition (BI) is the additional cost associated with switching back to a recently abandoned task. BI is a robust phenomenon, but cued BI is not observed when component tasks are uniquely associated with different spatial locations. In previous studies both cues and target stimuli were presented at unique locations, so localization of targets rather than task cues could be responsible for the change. To determine which component influences BI, cue and target location were independently manipulated. Results indicated that unique cue location for each task, independent of target location, underlies the elimination of BI with spatial cuing.

12:00 Adam Spadaro (spadaraj@mcmaster.ca), Bruce Milliken, Chao He
(241) *McMaster University*

In between positive and negative priming.

Inhibition of return (IOR) is commonly thought to reflect a basic mechanism of spatial orienting. Nonetheless, a small number of studies have reported IOR-like effects (i.e. repetition costs) with non-spatial stimuli. However, all such studies have used a cue-target procedure, in which only the second of two events on a trial receives a response. Here, we report the results of several experiments in which an IOR-like effect is observed with non-spatial stimulus dimensions using a target-target procedure, but only when an intervening event occurs between the two targets. The results are discussed with an episodic memory framework for interpreting stimulus repetition effects.

12:15 Kristie Dukewich (dukewich@dal.ca)
***(242)** *Dalhousie University*

An habituation account of inhibition of return.

Inhibition of return (IOR) is an effect whereby reaction times (RTs) to a target presented at a location where a stimulus had recently been presented are increased compared to when a target is presented at a new location. Early reports that habituation is not responsible for the IOR effect are shown to be ill conceived. More importantly, a large portion of the literature can be accounted for using the habituation framework. The current paper reviews some of the support for this theory, and explores some of the predictions that this theory suggests.

5.2 Cognition

11:00 - 12:30 Somerville 3315

Chair: S. Shukla

11:00 Steven Carroll (srcarrol@connect.carleton.ca), William Petrusic
(243) *Carleton University*

The time course of confidence processing.

The time course of confidence processing is discussed in light of three decision-making experiments: two psychophysical tasks and one general knowledge task. Each experiment consisted of a confidence block of trials, wherein participants expressed a confidence rating following each rendered decision, a no confidence block, where confidence was never expressed, and a stop-confidence block, where participants were told to expect to have to express confidence but were instructed not to do so if a tone sounded. Stop-confidence tone onset delays were varied systematically. Decisional response time data reveal how confidence processing unfolds linearly throughout the primary decision-making process.

11:15 Samuel Hannah¹ (hannahsd@mcmaster.ca), Matthew Crump², Meredith Young¹, Lorraine Allan¹,
(244) Shepard Siegel¹

¹*McMaster University*, ²*Vanderbilt University*

Age differences in cue interaction tasks.

Aging effects in a variety of domains suggest that aging impairs responding to multiple demands. However, much of the research on aging effects in contingency judgments have been restricted

Saturday June 21

to cases using a single cue and outcome. Using the streamed-trial procedure that we developed for the study of contingency judgments, we examined aging effects on cue interaction, a situation where multiple demands are potentially present. The introduction of a second cue produces notable differences between young and old participants. These differences remain even when trials begin by correctly informing participants as to which cue to attend to.

11:30 Michael Jones (jonesmn@indiana.edu)
(245) *Indiana University*

Active vs. passive category learning and retention.

In typical laboratory experiments of categorization, subjects learn by classifying exemplars selected randomly from the category space. In the real world, however, category learning is a more active task: strategic exemplars are selected to test hypotheses. Using the same categories, we tested learning in both random (passive) and strategic (active) learning. In addition, we had a third group (yolked) that performed passive learning, but viewed the “strategic” exemplars generated by the active group. Although the active group learned best during training, their performance suffered the most when feedback was removed. The “strategic” exemplars did not benefit the yolked group, suggesting that it is active learning rather than information content that benefits discovery learning, and this benefit is reliant on feedback.

11:45 Gregory Krätzig (gregory.kratzig@usask.ca), Jamie Campbell
(246) *University of Saskatchewan*

Effects of feedback on age-related differences in strategy choice adaptivity.

We examined adaptivity of strategy choice using a computational estimation task (Lemaire et al., 2004). Younger and older (mean 20.1 vs. 84.5 years) participants estimated two-digit by two-digit products either by rounding both digits up or down. Their task was to select and execute the strategy that provided the closer estimate of the exact product. Half of the participants received feedback (correct or incorrect) after each trial. Older-adults were nominally more accurate overall than younger-adults (73% vs. 70% correct). Only younger-adults, however benefited from feedback (no-feedback 52% vs. feedback 87%) whereas older-adults’ accuracy was largely unaffected (no-feedback 72% vs. feedback 74%).

12:00 Matti Saari¹ (mattis@nipissingu.ca), Trudi Stickland², Sheila MacIntosh¹
(247) ¹*Nipissing University*, ²*University of Calgary*

Postnatal day ten and isoflurane: Exploring a paradox.

Trudi Stickland and I (2004) reported that ten day old rats show a surprising resistance to the anaesthetic, isoflurane. We became interested in anaesthesia as a potential way of exploring the neural bases of consciousness. We reasoned that if consciousness is mediated by the brain then there may be developmental parameters associated with consciousness. We also reasoned that it is plausible to argue that an anesthetized rat is an unconscious rat. This paper is an overview of a number of experiments that we have conducted at Nipissing to further explore this and some other surprising findings.

12:15 Sonia Shukla¹ (shukla@testingthenull.com), Douglas Bors¹, Blair Armstrong², Jamie Gruman³
(248) ¹*University of Toronto at Scarborough*, ²*Carnegie Mellon University*, ³*University of Guelph*

The meaning in life questionnaire: Exploring meaning from a cognitive perspective.

This study examines individual differences in the Meaning in Life Questionnaire (MLQ), a 10-item measure of presence and search for meaning. Participants (N=382) completed an online experiment which included the Need for Cognition (NFC) and McLain’s Tolerance for Ambiguity scales. Previous findings that the MLQ consists of a two-factor structure are replicated here with an ethnically diverse sample. Results indicate that the MLQ presence score is positively correlated with NFC, Tolerance for Ambiguity and religiosity, whereas the search score is negatively correlated with religiosity. Additional properties of the MLQ and its relation to other measures are also discussed.

5.3 Symposium Developmental Neurobiology: Early Life Stress and Adult Psychopathology

11:00 - 12:30 Somerville 3317

Chair: M. C. Olmstead

11:00 Liisa Galea (lgalea@psych.ubc.ca), Susanne Brummelte
(249) *Department of Psychology*

Prolonged exposure to high levels of corticosterone during gestation and/or postpartum as an animal model of post partum stress and depression causes changes in maternal care and mood and alters offspring behaviour.

Stress and prolonged elevated levels of the stress hormone corticosterone (CORT) or cortisol are associated with depressive-like behaviours in humans and rodents. The present study investigated the effects of high CORT given to rat dams during pregnancy and/or the postpartum as a model of postpartum stress or depression. Prolonged exposure to CORT led to depressive-like behaviour in the dams and to a decrease in maternal care, but had no effect on hippocampal neurogenesis. Furthermore, offspring from CORT-treated dams were hyperactive and showed alterations in neurogenesis. Our data suggest that maternal hormonal state can crucially influence the outcome of the offspring.

11:15 Janet Menard¹ (menard@queensu.ca), Joanna Pohl², Mary Olmstead¹
(250) ¹*Queen's University*, ²*McGill University*

Exposure to stress across childhood-adolescence alters rats' anxiety- and depression-like behaviours in adulthood: The importance of stressor type and gender.

Rats were exposed to either severe, sporadic stress (SSS) or chronic mild stress (CMS) across childhood-adolescence and were tested in adulthood. SSS males showed exaggerated anxiety-related responses, including increases in shock-probe burying and escape-like jumps from the elevated plus-maze. SSS females displayed increases in escape behaviour and anhedonic-like decreases in sucrose consumption. CMS produced effects only in females, including decreases in burying and sucrose consumption and an exaggerated corticosterone response to cold-water immersion stress. The findings reiterate the link between early-life adversity and adult psychopathologies and emphasize the need to consider stressor type and gender in these analyses.

11:30 Stephanie Hancock (shancock@mta.ca)
(251) *Memorial University of Newfoundland*

Early maternal separation increases symptoms of activity-based anorexia in young adult male and female rats.

Running activates the hypothalamic-pituitary-adrenal (HPA) axis, increasing the release of stress hormones known to exert anorexic effects. HPA-axis reactivity is strongly influenced by early postnatal manipulations including handling and maternal separation. The present study examined the effects of handling and maternal separation on food intake, weight loss, and running rates of male and female rats in the activity-based anorexia (ABA) paradigm. Compared to handled rats, maternally-separated animals lost weight faster, ate less, ran more, and required fewer days to reach removal criterion. Females were particularly vulnerable. These findings suggest that sex and early postnatal treatment influence ABA.

11:45 Iva Mathews (iva.mathews@brocku.ca)
(252) *Brock University*

Saturday June 21

Lasting influence of chronic social stress in adolescence on conditioned place preference and locomotor sensitization to amphetamine in male and female rats.

We investigated age-related changes in the effects of chronic social stress (SS) in adolescence on both conditioned place preference (CPP) and locomotor sensitization to amphetamine. In the CPP experiment, SS females tested in adolescence had increased preference for the 1.0 mg/kg dose of amphetamine, whereas SS rats of both sexes showed a decrease in CPP for the 0.5 mg/kg dose when tested as adults. Irrespective of time of testing, SS males and females had enhanced locomotor sensitization compared to controls. Thus, adolescent SS produced immediate and enduring effects on behavioural responses to amphetamine, which holds implications for vulnerability to addiction.

Poster Session 3

12:30 - 2:15 Great Hall, Somerville

(253)*

Amanda Hertel (vanx2890@wlu.ca), Roelof Eikelboom
Wilfrid Laurier University

Overeating in rats induces a conditioned taste avoidance to a novel solution.

While feeding is rewarding, the feeling of satiation may sometimes be aversive. Using a food-restriction induced model of overeating in rats developed in our laboratory, we found that overeating induces a conditioned taste avoidance (CTA). Food-restricted rats were given a single 24-hour pairing of a novel saccharin solution and ad lib access to food, these overeating animals consumed significantly less of the saccharin solution in a two-bottle test than did regular feeding controls. This saccharin CTA was strengthened by 3 overeating plus saccharin training trials. The results of our ongoing latent inhibition experiment, where the saccharin is familiar, will be discussed.

(254)

Chloe McDonald (6cerm@queensu.ca)
Queen's University

Rats' behavioural defense profiles are optimized according to their current energy demands.

The current study examined the effects of chronic food restriction on rats' behavioural defense profiles in two animal models of anxiety; the shock-probe burying and elevated plus-maze tests. Food restriction increased risk assessment and escape-related responses in the shock-probe test. This same treatment dramatically increased rats' open-arm exploration in the plus-maze. Together, the results suggest that rats' willingness to explore normally avoided open arenas is sensitive to their current energy demands. Further, this dramatic shift in open-arm exploration seems to involve activation (as indexed by cFos) of brain regions previously implicated in rats' normal open-arm avoidance.

(255)*

Jennifer Hogsden (2jh4@queensu.ca), Hans Dringenberg
Queen's University

Plastic properties of the thalamocortical auditory system at different ages and following sensory deprivation during early postnatal life.

The plastic properties of the rat thalamocortical auditory system were examined at different ages and following early sensory deprivation. Long-term potentiation (LTP) between the medial geniculate nucleus and primary auditory cortex in urethane anesthetized rats declined with age. Young rats (30-35d) showed greater LTP (~52% potentiation) than older animals (40-45d, ~37%; 100-110d, ~25%; 200+d, ~10%). Patterned sound deprivation in young rats (~5-60d) by continuous white noise exposure resulted in the maintenance of juvenile-like plasticity (~65% LTP). This LTP enhancement was reversed by antagonists of the NMDA receptor NR2B subunit, suggesting the relative upregulation of NR2B following early auditory deprivation.

(256)

Tomek Banasikowski (5tb5@queensu.ca), Lindsey MacLeod, Richard Beninger
Queen's University

Effects of CNQX and nafadotride on conditioned place preference based on amphetamine: Greater effect on expression than acquisition.

Intact neurotransmission of dopamine (DA) and glutamate (Glu) is critical in reward-related learning in rats. We tested the AMPA receptor antagonist CNQX (0.01, 0.05, 0.1, 1.0 mg/kg) and the DA D3 receptor-preferring antagonist nafadotride (0.01, 0.1, 0.5, 1.0 mg/kg) on acquisition and expression of amphetamine (2.0 mg/kg) conditioned place preference (CPP). CNQX (0.05, 0.1, 1.0 mg/kg) and nafadotride (0.5, 1.0 mg/kg) blocked CPP at lower doses in expression than in acquisition. Results implicate AMPA and DA D3 receptors in regulating the expression of conditioned behaviors.

Saturday June 21

(257)

M Gordon, K Foley, A Taylor, F Boon, L Tichenoff (lticheno@uwo.ca), K- Ossenkopp, Derrick MacFabe

University of Western Ontario

Repeated intraventricular administration of propionic acid produces increased locomotor activity and neuroinflammation in rats: A novel rodent model of autism spectrum disorders.

Gastrointestinal and neuroinflammatory responses often co-exist in autism spectrum disorders (ASDs). Propionic acid (PPA) is a by-product of enteric bacteria that enters systemic circulation and the CNS. PPA in rats produces behavioral and brain changes similar to that seen in ASD patients. Effects of daily and weekly intraventricular PPA infusions were investigated. Male rats received infusions of PPA (0.26 M) or phosphate buffered saline either daily/5 days or weekly/5 weeks. Following microinfusion, locomotor activity was measured for 30min. PPA treated animals displayed significant increases in locomotor activity and increased innate neuroinflammation in the white matter that may model human ASDs.

(259)*

Miranda Feeney (mfeeney@uwo.ca), William Roberts, David Sherry

University of Western Ontario

Testing for episodic-like memory in the black-capped chickadee.

We conducted tests of episodic-like memory in a food-storing bird, the black-capped chickadee. Chickadees found concealed seeds and mealworms in selected sites of a testing board within their home cage, or artificial trees in an aviary. Birds searched these sites again after either short (3 hr) or long (123 hr) retention intervals; preferred mealworms were degraded and inedible after 123 hr. During home cage testing, chickadees showed some memory for what food type was previously encountered and where, but not for when. In Experiment 2, we birds showed a trend towards remembering when foods were previously encountered on which side of the aviary, but not specific food locations.

(260)

Tyson Baker (tysonwbaker@hotmail.com), Richard Beninger

Queen's University

The dopamine D3 receptor antagonist ABT-127 decreases responding.

Dopamine D3 receptor antagonists reliably decrease conditioned responding maintained by stimuli associated with rewarding drugs. The purpose of this experiment was to examine the effects of the novel D3 receptor antagonist ABT-127 (0.0, 0.1, 1.0, 2.0, 5.0 mg/kg) on responding for conditioned stimuli based on food delivered according to a second-order FR10(FR10) schedule. Results demonstrated a significant suppression of responding for conditioned stimuli at the 2.0 and 5.0 mg/kg doses and no significant effect on responding for unconditioned reward. These results implicate D3 receptors in responding for conditioned stimuli based on food.

(261)

Jonathan Beuk (jonb@biomed.queensu.ca), Richard Beninger, Martin Pare

Queen's University

A study of controlled movement processing in the rat using the countermanding paradigm.

Male Wistar rats (N=7) were trained to respond to a visual stimulus (go signal) by pressing the lever below the stimulus but to cancel their responses (25% trials) when an auditory tone (stop signal) was presented after a variable delay following go signal presentation. The ability to cancel a response decreased as stop signal delay increased. The time needed to inhibit a commanded movement was estimated between 100 and 200 ms by the race model of behavioural inhibition. Thus, rodent performance in countermanding can be accounted for by a simple race model, originally developed in human and nonhuman primate studies.

(262)

Nicole Thomas (nicole.thomas@usask.ca), Lorin Elias

University of Saskatchewan

Visual field differences in perceptual asymmetries.

Neurologically normal individuals exhibit leftward biases during judgements of brightness on two equivalent, mirror-reversed objects. Other spatial judgments are influenced by the relative vertical position of the stimulus. The current study involved judgments of brightness following presentations to the upper or lower visual fields. A stronger leftward bias was observed for presentations to the upper visual field. This

Saturday June 21

effect was modulated by presentation duration, with a stronger leftward bias occurring in the upper visual field during short presentations and the lower visual field under free-viewing conditions. This result suggests that the leftward bias is modulated by both position and duration.

(263)

Kate Dupuis (kated@psych.toronto.edu), Kathy Pichora-Fuller
University of Toronto

Age-related differences in perceiving emotion in speech.

Emotion is conveyed in speech by lexical content (what is said) and by prosody (how it is said). Older adults benefit from prosody when comprehending spoken language; however, there are age-related declines in the identification of emotional prosody. In this study, older and younger adults listened to recorded sentences and indicated whether the talker sounded happy or sad. Prosodic cues dominated lexical cues for younger adults, whereas older adults responded less consistently when these cues conflicted. This age-related difference was eliminated when listeners repeated the sentences or when a delay was imposed between presentation and response.

(264)

David Nichols (dnichols@cvr.yorku.ca), Hugh Wilson
York University

Factors in the measurement of interocular inhibition fields.

Patches of coherent dominance and traveling waves have been observed during binocular rivalry, implying spatial spread of interocular inhibition. We show that the range of suppression of a monocular target depends greatly on the luminance pattern defining it. For horizontal target bars, the range of suppression was approximately twice as much for target bars of uniform luminance or horizontal gratings, compared to target bars of random noise or vertical gratings. Traveling waves in dominance did not occur, unlike in rivalry, as the time until suppression was constant across distance. The implications for models of interocular suppression will be explored.

(265)

Daniel Saunders¹ (drsaunders@canada.com), Rick Gurnsey², Nikolaus Troje¹

¹Queen's University, ²Concordia University

Azimuth discrimination reveals local processes in biological motion perception.

Biological motion perception involves two distinct visual mechanisms. One is based on deriving the global shape of the agent, while the other is based on the local motion of individual dots. In this study, we present a new method that allows us to further characterize the two mechanisms. By measuring azimuth discrimination thresholds for point-light walkers that contain either only local information or only global structure, we avoid a number of confounds which make other methods less reliable. Our results confirm the dissociation between the two proposed mechanisms.

(266)

Christopher Taylor
(christopher.taylor@gmail.com)
McMaster University

Classification images reveal the effect of visual attention on shape discrimination.

We used classification images to examine the effect of visual attention on observers' strategies in a shape discrimination task. Sixty-three observers discriminated between two dot shapes in visual noise, at validly and invalidly cued locations. Observers performed better on validly cued trials, but classification images were more similar to the ideal discrimination template on invalidly cued trials. This is impossible according to standard linear psychophysical models, so our results indicate an important role for nonlinear processing in mechanisms of visual attention. We will consider what kinds of nonlinearities can account for our findings.

(267)*

Ali Jannati (ali_jannati@sfu.ca), Thomas Spalek, Vincent Di Lollo
Simon Fraser University

Visual masking in the attentional blink: The characteristics of preconscious processing.

Attentional Blink (AB) is the finding that perception of the second of two sequential targets (T2) is impaired if presented within 500ms of the first (T1), when T2 is stored in a preconscious buffer (PCB) while T1 is processed. We studied the characteristics of PCB by asking what type of masking interferes with the stored representation. Three experiments investigated the effects of masking

Saturday June 21

based on contour superimposition, contour proximity and onset transients. The results pointed to onset transients as the main masking factor. The outcome favours an attentional interruption account in line with the concepts of phenomenal versus access consciousness.

(268)

Amanda Clark¹ (aclark@uwaterloo.ca), Eric Roy¹, Daniel Smilek¹, Richard Staines¹, Jim Lyons²

¹University of Waterloo, ²McMaster University

Predicting slips of action: Contrasting and comparing both objective and subjective measures.

We examined slips of action within a context of a movement sequencing task. Slips were induced by occasionally requiring a change in a learned movement routine. This study considers how these slips relate to other objective (SART) and subjective (ARCES) measures of attention failure. We found that SART errors were highly predictive of slip of action errors ($r=0.549$, $p=0.002$), while the ARCES only predicted errors on trials that did not require a change in the sequence ($r=0.488$, $p=0.006$). Thus, while the SART and ARCES correlate well ($r=0.186$, $p=0.03$), they appear to measure two different aspects of attention, inhibitory control (SART) versus distractibility (ARCES).

(269)

Roy Ferguson (ra2fergu@watarts.uwaterloo.ca), Jennifer Stolz

University of Waterloo

Using spatial certainty to narrow and broaden posner's attentional beam.

In a lexical decision task, target letter-strings were uniquely coloured and presented in a display with nonword distractor letter-strings. Occasionally a word was included as a distractor. When the location of the coloured target was unknown in advance, the distractor items were sufficiently processed to influence responses to the target (indexed by slower responses to nonword-targets when a word was present as a distractor). When target location was known in advance, distractor items did not influence target responses. It is argued that attentional resources are narrowly allocated when target location is certain but diffusely allocated when target location is uncertain.

(270)

Mary MacLean (mm07fi@brocku.ca), Karen Arnell, Kirk Stokes, Michael Busseri
Brock University

Naturally occurring diffuse attentional state reduces the attentional blink.

In an RSVP, accuracy for identifying a second target decreases as its proximity to the first target increases - an attentional blink (AB). Olivers and Nieuwenhuis (2006) found that diffusing attention through an additional task or by inducing a positive mood attenuated the AB. The current study investigated whether self-report measures of naturally occurring affective and cognitive states and traits could predict AB size. Supporting the Olivers and Nieuwenhuis model, items conceptually related to a focused state predicted a larger AB while items conceptually related to a diffuse state predicted an attenuated AB.

(271)

Gillian Dale (gd03fh@brocku.ca), Ryan Young, Karen Arnell

Brock University

Electrophysiological investigation of emotional stimuli and the attentional blink.

When individuals are asked to identify two targets in an RSVP task, accuracy on the second target (T2) is reduced if presented shortly after the first target (T1) — an attentional blink (AB). Previous research shows that taboo/sexual words presented as T1 can increase the magnitude of the AB (Mathewson, Arnell, & Mansfield, 2008). This experiment examined event-related brain potentials (ERPs), specifically the P3, to emotionally neutral and taboo/sexual words presented as T1. The P3 was larger when a taboo/sexual word was presented, as compared to neutral word presentations, providing electrophysiological evidence that taboo/sexual words receive more attentional processing.

(272)

Chris Oriet (chris.orient@uregina.ca)

University of Regina

Contrasting influences of explicit and implicit change detection.

Observers localized a change between sequential pairs of displays of 8 oriented line segments arranged in a clock-face. The SOA between the displays (shown for 17 ms each) was staircased to yield 50% correct responding. On 1/8 of trials, the location of the change on

Saturday June 21

trial N repeated from trial N-1. The probability of successfully detecting the change on trial N was calculated, conditionalized on successful detection of the change on trial N-1. Change location repetition benefited change localization following explicit detection of the previous change, but impaired performance when changes were registered implicitly.

(273)

Beverly Butler (DrBevButler@gmail.com), Mike Lawrence, Gail Eskes, Ray Klein
Dalhousie University

Visual search patterns in neglect: Comparison of near and far space search.

We examined whether visual scanning differed in near space and far space in stroke participants with left neglect (NEG), stroke controls without neglect (RHC), and healthy volunteers (NC). The NC and RHC groups showed similar 'reading' type search strategies in both near and far space. The NEG group, however, displayed unsystematic search reflecting a rightward attentional bias, more target repetitions, and smaller attentional shifts (e.g., a smaller "spotlight" of attention). For the most part, visual search patterns were similar in near and far space, suggesting similar properties of the putative control systems within the dorsal and ventral streams, respectively.

(274)

Grayden Solman (gsolman@gmail.com), Daniel Smilek
University of Waterloo

Search in stable and unstable environments.

Visual search outside of the laboratory involves both configurational stability of environments over time, and advance knowledge of future search targets. In two experiments we examined the influence of these factors on search behaviour, as measured by response time and eye-movement data. Search performance was found to improve with increasing trial-to-trial configurational stability and, critically, we found that advance target knowledge was useful only for intermediate levels of stability, and not for either extreme. We discuss the implications of these findings for theories of the role of memory in visual search.

(275)

Jeffrey MacLeod¹
(mconnmacleo@univmail.cis.mcmaster.ca),
Meghan McConnell², David Shore²
¹*McMaster University*, ²*McMaster University*

Testing the validity and within-test reliability of the attention network test.

The Attention Network Test (ANT) is proposed to assess the quality of three unique attentional networks: alerting, orienting, and executive function. The ANT is regularly used in the evaluation of attention networks; however, its reliability and construct validity remain uncertain. We investigated the ability of the executive function measure provided by the ANT to predict performance on other, more commonly used, measures of executive function. Also, using ANT datasets from over 300 participants, we analyzed the within-test reliability of the measure, relationships between the three attention networks, and interactions between trial types.

(276)

Crystal Ehresman, Deborah Saucier
(deborah.saucier@uleth.ca)
University of Lethbridge

Do sex differences in working memory explain the sex difference in cardinal and landmark-based navigation?

When navigational instructions feature cardinal directions and distances (e.g. go 100 m and turn west) a male advantage emerges, although instructions featuring landmarks (e.g. turn right at the stopsign) reduce or reverse this pattern. 126 undergraduates (63 males) performed tasks of navigation, visuospatial (VS-WM) and linguistic working memory (L-WM). We observed that VS-WM and rotation ability were both significant predictors of the ability to follow cardinal directions, especially in women. However, nothing was predictive of the ability to follow landmark directions. Thus, cardinal based navigation is associated with spatial ability, whereas landmark based navigation is reliant on other unknown skills.

(277)

Julie Dumont (julie.dumont@mail.mcgill.ca),
Viviane Sziklas
McGill University

Lateral dorsal thalamic nucleus and spatial conditional learning.

Rats with lesions of the lateral dorsal thalamic nucleus (LD) were impaired in learning two tasks known to be sensitive to damage of the

Saturday June 21

hippocampal system. First, they were slower to acquire a spatial-visual conditional learning task in which they had to learn the following rule: if scene A, choose object X; if scene B, choose object Y. Second, LD rats were severely impaired on a spatial working memory task in the radial maze. Taken together with findings that LD has dense connections with the hippocampus, the findings suggest that LD is part of an extended hippocampal system underlying spatial learning.

(278)

Melissa Chan (mchan73@uwo.ca), Shelley Cross-Mellor, Klaus-Peter Ossenkopp
University of Western Ontario

Exposure to lipopolysaccharide (LPS) impairs the acquisition of LiCl-Induced anticipatory nausea.

The current study investigated the separate and combined effects of immune stimulation and LiCl on the development of anticipatory nausea. On each of the 4 conditioning days, rats were injected with lipopolysaccharide (LPS) or NaCl ninety minutes prior to a second injection of either LiCl or NaCl. Rats were then immediately placed in a distinctive context for 30 minutes. On the test day, rats were placed in the same testing chamber in the absence of any drug injection and behavioral responses were videotaped. Results show that stimulation of the immune system significantly impaired the acquisition of anticipatory nausea.

(279)

Peter Dixon¹ (peter.dixon@ualberta.ca), Scott Glover², Victoria Richards¹, Henry Li¹
¹*University of Alberta*, ²*Royal Holloway University of London*

Sequential contrast and assimilation in grasping.

Grip aperture was measured in a simple grasping task as a function of whether the target on the previous trial was smaller or larger. Early in the movement, a contrast effect was observed in which grip aperture was wider following a smaller target; later in the movement, an assimilation effect was observed in which grip aperture was smaller following a smaller target. However, the contrast effect was eliminated by providing context for the target on each trial. The results implicate memorial processes in both planning and executing a movement.

(280)

Evanya Musolino (emusoli@uwo.ca), Stephen Erdle

Huron University College at Western

The construction of an undergraduate risk-taking scale.

This study sought to create a psychometrically sound test to assess risk-taking among undergraduate students. There were 40 participants; 20 male and 20 female undergraduate students. The newly constructed Undergraduate Risk Taking Scale (URTS) had high internal consistency reliability. Males scored significantly higher on measures of risk-taking than females. Furthermore, the URTS was positively correlated with the Risk-Taking Scale of the JPI (Jackson, 1976), and negatively correlated with the Harm Avoidance Scale of the PRF-Form E (Jackson, 1974). Discriminant construct validity was shown by the lack of correlation with the Lie Scale of the EPQ (Eysenck & Eysenck, 1968).

(281)

John Grundy (jgrundy@mcmaster.ca), Judith Shedden

McMaster University

Externalization of self-defeating associations: The implicit association test and self-esteem.

The present study investigates how implicit self-esteem can be mediated by the introduction of compelling stories. By using the Implicit Association Test (IAT), we measured participants' implicit self-esteem before and after presenting them with stories of high- and low-self-esteem characters. In response to these stories, people with low self-esteem may have externalized their feelings of negative self-worth and consequently increased their implicit self-esteem. Changes in implicit-explicit correlation were observed. Effects of the stories on the IAT and the implicit-explicit correlation will be discussed in terms of temporary and long-term changes to self-evaluation.

(282)

Stephen Erdle (serdle@uwo.ca)

Huron University College at Western

The generalized expectancies measure.

This study describes the construction of the Generalized Expectancies Measure (GEM), a 16-item self-report inventory based on social learning theory (Rotter, 1954). The GEM was designed to measure generalized expectancies of reinforcement and punishment. A study of 86

Saturday June 21

introductory psychology students revealed that the dimensions of the GEM were internally consistent and had convergent and discriminant construct validity with the scales of the Big Five Inventory (BFI: Benet-Martinez and John, 1998).

(283)*

Justin Carré, Cheryl McCormick
(cmccormick@brocku.ca)
Brock University

Relationship between salivary testosterone, aggressive behaviour, and willingness to engage in a competitive task.

The current study investigated relationships among aggressive behaviour, change in salivary testosterone (T) concentrations, and willingness to compete. Thirty-eight men provided saliva samples before and after performing a laboratory task assessing aggressive behaviour. Baseline T concentrations were not related to aggression. However, aggressive responding (but not point reward or protection responding), predicted the task-induced change in T. Together, aggressive responding and change in T predicted willingness to choose a competitive versus a non-competitive task ($R^2 = 0.20$, $p = 0.02$). These results indicate that situation-specific aggressive behavior and T responsiveness are functionally relevant predictors of future social behaviour.

(284)

Lindsey MacLeod (lmac1079@uottawa.ca), C Kogan, C Messier, C Collin, R Gandhi
University of Ottawa

Novel Hebb-Williams mazes to evaluate visual-spatial abilities of fmr1 knockout mice and individuals with fragile x syndrome.

Fragile X syndrome (FXS), the most prevalent form of heritable mental retardation, leads to a wide range of behavioural and cognitive deficits, including using visual information to guide action adaptively. A computerized maze task, adapted from the animal literature, was used to quantify visual-spatial learning and memory deficits in FXS. Human performance is compared to a murine knock-out model of FXS as well as to individuals affected by Down Syndrome. Results are discussed in the context of previously described visual processing deficits and how these may impact visual-spatial learning and memory in those affected by FXS.

(285)

Dwayne Pare (dpare@psychexperiments.com), Steve Joordens
University of Toronto Scarborough

Self-efficacy in the context of peer-assessment: An examination of cognitive interference, changes in peer grading, and changes in self-assessment scores.

Previous research has shown that peer grades to written assignments acquired within peerScholar, an online peer-assessment tool, are similar in both level and rank to those provided by experts (Paré & Joordens, 2008). The current research examines the impact of adding a self-efficacy task to the assignment: 1) before submission, 2) after marking peer compositions, and 3) at both phases. Specifically, we examine the role self-assessment plays in student performance on the assignment in the context of cognitive interference, the effects the addition of a self-assessment task has on peer grades, and the changes that occur in self-assessment over time.

(286)

Sasha Davis, Christine Tsang
(ctsang33@huron.uwo.ca)
Huron University College at Western

Extending the Bouba-Kiki effect: Word-shape correspondences in 6-month-old infants.

Studies have documented a non-arbitrary sound-shape correspondence, in which curved or angular shapes are mapped to nonsense words based on whether these words have rounded (e.g. bouba) or unrounded (e.g. kiki) vowels (Ramachandran & Hubbard, 2001; Maurer, Pathman, & Mondloch, 2006). Using a head-turn preference task, the present study examined whether the bouba-kiki effect is present in pre-linguistic 6-month-old infants. The results show that infants look longer to congruent sound-shape pairings (i.e., bouba paired with round shapes) than to incongruent sound-shape pairings (i.e., kiki with round shapes), suggesting that this effect may occur early enough to influence the development of language comprehension.

(287)

Guy Lacroix¹ (guy_lacroix@carleton.ca), Helena Osana², Bradley Tucker², Amanda Cuffari¹, Andreia Couto¹, Glen Howell¹

¹Carleton University, ²Concordia University

Saturday June 21

The impact of print exposure quality, inference construction, and working memory on syllogistic reasoning.

This study extended Osana et al.'s research (2007) on the relation between verbal ability and syllogistic reasoning. We hypothesized that exposure to general and scientific print and the ability to generate bridging inferences while reading would predict syllogistic reasoning ability independently of WM capacity. Regression analyses revealed that WM was not a significant predictor of syllogistic reasoning once intelligence had been controlled for. Moreover, print exposure and bridging inference measures did not account for significant changes in variance explained. A restriction of range in scores for intelligence and print exposure may explain the failure to replicate Osana et al. results.

(288)

Bob Uttl¹ (uttlbob@gmail.com), Meaghan Henry^{1,2}, Jan Uttl³
¹Red Deer College, ²University of Calgary, ³Avidata

Decision making in avalanche avoidance and survival

We reviewed hundreds of avalanche incidents to examine human decision making in avalanche avoidance and survival. For each incident, we coded features of weather, terrain, snowpack, avalanche, participants, avalanche/avalanche/participant interactions, and participants' behavior both prior to, during, and after the avalanche. Our findings show that both amateurs and experts often make risky decisions and expose themselves to unnecessary dangers while traveling in avalanche terrain. Contrary to widespread claims, professionals (e.g., guides, ski patrol, avalanche control personnel) commit same or even more severe errors than recreational backcountry users. Most importantly, majority of accidents are avoidable.

(289)*

Christine Lackner¹ (6cll@queensu.ca), Catherine Mondloch²
¹Queen's University, ²Brock University

Facilitating face recognition: Categorical perception of distinctiveness in adults and 6-year-olds.

Adults' expert face recognition is partially attributable to their exquisite sensitivity to the spacing among features—a sensitivity that is

slow to develop. We are investigating the extent to which categorical perception underlies this sensitivity. We moved the eyes and mouth of 10 facial identities in equal steps to create continua that varied in distinctiveness. Adults and 6-year-olds sorted these faces into two categories—typical versus unusual. Adults and 6-year-olds perceived the continua categorically (i.e., they had discrete category boundaries). Adults showed better cross-boundary than within-category discrimination. We are currently testing 6-year-olds on a 2AFC discrimination task.

(290)

Amy Desroches (asdesroc@uwo.ca), Stephanie Neilson, Marc Joanisse
University of Western Ontario

Revealing differences in speech perception across typical development: Categorical versus gradient effects in perception.

Classical behavioral measures have observed similarly strong categorical perception of phonemes in children and adults. More recently, studies using on-line measures like eyetracking have suggested these categorical perception effects are in fact more graded. The present study examined whether eyetracking could also reveal developmental differences. Across two different acoustic-phonetic continua we observed similarly strong overt categorization responses in adults and children (ages 8;4-11;2). However, eyetracking revealed clear developmental differences, marked by a greater number of fixations to pictures of phonetic competitors for midpoint compared to endpoint stimuli. Results suggest phonetic categories continue to develop through the school years in children.

(291)

Tamsen Taylor (ttaylor@humansys.com), Lisa Rehak, David Smith
Humansystems Incorporated, Defense Research and Development Canada - Toronto

Helping military intelligence analysts process text.

Military intelligence analysis requires processing a large amount of text data. This study examined the types of text that must be analysed, how analysts extract meaning from text data, and how this information is communicated. Problems encountered by intelligence analysts include limitations on working memory, biases in long term memory,

Saturday June 21

biases in decision making, and difficulty communicating information. Results suggest that data-driven methods which produce summaries of the important concepts, relationships, and themes contained in text could reduce memory loads, the impact of bias, and assist communication.

(292)

Jean Saint-Aubin (jean.saint-aubin@umoncton.ca), Nicholas Routhier
Universite de Moncton

Do threatening words hold attention in reading connected texts? Evidences from the missing-letter effect.

The missing-letter effect was used to investigate processing of threatening words in connected text. A total of 60 participants (30 high and 30 low on trait anxiety) read three continuous texts while searching for a target letter embedded in a total of 105 threatening and 105 neutral words. Texts were presented with a rapid serial visual presentation procedure with a presentation rate of 250 msec per word. As expected, results revealed more omissions for target letters embedded in neutral than in threatening words. However, neither the effect of trait anxiety nor its interaction with word threatening value was significant.

(293)

Peter Jansen, Scott Watter
(watter@mcmaster.ca)
McMaster University

Saywhen: An automated method for high-accuracy speech onset detection.

Researchers across many experimental domains utilize the latency of spoken responses as a dependent measure. These measurements are typically made using a voice key, an electronic device that has been repeatedly shown to be alarmingly errorful in accurately detecting speech onset latencies. We present SayWhen—an easy to use software system for offline speech onset latency measurement that automatically detects speech onset latencies with high accuracy, while concurrently detecting and flagging a subset of trials most likely to have mis-measured onsets. This checking method approaches the gold standard performance of full manual coding in a small fraction of the time.

(294)

Daniel Trinh (dtrinh7@uwo.ca), Debra Jared
University of Western Ontario

The role of syllables in the reading of polysyllabic words.

Most existing theories and computational models of visual word recognition have focused on monosyllabic words even though the majority of English words are polysyllabic. The aim of the current study was to increase our understanding of polysyllabic word reading, and specifically, to investigate whether there is a role for the phonological syllable. Critical stimuli were disyllabic 7 letter words. They were presented in two colors, which either matched or mismatched the syllable boundary. The rationale was that faster response times should be obtained for words in the match condition than in the mismatch condition if readers recover phonological syllables when reading. Results are compared to findings from similar experiments with languages (e.g., Spanish) that have clearer syllabic boundaries than English.

(295)

Arpita Bose (bosea@uwindsor.ca), Lori Buchanan
University of Windsor

Relationship of semantic and phonological facilitation to the underlying processing abilities in aphasia.

Anomia is a universal feature in aphasia. This study tested if semantic (SF) and/or phonological (PF) facilitation in aphasia has a relationship with underlying semantic and phonological skills. Participants were six post-stroke aphasic speakers. The cue type (semantic versus phonological) and relatedness (related versus unrelated) were manipulated in a picture naming task. Results showed that PF was observed in four participants, SF was observed in one participant, and one participant did not show any facilitation. The individual with SF showed poor skills in both semantic and phonological domain, as opposed to individuals with PF who showed either good semantic or good phonological skills. The results will be discussed in the context of language production models.

(296)

Gillian Macdonald (macdon8@uwindsor.ca), Lori Buchanan
University of Windsor

Lexical competition and phonological distance.

The interplay of phonology and orthography in visual word recognition has yet to be completely

Saturday June 21

understood. Prime/target phonological similarity was manipulated to examine the impact of phonological processing in lexical decision. Primes differed from word and non-word targets by one or two phonemes while orthographic overlap was held constant (primes and targets differed by one letter). A greater priming effect for words differing by two phonemes than by one supports a competitive model of phonological processing during visual word recognition.

(297)

Derrick Bourassa (d.bourassa@uwinnipeg.ca),
Jennilee Beaupre
University of Winnipeg

Word recognition processes in elementary school children.

A number of models of reading development have pointed to the importance of orthographic rimes (bodies) as functional units of word recognition in developing readers. Evidence consistent with this view comes from the rime frequency effect: Children exhibit a processing advantage for letter strings that contain high frequency rime units as compared to those that contain low frequency rime units (e.g., Coltheart & Leahy, 1996; Wile, Bourassa, & Dolan, 2002). While this finding may be attributable to children's sensitivity to orthographic redundancy, it may also be indicative of phonology-to-orthography feedback processes. The investigation reported here demonstrates that both of these factors play a role in children's word recognition performance. Implications for models of reading development are discussed.

(298)

Pablo Gomez (pgomez1@depaul.edu)
DePaul University

Memory for 3-d objects.

We know that object identification can be affected by the orientation of the object. But how does the perspective from which we see an object affect memory? We present two experiments that test the effects of object perspective on memory. Our results revealed a dissociation between task (recognition and recall) and type of object perspective similar to word frequency effects. In recognition, items studied in the noncanonical viewpoint (Palmer, Rosch & Chase, 1981) produced higher proportions of "old" responses, while new objects presented from a noncanonical viewpoint produce fewer "old" responses than new objects presented from the canonical viewpoint.

(299)

Deanna Friesen (dfriesen@uwo.ca), Debra Jared

University of Western Ontario

Exploring the role of semantics in bilingual word recognition: Evidence from interlingual homophones.

The present study examined whether bilinguals activate semantic representations from both languages when reading in a single language. Participants were given a category verification task in which they were given a category name (e.g., Vegetable) and then a target word, and they had to decide whether the word was a member of the category. Critical trials were interlingual homophones (e.g., shoe) which are not members of the category but which sounded the same as a word in their other language that is a member (e.g., chou, which means cabbage in French). If bilinguals activate meanings associated with both members of an interlingual homophone pair, then they should have more difficulty deciding that the presented homophone is not a member of the category (i.e., that a shoe is not a vegetable) than an unrelated control (e.g., shop). The presence of interference depended on the language of the task (L1 or L2), bilinguals' L2 proficiency and homophone frequency. Results are discussed in terms of models of bilingual word recognition.

(300)

Vlad Zotov (Vladimir.Zotov@drdc-rddc.gc.ca),
David Smith, Renee Chow

Defense Research and Development Canada - Toronto

The role of voice communications in teams operating in a dynamic environment.

The impact of voice communications on distributed two-person teams was investigated in a simulated tactical-level dynamic environment. The type of voice communications allowed between participants was manipulated in full communications, within-session communications, and between-session communications (limited text communications were allowed in all conditions). Standard measures of task performance did not differ between conditions. However, new measures, meant to evaluate team collaboration and coordination, showed marked deterioration when participants were only allowed voice communications between sessions. We discuss

Saturday June 21

the findings in terms of the development of new measures of team performance and the impact of voice communications during a tactical-level task.

(301)

Karen Hussey, Albert Katz (katz@uwo.ca)
University of Western Ontario

Priming nonliteral language in communication.

Males tend to use nonliteral language in discourse more often than females. We test here whether this effect is due to a priming explanation (and not driven by top-down processes based on gender stereotype) based on speaker alignment. A mechanism of this type has been suggested by Pickering and Garrod (2004) for language use in general. We manipulated expectations of the gender of the interlocutor and the amount of nonliteral language used. Overall, we find evidence of priming of nonliteral language and that this effect, grew over time, and that, regardless, males still produced more nonliteral language overall.

(302)

Todd Girard¹ (todd.girard@ryerson.ca), Bruce Christensen², Sophie Lafaille³
¹Ryerson University, ²McMaster University & St. Joseph's Healthcare Hamilton, ³University of Toronto

Episodic memory and regional grey matter in schizophrenia: A voxel-based morphometry study.

Using the bin task, a human analog of rodent spatial maze tasks, we previously observed differential deficits in schizophrenia on measures of memory for allocentric (viewpoint independent) vs. egocentric (body-centered) locations, common objects, and unique events vs. repeated information (reference memory). This study extends these findings in examining correlations between these memory abilities and regional grey matter concentration (GMC). Of key interest, patients revealed robust associations between hippocampal GMC and allocentric, event, object, and associative memory, but not egocentric or reference memory. These results support specificity of hippocampal-dependent mnemonic deficits in Schizophrenia, particularly for allocentric locations.

(303)*

Shannon Matkovich (matk5520@wlu.ca),
Sukhvinder Obhi
Wilfrid Laurier University

Switching between internal and external triggers for action.

When internal preparation to move is interrupted by a stimulus prompting the same movement, responding is slowed compared to a SRT task – a so called “RT cost of internal preparation”. To investigate the source of this cost, we varied movement complexity in two experiments. We found that the cost seems not to increase as actions become more complex. Specifically, while bimanual SRTs were greater than unimanual SRTs (confirming that they are more computationally demanding), the RT cost was identical for both response types. Hence, the RT cost of internal preparation might be cognitive rather than motor in origin.

(304)

Daniel Bosnyak (bosnyak@mcmaster.ca), Phillip Gander, Larry Roberts
McMaster University

Does the amplitude of the 40-Hz auditory steady-state response track the tinnitus percept?

Tinnitus is an auditory phantom sensation that may be generated by abnormal synchronous neural activity in primary auditory cortex. The 40-Hz auditory “steady-state response” (aSSR) is augmented in tinnitus, which could reflect deficits in intracortical inhibition that occur with aging, and not specifically the tinnitus percept. We compared aSSR amplitudes evoked by brief tone probes between three groups of subjects (tinnitus, age-matched and young controls). aSSR amplitude was larger in older than younger control subjects but did not differ between tinnitus subjects and their age-matched controls. These results suggest that aSSR amplitude tracks changes in intracortical inhibition associated with aging.

(305)*

Phillip Gander (pgander@mcmaster.ca), Daniel Bosnyak, Larry Roberts
McMaster University

Modality-specific selective attention to simultaneous auditory and visual events.

Neurons in sensory cortices are targeted by cholinergic projections from the basal forebrain that modulate synaptic plasticity by making

Saturday June 21

neurons more sensitive to their afferent inputs. This suggests that the basal forebrain system, which is corticotopically organised, may perform some of the functions of an attention mechanism. Consistent with this hypothesis, we have shown that the amplitude of the 40-Hz auditory steady state response (aSSR), which localises to A1 and demonstrates a tonotopic ordering, is enhanced by attention. aSSR amplitude increased when subjects detected targets in a 1-s stream of 40-Hz stimulation compared to conditions in which subjects passively experienced the stimuli. In an experiment designed to test frequency specific modulation of primary auditory cortex using two simultaneously presented carrier frequencies our findings suggested that attention cannot selectively activate specific tonotopic regions in A1.

(306)

Larry Roberts (roberts@mcmaster.ca), Daniel Bosnyak, Phillip Gander
McMaster University

Attention modulates the amplitude and experience the phase of the 40-Hz auditory steady state response.

We describe results from several experiments using a 1-s 2-kHz carrier frequency amplitude-modulated at 40Hz. Subjects were required to detect targets consisting of a single 40Hz pulse of enhanced amplitude commencing randomly 400ms after stimulus onset. With these procedures we found evidence for a robust attentional modulation of the auditory core region expressed as an increase in the amplitude of the 40-Hz auditory steady state response (aSSR). With repeated sessions, aSSR phase advanced progressively with no consistent change in aSSR amplitude or effect of attention. Our results suggest several rules describing experience-induced remodelling of the auditory cortex in humans.

(307)

Ashley Langford, Bruce Bolster
(bolster@uwinnipeg.ca)
University of Winnipeg

The effect of narrative context on memory for visual scenes and stories.

The effect of narrative context on memory for visual stories was investigated. Participants viewed two sets of slides that depicted actors engaged in daily activities, one in ordered sequence and one in scrambled sequence.

Subsequently, subjects judged slide pairs for temporal order, and single slides for recognition. For the ordered sets, accuracy for temporal order was high and unrelated to temporal separation of slide pairs. By contrast for scrambled stories, accuracy for temporal order was low but sensitive to temporal separation. Recognition for single slides was unaffected by slide sequence. Results demonstrate that narrative context benefits episodic but not recognition memory.

(308)

Katherine Guérard¹
(katherine.guerard.¹@ulaval.ca), Ian Neath²,
Aimée Surprenant², Sébastien Tremblay¹
¹*Université Laval*, ²*Memorial University*

Extending distinctiveness to spatial memory.

Many theories on verbal memory are based on the concept of distinctiveness, namely, the idea that an item is better remembered when it stands out from the other items. The objective of the present study is to extend distinctiveness to the spatial domain. Participants had to recall the order in which series of spatial locations were presented. The color and shape of to-be-remembered items were manipulated. The results showed that these dimensions can produce distinctiveness effects and suggest that distinctiveness models of memory should be extended to account for the processing of spatial information.

(309)

Jason Ozubko (jdozubko@uwaterloo.ca),
Kathleen Hourihan, Colin MacLeod
University of Waterloo

“i’ll call that ‘pac-man’”: Directed forgetting of abstract visual symbols.

According to the selective rehearsal account of item method directed forgetting, the effect (better memory for Remember than Forget cued items) is caused by preferential rehearsal of Remember items, while Forget items are unrehearsed. If rehearsal is what drives directed forgetting, then materials which are difficult to name (and therefore rehearse) should not be subject to directed forgetting. In three experiments, we presented participants with abstract visual symbols to study and found that when participants did name the symbols memory was improved. However, consistent directed forgetting effects were observed for both named and unnamed symbols.

Saturday June 21

(310)

Christopher Teeter (teetercj@mcmaster.ca)
McMaster University

Quantifying the role of spatial updating during viewpoint changes of a spatial scene.

Shifting the viewpoint of a spatial scene reduces an observer's ability in change detection. This cost is smaller if the shift is caused by observer's self-motion around the scene (spatial updating) than rotation of the scene for a stationary observer (mental rotation). We examined the relation between the extent of self-motion and benefit of such spatial updating. For a given viewpoint shift caused by both rotation of an object array (on a rotatable table) and observer's walking around the table, ability to detect a change in the layout was found to be related to the extent of the self-motion.

(311)

Christine Baker, Josée Paul, Sylvie Séguin, Josée Turcotte (jturcotte@laurentienne.ca), Bruce Oddson
Université Laurentienne

The effect of temporal grouping on visuo-spatial Hebb repetition effect.

In the Hebb repetition paradigm, participants perform immediate serial recall of short lists of items. The Hebb repetition effect is observed when performance on a repeated list increases relative to random lists. We compare the Hebb effect for repeated lists defined by both temporal and visuo-spatial components, lists in which the visuo-spatial but not the temporal components are repeated, against a baseline of performance on all random lists. Similar to results with verbal sequences (Bower & Winzenz, 1969), our results indicate that changes in temporal grouping interfere with learning of visuo-spatial sequences showing some integration of these dimensions.

(312)

Amanda Wudarzewski¹ (aw04bw@brocku.ca), Antonia Mantonakis¹, Seema Clifasefi², Daniel Bernstein^{2,3}, Elizabeth Loftus⁴
¹*Brock University*, ²*University of Washington*, ³*Kwantlen University College*, ⁴*University of California, Irvine*

Remembering the taste: Constructed preferences from suggestion.

In a recent study on taste preferences, post-consumption feedback had no influence on

preference ratings (Lee Frederick & Ariely 2006). Contrary to this notion is the finding that people can be led to believe that they experienced a fictitious consumption experience, such as becoming sick after eating strawberry ice cream (Bernstein et al. 2005). In the current study, we demonstrate that taste preferences can be influenced by false feedback in both a positive and a negative manner, in the same experiment using the same critical item. We discuss boundary conditions of the effect, and propose a fluency hypothesis to account for post-consumption feedback illusions.

(313)

Yun Zheng, Chris Herdman (chris_herdman@carleton.ca), Matthew Brown
Carleton University

Objects and spaces in visual working memory: Can you attend to both?

The relative contributions of object-based and space-based attention in visual working memory (VWM) were investigated. Participants compared four circles grouped into two objects via connectedness across two sequentially presented displays. In E1 the two displays were static. In E2 the second display was rotated 90° to address the concerns that E1 relied on short term memory (not VWM) and that space-based and object-based effects were confounded. Changes were more readily detected when they occurred in a cued circle or in a cued object than in an uncued object, providing evidence for both space-based and object-based effects in VWM.

(314)

Jason Ozubko (ozubkoj@hotmail.com), Jonathan Fugelsang
University of Waterloo

Forgetting that it is not convincing: Investigating the interaction between the believability and memorability of factual evidence statements.

We investigated the impact of the believability of factual evidence statements on both memory and inferences. Unbelievable evidence is found to be more memorable than believable evidence. Unbelievable evidence also had a larger impact on inferences than did believable evidence, when evidence was provided. When evidence was memorized 1 week before the inferences task, memory accuracy was inversely related to the impact of evidence on inferences. Specifically, all evidence impacted inferences more than when evidence was provided, but

Saturday June 21

evidence that was less memorable (believable) was disproportionately more impactful. We discuss the possible implications of gist-based processing in these data.

(315)

Pauline Pearson (p.pearson@uwinnipeg.ca),
Hayley Grunsten
University of Winnipeg

Assessment of the influence of aging on colour and spatial memory.

Twenty younger (19.7 ± 4.4 years) and older adults' (64.8 ± 7.4 years) memory for colour and spatial patterns was assessed. Colours in the match-to-sample task were shades of yellow and performance was found to be similarly high for both groups. The span task examined memory for focal and non-focal colours, with and without articulation. Articulation influenced memory span of both groups; most for focal colours and least for spatial patterns. Memory for colours, but not spatial patterns, was resilient to aging. Findings are consistent with recent studies' reports that visual memory, when assessed exclusive of verbal memory, doesn't decline with age.

(316)

Christopher O'Connor (cmoconno@uwo.ca),
Albert Katz
University of Western Ontario

Event clusters in autobiographical memory: A multidimensional scaling of autobiographical events.

The organization of autobiographical memory has been studied by using one remembered event to cue another event memory. Odegard et al. (2004) investigated the similarity of these induced event clusters by having participants sort event descriptions following a 3-week delay. We argue that a sorting procedure is limiting, and that similarity ratings and multidimensional scaling (MDS) provide more valid analyses of event memory structure. Participants produced strings of event descriptions using event cueing and rated the similarity of descriptions following a 3-week delay. Ratings were subjected to MDS and cluster analyses. Using this improved procedure, we replicated Odegard et al.'s results and provide insights to dimensions relevant for clustering autobiographical events.

(317)

Brian Duffels (bduffels@ualberta.ca), Peter Dixon
University of Alberta

Stages of processing for environmental encoding.

When disoriented, people look to two prime sources of information to reorient themselves: geometry and landmarks. Geometry is easily and automatically encoded by all vertebrate species. When under cognitive load during environmental encoding, humans appear to ignore landmark information and attend to geometry. Some suggest that encoding landmarks requires working memory, while an automatic process encodes geometry. We have employed the PRP paradigm to test this. Subjects' attention to the first task interferes with the processing of landmark information. Thus, an additive effect is predicted. As geometry is automatic, an underadditive effect is predicted for longer SOAs.

(318)*

Marla Anderson (andermv@mcmaster.ca), M.D.
Rutherford
McMaster University

Remembering faces: How pregnancy impacts cognition.

Research shows that pregnancy may be a time of cognitive decline (Henry & Rendell, 2007) and the beliefs of young parents and child-birth professionals reflect these findings. An evolutionary view of human cognition would suggest that there may be an adaptive re-allocation of cognitive resources, so areas related to safety for mother and fetus would be advantaged. Pregnancy may require increased vigilance. In a face recognition task pregnant women outperformed non-pregnant women in remembering male faces, including those previously rated as creepiest. Contrary to popular belief, pregnancy produces a cognitive advantage in areas of social risk.

(319)

Erin Maloney
(eamalone@artsmail.uwaterloo.ca), Evan Risko,
Jonathan Fugelsang
University of Waterloo

Examining the impact of test pressure and math anxiety in acquiring a complex math task.

Saturday June 21

The present study examined the effect of test pressure on mathematical problem solving for math anxious and non-math anxious individuals. Participants completed a squaring task in which they were to square two-digit numbers. A test pressure induction occurred either before participants learned the task, after participants learned the task but before the test, or not at all. Results indicate that the performance of the non-math anxious students suffered more as a function of test pressure than did that of their math anxious counterparts. These data will be discussed with respect to the relation between pressure, working memory, and performance.

(320)

Karl Borgmann (kwuborgm@uwaterloo.ca)
University of Waterloo

Congruency proportion tells: Physical size counts more than numerical.

When manipulating the proportion of congruent trials in conflict tasks (i.e. Stroop, Simon etc), it is typically observed that the magnitude of the effect increases as the proportion of congruent trials increases. We investigate the influence of congruency proportion in the context of the Number Stroop Paradigm. Congruency proportion had a large impact on a numerical judgment task, but a reduced impact on a physical judgment task. In addition, congruency proportion was additive with the symbolic distance effect. Implications for our understanding of numerical magnitude processing as a distinct process from response selection are discussed.

(321)

Nelson Heapy (nheapy@uwo.ca), Aubrey Morrison
Huron University College at Western

Implicit theories of relationships.

Knee (1998) describes two types of beliefs regarding relationships: destiny beliefs and growth beliefs. A review of literature regarding successful relationships yielded a list of statements that seemed closely aligned with growth beliefs, whereas the idea of destiny did not appear on the list. Participants in the present study completed Knee's (2003) Implicit Theories of Relationships scale, Sprecher and Metts's (1989) Romantic Beliefs Scale, and items based on the statements related to relationship success. As hypothesized, a factor analysis yielded two factors: one composed of destiny and romance beliefs, and another composed of

growth beliefs and items associated with relationship success.

(322)

Kevin Barton (krbarton@uwaterloo.ca),
Jonathan Fugelsang, Daniel Smilek
University of Waterloo

Inhibiting beliefs demands attention.

In two experiments, we investigate the degree to which reasoning with and without beliefs demands attentional resources using a dual task manipulation. In Experiment 1, we found that reasoning with scenarios that contained thematically rich content required fewer attentional resources than reasoning with abstract content as evidenced by smaller costs on a secondary task for the former than the latter. This trend was reversed in Experiment 2 when participants were instructed not to use their beliefs when reasoning with such content. These findings provide evidence that beliefs automatically influence reasoning, and the inhibition of such processing comes with attentional costs.

(323)

Kirk Stokes¹, Antonia Mantonakis¹
(amantonakis@brocku.ca), Daniel Bernstein^{2,3}
¹*Brock University*, ²*Kwantlen University College*,
³*University of Washington*

A perceptual-discrepancy account of increased explicit memory and preference for brands.

As a result of legislation, skill-testing questions are found on many contest entry ballots across North America. Previous research demonstrates that solving a puzzle before seeing a brand increases one's claim of having seen that brand name before and to have higher preference towards the brand (Kronlund & Bernstein, 2006). Research suggests that this preference illusion is based on a perception of discrepancy. We further test the discrepancy hypothesis.

(324)

Guy Lacroix¹ (guy_lacroix@carleton.ca), Gyslain Giguère², Denis Cousineau³, Marco Hlouschko¹, Siyun Liu¹, Serge Laroche³
¹*Carleton University*, ²*Université du Québec à Montréal*, ³*Université de Montréal*

The impact of extensive training and large categories on performance in the dot-pattern classification paradigm.

Our experiment investigated participants' performance in the dot-pattern classification

Saturday June 21

paradigm using extensive training and large categories. Participants learned to classify dot-pattern categories containing up to 243 medium-level distortions each. They received 2916 trials of training on 4 consecutive days. Transfer phases were conducted 1 and 8 days later. Category prototypes as well as low-, medium-, and high-level distortions were presented. Classification accuracy was above 95% across transfer conditions. RTs were similar for prototypes, low-, and medium-level distortions, but were faster for high-level distortions when participants trained with large categories. These results suggest that prototype enhancement effects fade with extensive practice.

(325)

Jennifer Heisz (heiszj@mcmaster.ca), Sam Hannah, Judith Shedden, Lorraine Allan, Shepard Siegel
McMaster University

Neural markers of contingency judgments.

We recorded event-related potentials (ERPs) as neural markers while participants made contingency ratings between cues and outcomes using the streamed-trials procedure (Crump, Hannah, Allan, & Hord, 2007). Such markers were found over occipital-parietal cortex at ERP component N1. We will describe the effect of contingency on the amplitude of the N1 component between the cue and the outcome and also of the number of cue-outcome pairs. Of particular interest is the manner in which the N1 component was related to the frequencies in the cells of the contingency matrix for different contingency values.

(326)*

Xin Zheng (xz02kz@brocku.ca), Sidney Segalowitz
Brock University

The first 200 ms: A high-density ERP study on visual word recognition.

Using a standard lexical decision (LD) task and a lexical semantic (LS) version of it in which words used in each block were selected from a single category (e.g., animals), we investigated lexical semantic access with high-density event-related potentials (ERPs). Our results indicate that (1) lexicality status is established at 100 ms at an orthographic level; (2) correspondingly, the brain processes words and pseudowords differently in response to task manipulation; (3) lexical semantic access occurs at around 170

ms, suggested by the task x lexicality interaction; and (4) these early ERP effects correlate with participants' behavioural performance.

(327)

Jonathan Fawcett (jmfawcett@dal.ca), Aaron Newman
Dalhousie University

The perception of biological form and motion: An ERP study.

Previous research reporting event-related potentials (ERPs) sensitive to biological motion have not distinguished between stimuli depicting static human forms and motion. In the present study, we addressed the specificity of these ERP effects to biological motion by presenting static point-light displays of upright and inverted human forms that began to move after 400-600 msec. Pre-motion onset, equivalent N170 and N300 amplitudes were observed for upright and inverted human forms; post-motion onset, amplitudes of both N170 and N300 components were larger for upright stimuli. Results suggest that these components are not biological motion specific, but are enhanced by upright biological motion.

(328)

Michael Henighan
(mhenigha@connect.carleton.ca), Jo-Anne LeFevre
Carleton University

Working memory in subtraction and multiplication for chinese and canadian students.

Arithmetic skill and working memory in subtraction and multiplication were examined in a dual-task paradigm with phonological suppression as the interfering memory load. In dual task conditions, participants rehearsed consonant-vowel-consonant (CVCs) strings during arithmetic performance. Single task trials included a phonological suppression task only and an arithmetic performance task only. Students educated and raised in China were compared to Canadian students. Chinese students solved arithmetic problems faster than Canadian students and had fewer arithmetic errors. Of particular interest were the results from the working memory suppression task indicating little impairment for arithmetic for the Chinese and definite impairment for arithmetic for Canadians. It seems likely that non-retrieval strategies were used far more by Canadians

Saturday June 21

rather than Chinese (based on arithmetic fluency scores and previous research with Chinese) and this reliance on non-retrieval strategies for Canadians may have contributed to lower arithmetic performance once a working memory load was added.

(329)

Guy Lacroix (guy_lacroix@carleton.ca), Gyslain Giguère, Glen Howell, Serge Larochelle
Carleton University, Université du Québec à Montréal, Université de Montréal

The incidental learning of within-category attribute correlations in a one-attribute rule visual search classification paradigm.

In two experiments, we explored people's ability to incidentally learn attribute correlations in a one-attribute rule visual search classification paradigm. Participants classified stimuli that included one rule attribute and five diagnostic attributes for 640 or 1280 trials. In Experiment 1, stimuli with attributes from opposing categories were shown at transfer. These stimuli elicited slower classification RTs. In Experiment 2, the rule attribute was removed at transfer. Only a limited number of perfectly diagnostic attributes were used to correctly classify the stimuli. The results suggest that implicit sensitivity to attribute correlations generally does not translate into consciously usable categorical knowledge.

(330)

Pierre-Luc Gamache¹ (Pierre-Luc.Gamache.1@ulaval.ca), Dan Zakay², Simon Grondin¹

¹Université Laval, ²Tel-Aviv University

The impact of the foreperiod on time perception.

The period of time preceding an interval to be timed is called the foreperiod (FP). When multiple FPs are randomly varied within a testing session, longer FPs result in longer perceived duration. The aim of the present study is to test an attentional account of the impact of the FP a) by using different ranges of FP's durations in order to reach a potential limit to this effect and b) by manipulating the instructions given to the participants in order to create expectations about the FP. Results show that the impact of the FP is smaller when FPs belong to a longer range and that false expectations about the FP can lead to a shortening of perceived durations. The findings are discussed in the light of an

attentional model based on the concept of temporal uncertainty.

(331)

Marilyn Plourde, Pierre-Luc Gamache (Pierre-Luc.Gamache.1@ulaval.ca), Simon Grondin
Université Laval

Filled intervals perceived as longer than empty ones: The effect occurs even with a between-session design.

For a same physical duration, filled intervals (marked by continuous signals) are reported to be perceived as being longer than empty ones (marked by two successive brief signals). This effect is known to occur when filled and empty intervals are randomized within the same block of trials. In the present study, we tried to test the magnitude of the effect according to three experimental conditions: when filled and empty intervals were (a) randomized within blocks, (b) grouped by blocks, or (c) grouped by sessions. As expected, results showed that filled intervals are perceived as longer than empty ones, but interestingly, the effect remained at least as strong in the between-session condition. On the other hand, while there is some inconsistency in the time perception literature on the relative sensitivity for duration discrimination of filled and empty intervals, better performance was obtained in the present study with empty intervals.

(332)

Mike Yeomans (my.yeomans@gmail.com), Derek Koehler
University of Waterloo

Deliberation without attention and decision making.

Dijksterhuis' "sleep on it" effect (2004) shows that unconscious cognition may produce better decisions than conscious deliberation in preference judgments. This may result because unconscious resources cluster mutually supportive information, polarizing impressions of the decision targets. The present study examines the effect in a multiple cue probability learning paradigm, where decisions are based on cue-outcome relationships learned in an ecologically representative design. The results suggest that polarization by the unconscious is robust, and translates to an inferential judgment task; however, performance gains similar to Dijksterhuis' studies were not found, suggesting they may be limited to specific judgment contexts

Saturday June 21

Donald O. Hebb Lecture

2:30 - 4:00, Somerville 3345

(333) Ray Klein (Ray.Klein@Dal.Ca)
Dalhousie University
On the Control of Orienting