The following is a selection of presentations to be made at the Canadian Society for Brain, Behaviour and Cognitive Science conference that may be of particular interest to the general public. All presentations will be in Somerville House (SH) at the University of Western Ontario. Times (either Friday, June 20 or Saturday, June 21) and room locations are indicated for each presentation, as well as the abstract number used in the full program. Some presentations are talks and others are posters. Faculty member contact names are given for each topic area.

Memory

Faculty contacts: Colin MacLeod (cmacleod@uwaterloo.ca)

24. Did I tell you this before? (Talk, Friday 11:00-11:15, SH3345)
Nigel Gopie, Colin MacLeod (University of Waterloo)
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.

70. Boosting recollection in younger and older adults (Poster, Friday 12:30-2:30,Great Hall)
Erin Skinner, Myra Fernandes (University of Waterloo)
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.

84. Lifetime participation in cognitively stimulating activities can modulate the effect of education on cognitive performances in older adults (Poster, Friday 12:30-2:30, Great Hall)
Christine Gagnon, Maxime Lussier, Louis Bherer (University du Québec à Montréal)
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.

107. A 'mindless' activity that changes the mind: Differential ERPs in videogame players and non-video game players during a working memory task (Poster, Friday 12:30-2:30, Great Hall)
James Karle, Scott Watter, Judith Shedden (*McMaster University)*
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.

74. Prospective memory deficits in pregnant women (Poster, Friday 12:30-2:30,Great Hall)
Carrie Cuttler, Peter Graf (University of British Columbia)
"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.

318. Remembering faces: How pregnancy impacts cognition (Poster, Saturday 12:30-2:15, Great Hall)
Marla Anderson, Mel Rutherford (McMaster University)
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.

Reading

Faculty contacts: Marc Joanisse (marcj@uwo.ca) and Debra Jared (djjared@uwo.ca)

57. On-line dynamic combination of concepts during language comprehension (Poster, Friday 12:30-2:30, Great Hall)
Kazunaga Matsuki (UWO), Ken McRae (UWO), Mary Hare (Bowling Green State University), Jeffrey Elman (*University of California San Diego)*
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 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.

299. The role of semantics in bilingual word recognition: Evidence from interlingual homophones (Poster, Saturday 12:30-2:15, Great Hall)
Deanna Friesen, Debra Jared (University of Western Ontario)
The present study examined whether bilinguals activate semantic representations from both languages when reading in a single language. Participants completed 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.

Judgement and Decision Making

Faculty Contacts: Paul Minda (jpminda@uwo.ca)

140. On being sane in insane places: The role of psychiatric context on interpretation of non-clinical behaviour (Talk, Friday 5:30-5:45, SH3315)
Meredith Young, Lee Brooks, Geoffrey Norman (McMaster University)
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.

50. Using goal-oriented categories to group patients: The effects of expertise (Poster, Friday 12:30-2:30, Great Hall)
Sarah Devantier, Wael Haddara, Mark Goldszmidt, John Paul Minda (University of Western Ontario)
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.

171. Intra- and inter-item similarity in fingerprint matching (Poster, Friday 5:45-7:45, Great Hall)
John Vokey (University of Lethbridge)
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.

144. Can thinking from another's point of view improve scientific reasoning? (Talk, Friday 5:00-5:15, SH3317)
Erin Beatty, Valerie Thompson (University of Saskatchewan)
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.

288. Decision making in avalanche avoidance and survival (Poster, Saturday 12:30-2:15, Great Hall)
Bob Uttl (Red Deer College, AB), Meaghen Henry (Red Deer College & University of Calgary), Jan Uttl (Avidata)
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/participant interactions, and participants' behaviour 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 travelling 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.

332. Deliberation without attention and decision making (Poster, Saturday 12:30-2:15, Great Hall)
Mike Yeomans, Derek Koehler (University of Waterloo)
Dijksterhuis' (2004) "sleep on it" effect shows that unconscious cognition may produce better decisions than conscious deliberation in preference judgements. 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 a ecologically representative design. The results suggest that polarization by the unconscious is robust, and translates to an inferential judgement task; however, performance gains similar to Dijksterhuis' studies were not found, suggesting they may be limited to specific judgement contexts.

Emotion

Faculty contacts: Adam Anderson (anderson@psych.toronto.edu),Christine Tsang (ctsang33@huron.uwo.ca)

121. The hungry eye: Neural and psychological mechanisms underlying emotional encoding (A President's Symposium Talk, Friday 2:30-3:15, SH 3345)
Adam Anderson (University of Toronto)
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.

139. Infant perception of facial expressions of emotion (Talk, Friday 5:15-5:30, SH3315)
Glenda Prkachin (University of Northern British Columbia)
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 same15 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.

53. Is the message in the pitch? Infant pitch preferences and the role of affective context (Poster, Friday 12:30-2:30, Great Hall)
Jennifer Orr, Christine Tsang (Huron University College at Western), Nicole Conrad (Saint Mary's University).
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.

263. Age-related differences in perceiving emotion in speech (Poster, Saturday 12:30-2:15, Great Hall)
Kate Dupuis, Kathy Pichora-Fuller (University of Toronto)
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.

137. Neural correlates of opposing modulation of emotion on cognition: An event-related fMRI investigation (Talk, Friday 4:45-5:00, SH3315)
Florin Dolcos (University of Alberta), Roberto Cabeza (Duke University), Gregory McCarthy (Yale University)
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 co-occur - 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.

Mathematical Reasoning

Faculty Contacts: Daniel Ansari (daniel.ansari@uwo.ca)

7-11. Symposium on children's mathematical cognition (5 talks, Paper Session 1.2 Friday 9:00-10:30, SH2355)
Chair: Katherine Robinson (University of Regina)
Research in children's mathematical cognition is becoming increasingly diverse. This symposium reflects the breadth of current research. Agostino, Klein, Starkey, and Barnes examined low-income preschoolers' performance on informal mathematical skills. Dubéand Robinson studied the role of analogical reasoning and working memory on children's understanding of the multiplication/division arithmetic concept of inversion. De Smedt investigated basic number processing and single-digit arithmetic in children with dyscalculia. Smith Chant et al. explored children's performance on a numerical magnitude task and related it to their math knowledge. Finally, van Eimeren, MacMillan, and Ansari measured how young children's ability to subitize can affect their understanding of the cardinality principle.

For example:
9. Basic number processing and single-digit arithmetic in dyscalculia: Evidence from children with chromosome 22q11 deletion syndrome (9:30-10:15)
Bert De Smedt (*University of Leuven, Belgium & University of Western Ontario)*, Ann Swillen, Lieven Verschaffel, Pol Ghesquiere (*University of Leuven)*
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.

221-225. Symposium on adults' mathematical cognition (5 talks, Paper Session 4.1 Saturday 9:00-10:30, SH3345)
Chair: Jo-Anne LeFevre (Carleton University)
In this symposium, we will discuss recent work on the organization and processing of numbers. Campbell will present research supporting the view that solvers use their knowledge of addition facts to solve corresponding subtraction facts. Holloway and Ansari will present research in which fMRI was used to examine similarities and differences in neural activation during numerical comparison for symbolic (i.e., Arabic numerals) and nonsymbolic stimuli (i.e., arrays of squares). Imbo and LeFevre will present research evaluating how working memory is involved in complex multiplication problems (e.g., 18 x 9) across two groups: Chinese- and Canadian-educated participants. Metcalfe and Campbell will discuss work using an operand recognition paradigm to evaluate the complexity of processing involved in addition. Pyke and LeFevre will describe the results of a training study using alphabet arithmetic (e.g., d + 4) in which learning varied as a function of the type of training: a simulated calculator versus mental practice. Research on mathematical cognition is relevant for both theoretical work on memory and cognitive processing, but also raises questions that implicate instructional practices. This symposium will be of interest both to researchers in mathematical cognition, specifically, and to researchers interested more generally in memory. The wide range of methodologies (e.g., brain imaging, training, dual-task load, and priming) used in these research projects also highlight the diversity of work in this field.

Attention and Driving

Faculty contact: Chris Herdman (chris_herdman@carleton.ca)

102. Impaired driving while conversing: A temporal profile of performance (Poster, Friday 12:30-2:30, Great Hall)
Man Ching Lee, Scott Watter (McMaster University)
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.

150. The performance costs of digital head-up displays (Poster, Friday 5:45-7:45, Great Hall)
Lisa Hagen, Chris Herdman, Matthew Brown (Carleton University)
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.

175. Game on: Using 20 questions to assess the impact of cell phone use on driving performance (Poster, Friday 5:45-7:45, Great Hall)
Nicole Robert, Matthew Brown, Neal Leblanc, Chris Herdman (Carleton University)
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 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.

Neuroscience of Behaviour

Faculty contacts: Jody Culham (jculham@uwo.ca)

283. Relationship between salivary testosterone, aggressive behaviour, and willingness to engage in a competitive task (Poster, Saturday 12:30-2:15, Great Hall)
Justin Carra, Cheryl McCormick (Brock University)
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 ($R2 = 0.20$, $p = 0.02$). These results indicate that situation-specific aggressive behaviour and T responsiveness are functionally relevant predictors of future social behaviour.

128. fMRI and behavioural testing reveal preserved motion processing and visuomotor control in a patient with extensive occipitotemporal lesions (Talk, Friday 5:30-5:45, SH3345)
Jody Culham (UWO), Marla Wolf (UWO), Rob Whitwell (UWO), Liana Brown (Trent University), Sarah Khan (UWO), Jonathan Cant (UWO), Simona Monaco (UWO), Gordon Dutton (Royal Hospital for Sick Children), Melvyn Goodale (UWO)
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).

Bird Cognition

Faculty Contact: Scott MacDougall-Shackleton (smacdou2@uwo.ca)

30-35. Symposium on Avian Biocognition (6 talks, Paper Session 2.2 Friday 11:00 - 12:30, SH 2355)
Chair: Chris Sturdy (University of Alberta)
BioCognition is an integrated approach to understanding the biological basis of cognition in organisms throughout the animal kingdom, sitting at the crossroads of neuroscience and comparative cognition. In recent years there has been a plethora of such research in birds, for two reasons. First, it is recognized that birds display complex behaviours requiring sophisticated cognitive processes. Second, studies of the avian brain indicate that it is as complex as the mammalian brain, with both interesting anatomical similarities and differences from the mammalian brain. This symposium will bring together a diverse group studying processes such as acoustic communication, object processing, and spatial memory using techniques at many levels of analysis, from genes to behaviour.

For example:
33. The mating bird mind: Sexual selection and avian cognition (11:45-12:00)
Scott MacDougall-Shackleton (University of Western Ontario)
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.