



JULY 18-20, 2022

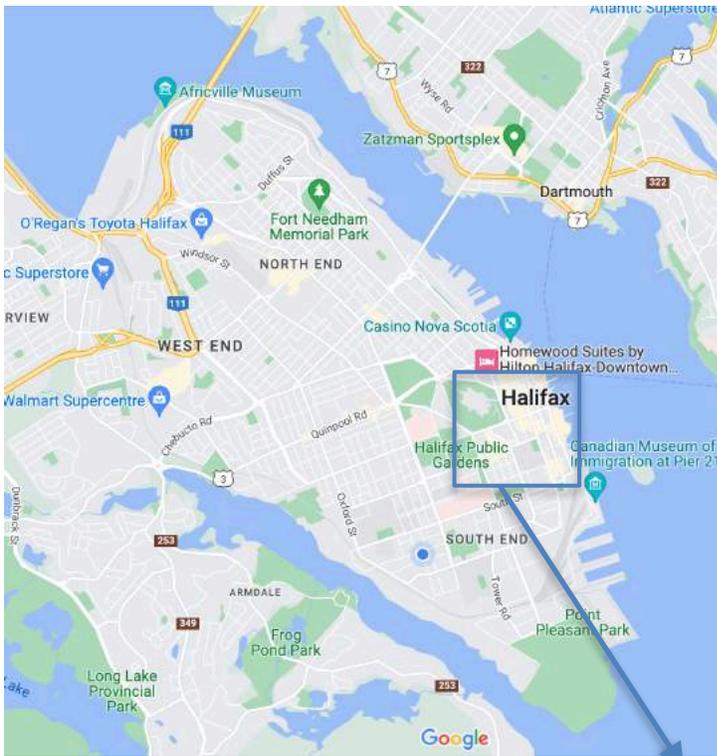
Canadian Society for Brain, Behaviour, and Cognitive Science

Société Canadienne des Sciences du Cerveau, du Comportement, et de la Cognition

32nd Annual Meeting in Halifax, Nova Scotia



CSBBCS
HALIFAX | 2022
SCSCCC



Halifax is located in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq People, and we acknowledge them as the past, present, and future caretakers of this land.

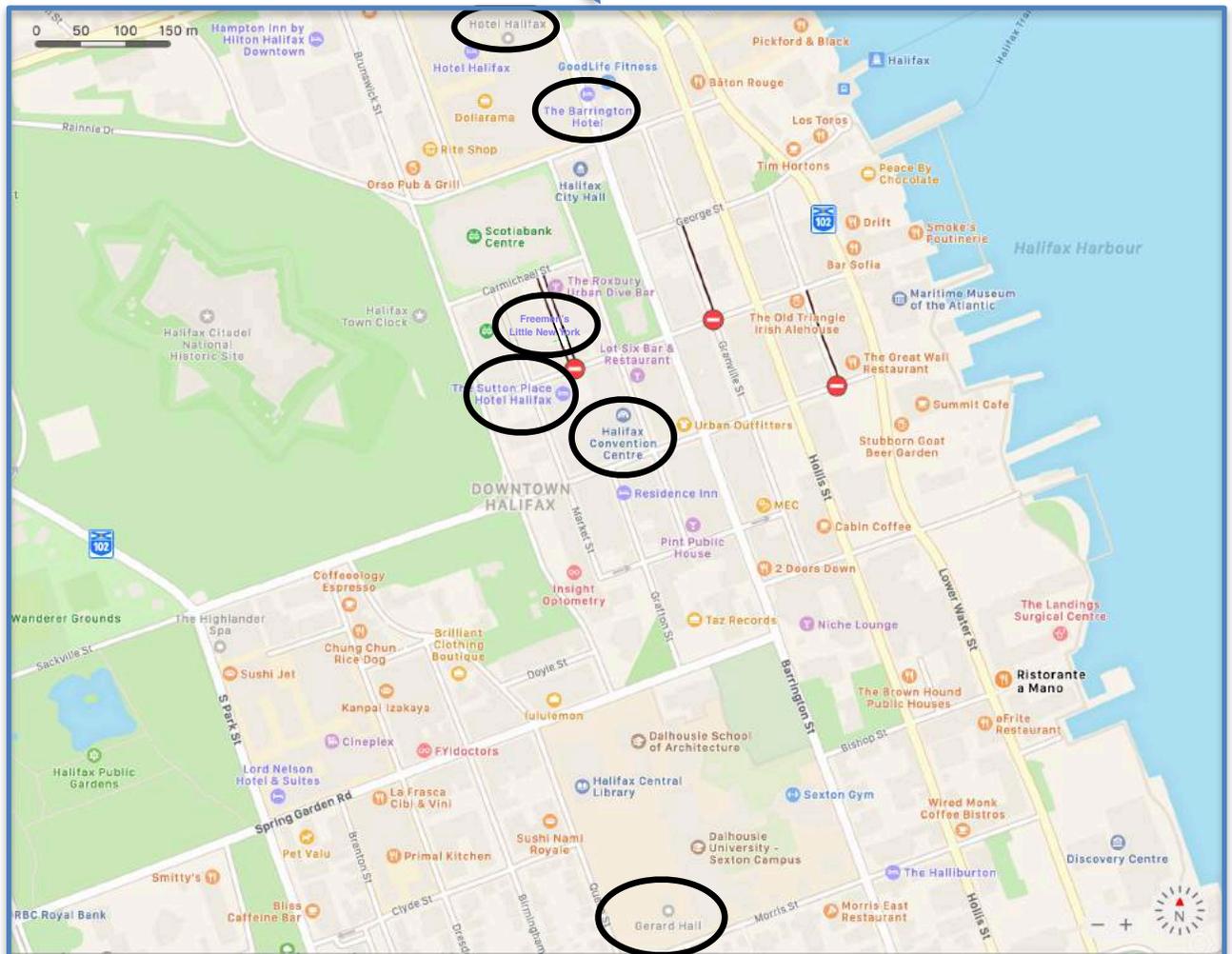


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Welcome

On behalf of the organizing committee and our society's executive, I want to welcome you to Halifax, Nova Scotia for the 32nd Annual Meeting of the Canadian Society for Brain Behaviour and Cognitive Science!

This is a special event for all of us as it is the first in-person meeting we have held since 2019. Although there was significant excitement about our return to in-person meetings, it was with some trepidation that we proceeded with the plan to host this one. It was the strong support from you the members and the backing of the executive that encouraged and allowed us to move forward with the plan. We are very excited to host you all here, at the Halifax Convention Centre (HCC), and this promises to be a fantastic meeting. We have (at press time) almost 250 registrants and the program includes:

- Women in Cognitive Science Canada, satellite meeting

- Welcome reception (co-sponsored by WiCSC)

- student-focussed social event

- 3 keynote events:

- the Hebb Award lecture by Rob Sutherland

- the DiLollo Award lecture by Brendan Johns

- the Executive's symposium

- 8 symposia (including 44 presentation)

- 28 talk sessions (including 91 oral presentations)

- 97 posters

- a presentation by NSERC that will be combined into our Business Meeting

- and for those who subscribed, a closing Banquet at the HCC.

Conferences involve a lot of work and planning so I am extremely grateful for all the time spent, decisions made, and support given by our local committee, all the members of the CSBBCS executive (especially our webmaster, Evan Curtis; secretary-treasurer, Chris Oriet; and President, Myra Fernandez), judges for the student Hebb prizes and our army of volunteers who have contributed to the success of this meeting. We are also grateful for the sponsorship of the hosting Universities: Dalhousie and Saint Mary's and our corporate sponsors: Brain Vision, Hogrefe, Pearson, S-R Research and VPiix. Thanks and congratulations to Sevda Montakhaby Nodeh of McMaster University for creating the prize-winning logo that you see on the cover of the program and at the conference website. Finally, the success of our meeting depends on the participation of its attendees and the quality and diversity of your scientific contributions. Your participation in the meeting is therefore deeply appreciated. We hope you will find the meeting an enjoyable and valuable opportunity to share your ideas and learn about those of others.

Sincerely,

Raymond Klein on behalf of and chair of the organizing committee,

Nicole Conrad, Patrick Carolan, Raymond Klein, Nick Murray and Aaron Newman

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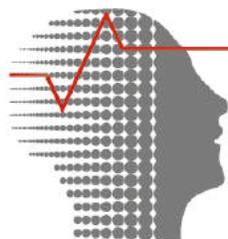


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General information

The conference will take place on the Convention level of the Halifax Convention Centre.

If one enters the HCC from Argyle Street you take the stairs or elevator down one flight. If one enters from Grafton Street you go down two flights. There is a floor plan of the Convention level of the HCC on the back (last page) of the program.

The registration desk (in the Convention Hall Atrium) will be open:

Noon - 7PM on July 18, and
8AM-noon on July 19.

An outline of the conference showing times and rooms for all the events/sessions is presented as “Schedule at a Glance” on the inside back cover.

All talks are allotted 15 minutes (including time for questions). Each room will have a PC Computer onto which you can load your presentations or you can connect your own computer to the data-projector via either VGA or HDMI.

At the HCC we have pre-paid wifi access. Instructions appear below.

Computers/Laptops

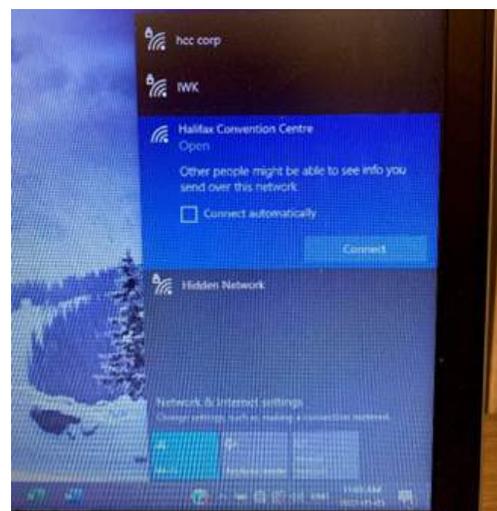
Locate the **“Network and Internet Settings”** on your computer

Ensure your Wi-Fi is enabled - to **“View Available Networks”**

Select **“Halifax Convention Centre”** network

Press the **“Connect”** button

This will open your default web browser and forward you to the **“Log In”** page

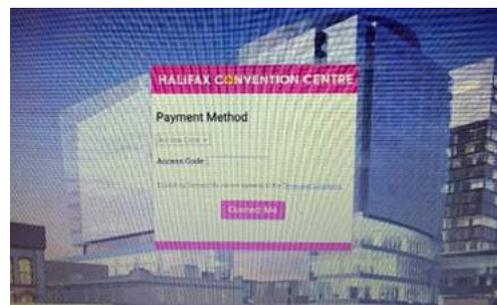


Ensure the payment method selected is **“Access Code”**

Enter your provided access code in the box

Press the **“Connect Me”** button

When a valid code is entered - the web page will redirect to the Halifax Convention Centre home page.



Order of Events

Day	Time	Event	Location
July 18	1PM-2PM	Comparative Cognition Symposium	C109
	2-3:30PM	WiCSC	C109
	3:30-5PM	Welcome reception hosted by CSBBCS and WiCSC (with hors d'oeuvres and music)	C5
	5-7PM	Poster Session 1	C5
	9-midnight	Student (19+) event	Freeman's Little NY in the Prince George Hotel
July 19	8:30-10AM	Morning talks and symposia sessions	C4, C102,103,104,109
	10-10:30AM	Refreshment break	C5
	10:30-noon	Morning talks and symposia sessions	C4, C102,103,104,109
	Noon-1:45PM	Lunch - on your own	
	1:45-3PM	Hebb Award Lecture by Rob Sutherland	C4
	3-3:30	Refreshment break	C5
	3:30-5PM	Afternoon talks and symposia sessions	C4, C102,103,104,109
	5-7PM	Poster Session 2	
July 20	8:30-10	Morning talks and symposia sessions	C4, C102,103,104,109
	10-10:30AM	Refreshment break	C5
	10:30-noon	Executive's Symposium	C4
	Noon-1:45PM	Lunch - on your own	
	1:45-3PM	DiLollo Award Lecture by Brendan Johns	C4
	3:30-5PM	Afternoon talks and symposia sessions	C4, C102,103,104,109
	5-7PM	NSERC Presentation and Business Meeting (including announcement of prize winners)	C4
	7-9:30	Banquet*	C3

*Attendance limited to ticket-holders

Special Events, Award Lectures, Award Winners

Satellite Meeting

Women in Cognitive Science – Canada (WiCSC)

Monday, July 18 2022, 2:00-3:30PM (C109)

[Women in Cognitive Science Canada \(WiCSC\)](#) is delighted to announce its 6th Annual Meeting at the 2022 In-Person Meeting of the Canadian Society for Brain, Behaviour, & Cognitive Science at the Halifax Convention Center



Order of Events:

2:00-3:00PM:

1. Welcome & WiCSC Announcements (Debra Titone, McGill University)
2. Presentation of the WiCSC Mentorship Award (Chris Oriet, University of Regina)
3. Presentation of the WiCSC Small Research Grants (Penny Pexman, University of Calgary)
4. Panel Discussion on – Preparing Cognitive Science Trainees for Diverse Careers: Why Non-Academic Experience is Important and How to Get It
 - Emilie Courteau, PhD Candidate (University of Montreal)
 - Dr. Erin Maloney (University of Ottawa)
 - Dr. Evan Risko (University of Waterloo)
 - Panel Moderators: Laura Elliott (Dalhousie University) & Debra Titone (McGill University)

3-3:30PM: WiCSC Speed Mentoring Session

Organizer: Erin Maloney (University of Ottawa)

Note: Information regarding Mitacs will be discussed during the meeting. Matt Adams, Business Development Specialist at Mitacs, will be present and can also be contacted by email at: madams@mitacs.ca or phone at C: (902) 221-4679.

Student Social Event

Date: Monday, July 18th, 9 PM – 12 AM

Location: Freeman's Little New York, 1726 Grafton St., Located in the Prince George Hotel

Come by to meet other students from CSBBCS. One drink ticket good for beer, wine, or mixed drink will be provided per person. Non-alcoholic options are also available. There will also be appetizers (free food!!) and cash bar.

This is a 19+ event. Please bring appropriate government issued photo ID with a second piece (second piece does not need a picture) for entrance. A CSBBCS conference name badge will be required to receive one drink ticket.

2022 Donald O. Hebb Distinguished Contribution Award Winner

Hebb Award Lecture: Tuesday July 19th, 1:45-3:00PM (C4)

Introduced by Myra Fernandes

Dr. Rob Sutherland

University of Lethbridge

The neurobiology of dynamic memory changes

Rob Sutherland is a Board of Governors Research Chair, Professor, Chair of the Department of Neuroscience, and Director of the Canadian Centre for Behavioural Neuroscience (CCBN). He obtained his B.Sc. from the University of Toronto and M. A. and Ph.D. in Psychology from Dalhousie University. Much of his work is focused on the neurobiology of cognition, especially on neural processes involved in normal and pathological memory.

Sutherland began studying neuroscience as it was becoming recognized as a field and he has watched it grow over the years. In the 1970s when he was starting his university studies, neuroscience courses were typically found in psychology departments. That changed with the establishment of an international society, and neuroscience evolved to the point where it now has many branches, including cognitive, behavioural, and computational neuroscience.



Following the completion of his PhD at Dalhousie University in Halifax, Sutherland joined the U of L supported by a NSERC Postdoctoral Fellowship receiving training in neuropsychology with Drs. Bryan Kolb and Ian Whishaw. His key focus was on developing better ways to measure memory in non-human animals. He devised methods that are now used by drug companies and laboratories around the world. Sutherland was then hired in the Department of Psychology as a faculty member working his way through the ranks to Professor in 1991.

Wanting to expand his skill set and work with students at all levels, Sutherland then took a position in the Department of Psychology at the University of New Mexico, soon cross-appointed to the School of Medicine in the Departments of Physiology and Neurosciences. There he was able to work with students from undergraduate to PhD levels and post-doctoral fellows and received multiple NIH grants for his memory research. During that time, he developed a theory of long-term memory that impacted the field and began focusing on understanding the role of the hippocampus in long-term memory. While scientists generally thought the hippocampus was only briefly involved in the storage of new memories, Sutherland's work showed that the hippocampus continues to be engaged during memory recall. He also began translating spatial memory tasks to humans in a computerized environment, showing that the human hippocampus was essential to virtual spatial navigation. He has continued to study normal and pathological memory with both human and non-human participants.

He returned to the U of L as an Alberta Heritage Foundation for Medical Research Scientist when the CCBN building opened in 2001 and the U of L became home to the first Department of Neuroscience in Canada to offer degrees at the bachelor's, master's and PhD levels.

Sutherland has served as President of CSBBCS, President of the Confederation of Alberta Faculty Associations, North American representative to the International Neuropsychology Symposium, and also has served as a member and chair of many grant selection committees at CIHR, NSERC, DFG, and NIH. He was elected as a Fellow of the Academy of Science, Royal Society of Canada in 2021.

More recently Sutherland has focused much of his research efforts into working with transgenic mouse models of Alzheimer's disease, focusing on the processes of spread of amyloid and pathological tau from seeded locations in the brain.

In addition to his research into Alzheimer's disease, Sutherland continues his work on understanding exactly what the hippocampus represents and its role in memory processes. His research focuses on the nature of memory representation that necessarily engage the hippocampus and on how hippocampal activity contributes to storing knowledge in the rest of the cerebral cortex.

Sutherland recognizes how fortunate he has been to work with an amazing group of undergraduates, graduate students, postdoctoral fellows, and faculty colleagues who have made essential contributions to this work.

Executive's Symposium

Wednesday July 20th, 10:30-noon (C4)

From the Lab to Classes Around the World: An Infusion Approach for Mobilizing Psychological Research

Steve Joordens
University of Toronto
Scarborough

Dwayne E. Paré
CEO – Cogneeto*

Nidhi Sachdeva
Ontario Institute for
Studies in Education

For research to have its optimal impact the time between the finding something of relevance in the lab, and mobilizing the finding for societal good, should be as short as possible. Within the field of educational psychology, one approach to reach this optimal mobilization is to create an educational technology that has a foundation in research-backed practices, and then to use that technology as the vehicle for both research and mobilization. Specifically, as opportunities arise to potentially enhance the impact of the tool, those potentials can be embedded in the technology in a way that supports research. If the research supports the efficacy of the new feature, that feature can then be made available immediately to all of those currently using the technology.

In our talk we will discuss how we have embedded findings from Cognitive Psychology, Biological Psychology, and Psychology in general into peerScholar, a tool created and researched within our Advanced Learning Technologies Lab. The discussion will range from the design of the core educational process, to ways in which we use microlearning to support students as they go through the process. As you will see, a lot of psychology can be embedded within a well-designed technology and technologies infused with research in this manner can have an immediate large-scale impact that continues to improve as more research is infused.

*Cogneeto is the company that partners with education institutions, providing peerScholar and supporting its use as a tool that takes a formal evidence-based approach to the development of the core skills of success (critical and creative thought, enhanced communication and collaboration, enhanced metacognitive awareness). peerScholar is now used in over 10 countries, often as an enterprise solution for those serious about supporting skill development. Over 200,000 students have been positively influenced to date. Prior to becoming CEO of Cogneeto, Dwayne completed his Ph.D. in the Advanced Learning Technology Lab. His research was entirely focused on peerScholar.



Professor Steve Joordens is the Director of the Advanced Learning Technologies Lab at the University of Toronto Scarborough. Initially trained within Cognitive Psychology, Steve's research is now focused on the creation and assessment of educational technologies as a tool for enhancing education. His work has been recognized by awards at the institutional, provincial and national levels including him being named a 3M National Teaching Fellow in 2015.



Dwayne is a cognitive psychologist and the Associate Director of the Advanced Learning Technologies Lab at the University of Toronto. He is also the co-founder and CEO of Cogneeto Inc, an EdTech company who's primary mission is to build evidence-based technologies that will best prepare students for success, leadership, and to be innovative thinkers. His PhD research focused on the efficacy of formative feedback using peer and self-assessment - which lead to the creation of peerScholar, a web application designed to enhance and measure transferable skills. Although he has spent much of the past year working from home (like many of us) he has found his silver lining of getting to spend family time with his wife and two young children.



Nidhi Sachdeva is a Microlearning SME and a PhD Candidate in the Curriculum, Teaching & Learning Department at the Ontario Institute for Studies in Education. She is a multilingual educator (English, Hindi, German) teaching a diverse repertoire of courses at York University and at the University of Toronto. Nidhi creates innovative microlearning content by combining science of learning and educational technology resources to enhance learners' interaction with content and to enrich the overall learning experience. Her research interests include microlearning, cognitive psychology and online learning.

2022 Vincent Di Lollo Early-Career Award Winner

Early-Career Award Lecture: Wednesday July 20th, 1:45-3:00PM (C4)

Introduced by Debra Titone and Randy Jamieson

Dr. Brendan Johns

McGill University

The Continued Importance of Theory: Lessons from Machine Learning Approaches to Cognition

Dr. Brendan Johns is an Assistant Professor in the Department of Psychology at McGill University, where he directs the McGill Cognitive Computing Laboratory. He is also an Associate Editor of the journal Behavior Research Methods. He obtained his Ph.D. in from Indiana University in the Departments of Psychological and Brain Sciences and Cognitive Science, and his undergraduate degree in Computing and Cognitive Science from Queen's University.



The goals of the Dr. Johns' research is to redefine the field of computational cognitive science through the development of new theoretical approaches to cognitive science grounded in modern machine learning and big data methodologies, with both theoretical and applied research prongs. The goal of his theoretical research prong is to understand the statistical underpinnings of the natural language environment, determine how humans learn this information, and to develop algorithms that can optimally learn and represent this information in a machine. The applied research prong uses the resulting knowledge-based intelligence systems to generate cognitive technologies that can be widely deployed, such as in the development of new automated clinical and educational computational tools.

Dr. Johns has published over 50 peer-reviewed articles, many in top journals, such as Psychological Review, Cognitive Psychology, and Journal of Memory and Language, among others. His research has been awarded numerous awards, such as the Early Career Impact Award from the Federation of Associations in Behavioral and Brain Sciences, article of the year award from CSBBCS/CPA, and the Marr Prize from the Cognitive Science Society.

Business Meeting including NSERC presentation

Wednesday July 20th, 5:00-7:00PM (C4)

Banquet

Wednesday July 20th, 7:00-9:30PM (C3)

2022 Richard C. Tees Distinguished Leadership Award Winner

Dr. Randy Jamieson

University of Manitoba

Randy Jamieson is a Professor at the University of Manitoba who uses experimental and computational methods to study how people and other animals learn, remember, think, and know. Dr. Jamieson served as President of CSBBCS in 2015-2019, Member-at-Large on the CSBBCS Executive Committee in 2011-2014, and was a conference Co-organizer for the 2011 CSBBCS annual meeting. He has also served as the CSBBCS Representative on the Board of Directors (2020-2021), the Scientific Affairs Committee (2012-2022), the Publications Committee (2018-2021), and Chair of the Brain and Cognitive Science Section (2014-2018) of the Canadian Psychological Association. In addition, Dr. Jamieson also served as President (2014-2017) and Member-At-Large on the Steering Committee (2010-2013) of the Society for Computation in Psychology. He has also contributed nationally, on NSERC's Discovery grant evaluation committee (2019-2022). In addition to all of his work, Randy was an invited panelist (NSERC and Equity, Diversity, Inclusion) in 2021 for the meeting of Women in Cognitive Science Canada.



Dr. Jamieson has been the Editor from 2018 to present, Associate Editor from 2013-2018, and Guest Editor, 2012, Volume 66 (2), for the Canadian Journal of Experimental Psychology. He has also been recognised for his contributions to the discipline by being named a Fellow of the Psychonomic Society in 2014. While Dr. Jamieson has done so much to promote cognitive psychology and brain science on both the national and international stage, he has done so while also serving his Department and University in a number of leadership roles that have included Associate Dean, Faculty of Graduate Studies (2021-2022), and Acting Department Head (2019-2020). Dr. Jamieson's contributions have been varied, numerous, significant, and exemplary.

2022 CSBBCS Mid-Career Award Winner

Dr. Jean Saint-Aubin

Université de Moncton

Dr. Saint-Aubin is an internationally recognized researcher in the field of human memory with a long and successful record of student mentorship and disciplinary leadership. He completed his PhD in 1998 at Université Laval. Since that time, he has published 94 articles and 7 book chapters in top journals (e.g., *Psychological Bulletin*, *Psychological Science*, *Journal of Experimental Psychology: Human Perception and Performance*, *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *Journal of Memory and Language*). His H-factor is 29 and he has been cited more than 3,000 times. His research program is in the bedrock of Canadian Cognitive Psychology, a fact recognized by over 20 years of NSERC Discovery Grant funding. His work is also recognized as innovative; signaled by a 2010 NSERC Discovery Accelerator Supplement that is given to "...researchers who have an established, superior research program that is highly rated in terms of originality and innovation, and who show strong potential to become international leaders within their field." He is an Elected Fellow of CSBBCS, APS, and CPA.



Dr. Saint-Aubin's research program is empirically rigorous, analytically precise, and intellectually deep. His work in the domain of memory is particularly compelling, especially his analysis of semantics and interactions between language and memory in the context of fundamentals like serial recall. However, he is also well known for his work on language and reading development where he leveraged his bilingualism to open opportunities for understanding language development in novel ways. He has also published work on the relationship between memory and eye movements.

Dr. Saint-Aubin is an impressive mentor who has supervised 29 NSERC Summer Undergraduate Students, 34 Honours Students, and 30 Graduate Students/Postdocs. His students appear as first authors on his papers and go on to success in academia, industry, and practice. All this hard work was rewarded at his institution with a 2019 Award for Best Supervisor at Université de Moncton and nationally by CSBBCS with the 2020 Richard C. Tees Leadership Award. As an aside, Dr. Saint-Aubin is an exceptionally generous mentor outside the lab who opens doors, issues invitations, and creates opportunities for young faculty around the country.

Dr. Saint-Aubin is a generous leader and effective spokesperson for our discipline. He is Associate Editor of *Canadian Journal of Experimental Psychology* and a member of Editorial Boards to four other journals (e.g., *Memory & Cognition*). He served as CSBBCS President as well as Science Director on the CPA Board of Directors. He has also served at NSERC several times including as Section Chair of the NSERC Discovery Grants Selection Committee. He uses his leadership opportunities to organize and create opportunities for students and faculty.

CSBBCS 2022 Schedule

Notes:

Keynote events are described above (pages 8-12)

Presented below and together are first the eight Symposia (S), then the Talk sessions (T) and finally the Poster sessions (P).

Abstracts appear at the end.

The first digit of a presentation number indicates the day of presentation:
(1=July 18, 2=July 19, 3=July 20)

In the next 3 sections (Symposia, Talks, Posters) the names of students competing for student Hebb Prizes are preceded by an *.

Symposium Organizers will chair Symposia. In the talk sessions, the first speaker is also the session chair, unless otherwise announced.

Symposia

Comparative Cognition

Organizer: L. Phillmore

Time: July 18th, 1:00-2:00PM

Location: C109

Number	Title	Presenter	Email
S101	Common calling: Black-capped chickadee (<i>Poecile atricapillus</i>) colony room chick-a-dee call convergence	Christopher Sturdy	csturdy@ualberta.ca
S102	Modulation of nociception by tricyclic antidepressants in the Speke's hinge-back tortoise	Christopher M. Makau	musembi06@yahoo.com
S103	Artificial intelligence in monitoring orangutan behaviour	Jenna V. Congdon	jcongdon@yorku.ca
S104	Can we replicate our own results?	Richard Brown	rebrown@dal.ca

Uniting the Domains of Metacognition: Integrating Findings Across Domains

Organizer: C. Fiacconi

Time: July 19th, 8:30-10:00AM

Location: Room C4

Number	Title	Presenter	Email
S201	Probing the Hidden Costs of Re-Studying	Chris Fiacconi	cfiaccon@uoguelph.ca
S202	Pupil response changes as a measure of processing fluency in judgments of learning (JOLs)	Kathleen L. Hourihan	khourihan@mun.ca
S203	How do you “know” if you were mind wandering? Investigating the metacognition of mind wandering using a novel remember/know paradigm.	Nicholaus P. Brosowsky	nicholaus.brosowsky@umanitoba.ca
S204	Probing the effect of perceptual (dis)fluency: It’s all relative	*Skylar Laursen	skylar.laursen@gmail.com
S205	Contextual influences on effort judgments	*Michelle Ashburner	ashburner@gmail.com
S206	Examining the “relatedness halo” in predictions of learning	*Xinyi Lu	xinyi.lu@uwaterloo.ca

The Production Effect: Future Directions

Organizer: J. Saint-Aubin

Time: July 19th, 10:30-12:00PM

Location: Room C4

Number	Title	Presenter	Email
S207	The prod eff: Partially producing items moderates the production effect	*Megan Kelly	mo2kelly@uwaterloo.ca
S208	Does the song remain the same? Singing does not necessarily improve memory more than reading aloud	Jedidiah Whitridge	jedidiah709@gmail.com
S209	The influence on the production effect of distinct but unrelated productions	Evan Risko	efrisko@uwaterloo.ca
S210	Gauging the effects of production on memory for text	Glen Bodner	glen.bodner@flinders.edu.au
S211	Does production of text benefit both comprehension and memory?	Brady R.T. Roberts	bradyroberts7@gmail.com
S212	The costs and benefits of producing spatial items	Jean Saint-Aubin	jean.saint-aubin@umoncton.ca

Reasoning and Metareasoning

Organizer: V. Thompson

Time: July 19th, 3:30-5:00PM

Location: Room C4

Number	Title	Presenter	Email
S213	On the illusion of explanatory “depth”	Ethan A. Meyers	emeyers@uwaterloo.ca
S214	More evidence for an optimism bias	Henry Markovits	henrymarkovits@gmail.com
S215	Feeling of Rightness in Consumer Choice	Ian Newman	ian.newman@usask.ca
S216	Metacognitive differences between good and bad reasoners	Kaiden Stewart	stewakai@uregina.ca
S217	Reasoning strategy, time and metacognition	Henry Markovits	henrymarkovits@gmail.com
S218	Can we change how people reason?	Valerie Thompson	valerie.thompson@usask.ca

Measuring Olfactory Learning and Memory in Rodent models of Alzheimer's disease and Autism Spectrum Disorder

Organizer: R. Brown

Time: July 19th, 3:30-5:00PM

Location: Room C109

Number	Title	Presenter	Email
S219	Measuring Olfactory Learning and Memory in Rodent models of Alzheimer's disease and Autism Spectrum Disorder.	Richard Brown	rebrown@dal.ca
S220	Measuring Olfactory Processes in Mus Musculus	Heather Schellinck	heathers@dal.ca
S221	Operant conditioning of odour discrimination learning in Alzheimer's disease model rats and mice	Kyle Roddick	kyle.roddick@dal.ca
S222	Olfactory Discrimination and Reversal Learning by the Nr1x1+/- mouse model of Autism Spectrum Disorder	*Wyatt Ortibus	wortibus@alumni.uwo.ca
S223	Measuring memory strength in 5xFAD mice through olfactory discrimination tasks and Atrx gene expression in hippocampus	Oliver Schnare	ol729453@dal.ca
S224	Pavlovian conditioned odour memory in the Neurexin 1+/- mouse model of Autism Spectrum Disorder	Jessica Garden	jessgarden01@gmail.com

[Building a comprehensive view of multiword and figurative language](#)

Organizers M. S. G. Senaldi, D. Titone, & B. T. Johns

Time: July 20th, 8:30-10:00AM

Location: Room C4

Number	Title	Presenter	Email
S301	Contextual diversity as a lexical organizer of multiword expressions	Marco Senaldi	marco.senaldi@mcgill.ca
S302	Cross-language activation of idioms	Debra Jared	djjared@uwo.ca
S303	How Emotional and Abstract Idioms Are: Affective and sensory-motor Norms for 210 English Idioms	Mahsa Morid	mmori115@uottawa.ca
S304	Insights from concreteness ratings of multiword expressions: Idiomatic expressions are less concrete than the sum of their parts	Emiko Muraki	ejmuraki@ucalgary.ca
S305	A computational model of veridical and false recognition of literal and nonliteral multiword expressions	Nick Reid	jeffreynicholas.reid@umanitoba.ca
S306	Holding the most truth in the least space: An overview	Albert Katz	katz@uwo.ca

Well...we didn't see that coming

Organizer: B. Butler

Time: July 20th, 8:30-9:45AM

Location: Room C109

Number	Title	Presenter	Email
S307	We don't know what kids want to hear (and they're not very helpful in clearing things up)	Blake Butler	bbutler9@uwo.ca
S308	Do you see what I see? When children do (and do not) experience visual illusions	Samantha Gualtieri	sgualtieri@uwaterloo.ca
S309	Now you see it, now you don't: Measuring left neglect with temporal order judgements	Gail A. Eskes	gail.eskes@dal.ca
S310	Searching for feature binding in trial-to-trial spatial repetition effects	Bruce Milliken	millike@mcmaster.ca
S311	Prediction Error: Sensorimotor Adaptation During Real World Speech Production	Daniel R. Lametti	danielrlametti@gmail.com

**Differences in the nature and quality of memory processes:
Evidence from young adults and older adults with normal and
impaired cognition**

Organizer: N. Phillips

Time July 20th, 3:30-4:45PM

Location: Room C4

Number	Title	Presenter	Email
S312	The benefit of active navigation on route memory in younger and older adults	Yadurshana Sivashankar	ysivasha@uwaterloo.ca
S313	Autobiographical memory & episodic future thinking in older adults at risk of mild cognitive impairment	Audrey Li-Chay-Chung	audreylili430@gmail.com
S314	Not all is lost: age effects on episodic recall depend on the kind of episodic content	Can Fenerci	can.fenerci@mail.mcgill.ca
S315	No Sex Differences in Cognitive Reserve in Memory in Mild Cognitive Impairment	Eden Mancor	edenmancor@icloud.com
S316	Serial Position Effects and Hearing Loss in the Progression of Alzheimer's Disease	Katrina Sollazzo	katrinasollazzo@gmail.com

Talks

Reading & Language

Time: July 19th, 8:30-9:45AM

Location: Room C102

Number	Title	Presenter	Email
T201	Statistical learning of orthographic regularities during independent text reading by skilled readers: Learning occurs, but is it statistical learning?	Nicole Conrad	nicole.conrad@smu.ca
T202	Bilingual language control is influenced by syntactic factors: Evidence from new procedures	Emalie Hendel	eeh0393@umoncton.ca
T203	Lexical decisions in ortho-semantic learning: A behavioural study of grade 3 children in English and French Immersion	Laura Elliott	lauraelliott210@gmail.com
T204	Using Perspective Cues in Pronominal Reference Resolution during Online Reading	*Tiana Simovic	tiana.simovic@mail.utoronto.ca
T205	Do Phonological Processing Skills Differentially Modulate Monolingual and Bilingual Children's Eye Movement Reading Behaviour for Naturalistic Texts?	*E. L. Guedea	er.guedea@gmail.com

Memory 1

Time: July 19th, 8:30-10:00AM

Location: Room C103

Number	Title	Presenter	Email
T206	Simulating dissociations between true and false recognition in the production effect	Evan Curtis	evan.curtis@boothuc.ca
T207	The Effect of Production on Background Context Memory	*Victoria Kavanagh	vajk87@mun.ca

Number	Title	Presenter	Email
T208	Symbol superiority: Why \$ is better remembered than 'dollar'	*Brady R.T. Roberts	bradyroberts7@gmail.com
T209	The Production Effect Interacts with Serial Positions: Further Evidence from a Between-Subjects Manipulation	Sébastien Gionet	esg8807@umoncton.ca
T210	Voluntary and involuntary autobiographical memories: More similar than different?	Ryan Yeung	rcyeung@uwaterloo.ca
T211	The Study of Recognition Memory Response Bias with First and Second Language	*Majd-Zahia Hawily	majdzahiahawily@uvic.ca

Attention 1

Time: July 19th, 8:30-9:45AM

Location: Room C104

Number	Title	Presenter	Email
T212	Perceptual and social salience drives initial eye movements when viewing banknotes	Biljana Stevanovski	bstevano@unb.ca
T213	Does 'the pill' predict attention? The relation between oral contraceptive use and sustained attention	*Alyssa Smith	alyssa.smith@uwaterloo.ca
T214	Narrow and unloved? Probing the role of inhibition in the ability to change the breadth of attention.	*Niyatee Narkar	nnarkar@uoguelph.ca
T215	The Relationship Between Sustained Attention and Mobile Phone Screen Time	*Kathryn Nason	kathrynnason2013@gmail.com
T216	Exploring "immunity" from attention capture: Is there an extra cost when disengaging from a recently cued fixation stimulus?	Raymond Klein	ray.klein@dal.ca

Cognitive Neuroscience

Time: July 19th, 8:30-10:00AM

Location: Room C109

Number	Title	Presenter	Email
T217	The timing of sensorimotor activation in picture and word comprehension: A spatiotemporal representational similarity analysis	Heath Matheson	heathericmatheson@gmail.com
T218	Distraction disrupts attentional filtering: Neural and behavioural evidence for the Filter Disruption Theory	Blaire Dube	bdube@uoguelph.ca
T219	Representational similarity analysis of fMRI data reveals differential representation of phonological information in aloud versus silent reading in the context of the production effect.	Lyam Bailey	lyam.bailey@dal.ca
T220	Pupil size anticipates exploration and predicts disorganization in prefrontal cortex	Akram Shourkeshti	akram.shourkeshti@gmail.com
T221	Neuropsychological Sequelae of COVID-19 Critical Illness: A Prospective Observational Study	*Sydni Paleczny	spaleczn@uwo.ca
T222	Re-analysis of body representation in the somatosensory cortex: An investigation of the “femunculus”	*Saisha Rankaduwa	saisha@dal.ca

Metacognition

Time: July 19th, 10:30-11:30PM

Location: Room C102

Number	Title	Presenter	Email
T223	The sense of agency in joint action: Investigating joint agency in duet and ensemble music performance	Janeen Loehr	janeen.loehr@usask.ca
T224	Observed Relationships Between Confidence, Cognitive Ability, and Metacognition in a Decision Making Task	Clark Kish-Greer	kishgreerclark@gmail.com
T225	Judgments of Learning Reveal Conscious Access to Stimulus Memorability	*Joseph Saito	joseph.saito@mail.utoronto.ca
T226	How does asking about memory change performance? Assessing the reactivity of metacognitive judgments through memory for order	Katherine Churey	kchurey@uoguelph.ca

Cognitive Development

Time: July 19th, 10:30-12:00PM

Location: Room C103

Number	Title	Presenter	Email
T227	What children bring to reading through elementary school.	Helene Deacon	helene.deacon@dal.ca
T228	Contributions of syntactic and morphosyntactic awareness to children's reading comprehension: A longitudinal study	Erin Robertson	erin_robertson@cbu.ca
T229	Uncovering Children's Developing Category Representations	Pablo Leon-Villagra	pablo.leon.villagra@gmail.com
T230	Word Age of Acquisition Effects on Bilingual Reading Behaviour Across the Adult Lifespan: An Eye-Tracking Investigation	*Courtney Stacey	courtney.stacey@unb.ca

Number	Title	Presenter	Email
T231	The Brain's Structural Connectome Correlates of Pre-reading Abilities in Pre-school Aged Children.	*Mohammad Ghasoub	ghasoub@ualberta.ca
T232	The Director Task is Robustly Associated with The Eyes Task But Neither are Associated With the Empathy Quotient	John Logan	johnlogan@cunet.carleton.ca

Thinking & Decision Making

Time: July 19th, 10:30-11:45PM

Location: Room C104

Number	Title	Presenter	Email
T233	Six Different Ways to Carve Nature at its Joints	John Paul Minda	jpminda@uwo.ca
T234	A Biologically-Inspired Neural Implementation of Affect Control Theory	*Aarti Malhotra	aarti.malhotra@uwaterloo.ca
T235	Conflict Detection is insensitive to cognitive load: Evidence for the intuitive nature of detecting conflict in reasoning	Kaiden Stewart	stewakai@uregina.ca
T236	Analyzing the intersectionality of sex, race and vocal characteristics on decisions of guilt and innocence	Charlene Forde-Smith	fordesmcmcmaster.ca
T237	Serial dependencies in recognition memory decisions: Investigating the temporal dynamics of the effects of prior response and similarity	Michelle A. Dollois	mdollois@uoguelph.ca

Clinical Cognitive Neuroscience

Time: July 19th, 10:30-12:00PM

Location: Room C109

Number	Title	Presenter	Email
T238	Blunted eye-blink startle in psychopathy and sadism	Douglas Williams	d.williams@uwinnipeg.ca
T239	Testing the procedural deficit hypothesis with brain potentials in French teenagers with developmental language disorder	Emilie Courteau	emilie.courteau@umontreal.ca
T240	Extended and replicated white matter changes in obesity: Spatial and effect size meta-analyses of diffusion tensor imaging studies	Lorielle M. F. Dietze	ldietze@dal.ca
T241	Reduced Temporal Precision in Neural Activity of Schizophrenia	Annemarie Wolff	awolf037@uottawa.ca
T242	The visual word form area as a route of auditory linguistic information into the visual cortex of early blind individuals: A dynamic causal modelling fMRI study.	Kiera O'Neil	kiera.oneil@dal.ca
T243	The Transdiagnostic Nature of Sensory Processing in Autism and ADHD	Nichole Scheerer	nikkischeerer@gmail.com

Individual Differences

Time: July 19th, 3:30-4:45PM

Location: Room C102

Number	Title	Presenter	Email
T244	Boredom, attention, and hearing: The impact of noise-induced hearing impairments is no worse in those who routinely experience boredom and failures of attention than in others.	Mark Fenske	mfenske@uoguelph.ca

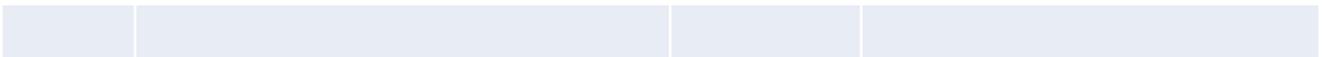
Number	Title	Presenter	Email
T245	Spatial Ability is Differently Related with Common Indices of the Numerical Distance Effect	*Fraulein Retanal	freta059@uottawa.ca
T246	Load it up! Combining experimental-manipulation and individual-difference approaches to explore the dependence of distractor devaluation on visual working memory	*Brooke Pardy	bepardy@yahoo.com
T247	The Sum of Its Parts: Exploring Relations Between Multiple Components of Financial Literacy, Math Anxiety, and Financial Anxiety	Andie Storozuk	astor074@uottawa.ca
T248	Development and Evaluation of the Measuring Anti-Social Tendencies (MAST) Addendum Scale	Mikhail Sokolov	misha.sokolov@gmail.com

Memory 2

Time: July 19th, 3:30-4:45PM

Location: Room C103

Number	Title	Presenter	Email
T249	Recognized words resist intentional forgetting	Pelin Tan	pelin.tan@uwaterloo.ca
T250	Improved Memory or Decreased Forgetting? Magnitude of Negative Generation Effect is Reduced in a Delayed Verbal Recall Test	*Michaela Ritchie	chaela.ritchie@outlook.com
T251	The Heart Remembers What the Mind Forgets: Meta-analysis of Emotional Enhancement on Episodic Memory for Emotional Pictures	*Nada Alaifan	nada.alaifan@psych.ubc.ca
T252	Is the errorful generation effect moderated by experimental design?	*Donnelle DiMarco	dimarcod@uoguelph.ca
T253	The interplay between concreteness effects and encoding strategies	Sophia Tran	s66tran@uwaterloo.ca



Attention 2

Time: July 19th, 3:30-4:45PM

Location: Room C104

Number	Title	Presenter	Email
T254	Evidence for shared resources between exogenous and endogenous attention in alpha rhythms	Mathieu Landry	mathieu.landry2@mail.mcgill.ca
T255	Mind-wandering is not as memorable as attentional engagement: Probe framing affects retrospective reporting of remembered attentional states	*Samantha Ayers-Glassey	sayersgl@uwaterloo.ca
T256	Preparation history effects on selective attention in a two-target method	*Ben Sclodnick	sclodnbc@mcmaster.ca
T257	Mindfulness and time perception: What do we know?	André Morin	andre.morin.science@gmail.com
T258	Gaze following as a result of cue directionality and mentalizing processes: An integrated approach	Florence Mayrand	florencemayrand@gmail.com

Technology & Cognitive Science

Time: July 20th, 8:30-10:00AM

Location: Room C102

Number	Title	Presenter	Email
T301	Graphical User Interface Design and User Reactions: How fNIRS Can Help Understand Technology Use	Anika Nissen	anika.nissen@uni-due.de
T302	Ignoring a cellphone and health-related decision making	Kristen Lott	kristenlott@trentu.ca

Number	Title	Presenter	Email
T303	The Effects of Video Quality on Online Video Lectures	Julianna Salvatierra	jksalvat@uwaterloo.ca
T304	Playback Speed influences Notetaking and Comprehension when Learning from Video Lectures	Laura J. Bianchi	ljbianchi@uwaterloo.ca
T305	Visual attention in French reading comprehension using AI-enhanced wearable eye tracking: a pilot study	Guillaume Loignon	guillaume.loignon@gmail.com
T306	Larger Distances from Larger Vehicles: Effect of Vehicle Size, Viewing Side, And Their Facia on Comfort Distance in Virtual Reality	Farid Pazhoohi	pazhoohi@gmail.com

Memory 3

Time: July 20th, 8:30-9:45AM

Location: Room C103

Number	Title	Presenter	Email
T307	Facilitating Hebbian learning via semantic similarity	Dominic Guitard	edg2851@umoncton.ca
T308	Can semantic similarity be better represented by valence, arousal and dominance?	René-Pierre Sonier	ers7241@umoncton.ca
T309	Cognition and well-being during the COVID-19 pandemic: unique events enhance episodic richness, mood, and temporal context of life experiences	Melissa Meade	mmeade@uwaterloo.ca
T310	What's behind the mask? Measuring observers' expectations of occluded facial features	Chris Oriet	chris.Oriet@uregina.ca
T311	COVID-19's Impact on the Calendar Effect	Norman Brown	nrbrown@ualberta.ca

Attention 3

Time: July 20th, 8:30-9:45AM

Location: Room C104

Number	Title	Presenter	Email
T312	Measuring the timing of visual feature processing through eye movement metrics	Mazyar Fallah	mfallah@uoguelph.ca
T313	The role of temporal cortex in the control of attention	Hamid Ramezanpour	hamidreza.ramezanpour@gmail.com
T314	Measures and impacts of mind wandering when using online learning software	Colin Conrad	colin.conrad@dal.ca
T315	Examining Autism Spectrum Disorder using the Attention Network Test: A Meta-Analysis	Samantha R Good	saamgood4@gmail.com
T316	Prism adaptation induces a premotor reaching bias on the attention-motor task	Jasmine Aziz	jasmine.aziz@dal.ca

Language & Music

Time: July 20th, 3:30-4:45PM

Location: Room C102

Number	Title	Presenter	Email
T317	Is it you you're looking for? The role of personal relevance in lexical access	Chris Westbury	chrisw@ualberta.ca
T318	Comparing computational and behavioural approaches to estimating relatedness of meaning for ambiguous words	Di Mo	di.mo@mail.utoronto.ca
T319	The Plasticity Theory of Implicit Music Knowledge Acquisition: PTIMKA	Annabel Cohen	acohen@upei.ca

Number	Title	Presenter	Email
T320	The influence of tonality and melodic contour on auditory stream segregation	Lauren H. Vomberg	lauren.vomberg@mail.utoronto.ca
T321	Exploring how Context Changes the Interpretation of Novel Noun Compounds	Tiana Simovic	tiana.simovic@mail.utoronto.ca

Social Cognition

Time: July 20th, 3:30-4:45PM

Location: Room C103

Number	Title	Presenter	Email
T322	Access to object concepts is modulated by usage-based properties of feature labels	Caitlyn Antal	caitlyn.antal@mail.concordia.ca
T323	Unattractive faces are more attractive when the bottom-half is masked, an effect that reverses when the top-half is concealed	Farid Pazhoohi	pazhoohi@gmail.com
T324	Representation Matters: How are implicit biases learned?	George Cree	george.cree@utoronto.ca
T325	No adaptation effects of voice-pitch on attractiveness judgements	Jessica Ostrega	ostregj@mcmaster.ca
T326	Unmasking emotions: The negative impact of facial occlusion by masks on reading emotions may be reduced with transparent masks and emotional context	Sarah McCrackin	sdmccrac@uwaterloo.ca

Teaching & Learning

Time: July 20th, 3:30-4:45PM

Location: Room C104

Number	Title	Presenter	Email
T327	The effect of pretesting on attention, motivation and memory	Jeremy Marty-Dugas	jmartydu@uwaterloo.ca
T328	An Experimental Examination of the influence of Active Learning	Laura J. Bianchi	ljbianchi@uwaterloo.ca
T329	The CAMPUS Method: Application of Research in Cognitive Science and Education	Swiya Murti	smurti@oshawapsychologist.com
T330	Influence of Effort Framing in a Learning Context	Kate Van Kessel	krvankes@uwaterloo.ca
T331	“Direct” Replications as Class Projects: Mixed News about the Bad News Game	D. Stephen Lindsay	slindsay@uvic.ca

Learning, Brain & Behaviour

Time: July 20th, 3:30-4:30PM

Location: Room C109

Number	Title	Presenter	Email
T332	Effect of feed-time duration on discrimination performance in a go/no-go operant paradigm	Christopher Sturdy	csturdy@ualberta.ca
T333	Examining physiological responses to events in platform arcade games and the modulating effects of expertise	Tyler Kruger	tbkruger@uwaterloo.ca
T334	Differential grey matter structure of the pars orbitalis, triangularis and opercularis in individuals with dyslexia: A volumetric asymmetry study	Kelly Nisbet	kanisbet@ualberta.ca

Number	Title	Presenter	Email
T335	Does chronic antipsychotic drug administration alter hippocampal dendritic spine density?	Mark Bardgett	bardgettm@gmail.com

Posters

Session 1

Time: July 18th, 5:00-7:00PM

Number	Title	Presenter	Email
P101	Can proactive control facilitate selective attention? Evidence from a two-target method	*Sevda Montakhaby	montakhs@mcmaster.ca
P102	Testing perceptual sensitivity in two forms of temporal attention	Colin McCormick	colinmccormick17@gmail.com
P103	Attention bias and social skills in youth with anxiety disorders	*Hailey Burns	haileyvburns@gmail.com
P104	Oral and Written Language Called Upon the Same Processes as Shown by the Missing-Phoneme Effect	Ian Dauphinee	ian.dauphinee@gmail.com
P105	Online lecture breaks can increase media-multitasking and harm learning	Kitty M.Q. Guo	guok12@mcmaster.ca
P106	Dual Processes in Recognition Memory	Ver-Se Denga	verse.denga@gmail.com
P107	Sleep and Dreaming During a Pandemic	*Samantha Tigchelaar	19slt2@queensu.ca
P108	Alterations to Genome-Wide DNA Methylation in the Brains of Adult Zebra Finches (<i>Taeniopygia guttata</i>) After Single Parenting	Rachel Gibbs	rachel@fprime.com
P109	Two-Alternative Forced Choice Visual Psychophysics in Unrestrained Wildtype Mice	Nicole M. Michaud	nicolemichaud@dal.ca

Number	Title	Presenter	Email
P110	Visual and Haptic Identification of Simple and Complex Objects	*Aidan Steeves	aidanebsteeves@gmail.com
P111	Multiple-object tracking (MOT) interferes differentially with visually guided touch, even when reporting techniques involve different response modalities	Mallory E. Terry	terry@uoguelph.ca
P112	An Investigation into the Self-Deployment of Reminders	Zion Leatham	zmleatha@uwaterloo.ca
P113	The Impact of Lunch Timing on Nap Quality	*Jennifer Fudge	jennfudge1@gmail.com
P114	The impact of cell phone interruptions during class: does controlling when to send a text improve performance?	Geneviève Desmarais	gdesmarais@mta.ca
P115	Statistical reasoning regarding possible adverse outcomes of vaccination	*Alexandra van der Valk	a47vande@uwaterloo.ca
P116	Individual Differences in Media Multitasking and Attentional Breadth	John Knox	hmsdl@stu.ca
P117	Is Gaze-Cuing More Like Endogenous or Exogenous Orienting?	Nicholas Murray	nick_murray7@hotmail.com
P118	Your Best Effort? Study Strategies and Subjective Experience	*Caitlin Reintjes	reintjec@mcmaster.ca
P119	The effect of target and distractor feature similarity in multiple object tracking	Rachel Eng	enr@uoguelph.ca
P120	How does the symbolic orienting of attention impact actions and their perceived effects?	Jason Ivanoff	jason.ivanoff@smu.ca
P121	Motivated Memory in Younger and Older Adults: A Comparison of Self-Serving and Prosocial Incentives	*Shadini Dematagoda	sdematagoda@ryerson.ca
P122	Investigating the role of attention and concussion history on Item and Associative memory	Adam Cox	adam.cox@uwaterloo.ca

Number	Title	Presenter	Email
P123	Improved Visual Working Memory Performance for Real-World Objects is Related to Memorability	Rosa E. Torres	rt18dk@brocku.ca
P124	Evidence that individuals modulate study effort consistent with anticipated environmental support	*Megan Kelly	mo2kelly@uwaterloo.ca
P125	Experiences of “acting as one” in group joint action	*Anh Hoang Tran	tranhoanganh.psy@gmail.com
P126	Examining subjective reports of caffeine consumption and attentional engagement in everyday life	Tyler Kruger	tbkruger@uwaterloo.ca
P127	Hemispheric Asymmetries in Auditory Distraction: A Right-Ear Disadvantage for the Categorical Deviation Effect	Francois Vachon	francois.vachon@psy.ulaval.ca
P128	Examining attention capture effects in complex visual search arrays	Anjali Pandey	anjali.pandey@dal.ca
P129	Individual difference factors affecting emotional contagion in young adults.	*Amanda McQuarrie	amanda.mcquarrie@umanitoba.ca
P130	Neural correlates and perceived attractiveness of male and female shoulder-to-hip ratio in men and women: an EEG study	Farid Pazhoohi	pazhoohi@gmail.com
P131	Investigating visuo-haptic processing using a matching task: Evidence for shared representations	Young In (Daisy) Song	youngin_song@hotmail.com
P132	The effects of cannabis use on event-related potential (ERP)-indexes of inhibitory functioning in cannabis users (vs. non-users)	Ashley Francis	ashley.francis@smu.ca
P133	Complex Mismatch Negativity Deficits in Early Phase Psychosis Elicited by the Dual Rule Paradigm	Jenna Bissonnette	jenna.bissonnette@msvu.ca
P134	The effects of imagery ability and handedness on the imagination of fine motor movements: An electroencephalographic investigation	Kathryn Lambert	kjlamber@ualberta.ca

Number	Title	Presenter	Email
P135	Automation Reliability and Its Influence on Trust Dynamics	Christopher Holland	chris_h1996@hotmail.com
P136	Assessing the interocular delay in amblyopia and its link to visual acuity	Daniel Gurman	daniel.gurman1@gmail.com
P137	Exploring individual-difference factors in distractor devaluation and No-go devaluation effects: Negativity bias and impulsivity	Robyn Mahood	rmahood@uoguelph.ca
P138	A Bi-Directional Training Paradigm Examining the Cross-Modal Relationship Between Cognitive Representations of Language and Mathematics	*Urvi Maheshwari	urvimaheshwari2@gmail.com
P139	Improving behavioural consistency as a function of expectation: Failure is not an inherently negative state	Yajing Zhang	yajing10@ualberta.ca
P140	The Effect of Prosocial Decision Making on Memory for Faces in Younger and Older Adults	Sana Junaid	sana.junaid@ryerson.ca
P141	Altogether now! A simultaneous-presentation variant of the Same-Different task	Morgan Garvie	bradley.harding@umoncton.ca
P142	Effects of Emotion Regulation on Decisions under Arousal	Adrian Colbert	adrian.colbert@ryerson.ca
P143	Relations between order judgment task performance and arithmetic ability	James Vellan	james.vellan@gmail.com
P144	Estimating Travel Times for One-Way and Return Trips	April Pereira	april.pereira@uwaterloo.ca
P145	The challenges of assessing bilingual language experience: The impact of contextual and individual variability in self-report data	Esteban Hernández-Rivera	esteban.hernandezrivera@mail.mcgill.ca
P146	Assessing invested effort when selecting items for restudy: Is there a role for cognitive offloading?	*Skylar Laursen	skylar.laursen@gmail.com

Number	Title	Presenter	Email
P147	Younger and older participants retain different memories of recently exposed excerpts of music popular over the last six decades.	Corey Collett	acohen@upei.ca
P148	A comparative study of exploratory decision-making in mice, monkeys, and humans	Veldon-James Laurie	veldonjames.laurie@gmail.com

Session 2

Time: July 19th, 5:00-7:00PM

Number	Title	Presenter	Email
P201	Knowledge of Popular Music and Singing Ability in North American and Non-North American University Students.	Kristen Gallant	acohen@upei.ca
P202	Is there a digital age divide in use of emojis for emotional communication on digital platforms?	Eva Sutera	esute031@uottawa.ca
P203	Exploring Lifestyle Factors as Predictors for Visually Induced Motion Sickness Susceptibility	Narmada Umatheva	numatheva@ryerson.ca
P204	The Learning, Executive, and Attention Functioning (LEAF) Scale correlates consistently with task-derived measures of executive function	Cory Munroe	CoryMunroe@hotmail.com
P205	The impact of personalizing realistic math word problems	Cheryll Fitzpatrick	cheryllf@mun.ca
P206	Role of the morphemic boundary in accessing compound constituents.	Alexander Taikh	ataikh@gmail.com
P207	Bilinguals Readily Acquire Language Specific Speech Motor Plans	Daniel R. Lametti	danielrlametti@gmail.com
P208	No Taboo Stroop Effect in Bilinguals' Second Language	Joline Guitard	ejg8346@umoncton.ca
P209	Comprehension Monitoring in Bilingual and Monolingual Adult Readers	Deanna Friesen	deanna.friesen@uwo.ca

Number	Title	Presenter	Email
P210	Validity of Corpus-Based Measures of Idiom Processing in English and Mandarin Chinese	Michelle Yang	michelle.yang5@mail.mcgill.ca
P211	Do cognitive biases shape patterns in the world's? Insights from a silent gesture task.	Ashley Yim	ay.ashleyyim@gmail.com
P212	To what extent do shared domain-general mechanisms support language processing?	Sonny Wang	sonnyfoi@hotmail.com
P213	Language Coactivation for Interlingual Homographs During Bilingual Reading: The Impact of Semantic Bias and Individual Differences in Language Entropy	Karla Tarin-Murillo	karla.tarin@mail.mcgill.ca
P214	Benchmarks that Computational Accounts of Visual Word Recognition Have Yet to Address	Torin Young	tpyoung@edu.uwaterloo.ca
P215	Ordering patterns in the noun phrase when counting: Insights from an artificial language learning experiment	Gregory Antono	gregory.antono@mail.utoronto.ca
P216	Testing an Age-appropriate Theory of Mind Assessment for Multilingual Adults		justin.feng@mail.mcgill.ca
P217	Mapping the Relations between Performance on Various Spatial Tasks and Performance on Various Mathematics Tasks in Undergraduate Students in North America	Véronique Delage	vdela018@uottawa.ca
P218	Visuomotor adaptation of co-speech hand movements is partially tied to speech production	Daniel R. Lametti	danielrlametti@gmail.com
P219	The spatial-mathematical abilities association: the role of spatial anxiety	Felix Ayesu	fa8584@mun.ca
P220	The Science of YouTube: The role of Enjoyment and Mind Wandering	Simon Leger	simon.leger.66@gmail.com
P221	The Power of the Pencil: Examining the impact of drawing on learning and memory	Celia Briand	celiabriand1@gmail.com

Number	Title	Presenter	Email
P222	Qualifying the “quantroversy”: A commentary on working memory training and transfer	Richard Drake	richard.drake@dal.ca
P223	Arousal affects short-term serial recall.	Éric Landry	eric21landry@gmail.com
P224	Anchoring in Time Estimation: The Effects of Explicit Anchoring on Prospective Time Estimates	Mohammed Aswad	mohammedaswad@cmail.carleton.ca
P225	Does ‘RIF’ Keep the Doctor Away? Evaluating Health Relevant Cognitive Biases via Retrieval-Induced Forgetting	Maddison Baldwin	mmbaldwin@mun.ca
P226	Spatial-manual tapping hinders more backward than forward recall when you know the upcoming recall direction	Danika McIntyre	danikaathome@gmail.com
P227	Musical cues enhance the quantity and quality of autobiographical memories	Pelin Tanberg	pelintan@waterloo.ca
P228	Motoric fluency and metacognitive monitoring: Using typing speed to investigate the impact of motoric fluency on judgments of learning (JOLs)	Michelle A. Dollois	mdollois@uoguelph.ca
P229	Can you spot the bot? Strategies to detect bots in online survey data	Andie Storozuk	astor074@uottawa.ca
P230	Assessing Dance Expertise Using Temporal Equivalence	Charles-Anthony Dubeau	chdubeau@gmail.com
P231	Time Perception as a Tool to Study Implicit Biases in an Intergroup Setting	Louis-Charles Reny	louis-charles.reny@hotmail.com
P232	Do Emojis Violate Norms and Decrease Perceived Competence in Professional Settings?	Charles Collin	ccollin@uottawa.ca
P233	Effect of metaphors in processing sexual orientation schemas: A study of eye movements	Marie-Pier Mazerolle	karolyncloutier.2000@gmail.com

Number	Title	Presenter	Email
P234	The Cone of Direct Gaze can be reliably measured online using the Virtual Chin Rest	Sarah McCrackin	sdmccrac@uwaterloo.ca
P235	The role of gaze direction and mental content in social orienting: An eye tracking investigation	Florence Mayrand	florencemayrand@gmail.com
P236	Contextual Cues about Reciprocity and Motivation to Lean Impact on Ratings of Smile Authenticity	Adèle Gallant	adele.gallant@hotmail.com
P237	A Virtual Reality Training Program for Volleyball Experts and Time Perception	Marie Dallaire	marie.dallaire2008@hotmail.com
P238	Mind wandering, task switching, and the maintenance of task goals	Shikang Peng	shikang@ualberta.ca
P239	Evaluating a novel 6-response zero-sum game against binary and non-binary spaces: Subjective complexity and the expression of stay behaviours	Eunchan Na	eunchan@ualberta.ca
P240	Lie to me (if you can): Deception with motion and gaze in a preference task	Dana Hayward	dana.hayward@ualberta.ca
P241	Getting back to nature: Preference for spaces featuring natural elements	Ruby S. Prinsen	rsprinse@ualberta.ca
P242	Same items, different bias: Recognition memory for words, drawings, and photos representing common objects	Kaitlyn Fallow	kmfallow@uvic.ca
P243	Individual Differences in Processing of Threat Cues in Faces Displaying Direct and Averted Gaze	Reegan McCheyne	reeganmccheyne@gmail.com
P244	Does pronunciation affect the morphological decomposition of pseudo-compound words?	JUANA PARK	jpark@aus.edu
P245	Approaching metaphor comprehensibility from a computational perspective	Parastoo Harati	p.harati@ualberta.ca
P246	Does TV Priority for Emotional Public Events Still Exist in the Online World?	Cheryl Techentin	ctechentin@mtroyal.ca

Number	Title	Presenter	Email
P247	Perceived Coherence of Crossed Moving Gratings obeys Gestalt laws.	Alan Ho	alan01.ho@gmail.com
P248	Physical Disability Affects Women's but Not Men's Perception of Opposite-Sex Attractiveness	Farid Pazhoohi	pazhoohi@gmail.com
P249	Natural Disaster as Transitional Event and Well-being Consequence	Eamin Heanoy	heanoy@ualberta.ca

Abstracts

Symposia

Comparative Cognition

S101 Common calling: Black-capped chickadee (*Poecile atricapillus*) colony room chick-a-dee call convergence. Sarah Smeltz, Moriah Deimeke, Carolina Montenegro, Prateek Sahu, Christopher Sturdy, *Department of Psychology, University of Alberta, Canada.*

Black-capped chickadees (*Poecile atricapillus*) are a small North American songbird, common across large sections of Canada and the United States. Interestingly, chickadees continue to exhibit vocal plasticity throughout their lifespans. Vocal plasticity in chickadees serves several functions, including facilitating vocal learning and to allow acoustic convergence (i.e., calls of a flock become increasingly similar and more distinct from other flocks). Acoustic convergence has previously been observed in wild and laboratory populations of chickadees, including in the namesake black-capped chick-a-dee contact call. However, previous studies have exclusively examined chickadee flocks whose members were able to physically interact. Here we examine whether laboratory-housed chickadees, housed individually but within vocal contact, undergo acoustic convergence of the chick-a-dee call similar to group housed birds, and if so, which acoustic features converge? Six black-capped chickadees from two previously established laboratory colony rooms were moved into one novel pseudo colony room. Calls from this new flock were compared over 10 weeks. In total, 12 acoustic features were measured for comparison including spectral and temporal measures. Preliminary results indicate that only maximum frequency and bandwidth converged.

S102 MODULATION OF NOCICEPTION BY TRICYCLIC ANTIDEPRESSANTS IN THE SPEKE'S HINGE-BACK TORTOISE. Christopher M. Makau, *University of Copenhagen, Department of Experimental Medicine, Faculty of Health and Medical Sciences, Blegdamsvej 3B, DK-2200 Copenhagen N, Denmark.*

Antidepressants are reported to be effective in management of chronic pain related behavior and anxiety in animal models. Tricyclic anti-depressants have been demonstrated to have antinociceptive effects with less severe side effects in several animal models of pain and could be used in reptiles. The aim of the study was to investigate the antinociceptive effects of tricyclic antidepressants in Speke's hinge-back tortoise. Amitriptyline, nortriptyline and desipramine hydrochloride were administered intracoelomically 30 minutes before the tests. The time spent in nocifensive behavior and associated observable effects during formalin, capsaicin and hot plate tests was analyzed. The higher doses of amitriptyline hydrochloride caused a significant increase in nociceptive behavior on the formalin and capsaicin nociceptive tests, suggesting a potentiating effect. Nortriptyline and desipramine hydrochloride had a dose dependent decrease in nocifensive behavior in both the formalin and capsaicin tests. No doses of any drug had significant effects on nocifensive behavior in the hot plate test. The side effects observed were excess salivation, dizziness and yawning. The results show that antidepressants modulate pain related behavior in the Speke's hinge-back tortoise by activating various receptor systems causing differential effects. The drugs did not have a significant effect on thermal induced inflammatory pain.

S103 Artificial intelligence in monitoring orangutan behaviour. Jenna V. Congdon, *Department of Psychology, Faculty of Health, York University,* Suzanne E. MacDonald, *Toronto Zoo Wildlife Conservancy, Toronto Zoo.*

Modern zoos, like the Toronto Zoo, are at the forefront of efforts to save species from extinction. Zoo staff work to ensure that the animals in their care lead enriched, healthy lives in species-typical environments; research on animal behaviour and cognition is a vital part of these efforts, however, this is typically achieved by scientists collecting real-time data in a fairly lengthy and tedious process. Together with our partner organization, the Canadian technology company EAIGLE Inc., we are training artificial intelligence (AI) for mass data collection using orangutan footage. This novel technology will be capable of 24/7 animal monitoring to greatly improve animal welfare outcomes. Tracking where the animals spend their time, what they are doing, and with whom in their social group they are interacting will allow for change of management and environment to improve welfare outcomes, and provide further data to drive research on comparative cognition. Previous findings from cognition research with orangutans will be presented in addition to a focus on the function and application of this technology with regards to animal research and welfare, including the successes and challenges faced in development.

S104 Can we replicate our own results? Richard Brown, *Department of Psychology and Neuroscience, Dalhousie University, Halifax, N.S. Canada*

In the study of transgenic mouse models of neurodevelopmental and neurodegenerative disorders, we use batteries of tests to measure deficits in behaviour and from the results of these tests, we make inferences about the mental states of the mice that we interpret as deficits in "learning", "memory", "anxiety", "depression", etc. In this presentation, I will discuss the problems of determining whether a particular transgenic mouse is a valid mouse model of disease X, the problem of background strains, and the question of whether our behavioral tests are measuring

what we say they are. I will then discuss the problem of the reliability of results: are they replicable between labs and can we replicate our results in our own lab? This involves intra- and inter- experimenter reliability. I will discuss the variables influence replicability and the importance of conducting a complete behavioural phenotype: sensory, motor, cognitive and social emotional behaviour. I will examine the thorny question of failure to replicate: Is it a curse or a blessing? Finally, I will discuss errors and what they tell us, and conclude with the philosophical problem: How do we use behavioural data to infer the mental state of the mouse?

Uniting the Domains of Metacognition: Integrating Findings Across Domains

S201 Probing the Hidden Costs of Re-Studying. Chris Fiacconi, *University of Guelph*, Skylar Laursen, *University of Guelph*.

In recent years, there has been immense interest in the relative benefits of testing, as compared to re-studying, on the retention of newly learned information. In the present series of experiments, we examined whether re-studying a subset of information may, under certain circumstances, induce a mnemonic cost for information that is not re-studied. This line of research was inspired by the well-established list-strength effect, in which repetition of some items from a list impairs memory for the non-repeated items relative to when all items are presented once. In two experiments, participants were forced to select half of the presented words in a list for later re-study. Following the re-presentation of the selected items, a free recall test was administered. After controlling for confounds arising from item-selection biases, serial position effects, and differences in retention interval, we indeed found that memory for the items not selected for re-study was indeed impaired relative to a condition in which participants studied all items only once. These findings demonstrate that, in addition to constituting a sub-optimal study strategy, re-studying a subset of self-selected items can yield a memory deficit for non-restudied information.

S202 Pupil response changes as a measure of processing fluency in judgments of learning (JOLs). Kathleen L. Hourihan, Rabia Farmahan, Jonathan M. Fawcett, *Memorial University of Newfoundland*.

The relative contributions of fluency and memory beliefs to the formation of judgments of learning (JOLs) has been the focus of much research in recent years. In the current study, we recorded changes in pupil diameter (a physiological measure of cognitive effort) during encoding to examine whether the magnitude of pupil change was predictive of JOL magnitude. Pupil diameter was measured during study trials in which participants provided immediate JOLs; memory was then tested with free recall. In Experiment 1, we examined a manipulation which has been shown to have congruent effects on JOLs and recall performance: word frequency. In Experiment 2, we used a manipulation in which JOLs are typically not predictive of recall performance: word volume. Behaviourally, JOLs and recall performance were as expected. Additionally, pupillometric results showed that pupil dilation was related to the magnitude of JOLs. Results are discussed in terms how processing fluency and beliefs are used as cues in the formation of JOLs.

S203 How do you "know" if you were mind wandering? Investigating the metacognition of mind wandering using a novel remember/know paradigm. Nathan Matthews, Umer Bin Faiz, Nicholas P. Brosowsky, *Department of Psychology, University of Manitoba, Canada.*

What were you thinking just before reading this sentence? Was your attention focused or were you distracted by unrelated thoughts? Mind wandering – the inward shift of one’s attention – is typically assessed with retrospective self-reports, using questions much like those above. Surprisingly, however, we know very little about how people make such metacognitive judgments. In this project, we investigated the metacognition of mind wandering using a novel remember/know paradigm. We hypothesized two possible sources of information that could be used to make mind wandering judgments: explicit memories of one’s prior thoughts (“remember”) and subjective feelings of inattention (“know”). Using this basic theoretical framework, we describe new experiments demonstrating meaningful distinctions between reports of mind wandering with explicit memory and subjective feelings of mind wandering in the absence of explicit memory. We discuss the methodological and theoretical implications of adopting such a framework and the potential importance of measuring “remember” versus “know” mind wandering judgments in future research.

S204 Probing the effect of perceptual (dis)fluency: It’s all relative. Skylar Laursen, Chris Fiacconi, *University of Guelph.*

Researchers have long debated whether perceptual fluency, the subjective ease of processing, influences individuals’ predictions of future memory performance. Recently, research by Fiacconi et al. (2020) used a letter set manipulation to demonstrate that perceptual fluency does influence individuals’ judgments of learning (i.e., predictions of future memory; JOLs) in an experience-dependent manner. Specifically, Fiacconi et al. (2020) found that perceptually fluent stimuli were given higher JOLs than perceptually disfluent stimuli. Critically however, because Fiacconi et al. (2020) did not include a baseline measure (i.e., stimuli that were not fluent or disfluent) it remained unclear whether the difference observed was due to increased JOLs for perceptually fluent stimuli, or decreased JOLs for perceptually disfluent stimuli. Moreover, given the comparative nature of JOLs, it was also unclear whether the difference in JOLs would still be observed when fluent and disfluent stimuli were shown in isolation. Across two experiments we demonstrate that compared to baseline, JOLs for perceptually disfluent stimuli are decreased, whereas those for fluent stimuli show no difference. Additionally, our results show that the effect of perceptual (dis)fluency is relative in nature, as the difference in JOLs between fluent and disfluent stimuli was only observed in a mixed-list design.

S205 Contextual influences on effort judgments. Michelle Ashburner, Evan F. Risko, *Psychology, University of Waterloo.*

Cognitive effort is a central construct in our daily lives; yet, there is still much unknown about how individuals make judgments of effort. One way in which to think about judgments of effort is as a type of metacognitive judgment. As such, effort judgments can be viewed as the product of a cue-based inferential process. In a recent set of experiments, individuals provided effort judgments for a reading task wherein displays of random words were disoriented in one of four ways (i.e., four display types). While some participants experienced and judged all four display types (i.e., a joint context), others only experienced and judged one of the four (i.e., a separate context). Effort judgments were heavily influenced by this manipulation of the experience/judgment context. Specifically, a graded pattern of effort judgments across display types was observed in the joint

context; however, judgments of effort were unaffected by display type when individuals provided judgments in the separate context. Furthermore, analysis of individuals' reasons for judgment suggests that the salient cues used to inform judgments of effort shifted markedly across these two contexts. Implications of the shifting of cue salience as a function of context for judgments of effort are discussed.

S206 Examining the “relatedness halo” in predictions of learning. Xinyi Lu, Evan Risko, *Department of Psychology, University of Waterloo, Canada.*

The effects of semantic relatedness on predictions of memory and learning have been repeatedly demonstrated. The relatedness benefit (that related word pairs and lists are predicted to be better remembered than unrelated words) is thought to be mediated by participants' beliefs and/or subjective experiences of processing fluency. This benefit tends to be metacognitively accurate in the sense that related words are usually better remembered than unrelated words. Here we investigated the effect of relatedness on participants' predictions in a location memory task, where we know from previous research that related words are remembered worse than unrelated words. Our participants learned words that were presented within grid displays; one display contained words that were all from the same category, and another contained words from different assorted categories. They predicted how many words they would be able to recall (Item Memory condition) or remember the correct locations for (Location Memory condition). For both item memory predictions and location memory predictions, our participants predicted that their memory would be better in the related words display, even though their location memory performance was worse. Participants appear to have a general belief that related words are better or more easily remembered, i.e., a “relatedness halo”.

[The Production Effect: Future Directions](#)

S207 The prod eff: Partially producing items moderates the production effect. Megan Kelly, Colin MacLeod, Evan Risko, *University of Waterloo.*

Current accounts of the production effect suggest that production leads to the encoding of additional production-associated features and/or better feature encoding. Thus, if it is the act of production that leads to these processes, then less of this act should reduce the resulting production effect. Indirect support for idea can be found in the modulation of the production effect by production intensity (e.g., singing > reading aloud > mouthing). We provide a more direct test by manipulating the amount of production within a single mode (typing) and thereby controlling within-experiment production distinctiveness. When producing just three letters, a significant production effect was observed that was more than half of the standard effect (i.e., from typing all six letters); when typing two letters, the production effect was marginally significant and less than half of the standard effect. Indeed, an exploratory analysis found that the partial production effects resulting from typing three versus two letters significantly differed. The present results suggest moderation of the production effect in response to amount of production despite all items and productions being unique.

S208 Does the song remain the same? Singing does not necessarily improve memory more than reading aloud. Jedidiah Whitridge, *Department of Psychology, Memorial University of Newfoundland, Canada*, Mark Huff, *School of Psychology, The University of Southern Mississippi, USA*, Jason Ozubko, *Department of Psychology, Statue University of New York at Geneseo, USA*, Chelsea Lahey, Jonathan Fawcett, *Department of Psychology, Memorial University of Newfoundland, Canada*.

The production effect refers to a memory advantage for items read aloud versus silently. This effect is often explained with reference to distinctiveness, with the idea being that any form of production (e.g., reading aloud, singing) appends additional sensorimotor features (e.g., auditory, tonal) to the encoding record, which facilitates retrieval. One corollary of this account is that the magnitude of the production effect should be larger for relatively more elaborate production modalities (e.g., singing vs. reading aloud), as has been demonstrated in previous literature. We challenge the empirical basis of such claims by comparing recognition performance for singing compared to reading aloud using a typical production paradigm. Across a series of pre-registered experiments, we observed improved recognition for both the singing and read aloud conditions compared to the silent condition (i.e., a production effect); however, rather than superior performance for singing, we observed evidence favouring equivalent performance between the singing and read aloud conditions. Our findings challenge prevailing wisdom that the magnitude of the production effect scales with the sensorimotor complexity of the production modality, with implications for distinctiveness-based theoretical accounts of production.

S209 The influence on the production effect of distinct but unrelated productions. Evan Risko, *University of Waterloo*, Megan Kelly, Xinyi Lu, *University of Waterloo*, Tyler Ensor, *California State University*, Colin MacLeod, *University of Waterloo*.

Producing information at study, relative to silent reading, leads to a benefit in recognition memory. This effect provides an opportunity to better understand how active engagement with material can influence memory. Consequently, a number of computational models of the production effect have been proposed. We consider these models in the context of examining the influence on the production effect of how what is produced relates to the target. In most studies of the production effect, individuals are presented with a set of unique items and produce a subset of them (e.g., they are presented with the to-be-remembered target item TABLE and produce “table”) such that the production is both distinct and typically identical to the target. MacLeod et al. (2010) demonstrated that producing an unrelated word to all items (i.e., saying “yes” to all produced targets)—so that the production was both non-distinct and unrelated to the target—did not yield a production effect. Here we examine the influence of a production that is distinct but unrelated to the target (e.g., producing “table” to the target FENCE, producing “car” to the target TREE, and so on). Results pose new challenges for existing models.

S210 Gauging the effects of production on memory for text. Glen Bodner, Nathan Weber, Max Kulbida, *Flinders University, Adelaide, South Australia*.

Research has begun exploring whether the beneficial effects of production (i.e., reading aloud) on memory for word lists extend to text materials. Here we gauged the effects of production on memory for text relative to a highlighting strategy. Online participants read 6 articles assigned to a 3 (encoding: silent vs. aloud vs. highlighting) x 2 (test: immediate vs. delay) design. Participants were asked to identify and read aloud or highlight the key portions of each paragraph for those articles. Both strategies improved multiple-choice accuracy to a similar degree relative to the silent/control condition. There was some indication that reading aloud was superior to

highlighting after a delay. Applying the strategy to more text enhanced the production effect but not the highlighting effect. In terms of efficiency, the memory improvement (over silent/control) per unit of encoding time was greater for aloud than highlighting. However, participants tended to underestimate the benefits of both strategies in their metacognitive judgments (e.g., judgments of learning, accuracy predictions, confidence ratings). Thus, although production holds promise as an alternative to highlighting as a study strategy, learners may not be metacognitively aware of its effectiveness, and hence they may need to be persuaded to give it a try.

S211 Does production of text benefit both comprehension and memory? Brady R.T. Roberts, Zoey S. Hu, David McLean, Colin M. MacLeod, *University of Waterloo*.

The production effect has been defined narrowly with reference to memory—that reading aloud leads to better memory than does reading silently—and it has been explored largely using single words as the material to be read and remembered. But might production benefit more than memory, and more than individual words? In this study, we explored the effects of production on comprehension of studied passages. Participants read the materials then completed both memory questions and comprehension questions about the passages. Based on the distinctiveness account of production—that information read aloud stands out at encoding and at test from information read silently—we expected passages read aloud to be better remembered than passages read silently. But would the benefit of production also be seen in comprehension? Separating the multiple-choice questions into memory-focused vs. comprehension-focused questions, we observed a production benefit for both. Production therefore enhances not only memory for but also comprehension of text. These findings speak to the practicality of production as a study strategy in everyday learning.

S212 The costs and benefits of producing spatial items. Jean Saint-Aubin, *Universite de Moncton*, Dominic Guitard, *Universite de Moncton & University of Missouri*, Marie Poirier, *City, University of London*, James Yearsley, *City, University of London*.

Memory is better for items read aloud at encoding (produced) compared to silently read items. According to the Revised Feature Model (RFM), produced items benefit from additional features improving memory performance. However, producing the items also hinders rehearsal impeding memory. Within the RFM, memory representations are not limited to verbal features; any encoded features that can be relied upon to increase distinctiveness should be beneficial. Here, we tested original predictions derived from the RFM by investigating the production effect for spatial information with pure lists. In 6 experiments, participants memorized the location of dots appearing at various locations. At recall, all dots reappeared, and participants clicked on them in their presentation order or there was a blank screen and participants clicked on the location of the dots in their correct order. In the production condition, participants clicked on the dots during their presentation. In the control condition, participants did nothing or clicked on one square at each external corner of the screen to block rehearsal. As predicted by the RFM, memory was better for produced items when rehearsal was blocked for control items, but worse when participants were allowed to rehearse. Results support the original predictions derived from the RFM.

Reasoning and Metareasoning

S213 On the illusion of explanatory “depth”. Ethan A. Meyers, Jeremy D. Gretton, Joshua R. C. Budge, Jonathan Fugelsang, Derek Koehler, *Department of Psychology, University of Waterloo.*

People often believe they understand even ordinary phenomenon in far greater depth than they truly do. This belief has been referred to as an “Illusion of Explanatory Depth (IOED)”. Fortunately, attempting to explain how something (e.g., a speedometer) works can make us aware of the gaps in knowledge about that thing, and reduce this illusion. A core assumption behind the IOED is that the illusion can only be reduced if the item explained is the same as the item the illusion is held for. Across three preregistered studies we provide evidence that challenges this core assumption. Specifically, we find that the IOED for a given item can be similarly reduced by explaining wholly unrelated items or phenomena (e.g., an IOED held for a speedometer can be reduced by failing to explain how a zipper works and how snow forms). Taken together, our results suggest that the IOED may be more “broad” than it is “deep”.

S214 More evidence for an optimism bias. Gaetan Beghin, Henry Markovits, *Psychologie, Université du Québec à Montréal.*

Classical studies of contingency learning present sequences of trials with a treatment for some illness given or not, and the resulting state of a patient. For each, patient state has typically been presented as dichotomous (cured or not). However, previous results have shown that when people are given highly complex indicators of patient state there is a relation between the extent to which ambiguous states are interpreted as the patient being cured and judgments of causal strength, when there is no objective causal relation between treatment and illness. In two studies, we replicate this optimism bias when patient state was determined by a small set of indicators. In addition, reasoning strategy is shown to be a robust predictor of the extent to which objectively ambiguous states are interpreted as corresponding to a good outcome.

S215 Feeling of Rightness in Consumer Choice. Ian Newman, Clark Kish-Greer, Giovanni Quartararo, Valerie Thompson, *University of Saskatchewan.*

We adapted the two-response paradigm (Thompson et al., 2011) to study metareasoning in a consumer choice context. On each trial, participants were asked to select between two options of a consumer product (e.g., two bags of potato chips). The options were either the participant’s favourite brand or a competing brand, some of which were labelled as sustainable versions of the product. Participants made an initial choice under time pressure and then rated their Feeling of Rightness (FOR) about their choice. They were then offered the option to either place the product in a hypothetical shopping basket or leave it on the shelf. We found that FOR was lowest on trials where brand preference conflicted with product sustainability, and conversely, FOR was highest on trials where preferences and sustainability were congruent. Strong FORs also translated into a higher likelihood of placing the product in the shopping basket, regardless of the brand or sustainability of the product chosen. These data validate Ackerman and Thompson’s (2017) MetaReasoning theory in a real-world context and suggest that the availability of sustainable product options may give consumers a reason to reconsider their typical purchasing behaviour.

S216 Metacognitive differences between good and bad reasoners. Kaiden Stewart, Ethan Meyers, *Department of Psychology, University of Waterloo, Canada*, Valerie Thompson, Clark Kish-Greer, *Department of Psychology, University of Saskatchewan, Canada*, Derek Koehler, *Department of Psychology, Jonathan Fugelsang, Department of Psychology, University of Waterloo, Canada*.

High-capacity (HC) reasoners and low-capacity (LC) reasoners differ in several key attributes that contribute to the difference in their ability to reason. Their intuitions (Type I processing) have been shown to be more accurate, they are more likely to supplement those intuitions with more reflective (Type II) processes, and those reflective (Type II) processes are more likely to guide them to the correct response. We test a novel hypothesis: that at least some of the difference between HC and LC reasoners is metacognitive in nature. The importance of metacognition for reasoning success is not a new observation, and it has been garnering increased attention. Indeed, it is argued to be a key antecedent for the deployment of more reflective (Type II) processes; items that elicit lower Feelings of Rightness (FOR) are associated with increased reflection. We observe capacity-based differences in both i) reasoners' translation of experienced difficulty into a FOR (i.e., monitoring difficulty), and ii) reasoners' use of FOR in deploying reflection (i.e., Type II processing). These results provide support for a key role of metacognitive processes in successful reasoning.

S217 Reasoning strategy, time and metacognition. Henry Markovits, *Psychologie, Université du Québec à Montréal*, Valerie Thompson, *Psychology, University of Saskatchewan*.

Reasoning strategy has been shown to predict very fast reasoning on belief-biased inferences. In this study, we examine whether there is some degree of metacognitive awareness of the nature of fast inferences by giving participants a set of belief-biased inferences with a very short response time with Feeling of Rightness (FOR) measured for each, followed by an equivalent set with unlimited time. Both Counterexample and Statistical reasoners improved with time. However, only Counterexample reasoners showed a relation between the degree of improvement and FOR ratings for fast inferences.

S218 Can we change how people reason? Valerie Thompson, *Department of Psychology, University of Saskatchewan*, Henry Markovits, *Department of Psychology, University of Montreal*.

In two large studies (N = 400), we examined whether it is possible to change the way in which people reason about two standard laboratory tasks, namely syllogistic reasoning and base-rate neglect. The study was grounded in our dual strategy model, which suggests that reasoners adopt one of two broad approaches to reasoning: Counterexample reasoners reject inferences for which a counterexample is available, even if it has low probability, and statistical reasoners assess the probability that conclusions are true. After completing a strategy diagnostic questionnaire, reasoners were given a set of instructions to reason either probabilistically or by using counter examples. We then gave them a short test to find out whether they could, indeed, follow the instructions, followed by the syllogistic task or the base-rate neglect task. Two key findings emerged: 1) the reasoning instruction intervention carried over to the subsequent reasoning task, demonstrating that it is possible to change the way in which people reason and 2) regardless of the instructions given, those who were successful at following them performed better on the subsequent reasoning task than those who were not.

Measuring Olfactory Learning and Memory in Rodent models of Alzheimer's disease and Autism Spectrum Disorder

S219 Measuring Olfactory Learning and Memory in Rodent models of Alzheimer's disease and Autism Spectrum Disorder. Richard Brown, *Department of Psychology and Neuroscience, Dalhousie University, Halifax, N.S. Canada.*

This symposium will examine research on olfactory learning and memory conducted in my lab over the last 35 years. The first talk will be by Heather Schellinck who started in my lab in 1986 and is now retired. The second and third talks on Pavlovian conditioned odour preferences will be given by my current students, Oliver Schnare and Jessica Garden. The fourth talk on transfer of training will be given by my current student, Val Burdeyney. The final two talks on operant conditioning will be given by my current students Kyle Roddick and Wyatt Ortibus. The focus of the symposium will be on different ways to study olfactory learning and memory, with a focus on long- and very-long term memory. We have developed new procedures for Pavlovian conditioning, transfer of training and operant conditioning which we would like to introduce. While two presentations (Schellinck and Roddick) will include published studies, the others are all on new, unpublished data. It is unusual to have a symposium of work from only one lab, but I think that it will be of general interest. Also, I know of no other labs doing research on this topic, so it will be unique.

S220 Measuring Olfactory Processes in Mus Musculus. Heather Schellinck, *Dept. of Psychology and Neuroscience, Dalhousie University.*

This presentation briefly reviews the behavioural tests for measuring olfactory acuity and odour discrimination learning. These include the food-seeking test, habituation-dishabituation test, the operant olfactometer and the conditioned odour preference task. The methodology associated with each test is described and the confounds of each are described. Recommendations for increasing the reliability and validity of experiments so as to further our understanding of olfactory processes in both healthy mice and those modelling human disease are made throughout the presentation.

S221 Operant conditioning of odour discrimination learning in Alzheimer's disease model rats and mice. Kyle Roddick, Richard Brown, *Dalhousie University.*

Although Alzheimer's disease (AD) is most often studied in terms of memory impairments, olfactory deficits are an early symptom of AD and olfactory ability has been proposed as a possible diagnostic test for AD. Rodents perform remarkably well on olfactory learning tasks compared to tasks relying upon other senses and investigating olfactory deficits in mouse and rat models of AD can help us understand the effects of AD related mutations and disease progression in these models. The operant olfactometer allows rodents to be tested on a variety of different olfactory based tasks to assess learning, memory, and olfactory sensitivity (Roddick, et al. 2016. *Chemical Senses*, 41, 433–440). In addition to using odour stimuli, the operant olfactometer has the advantage of requiring little motor activity to successfully complete the task. Many models of AD show age-related motor dysfunction, which can be a confounding factor in many behavioural tests of learning and memory. Our lab has tested the 3x-Tg-AD and 5xFAD mouse models of AD, and the McGill-R-Thy1-APP rat model of AD in the operant olfactometer. We present the results of two

odour discrimination learning, reversal learning, delayed matching to sample learning, and olfactory sensitivity tests using these animal models.

S222 Olfactory Discrimination and Reversal Learning by the *Nrxn1*+/- mouse model of Autism Spectrum Disorder. Wyatt Ortibus, Kyle Roddick, Richard Brown, *Department of Psychology and Neuroscience, Dalhousie University.*

The Neurexin 1+/- mouse is a new model of autism spectrum disorder which has not been previously tested. Our experiment trained 6-9 month-old male *Nrxn1* +/- and *Nrxn1* +/+ wildtype (C57BL/6J) mice in an operant olfactometer with tap water or 5% by sucrose reward. The mice were trained to respond to a C+ odour and not to a CS- odour and then given reversal training. The total errors made by the *Nrxn1*+/- mice and wildtype mice were analyzed in each phase of training (Introduction Task, Operant Odour Pair 1, Reversal of Odour Pair) and compared for genotype and sex differences. While there were no genotype differences in the number of errors in the initial operant tasks, there were significantly more errors on reversal learning in the *Nrxn1*+/- mice than in the wildtype controls. The study concludes that the *Nrxn1*+/- mice underperform in reversal learning olfaction tasks in an olfactometer as they demonstrate a weaker cognitive flexibility to perform a reversal task efficiently. Following this experiment, we recommend a larger sample size to verify results as well as testing for gender and age-related effects on reversal learning with the *Nrxn1*+/- autism spectrum model mice.

S223 Measuring memory strength in 5xFAD mice through olfactory discrimination tasks and *Atrx* gene expression in hippocampus. Oliver Schnare, Richard E. Brown, *Dept. of Psychology & Neuroscience - Dalhousie University.*

We investigated behavioural and epigenetic signs of olfactory learning and memory in 9-16-month old 5xFAD & wildtype mice. Mice were trained on a single day using the method of Schellinck et al. (2001 *Chem. Senses* 26:663–72) to associate a CS+ odour with a sugar reward, and a CS- odour with no reward. The behavioural measure of learning was the time digging in each odour pot and the measure of memory was the preference for the CS+ odour pot on 24-hr and 7-day memory tests. Epigenetic signs of learning and memory were measured as the normalized gene expression of *Atrx* in the hippocampus by RT-qPCR analysis. The 5xFAD mice spent significantly more time digging in the CS+ odour pot than wildtype mice during the acquisition stage, however their performances on memory tests did not differ. Wildtype mice displayed higher levels of *Atrx* expression than 5xFAD mice in the experimental groups, however *Atrx* expression was not related to performance on memory tests overall. Our results suggest that 5xFAD mice do not have impairments to olfactory learning and memory, and that *Atrx* expression in the hippocampus may not be related to olfactory learning and memory capabilities.

S224 Pavlovian conditioned odour memory in the Neurexin 1+/- mouse model of Autism Spectrum Disorder. Jessica Garden, *Dalhousie University, Department of Psychology and Neuroscience.*

Neurexins (NRXNs) are presynaptic cell-adhesion molecules that bind with postsynaptic ligands to connect synapses and regulate synaptic transmission. Altered *Nrxn* gene expression is linked to neurodevelopmental disorders, such as autism spectrum disorder (ASD), in which learning and memory are impaired. The *Nrxn1*+/- transgenic mouse model, with the loss of one *Nrxn1* allele, is a novel model of ASD that is utilized in this research. Mice conditioned to dig in an odor pot to receive a reward during a 1-day Pavlovian conditioning paradigm using the method of Schellinck

et al. (2001 *Chem. Senses* 26:663–72), were tested for short- and long-term olfactory memory. Given the recently identified role of NRXN in synaptic stability, we hypothesised that neurexin would be implicated in molecular processes required for long term memory, and thus, the *Nrxn1* +/- mice would have impaired long-term odour memory. Preliminary analyses reveal that *Nrxn1* +/- mice have reduced short-term memory during olfactory digging tasks compared to age- and sex-matched controls, and we expect to observe even greater deficits in long-term olfactory memory in *Nrxn1*+/- mice.

[Building a comprehensive view of multiword and figurative language](#)

S301 Contextual diversity as a lexical organizer of multiword expressions. Marco Senaldi, Debra Titone, Brendan Johns, *McGill University*.

Corpus-based models of the lexicon have suggested that contextual and semantic diversity are more reliable predictors of the lexical organization of single words with respect to word frequency. While contextual diversity builds on the notion of frequency by ignoring repetition in context, semantic diversity encodes the semantic redundancy of a word's contextual occurrences. A recent improvement proposed by Johns (2021) extends the above measures by tracking the variability in speakers' communication patterns across different discourse topics. In this contribution, we assessed whether diversity measures are superior predictors of lexical behavior also for multiword units, here operationalized as idioms, which make up a considerable portion of our linguistic production. Using a 55-billion-word corpus of Reddit comments, we computed measures of contextual, semantic and socially-based diversity for a set of 210 English idioms taken from Libben and Titone's (2008) norms and compared their performance in predicting human ratings of idioms' familiarity and meaningfulness. Results confirmed the superiority of corpus-based indices measuring diversity of social context with respect to frequency and canonical diversity measures. Finally, preliminary analyses were run to explore the cognitive plausibility of diversity measures in predicting online data of idiom processing.

S302 Cross-language activation of idioms. Debra Jared, Pearley Nguyen, Alyssa Grant-Pereira, Qamara Rizkyana, Mirrah Maziyah Mohamed, *Department of Psychology, University of Western Ontario*.

Many studies have shown that when bilinguals encounter words in one language, they activate word representations in their other language. Here, we considered a similar issue with respect to multiword utterances, specifically idioms (e.g., kick the bucket), which can be understood both literally and nonliterally. We examined whether bilinguals get the nonliteral meaning of an idiom from their first language (L1), when they hear a literal translation of the idiom in English (L2) sentences. In separate experiments, the L1 of bilingual participants was Vietnamese, Indonesian, and French. The translated idioms were put into English sentences such that the idiom appeared at the end. We used a cross modal priming paradigm in which the sentences were presented auditorily and then a printed stimulus appeared, and participants made a lexical decision. Critical targets were English words that were either related or unrelated to the L1 idiom meaning. A difference in response times between these target types by bilinguals (and not English monolinguals) indicates that participants activated the nonliteral meaning in L1 when reading in L2. More broadly, the results provide evidence that the range of meanings activated by an L2 speaker can differ considerably from that of an L1 speaker.

S303 How Emotional and Abstract Idioms Are: Affective and sensory-motor Norms for 210 English Idioms. Mahsa Morid, Laura Sabourin, *Linguistics, University of Ottawa.*

Idioms like “she threw a fit” and “she walked on sunshine” typically refer to abstract events and are more emotionally engaging than literal language (Citron et al., 2016). Surprisingly, though, the impact of affective and sensory-motor factors on idiom processing has largely been ignored in all but a few studies. This is partly due to the lack of such norming data on idioms. In this study, we asked 373 English speakers to read 210 idioms and rate them for emotional valence, arousal, imageability, and concreteness. Idioms were selected from a database which provides psycholinguistic properties for the same idioms (Libben & Titone, 2008). We will describe the relation between previously collected psycholinguistic and the newly gathered affective and sensory-motor properties. Moreover, we asked 200 participants to write down the first word that came to their mind upon reading these expressions. The aim is to show whether the provided words are semantic neighbours or whether they are distant in the semantic network. We will discuss a proposal for how the density of neighbours might affect idiom comprehension. This study will provide a useful tool for researchers who are interested in exploring the impact of the collected measures on idiom comprehension.

S304 Insights from concreteness ratings of multiword expressions: Idiomatic expressions are less concrete than the sum of their parts. Emiko Muraki, Summer Abdalla, *University of Calgary*, Marc Brysbaert, *Ghent University*, Penny Pexman, *University of Calgary.*

Concreteness ratings (the degree to which a word’s meaning is understood through perception and action) have been used to test theories of embodied semantic representation, evaluate computational models of semantics, and automate text analysis. Until recently these ratings have been limited primarily to English single words and a small number of two-word expressions. However, there has been increasing research interest in multiword expressions, common word sequences that are used to represent a single meaning or idea. In the present study we collected concreteness ratings for 62,889 compound noun, idiomatic, and particle verb expressions. We found that the rated concreteness of compound noun expressions is strongly related to the mean concreteness of the individual words within the expression. However, the rated concreteness of idiomatic and particle verb phrases were less related to the concreteness of individual words within the expressions, suggesting that these expressions take on a distinct representation from their constituent parts. We offer suggestions for how big multiword expression datasets, such as these new concreteness ratings, might be used to address unresolved research questions related to language acquisition and processing.

S305 A computational model of veridical and false recognition of literal and nonliteral multiword expressions. Nick Reid, Randall Jamieson, *University of Manitoba.*

People falsely recognize sentences that are semantically related to studied sentences (Bransford & Franks, 1971). Reid and Katz (2018) found that this also occurs for figurative expressions that share an underlying metaphorical theme. To examine the issue at precision, we created a computational model of language representation and memory to explain recognition (and false recognition) of ideas expressed in literal and figurative language. In the model, we derived word representations from text corpora using Mitchell and Lapata’s (2010) distributional model of semantics. Then, we used Mitchell and Lapata’s multiplicative functions for combining those word representations to encode the meaning of multiword expressions and sentences. Finally, we imported those word and sentence representations into Hintzman’s (1986) MINERVA 2 model of

human memory to simulate people's recognition performance. With that model, we report successful simulations of both Bransford and Franks' false recognition findings for literal sentences and, more germane to this symposium, Reid and Katz's parallel findings for figurative expressions. Our work demonstrates that people's memory for literal and nonliteral language expressions can be modelled and thereby better understood by a productive integration of theoretical and technical advances in the fields of computational linguistics and cognitive psychology.

S306 Holding the most truth in the least space: An overview. Albert Katz, *Western University (Professor Emeritus)*.

As the discussant of the symposium on multiword and figurative language, I plan to situate the wide range of presented talks within a historical context and identify some possible future avenues for research and theory.

[Well...we didn't see that coming](#)

S307 We don't know what kids want to hear (and they're not very helpful in clearing things up). Blake Butler, *University of Western Ontario*.

Long form auditory narratives like podcasts and audiobooks have grown rapidly in popularity as personal audio devices have become ubiquitous. The pool of potential listeners is quite broad, and includes young children who are increasingly accessing narrative media for entertainment and as part of their educational curricula. While there is a broad literature on children's preferences and habits around written materials, very little work has explored how kids engage with these emerging platforms. In this line of work, we surveyed parents/guardians of 8-13-year-old children to quantify listening behaviours (i.e., average duration/frequency of listening), and to examine the story themes and elements that most engage listeners in this age range. We subsequently developed a set of child-directed stories that would allow us to examine how children engage with spoken narratives across a variety of listening contexts. However, our attempts to validate these stories have provided some surprising results, and have forced us to think critically about subjective evaluation of enjoyment and how the relationship between enjoyment and engagement changes throughout development.

S308 Do you see what I see? When children do (and do not) experience visual illusions. Samantha Gualtieri, Kay Otsubo, Morgan Barense, *Department of Psychology, University of Toronto*, Asaf Gilboa, *Rotman Research Institute at Baycrest; Department of Psychology, University of Toronto*, Amy Finn, *Department of Psychology, University of Toronto*.

We explored perceptual integration in visual illusions across development and made some surprising discoveries along the way. Four- to ten-year-old children (N=93) and adults (N=30) viewed the Ebbinghaus, Sander, and Vertical-Horizontal illusions, which differ in how target items are visually integrated with the surrounding context, with no physical integration in the Ebbinghaus illusion (context does not touch the percept of interest) and direct physical integration in the Sander and Vertical-Horizontal illusions. Given the immaturity of their temporal lobes, we expected that young children would not integrate physically discrete items to perceive the more global context, thus blocking the Ebbinghaus illusion. In contrast, we expected young children to perform similarly to adults on the Sander and Vertical-Horizontal illusions, given that these do not require perceptual integration across space. As predicted, 4- to 6-year-olds experienced the

Ebbinghaus illusion much less compared with older children and adults. And, as predicted, participants of all ages were similarly susceptible to the Sander illusion. However, the Vertical-Horizontal illusion performance was more surprising: children were less susceptible than adults to this illusion! This surprising finding led to new hypotheses in how children's perception is unique and the many ways they see things that adults do not.

S309 Now you see it, now you don't: Measuring left neglect with temporal order judgements. Gail A. Eskes, *Dalhousie University*.

Spatial neglect after right hemisphere lesion is an attentional disorder associated with a failure to orient, detect or respond to stimuli on the left side. In this study, we aimed to characterize the spatial and temporal aspects of attention in neglect with a temporal order judgment (TOJ) task with lateralized stimuli. In this task, two stimuli are presented asynchronously and the viewer judges which one was presented first. The time between the onset of the two stimuli, stimulus onset asynchrony (SOA), varies and the point of subjective simultaneity is calculated to obtain a relative measure of attention/processing speed for each side. We tested an individual with chronic left neglect, who showed the expected pattern of left-sided omissions on a cancellation task, and hypothesized that we would see a right-sided attentional bias for stimuli as previously reported. Unexpectedly, the results showed the opposite pattern and indicated a bias to process left-sided stimuli first, at odds with our prediction. This pattern led to an in-depth case study to examine several hypotheses for these patterns. The findings supported the contribution of strategic endogenous orienting strategies to the recovery of neglect and have implications for the measurement of attention in patient populations.

S310 Searching for feature binding in trial-to-trial spatial repetition effects. Bruce Milliken, *Department of Psychology, Neuroscience & Behaviour, McMaster University*.

The role of feature binding in the coding of object files was introduced 30 years ago (Kahneman, Treisman & Gibbs, 1992; see also Hommel, Musseler & Aschersleben, 2001), and feature binding effects have now been reported in a wide range of literatures in the attention and performance domain. Although feature binding effects are pervasive, much can be learned by studying situations in which they do not occur. The present study centers on a first experiment in which feature binding was expected to influence trial-to-trial spatial repetition effects but did not, and then following experiments that chased after an understanding of this surprising finding. Ultimately, the results of the experiments point to feature binding co-occurring with at least one other process to determine trial-to-trial spatial repetition effects. The importance of distinguishing between processes that contribute to trial-to-trial repetition effects is discussed.

S311 Prediction Error: Sensorimotor Adaptation During Real World Speech Production. Daniel R. Lametti, *Acadia University*.

Sensorimotor adaptation has been extensively studied in speech production using real-time alterations of speech feedback. Typically, participants produce repetitions of the same word into a microphone ("Bed, Bed, Bed"); vowel sounds are altered and played back to them through headphones with an unnoticeable delay so that they hear themselves producing a different word ("Bad, Bad, Bad"). In response, participants learn compensatory changes in speech production to once again hear themselves producing the word they intended to produce. This work demonstrates that the brain predicts the acoustical consequences of simple speech and prediction errors drive sensorimotor adaptation. In 2017, we used altered auditory feedback to test whether

a similar phenomenon might be observed during real-world speech. Our hypothesis, based on the birdsong literature, was that sensorimotor adaptation during varied sentence production would be markedly reduced if present at all. This prediction was wrong. In fact, the extent of sensorimotor adaptation during varied sentence production was identical to that observed during the much simpler task of repetitively producing a single word—a result since replicated in different languages and speaking contexts. Taken together, this work demonstrates that the brain precisely predicts the acoustical consequences of real-world speech production.

Differences in the nature and quality of memory processes: Evidence from young adults and older adults with normal and impaired cognition

S312 The benefit of active navigation on route memory in younger and older adults.

Yadurshana Sivashankar, *University of Waterloo, Canada*, H  l  ne Sauz  on, *Universit   de Bordeaux, France*, Myra Fernandes, *University of Waterloo, Canada*.

Recent studies suggest that memory for routes is enhanced when people actively explore a map, relative to when they passively view a guided tour. In this study, we examined whether the cognitive benefit afforded by active navigation extended to older adults who sometimes have difficulties with way-finding. To this end, we created a set of maps (with routes in park, mall, and urban settings) within virtual reality. Younger and older adults ‘travelled’ along routes within these environments either by actively exploring, using intentional control of their own movement using hand-held controllers, or by passively viewing a guided tour of the maps. Subsequently, their ability to retrace their exact route travelled was assessed. We found a significant main effect of Encoding type such that self-guided active exploration, relative to passive, benefited both younger and older adults. The magnitude of the benefit from active encoding was significantly more pronounced in older relative to younger adults; This occurred despite the fact that older adults showed the expected deficit in memory for landmarks contained within each map. We suggest that self-navigation better engages the cognitive processes underlying route memory, and this factor plays a greater role for older adults.

S313 Autobiographical memory & episodic future thinking in older adults at risk of mild cognitive impairment. Audrey Li-Chay-Chung, Faryn Starrs, *Rotman Research Institute, Baycrest Health Sciences, Canada*, Jennifer Ryan, Morgan Barense, Rosanna Olsen, *Rotman Research Institute, Baycrest Health Sciences, Canada; Department of Psychology, University of Toronto, Canada*, Donna Rose Addis, *Rotman Research Institute, Baycrest Health Sciences, Canada; Department of Psychology, University of Toronto, Canada; School of Psychology, The University of Auckland, New Zealand*.

Research has documented changes in autobiographical memory and future thinking in mild cognitive impairment (MCI) and dementia. However, cognitive decline occurs gradually and may affect these abilities prior to clinical detection. We used the Autobiographical Interview to examine the episodic content of autobiographical past and future events generated by healthy older adults and older adults “at risk” of cognitive decline but not meeting formal diagnostic criteria for MCI. Participants (61-86 years) were enrolled in a larger longitudinal study where a Montreal Cognitive Assessment cut-off score of 26 is used to classify them as “at risk” of MCI or healthy controls (Olsen et al., 2017). Interviews were conducted by telephone during the COVID-19 pandemic across six monthly sessions. In each session, participants described four specific personal events.

Transcripts were scored by classifying each detail as internal or external to the main event, where the number of internal details provides a measure of the ability to generate relevant episodic content, while external details index off-task performance. The “at risk” group exhibited a differential reduction for internal (episodic) but not external details. Results will be discussed in light of recent evidence of early changes in medial temporal lobe integrity prior to clinical diagnosis.

S314 Not all is lost: age effects on episodic recall depend on the kind of episodic content.

Can Fenerci, *McGill University, Department of Psychology*, Emily Davis, Karen Campbell, *Brock University, Department of Psychology*, Signy Sheldon, *McGill University, Department of Psychology*.

Aging is associated with changes in the recollection of specific (i.e., episodic) details from past events. Here, we examined how aging changes the way these details are recalled from a complex event. Younger (N = 25) and older adults (N = 24) watched an 8-minute short-movie and after a delay, described it in detail. We scored the descriptions of the movie for different methods of recalling episodic content, focusing on the unfolding of the event (i.e., event details), incorporating inferences and evaluations about the event (i.e., concept details), or focusing on sensory-perceptual elements of the event (i.e., context details). We further examined the order of episodic content that participants recalled in comparison to order in which the details were presented in the movie. We found that age-groups showed comparable accuracy for event details within the movie. Younger adults tended to focus on recalling event details in the order these details were encoded, whereas older adults tended to recall these details in an order that deviated from encoding. Our data suggest that aging changes how complex episodic events are recalled. In this way, our results indicate that age-differences might be better viewed as shifts in the relative weighing of episodic content.

S315 No Sex Differences in Cognitive Reserve in Memory in Mild Cognitive Impairment. Eden Mancor, Katrina Sollazzo, Nicole Grant, Sana Rehan, Natalie Phillips, *Department of Psychology, Concordia University, Montreal, Canada*.

Cognitive reserve (CR) theory stipulates that life experiences compensate for neurodegeneration. Women generally outperform men in verbal memory, which contributes to CR in later life in that domain. It is unclear whether women have a greater capacity for CR in general, or if there are sex differences in CR in the pre-clinical dementia phases that mirror premorbid sex differences in cognitive performance. In this study, we compared scores by sex on tests of verbal, visuospatial, and associative memory, in which women typically show an advantage in verbal and associative and men in visuospatial memory. We hypothesized to find these sex differences in individuals with small levels of neurodegeneration (defined by hippocampal volume: HpVR) compared to those with larger levels. We analyzed scores on memory tests as a function of HpVR, split by sex, in participants with mild cognitive impairment (Females: n=46, age M=71years; Males: n=58, age M=72years; High education: n=44, M=19.3years; Low education: n=46, M=12.2years). We found no sex differences in memory scores, nor a Sex X HpVR interaction. We found an Education X HpVR interaction, such that high education produced higher scores compared to the low education group at larger HpVR – such a pattern is consistent with CR.

S316 Serial Position Effects and Hearing Loss in the Progression of Alzheimer's Disease.

Katrina Sollazzo, Eden Mancor, Nicholas Grunden, Sana Rehan, Natalie Phillips, *Department of Psychology, Concordia University, Montreal, Canada.*

Serial position effects reflect memory in various stages. The primacy position reveals rehearsed information stored in long-term memory, dependent on hippocampal function. Decreased primacy scores is associated with hippocampal atrophy and is exacerbated by hearing loss in pre- and non-clinical groups. This study examines long-term vs. short-term memory patterns using serial position effects (SPEs) in four groups of older adults: cognitively unimpaired, (n=60 F=49; age M=69; education M=16 years) , subjective cognitive decline (SCD) (n=55 F=43, age M=70, education M=17 years), mild cognitive impairment (MCI) (n=103 F=46, age M=72, education M=16 years), Alzheimer's disease (n=47 F=15, mean age=75, mean education=15 years). We found a position by group interaction. The primacy position better distinguished participants (Controls, SCD > MCI > AD; with a trend for SCD to differ from controls) than did the recency position (Controls, SCD, MCI > AD). There were no significant differences in SPEs as a function of hearing loss for the MCI group. Left hippocampal volume predicted primacy scores increase in the MCI group, consistent with its role in long-term verbal memory storage. These findings suggest that the primacy position is sensitive to early memory loss and hippocampal atrophy.



Talks

Reading & Language

T201 Statistical learning of orthographic regularities during independent text reading by skilled readers: Learning occurs, but is it statistical learning? Nicole Conrad, Ashley Kennedy, *Saint Mary's University Department of Psychology*.

The transition from beginning to skilled reading occurs through the establishment of word representations in memory that enable individual words to be recognized quickly and efficiently, rather than sounded out letter by letter. This process, referred to as orthographic mapping (Ehri, 2014), is facilitated by sensitivity to regularities that exist in the language. Orthographic regularities are the probabilistic co-occurrences of letters and letter patterns within words; for example, knowing that “bl” is a common bigram in English whereas “bk” is not. Awareness of these regularities is predicted to occur through statistical learning (Treiman & Kessler, 2014), a type of implicit learning. We test this prediction in an on-line study with 32 adult readers. The experimental group was first exposed to high vs. low frequency letter bigrams embedded within target pseudowords presented within silently read stories. Spelling production, word reading, and word-likeness tasks were used to assess learning. A control group completed only the outcome measures. Across all outcome measures, learning occurred, but no differences in learning were found between the high and low frequency bigram conditions. Thus, we can conclude that learning of orthographic regularities occurs, but we cannot definitively conclude that statistical learning is the mechanism underlying this effect.

T202 Bilingual language control is influenced by syntactic factors: Evidence from new procedures. Emalie Hendel, Dominic Guitard, Annie Roy-Charland, Jean Saint-Aubin, *Université de Moncton*.

Bilinguals rarely say a word in an unintended language. However, unintended language intrusions occur more frequently when bilinguals read aloud mixed-language texts, and these intrusions highlight bilingual language control processes. Intrusions are more frequent on function than content words and short than long words, but previous studies failed to equate word length within and across languages. These results are analogous to the missing-letter effect in reading in which participants missed the target letter more frequently in function and in short words. With that in mind, we developed a new procedure in which participants searched for language switches while silently reading. In Experiment 1, 48 English-French bilinguals read texts in which word length was equated within and across languages (e.g., the/les, sea/mer) while clicking on the few words presented in the wrong language. Results revealed that language switches were missed more frequently on function than on content words and on short than on long words. To control for eye movements, in Experiment 2, we used a Rapid Serial Visualisation Procedure. Results from another 48 English-French bilinguals replicated results of Experiment 1. Experiments 3 and 4 also replicated the results of the previous experiments among French first language bilinguals.

T203 Lexical decisions in ortho-semantic learning: A behavioural study of grade 3 children in English and French Immersion. Laura Elliott, *Dalhousie University, Canada*, Alena Galilee, *School of Psychology and Life Sciences, Canterbury Christ Church University*, Lisa Beck, *University of Rochester Medical Faculty Group, University of Rochester Medical Center*, Jennika Veinot, *Department of Medical Neuroscience, Dalhousie University*, Clara Lownie, *Dalhousie University*, and Research Assistant Western University, Catherine Mimeau, *Department of Human Sciences, Arts and Communication, Universite Teluq*, Helene Deacon, Aaron Newman, *Department of Psychology and Neuroscience, Dalhousie University, Canada*.

Enrolling a child in French or English education is an important decision, however little research has considered its impacts on reading development. We recruited native English speaking children in grade 3, in English and French immersion, to complete a novel ortho-semantic learning task (Mimeau et al., 2018). They read passages introducing novel words, followed by a multiple-choice test on the meanings and spellings of the words. Participants from both language programs showed equivalent learning of both spellings and meanings of novel words. Participants also completed a lexical decision task (LDT) with the novel words, real words, non-words, consonant strings, and false fonts. While both groups showed high (>95%) accuracy on real words, English students performed significantly worse in recognizing newly-learned words, while French students showed comparable performance on real words and newly learned words. Reaction times on the LDT were significantly faster for English students across all conditions. These results suggest that receiving formal reading education in a second language may reduce children's speed for making judgements on words in their first language, however it does not appear to influence their accuracy. Indeed, French immersion may confer a greater ability to learn spellings and meanings of words from context.

T204 Using Perspective Cues in Pronominal Reference Resolution during Online Reading. Tiana Simovic, Craig Chambers, *University of Toronto*.

Psycholinguistic accounts of pronoun resolution have tended to emphasize the influence of discourse-level and lexical cues (e.g., first-mention, coherence relations, implicit causality). Comparatively less work has investigated effects of situation-specific pragmatic reasoning. Here, we explore the latter by drawing on communicative perspective-taking (readers' reasoning about the mental states of story characters). Critical sentences contained pronouns whose gender-marking forces coreference with either a "perspectively-congruent" or "perspectively-incongruent" antecedent ("Sophia [asked Jerome if/told Jerome that] [he/she] likes learning new languages", wherein Sophia is unlikely to ask Jerome what SHE likes, likely entailing a processing "boggle" for [she] vs. [he] with the verb "ask", but the opposite pattern with "tell"). Self-paced reading measures showed statistically-reliable effects of pragmatic reasoning emerging several words downstream from the pronoun. Importantly, there was NO effect of antecedent topichood/first-mention. We argue that the downstream effect reflects a rational perspective-taking process that recognizes the potential importance of post-pronoun sentence content. (For example, with "Sophia asked Jerome if she/he had lint on the back of her/his coat", post-pronoun information makes it more sensible to link the pronoun(s) with the "asker" rather than the addressee.) Together, the results extend our understanding of how language comprehension spontaneously draws on forms of pragmatic reasoning.

T205 Do Phonological Processing Skills Differentially Modulate Monolingual and Bilingual Children's Eye Movement Reading Behaviour for Naturalistic Texts? E. L. Guedea, S. MacIsaac, *University of New Brunswick*, M.F. Joanisse, *University of Western Ontario*, V. Whitford, *University of New Brunswick*.

Little experimental research has investigated online reading behaviour in children, especially those from bilingual backgrounds, despite its importance to their learning outcomes and overall academic success. With increasing bilingualism rates across Canada and the world, a better understanding of how bilingualism impacts reading behaviour is crucial. Here, we help address this imbalance in the literature by examining how differences in an important reading-related skill, phonological processing (phonological awareness, phonological memory, and rapid naming), among English monolingual (n = 34) and English-French bilingual (n = 33) school-aged children influence their first-language (L1) and second-language (L2) eye movement reading behaviour for texts containing words varying in frequency. Linear mixed-effects models revealed that reduced L1 phonological processing skills related to reduced L1 lexical accessibility (evidenced by larger L1 word frequency effects) in both language groups, but especially so in bilingual children. They also revealed that reduced L2 phonological processing related to reduced L2 vs. L1 lexical accessibility (evidenced by larger L2 word frequency effects) among bilingual children. Our findings suggest that phonological processing skills do indeed influence children's online reading behaviour, but particularly under conditions of low lexical entrenchment: among bilinguals and during L2 reading.

[Memory 1](#)

T206 Simulating dissociations between true and false recognition in the production effect. Evan Curtis, *Booth University College*.

Saying a word aloud at study increases rates of recognition relative to non-produced words, a robust and well-known phenomenon known as the production effect. In addition to benefitting true recognition, verbal production has also been shown to reduce rates of false recognition. For example, Dodson and Schacter (2001) demonstrated that false alarms to critical lures in a standard DRM procedure were lower after saying a word aloud rather than simply seeing and hearing the word. However, the reduction was larger in a pure-list condition than in a mixed-list condition. It is well established that the opposite pattern occurs in true recognition. Together, the two patterns form a dissociation between true and false recognition as a result of production. I treat the dissociation as a challenging target for computational accounts of the production effect and, more generally, of memory. I simulate Dodson and Schacter's findings in Minerva2, an instance model of human memory. The model accommodates the dissociation with minimal adaptation, demonstrating its ability to not only explain a growing collection of experimental phenomena but also their interactions.

T207 The Effect of Production on Background Context Memory. Victoria Kavanagh, Kathleen Hourihan, *Memorial University of Newfoundland*, William Hockley, *Wilfred Laurier University*.

Whether production influences memory for an item's context has yet to be examined. In the current study, participants studied a list of words presented on background images. Half of the words were read aloud, and half were read silently. In Experiment 1, half of the studied items were tested on their studied background context image and half were tested on a new image. Although a production effect in word recognition was observed, context reinstatement had only a marginally

significant influence on hit rates and did not affect the production effect. However, false alarms to new words tested on studied background images differed based on production condition. In Experiment 2, recognition of studied words and background images were tested separately to examine whether production overshadowed encoding of background context. A production effect was found in word recognition, but there was no effect in image recognition. Experiment 3 used cued-recall testing with the studied background images as the cues. A production effect was found, but participants also showed higher intrusions of studied aloud items. Results are discussed in terms of how production influences encoding of context.

T208 Symbol superiority: Why \$ is better remembered than 'dollar'. Brady R.T. Roberts, Colin M. MacLeod, Myra A. Fernandes, *University of Waterloo*.

Retrieval is usually superior for information initially presented in picture format relative to word format. Dual-coding theory (Paivio, 1969) proposes that this is because pictures lead to imagery plus spontaneous verbal labelling, taking advantage of two codes, whereas words provide only a single (verbal) representation in memory. We investigated whether common symbols (e.g., !@#\$%&) are processed more like pictures or words: Are symbols afforded only verbal coding, akin to words, or do they also invoke visual imagery, as do pictures? Across four experiments, participants were presented at study with symbols or words (i.e., \$ or 'dollar'). We hypothesized that if symbols are processed using imagery, then at test they should be better recalled than words. In Experiment 1 memory was assessed using free recall; Experiment 2 used old-new recognition. Experiment 3 restricted the word set to a single category. Experiment 4 directly compared memory for symbols, pictures, and words. All four experiments demonstrated a memory benefit for symbols relative to words. In line with recent work on intrinsic stimulus memorability, ratings of symbol familiarity correlated positively with memory performance. These findings are consistent with the idea that, like pictures, symbols benefit memory by eliciting distinct representations in memory.

T209 The Production Effect Interacts with Serial Positions: Further Evidence from a Between-Subjects Manipulation. Sébastien Gionet, *École de Psychologie, Université de Moncton, Canada*, Dominic Guitard, *École de Psychologie, Université de Moncton, Canada, and Department of Psychological Sciences, University of Missouri, USA*, Jean Saint-Aubin, *École de Psychologie, Université de Moncton, Canada*.

Reading some words aloud during presentation, that is, producing them, and reading other words silently generate a large memory advantage for words that are produced. This robust within-list production effect is in contrast with the between lists condition in which all words are read aloud or silently. In a between-lists condition, produced items are better recognized, but not better recalled. The lack of a between-lists production effect with recall tasks has been presented as one of its defining characteristics and as a benchmark for evaluating models. Recently, Cyr et al. (2021) showed that this occurs because item production interacts with serial positions: Produced items are less well recalled on the first serial positions than silently read items, while the reverse pattern is observed for the recency portion of the curve. However, this pattern was observed with a repeated-measures design, and it may be a by-product of compensatory processes under the control of participants. Here, using a between-participants design, we observed the predicted interaction between production and serial positions. The results further support the Revised Feature Model suggesting that produced items are encoded with more modality-dependent distinctive features, therefore benefiting recall. However, the production of the additional features would disrupt rehearsal.

T210 Voluntary and involuntary autobiographical memories: More similar than different?

Ryan Yeung, Myra A. Fernandes, *Department of Psychology, University of Waterloo, Canada.*

In everyday life, memories of one's personal past (autobiographical memories; AMs) are typically retrieved either voluntarily or involuntarily. Whereas voluntary AMs are retrieved using deliberate search processes, involuntary autobiographical memories (IAMs) pop into awareness without any attempt at retrieval. Recent work indicates that these IAMs are often recurrent: episodes of the same event are reexperienced repetitively. However, the basic nature of recurrent memories as a form of AM is disputed. While some argue that recurrent IAMs and voluntary AMs exist along a spectrum in terms of memory properties (e.g., vividness, emotionality), others argue that they are categorically different phenomena with categorically different impacts on mental health (e.g., depression, PTSD). Here, we examined current models of IAMs by administering surveys to undergraduates (N = 4,801), which probed for recurrent IAMs, voluntary AMs, and symptoms of mental health disorders. Results indicated that recurrent IAMs were largely distinguished by higher emotionality/importance and lower vividness than voluntary AMs, though both types of memory overlapped considerably with regard to memory properties. Importantly, the emotionality of recurrent IAMs predicted symptoms of mental health disorders significantly better than voluntary AMs. Our work supports modeling recurrent IAMs as general cognitive phenomena with unique links to mental health.

T211 The Study of Recognition Memory Response Bias with First and Second Language.

Majd-Zahia Hawily, D. Stephen Lindsay, Kaitlyn M. Fallow, *Graduate School of Psychology, University of Victoria, Canada.*

In recognition memory tests, subjects may demonstrate liberal, conservative, or no response bias as defined in signal detection theory. Across a number of studies, we found that subjects showed a liberal or neutral bias when presented English words as stimuli. We aimed to extend our research in to compare response bias for bilingual subjects to detect whether response bias could be better for their first language compared to their second-learned language. We recruited 50 participants, of all nationalities, having English as their first language and French as their second fluent language. Unexpectedly, in our study, subjects tended to show a neutral response bias for French and a conservative bias for English.

Attention 1

T212 Perceptual and social salience drives initial eye movements when viewing banknotes.

Biljana Stevanovski, *Department of Psychology, University of New Brunswick, Fredericton, New Brunswick, Canada*, Jane E. Raymond, *School of Psychology, University of Birmingham, Edgbaston, Birmingham, United Kingdom*, Raymond Klein, *Department of Psychology and Neuroscience, Dalhousie University, Halifax, Nova Scotia, Canada.*

Eye movements are thought to be controlled partly by a low-level response to perceptual salience in scenes, and by internal cognitive processes related to goals and meaning. Some studies suggest that these control systems have similar contributions across successive fixations. Other work suggests that salience plays a major role early in a looking episode. Rapid salience-based control indicates the importance of design for briefly viewed objects (e.g., banknotes). To investigate, we presented 24 banknotes (3x each) with/without portraits and measured sequential fixations of 24 observers. The spatial distribution of salience on each banknote was determined using a graph-based visual salience algorithm that was or was not augmented to boost salience for one primary

social (face, body) or non-social (building, map) element. Saliency-based looking was indexed by the correlation between saliency and fixation distribution. On average, saliency-based control was strongest for the first two fixations and degraded thereafter. Boosting saliency for social elements enhanced these correlations, but only for later eye movements. Results suggest that early fixations are more likely to be controlled by saliency, including social saliency, than later fixations. A design implication is that information critical for safe and effective use of briefly handled objects should be especially salient.

T213 Does ‘the pill’ predict attention? The relation between oral contraceptive use and sustained attention. Alyssa Smith, Effie Pereira, Daniel Smilek, *University of Waterloo*.

Oral contraceptives (OCs) are used by more than 150 million women worldwide, yet few studies have probed the relation between the use of this hormone-based medication and its effects on cognition, and more specifically sustained attention. In the present study, we examined the relation between OC use and sustained attention during a cognitive task by recruiting a large and diverse sample of women who were currently using OCs (N = 110) or who were not using any form of hormonal contraceptives (including OCs; N = 326). Both groups completed the Sustained Attention to Response Task (SART) online, during which participants were intermittently presented with thought probes that asked them to indicate whether they were on task or mind wandering just before the probe appeared. SART performance was used as a behavioural metric of attentional engagement and the thought probes were used as a convergent measure. We found no significant differences between groups on SART performance or reports of mind wandering, indicating little evidence for the notion that OC use is associated with detriments in attention.

T214 Narrow and unloved? Probing the role of inhibition in the ability to change the breadth of attention. Niyatee Narkar, Mark J. Fenske, *Department of Psychology, University of Guelph*.

Narrowing the focus of attention can be critical for our survival, as it enhances perceptual sensitivity and behavioural responsiveness to information needed to fulfil needs or avoid threats. Some accounts (amplification-plus-inhibition) suggest that effective information processing inside a narrowed attentional focus is accomplished in part through the inhibition of distracting or otherwise-irrelevant peripheral information. Other accounts (amplification only) contest this role of inhibition and maintain that narrowing attentional focus solely requires enhancing the processing of stimulus representations within the focus. Here we combine a global/local perceptual manipulation of the scope of attention with an affective-evaluation task to test between these two competing hypotheses. If narrowing attention to the local elements of a stimulus involves inhibition, such items should become affectively devalued relative to when attention is drawn to their global elements because inhibited stimuli tend to be rated more negatively than non-inhibited stimuli in subsequent evaluations. We discuss our results (N=154) in terms of the close interplay between mechanisms of attention and emotion and growing evidence of the usefulness of affective measures for probing the functional architecture of the mechanisms supporting visual cognition. Our results also underscore the importance of considering individual differences in the link between attention and emotion.

T215 The Relationship Between Sustained Attention and Mobile Phone Screen Time.

Kathryn Nason, Jonathan Wilbiks, *Associate Professor, University of New Brunswick Saint John.*

Cognitive load has been shown to increase in individuals when they are in the same room as their mobile phone, a relationship that is worse for those who are more phone-dependent. Sustained attention performance is also impacted due to exogenous attentional cues such as receiving mobile phone notifications. The present study was conducted to examine the relationship between mobile phone behaviours and sustained attention. The Cognitive Failures Questionnaire and the Mobile Attention and Preoccupation in Phones Scale were used, in addition to screen time and notifications reported from the individual based on their phone settings. It was hypothesized individuals who reported perceived attentional failures would perform worse on the Sustained Attention to Response Task, in both fixed and random conditions. We found participants who reported more attentional failures predicted improved sustained attention, however those who reported higher preoccupation reported lower sustained attention accuracy and slower reaction time. In addition, notifications were shown to be a predictor of lower sustained attention accuracy. These findings connect the literature surrounding the negative impact mobile phones have on cognition, with the influences of cognitive load on mobile phone screen time, causing lapses in sustained attention and affecting everyday life in those with more usage.

T216 Exploring “immunity” from attention capture: Is there an extra cost when disengaging from a recently cued fixation stimulus?. Seema Prasad, *TU Dresden*, Brett Feltmate,, Celia Briand, Dawson Sutherland, Raymond Klein, *Dalhousie University.*

Ruthruff and Gaspelin (2018; hereafter R&R) claimed “immunity to attention capture at ignored locations” from their finding that peripheral cues at irrelevant locations fail to capture attention relative to a no-cue baseline. Previously, Ishigami, Klein and Christie (2009) reported reduced attentional capture but not “immunity.”. An important difference between these studies was that Ishigami used an audible warning beep as an alerting signal on every trial whereas R&R did not. When we (Prasad, Mishra and Klein, 2021) replicated R&R’s design while eliminating their alerting confound by providing a warning signal on every trial, we found reduced capture but no evidence for immunity. R&R tried to address this confound in their Experiment 2 by including a central cue condition as the baseline. They found equivalent performance on cue absent, central cue, and irrelevant cue trials. Although such a central cue addresses the alertness confound, we hypothesized that it introduced a different one: The central cue could have slowed down responses due to delayed disengagement from a recently changed central fixation. In the present study we tested this hypothesis in two experiments closely built upon the methods of Ishigami and R&R.

Cognitive Neuroscience

T217 The timing of sensorimotor activation in picture and word comprehension: A spatiotemporal representational similarity analysis. Heath Matheson, Susie MacRae, Nicole White, *Psychology Department, University of Northern British Columbia.*

How do we identify objects and understand the meaning of words? Embodied theories of cognition propose that these capacities are supported by the reactivation of sensorimotor systems that are active during experience with objects. However, the timing of these reactivations is largely unknown. In the present study, we investigated the timing of activation of sensorimotor knowledge in object and word comprehension. Participants (n = 17) categorized pictures of

common tools or their nouns while we recorded electroencephalography (EEG). We used spatiotemporal representational similarity analysis (RSA) to decode the timing of representations of sensorimotor information (based on ratings of manipulability) during picture and noun categorization. We showed robust ($BF > 6$) decoding of sensorimotor information at approximately 200 ms for pictures and at approximately 400 ms for words. This suggests that sensorimotor contributions to representations of concepts occur early in processing pictures, where the image provides visual cues to object manipulability; conversely, sensorimotor contributions to reading comprehension occur later, likely due to the extra processing time required to associate word forms with previous experience. Overall, our results provide the first evidence of the timing of sensorimotor contributions to the meaning of words and objects and significantly advance theories of embodied cognition.

T218 Distraction disrupts attentional filtering: Neural and behavioural evidence for the Filter Disruption Theory. Blaire Dube, Lasyapriya Pidaparathi, Julie Golomb, *The Ohio State University*.

What are the consequences of distraction? Aside from spatial capture of attention and slowed visual search, we propose a broader Filter Disruption Theory (FDT): distraction also disrupts nonspatial filters that gate feature-based attention and working memory encoding. To test this theory, we used fMRI to assess filters controlling category-based attentional selection (E1) and a behavioral memory-driven capture paradigm to assess filters gating working memory access (E2). In E1 participants viewed arrays of hybrid face/house images while performing a 1-back task. On no-distractor trials, we found the standard pattern of attentional modulation (greater activation in FFA during attend-faces and PPA during attend-houses). However, on trials containing a salient abrupt-onset distractor, attentional filtering was disrupted, resulting in increased neural processing of the irrelevant category. In E2, participants performed two consecutive visual search tasks. In the absence of a distractor on search 1, irrelevant color information was filtered from VWM. However, when a salient distractor appeared, the irrelevant features of the distractor were incidentally encoded into memory and then drove subsequent attention on search 2. These data support out FDT and broaden our understanding of the consequences of distraction: beyond spatial capture, distraction disrupts the filters that control attentional selection and VWM encoding.

T219 Pupil size anticipates exploration and predicts disorganization in prefrontal cortex. Akram Shourkeesthi, Gabriel Marrocco, *Department of Neurosciences, University de Montreal, Montreal*, Tirin Moore, *Department of Neurobiology, Stanford University School of Medicine, R. Becket Ebitz, Department of Neurosciences, University of Montreal, Quebec*.

In uncertain environments, we generally exploit rewarding opportunities but sometimes explore uncertain alternatives that could be better. At the onset of exploration, neuronal activity patterns in the prefrontal cortex suddenly disorganize, which could promote discovery and learning. One possible mechanism behind this disorganization is pupil-linked neuromodulatory systems. However, it is not clear whether pupil size predicts neural signatures of exploration or transitions to exploration. Here, we simultaneously measured pupil size and neuronal activity in the prefrontal cortex while two rhesus macaques made decisions in a dynamic environment that encouraged both exploration and exploitation. We found that pupil size was larger during exploration than exploitation and predicted disorganized patterns of prefrontal activity in both single neurons and populations. The pupil also exhibited surprising trial-by-trial dynamics: it grew larger across trials before exploration, then abruptly decreased to below-baseline levels. Because

pupil size dropped immediately after the first explore trial, pupil-linked mechanisms may anticipate the start of exploration, without being sustained throughout periods of exploration. In sum, we found that pupil size tracked both exploratory behavior and its neural correlates. However, the trial-by-trial dynamics of these effects implicate pupil-linked mechanisms at the onset of exploration, rather than in sustaining exploration over time.

T220 Representational similarity analysis of fMRI data reveals differential representation of phonological information in aloud versus silent reading in the context of the production effect. Lyam Bailey, *Dalhousie University*, Glen Bodner, *Flinders University*, Heath Matheson, *University of Northern British Columbia*, Jonathan Fawcett, *Memorial University of Newfoundland*, Aaron Newman, *Dalhousie University*.

Memory is improved for words spoken aloud compared to words read silently; this is known as the production effect. One account holds that produced words benefit from more distinctive encoding—speaking aloud entails sensory components (moving one’s mouth, hearing one’s own voice, etc.) that are absent in silent reading. Recent fMRI work has shown that speaking aloud indeed recruits auditory and motor cortices, even when controlling for non-specific articulatory processes, and that this recruitment seems to support encoding. However, it remains unclear whether speaking aloud also confers greater attention to, or deeper semantic processing of aloud words during encoding. The current study seeks to tease apart these processes using representational similarity analysis. We report results from an fMRI study in which participants read words either aloud or silently during fMRI scanning. Item-specific activation patterns were compared against computational models representing phonological, orthographic, semantic, and visual information. Preliminary results indicate that, compared to silent words, aloud words are associated with greater representation of phonological information across multiple brain regions, including motor and auditory cortices. These results suggest that the rich, multisensory experience associated with articulation allows differentiation of individual words at the neural level, which may support encoding and subsequent retrieval.

T221 Neuropsychological Sequelae of COVID-19 Critical Illness: A Prospective Observational Study. Sydni Paleczny, *Neuroscience Graduate Program, Schulich School of Medicine & Dentistry, Western University*, Michelle Wong, Karen Bosma, John Basmaji, Marat Slessarev, Cheryl Forchuk, Danielle Leblanc, Krista Wright, *Division of Critical Care, Department of Medicine, London Health Sciences Centre*, Adrian Owen, *Department of Physiology & Pharmacology, Schulich School of Medicine & Dentistry, Western University*; *Department of Psychology, Western University*, Kimia Honarmand, *Division of Critical Care, Department of Medicine, London Health Sciences Centre*.

Background. Patients who survive severe COVID-19 often report cognitive deficits, colloquially called ‘brain fog’, that may persist long after recovering from acute illness. Evaluating long-term cognitive outcomes is often time-consuming and costly. The Cambridge Brain Sciences (CBS) is a widely used, web-based neurocognitive battery that can be self-administered by patients remotely. **Objective.** We aimed to establish a feasible, web-based approach to evaluating neuropsychological function and to characterize neuropsychological function among survivors of severe COVID-19. **Methods.** We recruited adults (>18 years old) between 6-12 months after hospitalization with severe COVID-19. We excluded non-English speakers and patients with cognitive, visual, or motor deficits. Patients completed the 6-test version of the CBS using a computer or tablet device. We defined cognitive impairment as a score of 1.5 standard deviations below age- and sex-matched norms from healthy controls. **Results.** Thirty survivors of COVID-19 (13 women, median age: 62, IQR = 48-74) completed the CBS-6. Twenty-one patients showed

impairment on at least one test, 11 participants had mildly impaired reasoning ability, and 18 had impaired verbal processing skills. Conclusions. Remote neuropsychological evaluation using the CBS-6 is feasible and may facilitate long-term patient evaluation. Severe COVID-19 survivors had impaired function on verbal processing and reasoning skills.

T222 Re-analysis of body representation in the somatosensory cortex: An investigation of the “femunculus”. Saisha Rankaduwa, Jennifer Stamp, *Dalhousie University*.

Despite his collection of data from females, the original 2-D somatosensory homunculus based on Wilder Penfield’s work lacks any representation of uniquely female anatomy. For this reason, we created a quantitative 2-D map of female-specific anatomy in the primary somatosensory cortex (S1) based upon a systematic review of published neuroimaging literature, that comprised 11 studies. These studies reported localization of representations of the clitoris, cervix, vagina, dorsal pudendal nerve, perineal nerve, nipple, and breast in the medial wall of S1 in the paracentral lobule — corresponding to the genital region of the homunculus. Representations of the dorsal clitoral nerve, posterior vulva, clitoris, breast, and nipple were also found in the secondary somatosensory cortex (S2), outside the genital region as defined in the male homunculus. Our findings indicate inconsistencies between the locations of anatomical parts between studies. This emphasizes the gaps in our knowledge of how the female body is represented in the brain. Understanding these limitations allowed us to propose a research plan that comprehensively maps female-specific anatomy in the somatosensory cortices. The creation of a female somatosensory “femunculus” is necessary considering the implications it has for assessing neuroplasticity after changes to female anatomy in mastectomies and gender affirmation surgery.

[Metacognition](#)

T223 The sense of agency in joint action: Investigating joint agency in duet and ensemble music performance. Janeen Loehr, *Department of Psychology and Health Studies, University of Saskatchewan*.

When people perform joint actions together, their individual actions (e.g., producing a series of tones) must be coordinated to achieve a collective goal (e.g., performing a musical duet). Engaging in joint action has intriguing consequences for people’s sense of agency, that is, their sense of generating and controlling actions and their effects on the world. Namely, each person engaged in a joint action can have a sense of agency not only at the individual level (a sense that “I did that” or “You did that”), but also at the collective level (a sense that “We did that together,” referred to as joint agency). This presentation will discuss three studies that investigated joint agency in musical joint action. These studies employed a mixed-methods approach that included experimental manipulations of joint agency in duet music performance and qualitative investigations of people’s first-hand reports of joint agency in a variety of musical settings. Implications of our findings for understanding different forms of joint agency, including shared agency (a sense that agency is distributed among co-performers) and united agency (a sense that co-performers are acting a single unit), as well as implications for models of agency in joint action, will be discussed.

T224 Observed Relationships Between Confidence, Cognitive Ability, and Metacognition in a Decision Making Task. Clark Kish-Greer, Valerie Thompson, *Department of Psychology, University of Saskatchewan, Canada.*

This project examines the impact of cognitive ability and trait confidence on one's perception of metacognitive cues in a problem-solving task. 143 University Students evaluated the validity of sixteen logical syllogisms, rating their certainty in each answer. Problems were completed twice, once under deadline and again with no time constraint. Participants also completed two inventories: The Personal Evaluation Inventory (PEI), a measure of trait confidence, and the ICAR, a measure of cognitive ability. Marginally significant effects of PEI and ICAR on item-level confidence and accuracy were detected, suggesting that performance on these individual difference inventories is related to behaviours that occur in the moment. We also found significant correlations between PEI scores, ICAR scores, and engagement in changing answers between time conditions. Our most puzzling finding was the large effects of time and question type that disappeared when we included the PEI and ICAR as covariates. These effects indicate that the examined individual difference variables play a role in one's performance and other relevant behaviours in a logical reasoning task, though the exact nature of this role remains to be determined.

T225 Judgments of Learning Reveal Conscious Access to Stimulus Memorability. Joseph Saito, *Psychology Department, University of Toronto, Canada*, Matthew Kolisnyk, *Psychology Department, Western University, Canada*, Keisuke Fukuda, *Psychology Department, University of Toronto Mississauga, Canada.*

Despite the massive capacity of visual long-term memory, individuals do not successfully encode all visual stimuli that they wish to remember. This variability in encoding success has been traditionally ascribed to fluctuations in cognitive states (e.g., sustained attention) and encoding processes (e.g., depth of encoding) at the time of learning. However, a considerable amount of encoding variability also stems from intrinsic properties of the stimuli that make them more or less memorable across individuals. While some of these intrinsic properties have been identified, much about memorability remains unknown, including whether individuals are aware of the memorability of stimuli that they encounter. Here, we investigated whether individuals have conscious access to the memorability of real-world stimuli while forming self-referential judgments of learning (JOL) during memory encoding (Experiments 1A-B) and when asked about the perceived memorability of stimuli in the absence of attempted encoding (Experiments 2A-B). Both JOLs and perceived memorability estimates were consistent across individuals and predicted memorability. However, this access was not comprehensive; individuals unexpectedly remembered and forgot consistent sets of stimuli as well. Thus, individuals have conscious access to some—but not all—aspects of memorability and this access persists regardless of the demands on memory encoding.

T226 How does asking about memory change performance? Assessing the reactivity of metacognitive judgments through memory for order. Katherine Churey, Skylar J. Laursen, *Neuroscience & Applied Cognitive Sciences, University of Guelph, Canada*, Chris M. Fiacconi, *Associate Professor, Department of Psychology, University of Guelph, Canada.*

In everyday life, individuals automatically commit experiences to memory in a structure that can guide later recall attempts. Often, this structuring follows the order in which experiences originally occurred, such that experiences that occurred close in time are more likely to be recalled together

than those that were further apart. This pattern of recall, known as the Temporal Contiguity Effect (TCE), is influenced by how information is processed during encoding, and is typically largest when the temporal relations between experiences are emphasized. According to the item-order framework, encoding of relations between experiences disrupts encoding of information specific to each unique experience, and vice versa. Interestingly, some encoding task manipulations – including those commonly used when studying metamemory – have been shown to promote item-specific encoding; suggesting that they may weaken the TCE, per the proposed processing trade-off. Indeed, we recently found that making metacognitive control decisions (e.g., choosing whether to re-study a given item) during encoding resulted in a reduced TCE. Moreover, our current research suggests that metacognitive monitoring tasks (e.g., making judgments of learning; JOLs) may have a similar effect. Importantly, these findings question the default assumption that metacognitive judgments merely probe metamemory processes without affecting memory performance itself.

Cognitive Development

T227 What children bring to reading through elementary school.. Helene Deacon, Stephanie Hartlin, Alex Ryken, Mariam Elgendi, Elizabeth MacKay, Tamara Sorenson Duncan, *Department of Psychology and Neuroscience, Dalhousie University, George Frempong, Delmore Buddy" Daye Learning Institute".*

Learning to read is one of the most important achievements in the elementary school years. And it begins early, with oral language skills. We examined the components within the broader construct of oral language: children's awareness of the sounds, meanings and components of words, as well as of sentences. We report here on a large-scale study designed to investigate these component language skills in a study with 300 elementary school aged children across 18 schools in Nova Scotia. In grade 1, we assessed multiple components of their language skills. We report here on how each of these supported reading through to Grade 2, and our plans with this study now that schools have reopened to research.

T228 Contributions of syntactic and morphosyntactic awareness to children's reading comprehension: A longitudinal study. Erin Robertson, *Cape Breton University*, Elizabeth J. MacKay, *Dalhousie University*, Helene S. Deacon, *Dalhousie University*, Mark T. Vickers, *School Psychologist, NB*, Catherine Mimeau, *U Teluq*.

Syntactic awareness is the ability to reflect on and manipulate the organization of words within sentences and its value is acknowledged in reading comprehension models (Perfetti & Stafura, 2014). Words within sentences are composed of morphemes, the smallest meaningful units of language, and measurements of syntactic awareness are often conflated with morphological awareness - the ability to analyze words based on their morphological structure. We designed a task to tease apart contributions of syntactic and morphological awareness. 163 children in Grades 3-4 completed an oral word order correction task with scrambled words containing trials with syntactic, morphological, and both syntactic and morphological violations. Reading comprehension was measured at two time periods, one year apart. A hierarchical linear regression controlled for reading comprehension at time 1 and word reading, phonological awareness, working memory, and nonverbal cognition. Subsequently syntactic and morphosyntactic awareness emerged as a significant predictor of gains in year 2 reading comprehension, but only in the younger group. Morphological awareness was not a significant predictor. Results are discussed

within the framework of reading comprehension models (Gough and Tunmer, 1986, Perfetti & Stafura, 2014) and changes in reading development over the mid-late elementary school years.

T229 Uncovering Children’s Developing Category Representations. Pablo Leon-Villagra, *Department of Cognitive, Linguistic & Psychological Sciences, Brown University, USA*, Isaac Ehrlich, *University of Toronto, Canada*, Christopher G. Lucas, *Informatics, University of Edinburgh, UK*, Daphna Buchsbaum, *Department of Cognitive, Linguistic & Psychological Sciences, Brown University, USA*.

Uncovering how categories develop through childhood is crucial for cognitive science. However, even for simple domains, categories can be complex, making it challenging to access them experimentally. As a result, most experiments only probe the categorization of a small set of items by asking for the item’s category features or determining their similarity to each other. Here, we present a method that is based on a statistical procedure that is not limited to probing a few experimenter-picked stimuli (Markov Chain Monte Carlo with People, MCMCP). MCMCP allows us to produce exemplars from children’s implicit categories directly. Instead of querying pre-specified materials, MCMCP adaptively selects which stimuli to present, allowing us to focus on the most informative exemplars. We use MCMCP to uncover age-dependent differences in the category organization of fruits in a pre-registered online experiment. Comparing five-year-olds, seven-year-olds, and adults, we find a developmental progression of initially broad and overlapping fruit categories to more differentiated distributions. Furthermore, we find that across age groups, apple and grape categories exhibit bi-modal color distributions. We discuss these results in the context of theories of randomness reduction over the lifespan and shape biases in category induction.

T230 Word Age of Acquisition Effects on Bilingual Reading Behaviour Across the Adult Lifespan: An Eye-Tracking Investigation. Courtney Stacey, Narissa Byers, Gabrielle Levasseur, *University of New Brunswick*, Debra Titone, *McGill University*, Veronica Whitford, *University of New Brunswick*.

Although the ability to read is central to older adults’ daily lives, age-related changes in reading performance have received relatively little experimental investigation, especially among bilingual older adults. With increasing aging and bilingualism rates globally, a better understanding of reading in bilingual older adults is crucial. Here, we help address this gap in the literature by investigating both French-English bilingual younger (19-30 years) and older (61-81 years) adults’ first-language (L1) and second-language (L2) eye movement reading behaviour for naturalistic texts, as a function of a key lexical property: word age of acquisition (AoA)—the age at which words were learned. Linear mixed-effects models revealed robust word AoA effects across the L1 and L2 in both age groups, where earlier-learned words were read faster than later-learned words (evidenced by shorter fixation durations). However, the magnitude of these effects was larger in bilingual older adults (across both languages) and during L2 reading (across both age groups). Taken together, our findings suggest that word AoA exerts a strong influence on bilinguals’ eye movement reading behaviour, especially under conditions where words are not as easily/quickly retrieved from semantic memory: among individuals experiencing neurocognitive changes (older adults) and when processing in a weaker language (L2).

T231 The Brain's Structural Connectome Correlates of Pre-reading Abilities in Pre-school Aged Children. . Mohammad Ghasoub, Xiangyu Long, Claire Donnici, Deborah Dewey, Catherine Lebel, *Cumming School of Medicine, University of Calgary, Canada.*

Pre-reading abilities such as phonological awareness and naming speed are indicators of future reading skills. Prior studies examining the association between structural neural connectivity and pre-reading/reading abilities have mainly focused on older children. Little research has been done with pre-school aged children, despite this being a critical learning period. Studying the brain's structural connectivity from an early age can provide insight into the roots of reading abilities in the developing brain. 64 typically-developing children aged 2-4 years (35 males/29 females) underwent pre-reading skills assessments using the Phonological Processing and Speeded Naming subtests from NEPSY-II. Children also underwent diffusion MRI to assess white matter connectivity. 16 brain regions associated with primary and secondary language networks were extracted, and the structural connections between them were assessed using graph theory, a mathematical technique to study brain networks. Measures of network connectivity at the local (between neighboring regions) and global (between all regions) levels were calculated. Global network efficiency, and nodal degree (number of directly connected regions) were significantly positively associated with Phonological Processing scores. Our findings complement previous studies done with older children and suggest that phonological awareness is linked to integrative processing of information at the global level of reading networks.

T232 The Director Task is Robustly Associated with The Eyes Task But Neither are Associated With the Empathy Quotient. Mikhail Sokolov, John Logan, *Institute of Cognitive Science, Carleton University.*

Previously, the Director Task showed poor differentiation of Theory of Mind (TOM) abilities in young adults (Sokolov & Logan, 2019), raising the question of whether the Director Task actually measures TOM in this population. In this study we extend the original work to assess the relationship between the Director Task, the Eyes Task, and the Empathy Quotient (EQ) using structural equation modelling. An initial confirmatory factor analysis showed a well-fitting single-factor solution for the Director Task ($\chi^2/df = 1.70$; RMSEA = .086), however the Eyes Task and EQ showed poor initial fit. After respecifying the EQ into a bi-factor model and removing poor fitting Eyes Task items, acceptable fit was achieved for both. Results indicate that after controlling for method variance between the Director and Eyes tasks ($b = 0.11$), a significant association remained for both ($b = 0.73$, $z = 2.25$, $p = .027$), but no association between the EQ and the Director ($b = -0.08$, $z = -0.70$, $p = .487$) or Eyes ($b = 0.08$, $z = 0.18$, $p = .858$) tasks was observed. We conclude the Director Task is substantially and robustly associated with the Eyes Task but neither appear to be related to the EQ.

Thinking & Decision Making

T233 Six Different Ways to Carve Nature at its Joints. John Paul Minda, *Western University.*

Humans and other animals organize their experiences with the world into categories—behavioural equivalence classes. A representationalist account assumes that we represent categories as concepts and that these concepts are represented by abstracted prototypes, verbalizable rules, implicit stimulus-response associations, clusters of features, and collections of exemplars bound together by similarity. Foundational research by Roger Shepherd in the 1960s laid the groundwork for the cognitive revolution and explored the basic cognitive mechanisms that

underlie new category acquisition. Shepherd devised six different kinds of category structures; six different ways to organize the same stimulus space into categories and discovered a stable pattern of learning across participants. This pattern has been replicated by many other labs, including my own. In my talk I first consider over a decade of research in my lab in which we used Shepard's six category set to understand the differences between human and nonhuman primates, the developmental trajectory of learning from childhood through old age, and the ways in which cognitive/affective states alter this pattern of category learning. I also present new research from my lab in which we explore the possibility that language, culture, and thinking style can influence how these six different categories are acquired.

T234 A Biologically-Inspired Neural Implementation of Affect Control Theory. Aarti Malhotra, *David R. Cheriton School of Computer Science, University of Waterloo, Canada*, Terrence Stewart, *National Research Council of Canada, University of Waterloo Collaboration Centre, Canada*, Jesse Hoey, *David R. Cheriton School of Computer Science, University of Waterloo, Canada*.

Social interactions are a part of day-to-day life of most human beings. Affect, decision-making and behavior are central to it. With increased adoption of technology in our society, interaction between humans and artificially intelligent agents is also increasing. Large-scale brain-inspired neural models have been equipped with capabilities to fulfil a variety of tasks, but there has been relatively limited focus on making them capable of handling social interaction. In this paper, NeuroACT, a neural computational model and implementation of a sociopsychological theory called Affect Control Theory (ACT) is presented. This is towards building an emotionally intelligent AI agent, that can handle interactions. It takes as input a continuous affective interpretation of a perceived event, consisting of an actor, behavior and an object and generates post-event predictions of the next optimal behavior to minimize deflection. The aim is to model the role of affect guiding decision making in AI agents, resulting in interactions that are similar to human interactions, while inhibiting some behaviors based on the social context.

T235 Conflict Detection is insensitive to cognitive load: Evidence for the intuitive nature of detecting conflict in reasoning. Kaiden Stewart, Jonathan Fugelsang, *Department of Psychology, University of Waterloo, Canada*.

Dual-Process models of decision-making posit that decisions are a product of two qualitatively distinct types of processing. Type I processes are faster and, relative to Type II processes, less resource-intensive. Recently, dominant dual process models have shifted to include three distinct stages: Type I and Type II processes both initiate at Stage 1, followed by a stage devoted to the detection of any conflict between them (Conflict Detection), and a third stage wherein individuals, in the presence of conflict, reflectively select a response. A key question is the extent to which Conflict Detection is itself a Type I or Type II process. Extant work suggests Conflict Detection is Type I; under load, individuals can respond in ways consistent with detected conflict. Recent advances have suggested that Conflict Detection can be detected in differences in confidence ratings between conflict and non-conflict items answered intuitively. Here, we pair such a methodology with the inclusion of cognitive load in order to test the perseverance of Conflict Detection under conditions of limited resources. We observe, in the most severe test yet, that Conflict Detection operates in a resource-free fashion, thus providing support for the idea that it is (probably) a Type I process.

T236 Analyzing the intersectionality of sex, race and vocal characteristics on decisions of guilt and innocence. Charlene Forde-Smith, Dr. David Feinberg, *Graduate School of Science, McMaster University, Canada.*

Research has shown that we make judgments about others within seconds of contact. We often draw conclusions based on pre-conceived stereotypes from non-verbal vocal properties influencing the trajectory of relationships we have with others. Voice pitch is the primary vocal feature associated with perceived trust in multiple contexts. The proposed study investigates the relationship between perceptions of trust, voice pitch, and emotion within the context of courtroom testimonies. Moreover, we examined how the race and sex of speakers moderate this relationship. We also tested if findings are different when participants are exposed to auditory testimony about high (gun-present) or low (gun-absent) intensity crimes. To test this, we used audio recordings differing in voice pitch, sex, race, and emotion. Participants hear a random sample of voices that say “That is exactly what happened” then respond yes or no when asked if they trust the speaker. Results showed that participants rated voices differently across emotion, race, and sex of the speaker. Participants trusted white men most, then African American women, white women, and African American men least. Highlighting potential courtroom judgment biases is crucial to ensuring that all individuals are given an equal prosecution.

T237 Serial dependencies in recognition memory decisions: Investigating the temporal dynamics of the effects of prior response and similarity. Michelle A. Dollois, Chris M. Fiacconi, *University of Guelph.*

Recognition memory decisions are dependent on factors beyond the memory traces linked to the item being evaluated. In addition to the impact of an individual’s overall response bias increasing the likelihood of an “old” or “new” response on any given trial, there is evidence that memory decisions exhibit serial dependencies. Though limited, previous research has demonstrated that the response given on the previous trial often predicts the response made to the current trial, such that responses are likely to repeat. Here we present work that examines the temporal dynamics of the serial dependencies in recognition memory. Using extant data, we replicate the finding that responses tend to repeat, and expand upon it by considering the role of item-level similarity between consecutive trials. Regardless of old/new item status, graphemic similarity between trials increased the odds of a repeat response. In both cases, these effects dissipated with time, where slow decisions were less dependent on the previous trial. Results are discussed in the context of the diffusion model for recognition decision making.

[Clinical Cognitive Neuroscience](#)

T238 Blunted eye-blink startle in psychopathy and sadism. Douglas Williams, Paul Trapnell, Erin Buckels, Owen Javra, Sasha Svenne, Siavash Kermani Koosheh, *Psychology, University of Winnipeg.*

Two studies examined the relationships between startle eye-blink reflex magnitude and the Dark Tetrad of personality (narcissism, Machiavellianism, psychopathy, and sadism). We measured electromyographic activity of the orbicularis oculi muscle evoked by a startle stimulus while subjects viewed images on a computer screen. Both studies revealed a negative correlation between general startle reactivity (averaged across positive, negative, and neutral photos) and sadistic tendencies assessed by the Short Dark Tetrad. In Study 2, all four dark traits were negative correlates of general startle reactivity. Study 2 also examined the personality correlates of aversive

startle potentiation (ASP; indexed by greater reactivity while viewing negatively-valenced photos than positive or neutral photos). ASP correlated negatively with overall measures of psychopathy and sadism, their facets, and related personality tendencies (callousness, risk-taking, and restricted affect). These findings suggest that ordinary people with unusually high levels of callousness and antagonism display physiological evidence of non-reactivity (i.e., blunted acoustic startle in general). Psychopathy and sadism were preferentially associated with lessened ASP.

T239 Testing the procedural deficit hypothesis with brain potentials in French teenagers with developmental language disorder. Emilie Courteau, *School of Speech Language Pathology and Audiology, University of Montreal, Canada; Department of Psychology & Neuroscience, Dalhousie University, Halifax, Canada; Centre for Research on Brain, Language and Music (CRBLM), Montreal, Canada*, Phaedra Royle, *School of Speech Language Pathology and Audiology, University of Montreal, Canada; Centre for Research on Brain, Language and Music (CRBLM), Montreal, Canada*, Karsten Steinhauer, *School of Communication Sciences and Disorders, McGill University, Montreal, Canada; Centre for Research on Brain, Language and Music (CRBLM), Montreal, Canada*.

Ullman's procedural deficit hypothesis (2005, 2020) posits that in developmental language disorder (DLD), declarative memory is preserved whereas procedural memory is impaired. Within language, we thus expect that DLD and neurotypical (TL) teenagers will process lexico-semantics and irregular subject-verb number agreement similarly, as both are assumed to be subserved by the declarative system. However, we expect different processing on regular agreement that relies on the procedural system. We tested this hypothesis using an event-related potential (ERP) sentence processing experiment with two groups of French-speaking (pre-)adolescents: DLD and TL. They listened to grammatical sentences describing depicted images. Lexico-semantic mismatches were created by presenting a verb that did not match the depicted action. Subject-verb number agreement mismatches were created by varying the number of visually presented subjects and number cues in the auditory stimuli and was marked on plural verb-forms through verb-final consonants or regular liaison. Results revealed similar ERPs between groups in the lexico-semantic and consonant-final agreement conditions, indexed by N400s. For liaison plural mismatches, P600s were found for the TL group, while the DLD group showed no effect. We discuss how groups differences on most conditions confirm the procedural deficit hypothesis.

T240 Extended and replicated white matter changes in obesity: Spatial and effect size meta-analyses of diffusion tensor imaging studies. Lorie M. F. Dietze, *Department of Medical Neuroscience, Dalhousie University, Canada*, Sean R. McWhinney, *Department of Psychiatry, Dalhousie University, Canada*, Joaquim Radua, *FIDMAG Germanes Hospitalaries, Sant Boi de Llobregat, Barcelona, Spain*, Tomas Hajek, *Department of Psychiatry, Dalhousie University, Canada*.

Obesity has become a global public health issue, with an impact spanning increased health care costs, and serious health conditions both mental and physical. Associations between obesity and brain structure are frequently reported for gray matter but understudied in white matter, where associations as measured by fractional anisotropy (FA) are less replicated and more heterogeneous. We analyzed the location of brain changes in obesity using seed-based mapping in a spatial meta-analysis, and then validated the extent of obesity related changes in a region of interest effect size meta-analysis. Spatial meta-analysis results indicated obesity measures were related to reduced FA in several white matter regions including the genu and splenium of the corpus callosum, middle cerebellar peduncles, anterior thalamic radiation, cortico-spinal projections, and cerebellum. The effect-size meta-analysis validated some of the spatial meta-analysis results, where obesity was related to lower FA in the genu and splenium of the corpus

callosum, middle cerebellar peduncles, and the superior longitudinal fasciculus which was not represented in the spatial results. The extent of these obesity related brain changes was a small to medium effect. Our findings demonstrate that brain changes related to obesity involve specific regions replicated in our effect size meta-analysis.

T241 Reduced Temporal Precision in Neural Activity of Schizophrenia. Annemarie Wolff, *Faculty of Medicine, University of Ottawa, Canada.*

Studies of perception and cognition in schizophrenia (SCZ) show neuronal background noise (ongoing activity) to intermittently overwhelm the processing of external stimuli. This increased noise, relative to the activity evoked by the stimulus, results in temporal imprecision and higher variability of behavioural responses. What, however, are the neural correlates of temporal imprecision in SCZ behaviour? We first report a decrease in electroencephalography signal-to-noise ratio (SNR) in two SCZ datasets and tasks in the broadband (1–80 Hz), theta (4–8 Hz), and alpha (8–13 Hz) bands. SCZ participants also show lower intertrial phase coherence (ITPC) - consistency over trials in phase activity - in theta. From these ITPC results, we varied phase offsets in a computational simulation, which illustrated phase-based temporal desynchronization. This modeling also provided a necessary link to our results and showed decreased neural synchrony in SCZ in both datasets and tasks when compared with healthy controls. Finally, we showed that reduced SNR and ITPC are related and showed a relationship to temporal precision on the behavioural level. In conclusion, we demonstrate how temporal imprecision in SCZ neural activity - reduced relative signal strength and phase coherence - mediates temporal imprecision on the behavioural level.

T242 The visual word form area as a route of auditory linguistic information into the visual cortex of early blind individuals: A dynamic causal modelling fMRI study. Kiera O'Neil, Aaron Newman, *Dalhousie University.*

Auditory language processing in the visual cortex of blind individuals is thought to be caused by input from the left frontal-temporal language network, however the pathways and brain areas involved are not established. The current fMRI study compared brain activity during semantic and phonological processing in early blind and sighted individuals. We used dynamic causal modelling (DCM) to determine how linguistic information reaches the visual cortex in blind individuals via effective connections from the typical language network. Consistent with past studies, both early blind and sighted individuals showed activation in the frontal-temporal language network during semantic and phonological processing, including the inferior frontal gyrus (IFG) and the visual word form area (VWFA), but only early blind individuals demonstrated activity in the visual cortex (V2). DCM showed that in blind individuals, there was an endogenous connection from the VWFA to V2, and a direct modulatory connection from the VWFA to V2 during semantic and phonological processing. This suggests that in early blind individuals, the VWFA forms a reentrant endogenous connection to the visual cortex, and that visual cortex activity associated with semantic and phonological processing is the result of direct integration into the frontal-temporal language network, via connections with the VWFA.

T243 The Transdiagnostic Nature of Sensory Processing in Autism and ADHD . Nichole Scheerer, Anahid Pourtousi, Connie Yang, *Western University*, Bobby Stojanoski, *University of Ontario Institute of Technology*, Evdokia Anagnostou, *Holland Bloorview Kids Rehabilitation Hospital*, Robert Nicolson, *Western University*, Elizabeth Kelley, *Queens University*, Stelios Georgiades, *McMaster University*, Jennifer Crosbie, *The Hospital for Sick Children*, Ryan Stevenson, *Western University*.

Autistic children and children with attention-deficit/hyperactivity disorder (ADHD) experience sensory processing difficulties that are highly heterogeneous within and across these diagnoses. This study aimed to assess the transdiagnostic nature of sensory processing and examine the relationship between patterns of sensory processing abilities and core diagnostic features of autism and ADHD. Short Sensory Profile data from 495 autistic children and 461 children with ADHD between the ages of 1 and 21 years were subjected to a K-means cluster analyses to determine whether meaningful sensory phenotypes could be modelled. Follow-up ANOVAs were used to compare autism and ADHD traits across the resultant phenotypes. Overall, autistic children and children with ADHD demonstrated highly similar patterns of sensory processing abilities. A five-cluster solution best characterized sensory processing abilities in both diagnostic samples. The resultant sensory phenotypes are best described as sensory adaptive, generalized sensory differences, taste and smell sensitivity, under-responsive and sensation seeking, and low energy with weakness. Autism and ADHD traits differed across the five phenotypes ($p < .001$), but these patterns were very similar across the diagnostic groups. These findings highlight the transdiagnostic nature of sensory processing abilities and speak to a shared underlying neurobiological mechanism.

Individual Differences

T244 Boredom, attention, and hearing: The impact of noise-induced hearing impairments is no worse in those who routinely experience boredom and failures of attention than in others.. Mark Fenske, Carolyn Crawford, Yasmin Elliott, Sibley Hutchinson, *University of Guelph*, Gurjit Singh, *Phonak Canada*, *University of Toronto*, & *Ryerson University*.

Individuals who routinely experience boredom often have difficulties with attention and task engagement. We recently discovered that such individual differences in boredom proneness and attention-related difficulties are important for understanding the subjective impact of age-related hearing loss— a perceptual impairment that impacts auditory-task engagement. Among first-time hearing-clinic visitors, the subjective impact of hearing loss was more intensely negative for those susceptible to experiencing boredom; a relationship mediated by self-reported differences in task-focused attention abilities. Here we move from a clinic-based correlational approach to a lab-based experimental approach to elucidate the causal nature of the associations between boredom, attention, and auditory perceptual impairments. Participants (N=365) listened to a recorded lecture with high or low levels of babble noise. As predicted, we found that the noise-induced perceptual impairment resulted in higher levels of state boredom, listening effort, effortful attention, and poorer memory for lecture material. Unexpectedly, these negative effects of noise-induced hearing impairments were no worse for individuals with high trait boredom and attentional difficulties than those low in trait boredom / attentional difficulties. Thus, hearing impairments can cause boredom and attentional failures, but it remains unclear how individual differences in boredom/attention contribute to the subjective impact of hearing issues.

T245 Spatial Ability is Differently Related with Common Indices of the Numerical Distance Effect. Fraulein Retanal, Veronic Delage, *School of Psychology, University of Ottawa, Canada*, Evan Risko, *Department of Psychology, University of Waterloo, Canada*, Erin Maloney, *School of Psychology, University of Ottawa, Canada*.

The processing of numerical magnitude is commonly assessed using one of two number comparison tasks; comparison to a standard, where participants compare a single digit to a fixed standard or simultaneous comparison, where participants compare two digits simultaneously. The two tasks have been used interchangeably as they yield a similar pattern known as the numerical distance effect (NDE), where comparison performance is faster and more accurate as the numerical distance between two numbers become larger. However, recent research suggests that the mechanisms underlying how the comparison is made can vary as a function of task instructions. Across two studies, we seek to enhance our understanding of how individuals compare digits by investigating the relation between spatial ability and the NDE generated by each comparison tasks. Our results demonstrate that while NDE is generated for both comparison tasks, only the NDE generated when comparing simultaneously presented digits is negatively correlated with spatial ability. The NDE generated when comparing a digit to a standard did not correlate with spatial ability. This is true even after controlling for working memory, which we used as a rough proxy for general intelligence. The implications of our findings within the theory of numerical processing are discussed.

T246 Load it up! Combining experimental-manipulation and individual-difference approaches to explore the dependence of distractor devaluation on visual working memory. Brooke Parady, Elizabeth M. Clancy, Mark J. Fenske, *Neuroscience & Applied Cognitive Sciences, Psychology, University of Guelph*.

Stimuli appearing as distractors in visual-search tasks subsequently receive more negative affective ratings than novel stimuli or attentional targets. Goolsby et al. (2009) demonstrated that this 'distractor-devaluation effect' is eliminated with a concurrent visual working-memory load, providing evidence that working-memory resources may be important for encoding associative links between the perceptual details of a distractor and the negatively altered representations of stimulus-value. Here we report a conceptual replication/extension of Goolsby et al. using a similar within-participant manipulation of working-memory load during the measurement of distractor devaluation, while also using an individual-difference approach as a converging test of the hypothesis that distractor devaluation requires working-memory resources. By using different working-memory capacity tasks to assess individual-differences in storage capacity versus attentional control, we sought to test whether the role of visual working memory in mediating distractor devaluation primarily concerns mere maintenance of visual information, or active manipulation of information during working-memory maintenance. Our results (N=232) suggest the affective consequences of selective attention are surprisingly robust across experimentally-induced and participant trait-level differences in the availability of working-memory resources, but that individual differences in attentional-control of memory contents may be more critical than mere maintenance in determining the magnitude of distractor devaluation.

T247 The Sum of Its Parts: Exploring Relations Between Multiple Components of Financial Literacy, Math Anxiety, and Financial Anxiety. Andie Storozuk, Erin A. Maloney, *School of Psychology, University of Ottawa.*

Financial literacy is globally recognized as a vital life skill. Math anxiety and financial anxiety have been negatively linked to various components of financial literacy, but these links are poorly understood due to the multifaceted nature of financial literacy as a construct. Using survey data from Canadian adults (N = 241), we examined the relations between anxiety (i.e., math and financial) and each component of financial literacy (i.e., financial knowledge, confidence, attitudes, and behaviour). As predicted, the link previously established between math anxiety and financial literacy was driven by the relation between math anxiety and financial knowledge, which requires mathematical skill. Indeed, math anxiety was unrelated to a conceptual understanding of finances, financial confidence, or ideal financial behaviours. Unexpectedly, math anxiety was positively related to financial attitudes (i.e., favouring the long-term). Further, financial anxiety was negatively related to both mathematical and conceptual financial knowledge, financial confidence, and financial behaviours, but was unrelated to financial attitudes. In sum, both math and financial anxiety are important factors when considering financial literacy more broadly, but these relations differ for each component of financial literacy. These findings underscore the need to take a nuanced approach to understand the factors that relate to financial literacy.

T248 Development and Evaluation of the Measuring Anti-Social Tendencies (MAST) Addendum Scale. Mikhail Sokolov, *Director General Military Personnel Research and Analysis, National Defence, Government of Canada.* , John Logan, *Institute of Cognitive Science, Carleton University.*

Cognitive research that incorporates personality characteristics such as psychopathy may be problematic when trait prevalence in the general population is low, making it challenging to assess the relationship of personality with cognitive processes. Specifically, although designed to measure psychopathy in non-forensic groups, the Self-Report Psychopathy (SRP) scale exhibits a floor-effect in young adult populations. Recently, a large-scale study (Sokolov, forthcoming) of undergraduate students (n = 5856) showed that 16.88% of female and 5.76% of male respondents scored in the bottom 5% of the SRP, indicating a floor-effect. We developed, validated, and made available the Measuring Anti-Social Tendencies (MAST) addendum scale which may be presented to respondents concurrently with the SRP to improve measurement in low psychopathy populations. Results based on validation data (n = 611) show that when including the MAST with the SRP, model fit ($\chi^2/df = 4.11$, RMSEA = .071) improved ($\chi^2/df = 3.33$, RMSEA = .062) and the floor effect attenuated from 22.75% of female and 4.79% male respondents scoring in the bottom 5% to 5.41% of female and 0.60% male respondents scoring in the bottom 5%. We encourage psychopathy researchers to concurrently utilize the MAST and SRP scales to counteract any potential floor effects.

[Memory 2](#)

T249 Recognized words resist intentional forgetting. Pelin Tan, Myra A. Fernandes, Colin M. MacLeod, *University of Waterloo.*

Item-method directed forgetting (better memory for Remember-cued items than for Forget-cued items) typically is a robust effect, demonstrating our ability to forget information intentionally. The most enduring account holds that participants continuously rehearse Remember-cued items but

that Forget-cued items are not allocated additional rehearsal. In a series of experiments, we tested a novel theoretical account—that the boost to the Remember-cued items arises from selective retrieval. Under this explanation, Remember-cued items are continuously retrieved whereas Forget-cued items are not retrieved after initial presentation. Participants studied one word at a time, each followed by a cue either to Remember or to Forget. Critically, some words were presented a second time in the study list. The directed forgetting effect was eliminated for words recognized as repeated, but persisted for items not recognized as repeated. This evidence suggests that retrieval plays a crucial role in item-method directed forgetting.

T250 Improved Memory or Decreased Forgetting? Magnitude of Negative Generation Effect is Reduced in a Delayed Verbal Recall Test. Michaela Ritchie, Jonathan Wilbiks, *University of New Brunswick Saint John*.

The generation effect (GE) states that words generated from one's own mind are better remembered than merely read material. Whether the amount of semantic processing elicited at encoding further enhances the size of the generation effect, beyond the mere elicitation of semantic processes, remains unknown. A total of 84 psychology students from the University of New Brunswick participated in each of two studies, comprising three reading and three generation tasks across three stimulus types: nonword list, wordlist, passage. After studying, participants engaged in a 2-minute (experiment one) or 6-minute (experiment two) distractor task before recall. A reverse GE was found in experiment one. Whether a reverse GE would be eliminated by a longer delay, as indicated by past work, was tested in experiment two, also conducted online. A repeated-measures ANOVA with a between-subjects factor of delay revealed a reverse GE across both experiments, but generating was related to more robust memory over longer delays. The semantic processing accounts of the generation effect may be contingent on writing modality; however, generation, even when typed, may produce a more robust memory trace, relative to reading, over longer delays.

T251 The Heart Remembers What the Mind Forgets: Meta-analysis of Emotional Enhancement on Episodic Memory for Emotional Pictures. Nada Alaifan, *Cognitive science/ Department of Psychology, University of British Columbia*, Yiheng Luo, *University of British Columbia*, Peter Graf, *University of British Columbia*.

Emotional events (e.g., a graduation celebration or a funeral ceremony) are better remembered than neutral events (e.g., preparing breakfast on a particular day). Considerable evidence is mainly available from research on autobiographical memory, but the evidence from episodic memory remains unclear. This meta-analysis aimed to examine whether there is an emotional enhancement effect on episodic memory for valenced pictures, and whether the magnitude of this effect is the same for recall and recognition memory. I also examined the influence of a number of potential moderators in the magnitude of the emotional enhancement effect for both recall and recognition. The main findings of my meta-analysis revealed a medium-to-large emotional enhancement effect on episodic memory. The emotional enhancement effect was more pronounced for recall than for recognition. In both recall and recognition, the emotional enhancement effect was larger for negative pictures than for positive ones, and larger after a long retention interval than after a short retention interval.

T252 Is the errorful generation effect moderated by experimental design?. Donnelle DiMarco, Skylar Laursen, Chris Fiacconi, *University of Guelph*.

Within cognitive psychology, there are many findings that are altered based on the type of design employed by researchers (i.e., between-subjects or within-subjects). The Errorful Generation effect, which has solely been explored using a within-subject design, is the finding that when required to generate errors and then subsequently provided with corrective feedback individuals' memory performance is increased compared to simply studying a list of presented material (Yang et al., 2017). The goal of the current research was to determine whether the performance benefit associated with errorful generation is dependent on experimental design. We employed the Erlebacher's (1977) method to directly compare the Errorful Generation effect with design effects. Consistent with previous literature, cued-recall performance was greater when participants were required to generate errors in both Experiment 1 and 2. This effect did not differ by design type, as we observed a performance benefit in both the between- and within-subject conditions. However, studies exploring design effects that employed free recall on the final test found within-subjects to be superior to between-subjects designs (Mulligan et al., 2020). The preliminary results of Experiment 3 suggest that when participants complete a free recall test, errorful generation is most beneficial when completed with studying.

T253 The interplay between concreteness effects and encoding strategies. Sophia Tran, Myra Fernandes, *University of Waterloo*.

Encoding is the act of getting information into memory through automatic or effortful processing. We compared the effectiveness of different encoding strategies. 100 participants were visually presented with concrete and abstract words. Prior to each, prompts were provided (randomly and intermixed) to either silently read, write, repeat aloud, or draw a picture of the ensuing word. On the subsequent typed recall test, memory was highest for words drawn, and worst for words read silently during encoding. There was a significant interaction: the magnitude of boost to concrete compared to abstract words differed depending on encoding strategy. The benefit of reading aloud relative to silently was equally large for concrete and abstract words, suggesting the mechanism by which speaking boosts memory occurs irrespective of a word's imageability. In contrast, the benefit for words drawn or written during encoding was larger for concrete than abstract words, suggesting these techniques enhance memory by engaging a visuo-spatial representation; Drawing and writing during encoding also add unique motoric representations, accounting for why they led to the greatest enhancements to performance. Our findings suggest the use of multi-modal encoding strategies is more beneficial than simply reading, and could be adopted in educational settings to maximize memory.

Attention 2

T254 Evidence for shared resources between exogenous and endogenous attention in alpha rhythms. Mathieu Landry, Jason Da Silva Castanheira, *McGill University*, Sylvain Baillet, *McGill University*, Jerome Sackur, *Ecole Normale Supérieure*.

Exogenous and endogenous attention are functionally separable systems capable of mutual interference – an important feature with a long-standing history in the field. In their influential work, Berger et al. (2005) hypothesize that these dynamics follow from shared resources between them. The present study examines this hypothesis applying multivariate pattern classification to electroencephalography (EEG) through different experiments. Here, we contrasted the effects of

exogenous and endogenous attention across single cueing where each form of attention orienting is engaged alone, and double cueing where both are concurrently engaged. Our results confirm that the simultaneous engagement of exogenous and endogenous attention yields interference between them and that these effects encompass alpha rhythms – an established marker of visuospatial attention. Specifically, classifiers trained to decode exogenous attention from the power and phase of alpha band activity during single cueing were systematically misled by endogenous attention when they were tested in the context of double cueing. Moreover, we show that interference from exogenous attention over endogenous attention is captured by a moderated mediation analysis linking both forms of attention orienting to alpha power and behavioural performance. Our findings highlight that the dynamics of visuospatial attention are characterized by overlapping neural processes and limited resources.

T255 Mind-wandering is not as memorable as attentional engagement: Probe framing affects retrospective reporting of remembered attentional states. Samantha Ayers-Glassey, Effie J. Pereira, *Department of Psychology, University of Waterloo, Canada*, Jeffrey D. Wammes, *Department of Psychology, Queen's University, Canada*, Daniel Smilek, *Department of Psychology, University of Waterloo, Canada*.

States of attentional engagement and mind-wandering fluctuate dynamically over time. Although in-the-moment assessments can accurately capture these fluctuations, they also disrupt the ongoing task. Retrospective measures would solve this problem, but it is unclear whether these different attentional states can be equally remembered with sufficient precision. Across two experiments, participants (NE1 = 102, NE2 = 96) watched online video lectures while being intermittently probed to report their subjective levels of attentional engagement (E1) or mind-wandering (E2). After watching the entire lecture, participants were then presented with short excerpts from it and asked to recall their level of attentional engagement or mind-wandering when they initially watched the excerpt. When reporting on attentional engagement (E1), cross-correlation analyses revealed high concordance between participants' in-the-moment and retrospective ratings. However, when reporting on mind-wandering (E2), concordance was only high for videos that were considered less engaging. Contrasting across experiments revealed that the overlap between in-the-moment and retrospective ratings were significantly lower when participants reported mind-wandering compared to attentional engagement. Together, our findings suggest that it is easier to remember being on-task (attentionally engaged) than off-task (mind-wandering). Thus, not all attentional states are equally memorable, and probe framing affects retrospective reporting of remembered attentional states.

T256 Preparation history effects on selective attention in a two-target method . Ben Scloznick, Ellen MacLellan, Bruce Milliken, *McMaster University*.

There is growing appreciation that “top-down” control can be impacted by automatic learning processes. We report a unique form of experience-based control over selective attention that is produced by preparation in response to task instructions. We used a skeletal two-target method introduced recently to measure the attentional blink (MacLellan, Shore, & Milliken, 2015). With this method, when a first target (T1) is displayed together with a distractor a stark identification deficit (an attentional blink) is produced for the second target (T2). In our adaptation of this method, we included an additional word-naming task prior to each two-target trial. We manipulated instructions for the additional word-naming task with the aim of influencing participants' preparatory state at the outset of each trial. This instructional manipulation did produce a preparatory state effect on report of both T1 and T2. We demonstrate that this effect is

replicable, depends on cumulative experiences preparing in a particular way (not a one-shot effect of conscious control), and is specific to the context in which it is developed. These findings point to the possibility that top-down goals in relation to selective attention can be automatized.

T257 Mindfulness and time perception: What do we know? André Morin, Simon Grondin, *Université Laval*.

Mindfulness can be broadly described as the ability to bring a nonjudgmental awareness towards the present moment. While some people choose to cultivate it through practices such as formal meditation, the personal tendency to be mindful in everyday life (i.e., trait mindfulness) can be measured even in those who do not. In recent years, numerous studies have investigated how mindfulness may affect, or be linked to, time perception. In an effort to better understand some of the relationships between both constructs, a review of the current scientific literature on this topic was conducted. Articles included in the review investigated the links between mindfulness and time perception using various tasks and measures, including guided meditations, trait mindfulness questionnaires, duration estimations, and reports on the subjective passage of time. By integrating results from a variety of studies into a unified conceptual framework, we explored how a few key theoretical considerations and aspects related to study design may be crucial to a meaningful interpretation of the data. Overall, current knowledge suggests that the relationships between mindfulness and time perception depend on a variety of factors, including mindfulness meditation proficiency and the type of time perception task at play.

T258 Gaze following as a result of cue directionality and mentalizing processes: An integrated approach. Florence Mayrand, Sarah D. McCrackin, Jelena Ristic, *Department of Psychology, McGill University*.

Although it is well established that humans attend to where others are looking, it remains debated whether this gaze following behavior occurs because gaze communicates directional information or the agent's inferred mental content. To address this debate, we developed a novel paradigm which manipulates cue direction and agent mental content orthogonally, creating conditions in which the two aspects of the cue information combine and conditions in which they dissociate. Across two studies, we examined the speed of participants' target responses when they adopted the 'self' or 'other' mental perspective and assessed variability in data with individual differences in perspective taking ability. Overall, the results indicated that participants were slower to respond to targets when the cue's direction and mental content information dissociated relative to when they combined. This effect varied little with individuals' perspective taking abilities. As such these data suggest that gaze following depends on both cue directionality and gazer's mental content.

[Technology & Cognitive Science](#)

T301 Graphical User Interface Design and User Reactions: How fNIRS Can Help Understand Technology Use. Anika Nissen, *University of Duisburg-Essen, Germany*.

The understanding of human perception and processing is crucial to improve the usability and user experience (UX) of graphical user interfaces (GUI). Among the GUIs, a great part of literature in Information Systems (IS) and Human-Computer Interaction (HCI) has focused on the visual design and use of e-commerce websites. It is understood that a great part of user behavior during decision-making is formed by spontaneous processes, and that the utilization of

neurophysiological measurements can help to uncover these processes. As a result, more and more IS and HCI researchers draw on methods and theories from cognitive neuroscience to understand and investigate these processes. With this, pain points in current GUIs may be better identified and higher ease of use can be designed for. To exemplify how the application of neuroimaging (i.e., fNIRS) can help, we present results of studies on website design and its effects on users. We conclude by discussing emerging research directions for HCI research as an application field of cognitive neuroscience.

T302 Ignoring a cellphone and health-related decision making. Zachary Shapardanis, Kristen Lott, Michael Reynolds, *Department of Psychology, Trent University.*

It is well established that using a cellphone directly interferes with concurrent task performance (Rosen et al., 2012). Consequently, people are often told to ignore their phone while performing a wide range of tasks (e.g., learning, driving, etc.). Yet, cellphones have been argued to be habit-forming and addictive. Previous research has shown that using self-control to resist a habitual behavior is tiring and can increase mental passivity and negatively effect an individual's ability to evaluate risk on a subsequent decision making task (Vonasch et al., 2017). Further, recent evidence suggests that ignoring a cellphone uses self-control and leads to later decrements in self-control performance on an anagram task (Lott & Reynolds, 2022). Here, we examined whether briefly ignoring a cellphone (10mins) while completing a simple go/no-go task at Time 1 uses self-control and changes how costs and benefits are weighed when making health-related decisions at Time 2, measured using a revised discounting task. Implications for cellphone use and decision making will be discussed.

T303 The Effects of Video Quality on Online Video Lectures . Julianna Salvatierra, *Graduate School of Psychology, University of Waterloo, Canada.*

With the increase in online learning, there is an increasing need to determine the most effective way to present lectures online (e.g., video lectures). While video lectures have several benefits for learning, they are vulnerable to video quality issues such as freezing. Freezing events introduce potential costs and benefits regarding a learner's ability to process information in working memory. These costs and benefits from freezing may also be affected by the availability of visual content during a lecture. In this study, we manipulated the presence of freezing in video lectures to examine how freezing might impact students' learning experience. We also manipulated the presence of visual content to examine if the impact of freezing varies with the availability of visual content. While freezing clearly impacted lecture viewing behaviour, overall, the impact was modest. In addition, the influence of freezing did not vary with the availability of visual content. However, the presence of visual content did have marked effects on the learning experience. Implications for learning from lectures and instructional design will be discussed.

T304 Playback Speed influences Notetaking and Comprehension when Learning from Video Lectures. Laura J. Bianchi, Kitty Lamarr, Evan F. Risko, *University of Waterloo.*

Increasing lecture playback speed for a pre-recorded video lecture is a time saving feature university students use when interacting with videos online. Past research has suggested limited impact on comprehension when a lecture is speeded within reason (under 2x), however this shortens the time students have to engage with the materials. This could impact other common practices which occur when students watch a lecture (e.g., taking notes). Notetaking is a valuable learning aid, especially for open book exams. However, the effect of lecture speed on notetaking is

not well understood. In two experiments we examined the effects of speeding lectures on note-taking quality and downstream performance. Participants watched a lecture video at speeds of 1.0x, 1.5x, or 2.0x, while taking notes. They were told these notes could be used at test (i.e., it was “open book”). We examined open book test performance, note-taking quality and quantity, as well as a number of other variables relevant to the learning experience (i.e., affect, load, metacognitive judgements). Critically, we found that speeding can both reduce notetaking quality and quantity and impair open book test performance. These results inform online learners on best practices for students and instructors looking to speed up their videos.

T305 Visual attention in French reading comprehension using AI-enhanced wearable eye tracking: a pilot study. Guillaume Loignon, *Université du Québec en Outaouais*, Nathalie Loye, *Université de Montréal*.

Wearable eye-tracking devices facilitate the study of visual attention in a natural context - an advantage over the stationary devices generally used to study reading. However, data recorded through wearable eye-tracking is affected by the participant’s movements, and its analysis typically requires manual delineation of stimuli in thousands of video frames, a fastidious and error-prone process. We investigated whether computer vision, a branch of artificial intelligence, could help automate the analysis of mobile eye-tracking data. In this pilot study, a group of francophone novices (post-secondary students) and experts (teachers and education professionals) were asked to answer multiple-choice questions on short argumentative texts in French while wearing eye-tracking glasses. Eye-tracking data was stabilized using computer vision techniques. Mixed-effect model results indicate that allocation of visual attention during reading differed between groups, with experts directing a greater proportion of visual attention to the question stem and response options. This suggests that AI could enable the use of relatively cheap devices to study visual attention in a more natural setting. We discuss the potential, challenges, and limitations of the proposed method.

T306 Larger Distances from Larger Vehicles: Effect of Vehicle Size, Viewing Side, And Their Facia on Comfort Distance in Virtual Reality. Farid Pazhoohi, Gini Choi, Alan Kingstone, *Department of Psychology, University of British Columbia*.

It is of critical importance to develop socially sensitive vehicles that will enhance pedestrians’ sense of comfort and safety. The current study is the first to extend these effects to vehicles, by investigating individual comfort distance in virtual reality with regard to vehicles that vary in terms of size, viewing angle, and anthropomorphized emotional expression. Furthermore, we investigate the effect of individual differences in terms of height, anxiety, and aggression. Forty-four individuals were presented with three-dimensional stimuli of vehicle models differing in size and viewing angle in virtual reality and positioned them at the distance they felt the most comfortable with. Our results show that individuals are more comfortable standing further from larger vehicles and when presented with the front versus rear view of a vehicle. Moreover, the distance from vehicles was negatively associated with the height of the individuals. This study suggests that it is important for designing self-driving and autonomous vehicle to consider that vehicle size and direction as well as pedestrian’s height may impact the comfort distance felt by pedestrians. These data have clear implications for vehicle design, including self-driving and autonomous vehicles.

Memory 3

T307 Facilitating Hebbian learning via semantic similarity. Dominic Guitard, *École de Psychologie, Université de Moncton, Canada, Department of Psychological Sciences, University of Missouri, USA, Department of Psychology, University of Manitoba, Winnipeg, Manitoba, Canada*, Jean Saint-Aubin, *École de Psychologie, Université de Moncton, Canada*, Randall K. Jamieson, *Department of Psychology, University of Manitoba, Winnipeg, Manitoba, Canada*.

Understanding how we can learn the order of presented information is one of the most fundamental questions of experimental psychology with important theoretical and practical ramifications. To better understand this question, researchers have used the Hebb repetition effect, the gradual memory improvement of a list as a function of its repetition across the experiment. Here for the first time, we investigated if the Hebb repetition effect can be facilitated by the presence of prior semantic knowledge of the repeated lists. More exactly, we examined a prediction derived from spreading activation, when presented items activated related items in memory (e.g., the presentation of the word table activating the word chair), suggesting facilitation of learning of a new list composed of semantically related items to a previously learned sequence. In a series of three experiments, we systematically showed that learning a second list was facilitated if the items were semantically related to the items presented in the first list, a benefit observed when semantically related items share the same serial position as in the first list, without damaging the learning of the first list. A retrieval-based explanation of our results is presented within an instance memory model of serial recall.

T308 Can semantic similarity be better represented by valence, arousal and dominance?.

René-Pierre Sonier, *École de psychologie, Université de Moncton, Canada*, Dominic Guitard, *École de psychologie, Université de Moncton, Canada and Department of Psychological Sciences, University of Missouri, USA*, Emma Melanson, *École de psychologie, Université de Moncton, Canada*, Randall K. Jamieson, *Department of Psychology, University of Manitoba, Canada*, Jean Saint-Aubin, *École de psychologie, Université de Moncton, Canada*.

In short-term ordered recall tasks, phonological similarity impedes order recall while semantic similarity has only a weak or null effect, while providing a large advantage for item recall. Ishiguro and Saito (2021) recently suggested that these contradictory findings were due to an inadequate assessment of semantic similarity. They suggested to measure semantic similarity as the distance between items in a three-dimensional space composed of the semantic dimensions of valence, arousal and dominance (VAD). We conducted the first experimental examination of their proposal. In four experiments, participants performed an immediate serial recall or an immediate order reconstruction task. Performance was contrasted for semantically similar lists based on the VAD measure, the typical LSA measure, and semantically dissimilar lists. Two sets of words were used to assess the reproducibility of the findings and similar results were observed with both sets. When similarity was defined with LSA, the typical findings were observed: item memory for similar items was better without negatively impacting their order memory. However, contrary to Ishiguro and Saito's claim, when similarity was defined with VAD, no effect at all emerged. Implications for modelling semantic similarity are discussed.

T309 Cognition and well-being during the COVID-19 pandemic: unique events enhance episodic richness, mood, and temporal context of life experiences. Melissa Meade, Miranda Chang, Katarina Savel, Bryan Hong, *University of Toronto*, Chris Martin, *Florida State University*, Morgan Barense, *University of Toronto*.

Living in isolation during COVID-19 lockdowns vastly impaired quality of life and increased risk of advancing cognitive decline for older adults. We examined how actively engaging in unique, relative to routine, events during an uneventful period of COVID-19 lockdown enhances memory, well-being, and ability to place experiences in a temporal context. Healthy older adults used a smartphone-based application called the “HippoCamera”, in which memory cues of daily life events were captured by recording short video-audio cues that were later reviewed in replay sessions. Over an 8-week period we interleaved weeks of “active replay” (recorded and replayed unique events) and “hidden control” (recorded but not replayed routine events). Unique events were recalled in more episodic detail, were more accurately placed in a temporal context, and on unique event days participants experienced increased positive affect and decreased boredom, and perceived time to go by faster. We showed that using the HippoCamera to promote active engagement in unique, non-routine events is effective in improving episodic memory, temporal context, and emotional well-being for older adults living in isolation. Our findings have implications for life during lockdown as well as for those who typically live in relative isolation due to health and mobility issues.

T310 What’s behind the mask? Measuring observers’ expectations of occluded facial features. Chris Oriet, Caitlyn M. Winand, *Department of Psychology, University of Regina*.

We’ve now lived two years in a world where we frequently encounter partially occluded faces. Indeed, the representation of the faces of people we first met during the pandemic may be incomplete, leaving us with a ‘holistic’ representation that is missing critical information provided by internal facial features. When we can’t see the whole face, do we generate an expectation about what the rest of it looks like? We attempted to answer this question in a series of experiments in which we paired the top half of a face with its corresponding bottom half, or with the bottom half of another individual. Our reasoning was that if observers generate expectations about the bottom half based on what they see in the top half, they should be better than expected by chance at selecting the correct bottom half. This expectation was confirmed, but methodological considerations limit the strength of the conclusions that can be drawn. Nevertheless, the use of facial composites appears to be a promising approach to exploring the nature of incomplete facial representations in memory.

T311 COVID-19’s Impact on the Calendar Effect. Norman Brown, Eamin Heanoy, *University of Alberta*.

The Calendar Effect (Pillemer, Rhinehart & White, 1986) is a tendency for memorable events to happen more frequently during some months than others, because some months, but not others, are associated with novel life-events. The present study was predicated on the assumption that the onset of the COVID-19 Pandemic was a novel transition and hence that people would recall more events from March 2020 than from surrounding months. Data were collected from first-year undergraduates in two waves: Fall 2020 and Fall 2021. Wave 1 involved two groups; the MII group recalled memorable, interesting, or important events that happened between September 2019 and August 2020; participants in the second group recalled word-cued memories from the same period. Wave-2 participants recalled only MII events from September 2020 to August 2021. As

predicted, the Wave-1 MII group displayed a clear COVID Bump, i.e., participants recalled more events from March 2020 (13%) than from February 2020 (6%) or April 2020 (5%). Neither the Wave-1 word-cued group nor the Wave-2 MII group displayed elevated recall for events from March. We conclude by considering differences between word-cued and MII memories and by interpreting the COVID Bump from a Transition-Theory Perspective (Brown, 2016, 2021).

Attention 3

T312 Measuring the timing of visual feature processing through eye movement metrics.

Mazyar Fallah, *College of Biological Science, University of Guelph, Canada*, Devin H. Kehoe, *Department of Psychology, York University, Canada*.

During oculomotor target selection, unresolved activation or suppression at a competing distractor locus in the epoch ~30 ms prior to saccade initiation elicits saccades curved towards or away from the distractor (respectively). We therefore developed a non-invasive technique to measure the time course of excitatory and inhibitory activity encoding a distractor in which human saccade curvature is modeled as a function of saccade-distractor onset asynchrony (SDOA): the time between the transient onset of a task irrelevant distractor and the initiation of a saccade to a target. We used the SDOA technique to investigate how the timing of different visual features across the visual streams affects saccade planning and execution. Specifically, we compared the effects of distractors that were either oriented greyscale gabors, color-defined gabors, moving gabors, and complex objects. We find that peak saccade curvature and endpoint deviation activity are related to feature complexity (greyscale < motion = color < complex objects). The onset latencies for saccade curvature effects were mostly consistent with the peaks (greyscale = motion < color < complex objects). However, onset latencies for end-point deviations were rapid across the three early/mid features (greyscale = motion = color), but complex objects needed more time to affect them.

T313 The role of temporal cortex in the control of attention. Hamid Ramezanpour, *Centre for Vision Research, York University, Toronto, Ontario*, Mazyar Fallah, *Department of Human Health and Nutritional Sciences, College of Biological Science, University of Guelph, Guelph, Ontario*.

Attention is an indispensable component of active vision. Contrary to the widely accepted notion that temporal cortex processing primarily focusses on passive object recognition, a series of very recent studies emphasize the role of temporal cortex structures, specifically the superior temporal sulcus (STS) and inferotemporal (IT) cortex, in guiding attention and implementing cognitive programs relevant for behavioral tasks. The goal of this theoretical work is to advance the hypothesis that the temporal cortex attention network (TAN) entails necessary components to actively participate in attentional control in a flexible task-dependent manner. First, we will briefly discuss the general architecture of the temporal cortex with a focus on the STS and IT cortex of monkeys and their modulation with attention. Then we will review evidence from behavioral and neurophysiological studies that support their guidance of attention in the presence of cognitive control signals. Finally, we propose a mechanistic framework for executive control of attention in the temporal cortex. Our theoretical model also supports the role of temporal cortex in implementing cognitive programs and their contribution to the dynamic nature of visual attention to ensure flexible behavior.

T314 Measures and impacts of mind wandering when using online learning software. Colin Conrad, *Dalhousie University.*

Online learning is by no means a new phenomenon, though there is growing evidence that it will play an essential role in universities moving forward. It is thus important for pedagogues to have a clear understanding of cognitive factors that can facilitate or inhibit effective use of online learning technology. In this presentation, we will discuss the results of two studies that seek to identify effective measures of mind wandering as well as the role that it plays when facilitating effective online learning software use. In the first study, participants attended to a long educational video and were prompted to report their experienced mind wandering while wearing EEG. Results revealed markers of mind wandering which might be applied in future work to passively measure mind wandering while engaged in an extended technology task. In the second study participants watched a long video which contained errors and were instructed to record observed errors using the press of a button. Preliminary results suggest an alternative behavioural method for measuring mind wandering. Taken together, we add new knowledge to the role of mind wandering in education technology, which has implications for research in cognitive neuroscience, information systems and human-computer interaction.

T315 Examining Autism Spectrum Disorder using the Attention Network Test: A Meta-Analysis. Samantha R Good, Swasti Arora, *Department of Psychology and Neuroscience, Dalhousie University, Canada*, Jeanne Townsend, *Department of Neurosciences, University of California, USA*, Lisa E Mash, *Department of Pediatrics, Baylor College of Medicine, USA*, Raymond M Klein, *Department of Psychology and Neuroscience, Dalhousie University, Canada.*

Attentional deficits are common in autism spectrum disorder (ASD) however the nature of these deficits is yet to be fully understood. The present study aimed to assess the three attention networks (alerting, orienting, and executive control) as identified by Posner and Peterson. We conducted a Bayesian hierarchical meta-analysis of studies that implemented the Attention Network Test or its variants to explore whether individuals with ASD exhibited differences in any of the attentional networks when compared to typically developing controls. Eight studies were included in our analysis, comprising 322 children and young adults with the average age ranging from 4.76 - 30 years (Mdn = 13.24). There were no credible differences between participants with ASD versus typically developing controls in the alerting network. Orienting scores were not credibly different, however there was a trend suggesting less efficient attentional response to spatial information in ASD. Executive control scores were not credibly different, but there was a trend showing higher average scores in people with ASD. Although the results from this meta-analysis add to the growing literature on the nature of attentional deficits in people with ASD, our findings are limited by the relatively small number of studies.

T316 Prism adaptation induces a premotor reaching bias on the attention-motor task. Jasmine Aziz, Gail Eskes, *Department of Psychology and Neuroscience, Dalhousie University.*

Prism adaptation (PA) is both a visuomotor learning task and a potential treatment for spatial attention problems after stroke. During PA, people reach for targets while wearing prism goggles that displace their visual field horizontally. They adapt to the visual shift as they reach and, upon goggle removal, make reaching errors in the direction opposite to the visual shift (i.e., aftereffects). It is unclear what attentional processing stage (perceptual versus premotor) PA primarily acts on, though some claim it selectively impacts premotor processes. We investigated whether PA could produce a premotor reaching bias on the attention-motor task (AMT). The AMT aims to separate

the perceptual and premotor stages of attention by comparing the initiation time of leftward and rightward reaches to peripheral targets, while holding the target locations (i.e., perceptual input) constant. Thirty healthy right-handed adults completed the AMT before and after either leftward (n=15) or rightward (n=15) PA. As hypothesized, leftward PA selectively speeded rightward reach initiation time, suggesting that PA induced a premotor bias in the direction of the prism aftereffect. These findings can inform future research on patient selection for PA therapy, given that stroke patients may present with attention problems at the perceptual and/or premotor stage.

Language & Music

T317 Is it you you're looking for? The role of personal relevance in lexical access. Chris Westbury, *Department of Psychology, University of Alberta*, Lee Wurm, *Department of Psychology, Gonzaga University*.

Previous evidence has implicated personal relevance as a predictive factor in lexical access. Westbury (2014) showed that personally relevant words were rated as having a higher subjective familiarity than words that were not personally relevant, suggesting that personally relevant words are processed more fluently than less personally relevant words. Here we extend this work by defining a measure of personal relevance that does not rely on human judgments but is rather derived from first-order co-occurrence of words with the first-person singular personal pronoun, I. We show that words estimated as most personally relevant are recognized more quickly, named faster, judged as more familiar, and used by infants earlier than words that are less personally relevant. Self-relevance is also a strong predictor of several measures that are usually measured only by human judgments or their computational estimates, such as subjective familiarity, age of acquisition, imageability, concreteness, and body-object interaction.

T318 Comparing computational and behavioural approaches to estimating relatedness of meaning for ambiguous words . Di Mo, Blair Armstrong, *Psychology Department, University of Toronto*.

Extensive research has established that the relatedness of an ambiguous word's meanings (RoM), which is often used to dichotomize item as either polysemes or homonyms, impacts word processing. Different researchers have derived their RoM estimates either from dictionaries or subjective norms, making direct comparisons between experiments difficult. To narrow this gap, we collected subjective RoM data for 751 ambiguous words (23,760 meaning pairs), starting from their WordSmyth dictionary glosses. We also computed distributional semantic vectors for each gloss and compared these vectors to derive a computational measure of RoM. The two measures correlated moderately ($r = .59$), indicating substantial commonality in their underlying representations. Entropy over the distribution of RoM ratings predicted significant variability in lexical decision mega-studies over and above number of meanings and dictionary-based polysemy-homonymy classifications. Simplifying our measures to a dichotomous homonym-polyseme representation using thresholded hierarchical clustering also predicted significant variability over and above the dictionary-based polyseme-homonym classification, while also predicting dictionary-based dichotomization above chance (computational: 55%; behavioural: ~67%). These findings indicate that a computational RoM measure can improve upon using dictionary classifications alone without the resource-intensiveness of deriving subjective norms from scratch.

T319 The Plasticity Theory of Implicit Music Knowledge Acquisition: PTIMKA. Annabel Cohen, Kristen Gallant, Corey Collett, *University of Prince Edward Island*.

Anecdotal and empirical evidence suggest that from birth to late adolescence, the brain is attuned to regularities in sounds in the environment, specifically those of speech and music. While much attention has been directed to sensitive periods for acquisition of language, the present focus is on sensitive periods for the acquisition of musical knowledge. We report on a programme of research designed to test a plasticity theory of everyday implicit music knowledge acquisition (PTIMKA) which emphasizes the establishment of a music grammar during adolescence that offers lifelong privilege for encoding of music consistent with that grammar in contrast to music that violates the grammar, such as music in more recent styles. Following a review of early work including children, we report studies of late adolescents and older adults who rated their familiarity with excerpts of popular music from the last 6 decades and subsequently carried out a retention task for those same excerpts when compared against foils from matching half-decades. Music knowledge trajectories are heightened for music of childhood and adolescence, and, importantly, consistent with the PTIMKA theory, retention functions show the same pattern, even though excerpts from all six decades received equal exposure during the study.

T320 The influence of tonality and melodic contour on auditory stream segregation. Lauren H. Vomberg, Mark A. Schmuckler, *Department of Psychology, University of Toronto Scarborough*.

Auditory scene analysis research has primarily investigated low-level parameters (pitch spread, timbre) in perceptual organization, generally neglecting the influence of top-down factors (melodic contour, tonality). Accordingly, two experiments examined the perceptual influence of such factors on the perceptual organization of melodies. Specifically, interleaved melodies were created in which the component melodies varied in the top-down factors of Tonality (same, related, unrelated, atonal) and melodic Contour Correlation (correlated, uncorrelated), along with low-level factors of Pitch Spread and Interonset Interval. In Experiment 1, participants made subjective streaming ratings for interleaved melodies. Analyses of streaming ratings (i.e., hearing the interleaved melody as one versus two streams) indicated that Tonality and Contour interacted, with tonality influencing the degree of streaming for correlated contours, but not for uncorrelated contours. In Experiment 2, listeners performed an objective same/different task, determining whether an initially presented target melody was one of the component melodies in the interleaved stimulus. Analysis of discrimination accuracy again revealed a Tonality x Contour interaction, with discrimination increasing with greater tonal relatedness for correlated contours, but constant across uncorrelated contours. Together, these studies demonstrate that top-down factors (tonality and contour) also drive basic auditory scene analysis, influencing listeners' segregation and recognition of melodies.

T321 Exploring how Context Changes the Interpretation of Novel Noun Compounds. Tiana Simovic, Barend Beekhuizen, *University of Toronto*.

Noun compounding is a productive word formation strategy in English. Low-frequency (hence: 'novel') noun compounds (NCs) like "animal teacher" elicit diverse responses when presented without a sentence context (e.g., Schäfer and Bell, 2020), suggesting that they are semantically underspecified and particularly difficult to interpret out-of-context. This suggests that sentence contexts should contribute to the interpretability of these compounds. We explore exactly how much the sentence contexts change default interpretations of novel English NCs by considering naturally occurring (corpus-derived) sentence contexts. We consider compounds with two

plausible interpretations: OF-relations (teacher OF animals) and IS-relations (animal who IS a teacher). We predicted context would increase participants' ratings of the plausibility of given compound interpretations and that certainty would differ between relations. Participant plausibility ratings showed OF-relations were more interpretable out-of-context ($M=68/100$ rating) than IS-relations, which were rated closer to chance level ($M=53.5/100$). Beta regression modelling showed a significant effect of context ($p<.01$). The results suggest context increases interpretation certainty, particularly when prompted with an OF-relation. However, several groups of cases notably defy this pattern. Finally, we use computational language models to identify aspects of context that are critical to novel NC interpretation.

Social Cognition

T322 Access to object concepts is modulated by usage-based properties of feature labels.

Caitlyn Antal, *McGill University*, Roberto G. de Almeida, *Concordia University*, Brendan T. Johns, *McGill University*.

We investigated how social usage-based properties of lexical items, which label object features, affect access to an object concept, using a picture-word congruency task with brief exposures (50-200ms). For each picture, one of four word probes was presented for congruency decision: the basic level category label of the picture (dog), a high-prototypical (bark), a low-prototypical (fur), or a superordinate feature (animal). We also computed four different social usage measures of lexical strength, for each word probe: word frequency (WF), contextual diversity (CD), discourse contextual diversity (DCD), and user contextual diversity (UCD). These measures were based on a Reddit corpus of approximately 55.4 billion words. Results show that, at 50 and 200 ms, object names and superordinate features yield shorter response times (RTs) and greater accuracy than high- and low-prototypical features. Results also show that high- and low-prototypical features are more affected by UCD and DCD variables, than basic-level labels. These results suggest that congruency judgment RTs and accuracy of the relation between a feature and a concept (DOG) is sensitive to the social properties (UCD, DCD) of lexical variables: the greater the frequency of the feature label, the faster and more accurate is the access to the object concept.

T323 Unattractive faces are more attractive when the bottom-half is masked, an effect that reverses when the top-half is concealed. Farid Pazhoohi, Alan Kingstone, *Department of Psychology, University of British Columbia*.

Facial attractiveness in humans signals an individual's genetic condition, underlying physiology and health status, serving as a cue to one's mate value. The current research investigated the effect of face masks on the perception of face attractiveness. Across four studies, we tested if below- and above-average attractive full faces are equally affected by wearing facial masks. The results reveal that for young faces (Study 1) and old faces (Study 2) a facial mask increases the perceived attractiveness of relatively unattractive faces, but there is no effect of wearing a face mask for highly attractive faces. Study 3 shows that the same pattern of ratings emerged when the bottom-half of the faces are cropped rather than masked, indicating that the effect is not mask-specific. Our final Study 4, in which information from only the lower half of the faces was made available, showed that contrary to our previous findings, highly attractive half-faces are perceived to be less attractive than their full-face counterpart; but there is no such effect for the less attractive faces. This demonstrates the importance of the eye-region in the perception of attractiveness, especially for highly attractive faces.

T324 Representation Matters: How are implicit biases learned?. George Cree, Brian Wu, *Department of Psychology, University of Toronto Scarborough, Canada.*

How do we acquire the representations that underlie our implicit biases about race and gender? We present a neural network model that provides insight into one important mechanism through which these biases are learned. The model is trained to compute knowledge about people who work in different occupations (e.g., black female doctor) when presented with visual information about race (e.g., black), gender (e.g., woman), and the visual context in which the person appears (e.g., stethoscope, hospital beds, etc.) as input. The frequency with which people of different races and genders appeared in different occupations, and the visual context attributes, were derived from a Google Image Search analysis in which the race and gender of the main person in each picture, and visual context attributes present in each picture, were counted across 100 pictures returned as results for the search term “Canadian ” (e.g., Canadian doctor). The model developed representations across early hidden layers that clearly capture information about race and gender even though localist representations were used as input (e.g., black woman = 1 unit) and there are no feedback connections from semantics. We explain why and how this occurs in the model, and relate the results to human representations.

T325 No adaptation effects of voice-pitch on attractiveness judgements. Jessica Ostrega, *Department of Psychology, Neuroscience & Behaviour, McMaster University, Canada,* Anthony Little, *Department of Psychology, University of Bath, United Kingdom,* David Feinberg, *Department of Psychology, Neuroscience & Behaviour, McMaster University, Canada.*

There are two competing theories about averageness and attractiveness. The average is attractive hypothesis states that people find average stimuli attractive because they resemble internal representations and are easy to process. The contrast hypothesis states that attractiveness depends on contrast from average such that exaggerated traits of stimuli in one direction increases attractiveness and exaggerated traits of stimuli in the opposite direction decreases attractiveness. Studies on facial attractiveness show that after adaptation to unattractive faces, unattractive faces become more normal looking, and more attractive, whereas attractive faces become less normal and less attractive. Voices are thought to be processed in a similar fashion to faces, and the strength of preferences for sex-typical voice and face features are positively correlated. We tested if adaptation to sex-typical and sex-atypical voice pitch influences attractiveness of voices. Using identical stimuli and paradigm as prior work showing adaptation effects of voice pitch on normality judgments, we tested for adaptation effects of high and low-pitched voices for both male and female vocalizers. No adaptation effects were observed for attractiveness. Previous studies have claimed perceptual aftereffects without using male voices and/or faces. We encourage a re-examination of previous perceptual aftereffect literature with more replication studies.

T326 Unmasking emotions: The negative impact of facial occlusion by masks on reading emotions may be reduced with transparent masks and emotional context. Sarah McCrackin, Sabrina Provencher, Ethan Mendell, India Audet, Jelena Ristic, *McGill University.*

While face masks are unquestionably effective at stopping virus spread, they occlude lower face features which are key for reading emotional states in others. In a series of studies, we examined the negative impact of facial occlusion by masks on reading emotions and investigated two potential strategies to mitigate it. We first demonstrated that accuracy to recognize the six basic emotions was impaired when individuals wore masks. These individuals were also judged as feeling less intense and more neutral emotions. We then investigated whether the use of

transparent face masks or the addition of an emotional context may be able to reduce this negative impact of face occlusion. We found that the ratings of emotional intensity and valence were fully restored for protagonists wearing transparent face masks. These ratings were also partially ameliorated by the availability of an emotional context. Together, these results demonstrate that visibility of the lower face is key for determining emotional states in others. While visual occlusion of the face by masks impairs emotion recognition and emotional judgements, transparent face masks and the addition of emotional context are strategies that are able to restore much of the typical emotional inferences.

Teaching & Learning

T327 The effect of pretesting on attention, motivation and memory. Jeremy Marty-Dugas, Sage Hartmann, Joe Kim, *McMaster University*, Faria Sana, *Athabasca University*, *McMaster University*.

We investigated whether pretesting shifted attention and motivation (assessed via intermittent thought probes) towards relevant information while reading, and whether pretesting shifted subsequent quiz performance. To assess this, we manipulated which half of the reading the pretest questions came from, thus orienting participants to the information in either the first half (i.e. the first-half pretest group), or the second half (the second-half pretest group) of the reading. A third group received no pretest. While we found no evidence that the proportion of off-task thoughts/behaviours was impacted by group, there was a significant interaction between group and time when examining motivation. When examining quiz performance, there was a significant interaction between group and time, such that each pretest group significantly outperformed the other on the content they were pretested on (i.e. the first-half pretest group did significantly better on the first half of the quiz, while the second-half pretest group did significantly better on the second half of the quiz when compared to one another). However, critically, neither pretest group outperformed the no pretest group on the quiz and there was no evidence that pretesting impacted overall quiz performance. These results highlight the need for further research on pretesting effects.

T328 An Experimental Examination of the influence of Active Learning. Laura J. Bianchi, Joyce Park, Alyssa C. Smith, Suzanne Suzanne Kearns, Daniel Smilek, *University of Waterloo*, Patrick Craven, *Lockheed Martin Corporation*, Evan F. Risko, *University of Waterloo*.

Researchers and educators have often argued that active learning is superior to more passive forms of learning (e.g., lectures), however, there is a lack of controlled experiments examining this method and the potential cognitive mechanisms underlying the putative benefits. To this end, we conducted a 3-part study online examining the influence of a popular type of active learning – peer instruction – across a range of learning relevant variables (i.e., comprehension, attention, affect, liking, metacognition and effort). Peer instruction involved participants problem solving on their own, before pairing off to discuss the problem, then sharing their reasoning with the group and getting instructor feedback. In our study, participants were first asked to read a textbook-like passage of the material to gain background knowledge of the topic. In the second part of the study, participants were brought into “class” and either watched a video lecture or took part in peer instruction. Part 3 occurred 1 week later and consisted of another test on the material. Results revealed a complex mix of costs and benefits. The implications for learning and the development of a deeper mechanistic understanding of active learning will be discussed.

T329 The CAMPUS Method: Application of Research in Cognitive Science and Education. Swiya Murti, *PUPIL Clinic (Program Using Psychoeducational Intervention for Learning) at Psychological and Counselling Services Group*, Ken Kwan, *Psychological and Counselling Services Group*.

Research in cognitive science and education is advancing exponentially! How do we apply this research to those who would benefit the most – children with learning disabilities? While the findings of cognitive training are controversial at best, studies concur that explicit instruction, interaction with feedback, and adaptation are pivotal for learning. Within this framework, we created our CAMPUS method - an acronym for: Compensation, Accommodation, Modification, Practice, Understanding and Strengthening. Our case formulation is grounded in detailed psychoeducational assessment of clients. During one-on-one intervention sessions, we identify and encourage the most beneficial compensatory mechanisms, accommodations, modifications, and practices, while mitigating inefficient ones. Knowledge translation is required for clients to understand their own cognitive profile, which then facilitates their metacognition. With this arsenal in their cognitive toolbox, we focus on strengthening cognitive weaknesses that affect academic performance and quality of life through scaffolding explicit instruction and strategies. Instead of creating additional mental load and homework, we integrate these strategies into the academics and daily lives of our clients, generalizing the learning to their academic curriculum. This holistic intervention program is tailored to the cognitive profile of each client, which allows use of regularly updated research that applies to their unique circumstances.

T330 Influence of Effort Framing in a Learning Context. Kate Van Kessel, Michelle Ashburner, Evan F. Risko, *University of Waterloo*.

Measuring effort has long been a challenge and this seems particularly true in the case of subjective effort. Koriat and Nussinson (2014) recently compared two types of effort-frames, what they call data-driven effort, the amount of effort required by a task (similar to difficulty), and goal-driven effort, the amount of effort deployed. The present study investigates whether self-reports of required and invested effort are differentially associated with affect, liking, prospective and retrospective confidence (i.e., performance prediction prior to and after the test), and memory performance in a complex learning task. Results demonstrate that data-driven and goal-driven effort have qualitatively different relations with many of these variables. For example, partial correlations revealed required effort was negatively associated with prospective and retrospective confidence, but the opposite pattern emerged for invested effort. These results demonstrate that how subjective measures of effort are framed (and interpreted by the respondent) can drastically influence how they relate to other variables of interest.

T331 “Direct” Replications as Class Projects: Mixed News about the Bad News Game . D. Stephen Lindsay, Megan Graham, Brittany Skov, Zoe Gilson, Calvin Heise, Kaitlyn Fallow, *University of Victoria*

I describe an approach to upper-level psychology seminar courses, inspired by Lorne Campbell (2017, <https://osf.io/7utzq/>). Students work in teams to conduct a “direct” replication of a published experiment. The course begins with a module on methodological reforms aimed at enhancing transparency and replicability. Then there are many readings related to the target study that students are to replicate. I present details of a recent case in which each of four teams quasi-independently attempted to replicate Basol et al. (2020), who reported that a “Bad News Game” intervention “improves people’s ability to spot misinformation techniques.” Maybe it does, but our

results suggests the intervention mostly just shifts response bias. The differences that cropped up between the teams' replications, both methods and results, are a lesson to us all. Student feedback on this approach has been very positive.

Learning, Brain & Behaviour

T332 Effect of feed-time duration on discrimination performance in a go/no-go operant paradigm. Prateek Sahu, Carolina Montenegro, Connor Lambert, Alexandra Oprea, *Department of Psychology and Neuroscience, Dalhousie University, Canada*, Moriah Deimeke, Victoria Rennie, Sarah Smeltz, *Department of Psychology, University of Alberta, Canada*, Leslie Phillmore, *Department of Psychology and Neuroscience, Dalhousie University, Canada*, Lauren Guillette, Christopher Sturdy, *Department of Psychology, University of Alberta, Canada*.

Refining and modifying experimental procedures plays a vital role in improving methodology while also reducing animal distress and improving animal welfare. In this study, we asked if increasing feed time duration from 1 second to 2 seconds affects discrimination in an operant go/no-go task. Specifically, zebra finches had to learn to discriminate sexually dimorphic distance calls as acoustic stimuli to test whether there were any significant differences in performance to learn this discrimination task when feed time duration was increased from 1 second to 2 seconds. We found no differences in learning speed (trials to criterion) between birds that were given 1 sec or 2 sec of food access following a correct go response. Our results indicate doubling food access duration did not impact the speed of acquisition of a distance call discrimination in zebra finches. These findings suggest that we can provide twice as much time for zebra finches to have access to food, potentially improving animal welfare, with no impact on experimental outcomes.

T333 Examining physiological responses to events in platform arcade games and the modulating effects of expertise . Tyler Kruger, *Department of Psychology, University of Waterloo*, Chanel J. Larche, *Centre of Excellence in Responsible Gaming, University of Gibraltar*, Navi Dhaliwal, *Gambling Research Lab, University of Waterloo*, Daniel Smilek, Mike J. Dixon, *Department of Psychology, University of Waterloo*.

Research examining sympathetic arousal in video game play often compares measures of arousal (e.g., skin conductance, heart rate) during gameplay epochs and baseline epochs, thus ignoring the potential impact of specific in-game events. Additionally, there is a paucity of research suggesting that arousal may vary as a function of player expertise/skill. Here we aim to measure event-based arousal using skin conductance and heart rate as well as explore differences in arousal between high and low skilled players using a simple platform game, Winterbells. Compared to control events (i.e., having the avatar climb during gameplay), players experienced an increase in heart rate for the falling events (i.e., having the avatar fall to the ground resulting in termination of play). These findings were also corroborated by increased skin conductance patterns following a fall compared to a climbing event. Intriguingly, our exploratory analysis involving expertise showed that highly skilled players in our sample elicited greater skin conductance following a fall. These findings highlight the importance of using event-related analyses of arousal to help inform hypotheses regarding sympathetic reactivity in a gaming context, as well as provide preliminary evidence of the potential emotional investment of skilled players during gameplay.

T334 Differential grey matter structure of the pars orbitalis, triangularis and opercularis in individuals with dyslexia: A volumetric asymmetry study. Kelly Nisbet, *Communication Sciences and Disorders, Faculty of Rehabilitation Medicine, University of Alberta*, Avary Kostiw, *Neuroscience and Mental Health Institute, Faculty of Medicine and Dentistry, University of Alberta*, Thi Kim Truc Huynh, *Psychology, Faculty of Science, University of Alberta*, Sukhmani Kaur Saggu, *Neuroscience and Mental Health Institute, Faculty of Medicine and Dentistry, University of Alberta*, Dev Patel, **, *Communication Sciences and Disorders, Faculty of Rehabilitation Medicine, University of Alberta; Neuroscience and Mental Health Institute, Faculty of Medicine and Dentistry, University of Alberta.*

Brain imaging work aimed at increased classification of dyslexia has underscored an important role of the inferior frontal gyrus (IFG; Eckert, 2004). The extent to which components of the IFG, namely the pars orbitalis, triangularis and opercularis, have differential grey matter properties, compared to typical readers, requires further investigation. Additionally, relationships between the IFG and other regions associated with reading would facilitate our understanding of the neural underpinnings of dyslexia. Adult participants (N = 38; 16 with dyslexia) took part in an MRI study, whereby high resolution structural scans were obtained of the IFG, superior temporal gyrus (STG) and the supramarginal gyrus (SG). Significant differences were found for the IFG regions, such that skilled readers had a greater leftward asymmetry of the orbitalis and triangularis, and greater rightward asymmetry of the opercularis, compared to individuals with dyslexia. Furthermore, the pars triangularis was significantly associated with leftward asymmetry of the STG for only the skilled reading group. The cortical asymmetry of the IFG, and corresponding connections with other reading-related regions, is inherently different between individuals with dyslexia and skilled readers. We discuss our findings in the context of the print-to-speech framework to further understanding of the neural underpinnings associated with dyslexia.

T335 Does chronic antipsychotic drug administration alter hippocampal dendritic spine density? Mark Bardgett, Karlee Migneault, Natasha Nail, *Department of Psychological Science, Northern Kentucky University.*

Over the last 30 years, the use of antipsychotic drugs in the treatment of pediatric psychiatric disorders has increased significantly. This phenomenon has occurred in the absence of data documenting the effects of early-life antipsychotic treatment on brain development. In the present study, rats were used to assess whether chronic antipsychotic drug administration in early postnatal life affected dendritic spine density in the CA1 region of the hippocampus. Rats received daily injections of risperidone, the most widely used antipsychotic drug in children, from postnatal days 14-42. Brain tissue was collected one week later and processed for Golgi staining of individual neurons. A comparison group of rats were chronically administered risperidone from postnatal days 77-105 to control for the effects of age. Assessments of large and small spine heads on the apical or basal dendrites of CA1 pyramidal neurons did not reveal a significant effect of chronic risperidone on spine density at either age. The results indicate that prolonged antipsychotic administration does not dramatically alter fine dendritic structure in the adult hippocampus. Future studies are nonetheless merited that consider the effects of developmental antipsychotic administration on other elements of neuronal structure in other brain regions.

Posters

Session 1

P101 Can proactive control facilitate selective attention? Evidence from a two-target method . Sevda Montakhaby, Bruce Milliken, Ellen MacLellan, *McMaster University*.

Cognitive control enables adaptive biasing of attention, perception, and behaviour in servitude to task goals. This control may occur proactively in anticipation of task goals, or reactively in response to processing difficulty as it unfolds. In this study, we used a skeletal two-target method to examine whether proactive preparation to attend selectively to a first target (T1) influences the accuracy to report both T1 and a following second target (T2). T1 was a word presented alone (no-selection trials) or interleaved with a distractor word (selection trials), while T2 was a single pattern masked word. Prior work using this method has demonstrated a pronounced attentional blink effect for selection trials only. Preparation to attend selectively was manipulated by cueing in advance of each trial whether T1 would or would not require selective attention. Data were collected both online and in-person. The results did reveal a modest cueing effect when informative and uninformative cue trials were randomly intermixed, but overall offer little evidence that this cueing effect constitutes a benefit of proactive preparation on informative cue trials. Together, the results offer surprisingly little support for a role of proactive control on selective attention in this task context.

P102 Testing perceptual sensitivity in two forms of temporal attention. Colin McCormick, Raymond Klein, *Dalhousie University*.

Temporal attention research often conflates endogenous and exogenous mechanisms by cueing participants to the interval in which a target will likely appear (eliciting endogenous mechanisms) with some salient stimulus (eliciting exogenous mechanisms). In McCormick et al. (2018), we used Lawrence and Klein's signalling method (2013) within a temporal cueing paradigm to compare purely endogenous temporal attention (which used an iso-intense cue) to the more common combined form (which used an intense cue). In doing so, we observed the independence of these two temporal mechanisms. However, we still do not know much about how these two mechanisms may differently impact the perception and processing of stimuli. In the current experiment, participants are cued to when a target is likely to be presented using intense or iso-intense signals. Instead of using two possible target forms (2AFC), we used a target whose colour is pulled from a continuous colour distribution. Participants made a speeded detection response and then identified the target colour on a response wheel. We applied a mixed-model analysis of colour-identification accuracy to see if there are differences in perceptual sensitivity between endogenous and exogenous temporal attention.

P103 Attention bias and social skills in youth with anxiety disorders . Hailey Burns, Dr. Sandra Meier, *Department of Psychiatry, Dalhousie University, Halifax, Nova Scotia, Canada*, Dr. Raymond Klein, *Department of Psychology and Neuroscience, Dalhousie University, Halifax, Nova Scotia, Canada*, Dr. Jose Mejia, *Department of Psychiatry, Dalhousie University, Halifax, Nova Scotia, Canada*.

Anxiety disorders are one of the most prevalent psychiatric disorders in youth today and social support (online or in-person) is a key factor in the development and maintenance of these disorders. An increased attentional bias towards negative social stimuli may also cause and maintain anxiety; however, few studies have explored the relationship between negative social stimuli found on social media platforms and anxiety. Therefore, we intend to investigate (1) whether anxious youth show an attentional bias towards negative stimuli compared to healthy youth, and (2) whether this attentional bias is related to poorer social skills. Female youth (n = 90; age 15-24) will first complete a questionnaire regarding their experiences in social settings, social skills, and anxiety symptoms. Their daily social life, such as the number of phone calls made, will be objectively and passively recorded for two-weeks using a mobile sensing app. Eye-tracking software will be employed to assess attentional biases in 3 social settings: (1) static photos, (2) dynamic videos, and (3) social media content. We expect anxious youth to focus primarily on negative stimuli in the photos, videos, and social media posts and this bias to be linked to lower perceived social competence and fewer social activities.

P104 Oral and Written Language Called Upon the Same Processes as Shown by the Missing-Phoneme Effect. Ian Dauphinee, Mathis Roy, Jean Saint-Aubin, *Université de Moncton, Canada*.

When looking for target letters while reading, readers miss more targets embedded in content than in function words. This missing-letter effect in reading has an equivalent in oral language: the missing-phoneme effect observed when participants listen to the narration of a text while searching for a target phoneme. This functional equivalence of the reading and the oral language tasks might be more apparent than real. In reading, the effect would be due to the allocation of attention, while in oral language, omissions of phonemes in function words would be due to a phenomenon called speech reduction. To control for coarticulation, we used a rapid serial auditory presentation procedure (RSAP), and in the control condition, we used a rapid serial visual presentation procedure (RSVP). Forty-eight participants read two texts with an RSVP procedure and pressed a key when they detect the target letter. Forty-eight participants listen to the same passages presented with an RSAP procedure and pressed a key when they detected the target phoneme which always matched the target letter. With both tasks, the target was more frequently omitted when it was embedded in a function than a content word. Results are interpreted in light of the Attentional Disengagement model.

P105 Online lecture breaks can increase media-multitasking and harm learning. Kitty M.Q. Guo, Abigail J. Fisher, Noah D. Forrin, *McMaster University*, Faria Sana, *Athabasca University*, Joseph A. Kim, *McMaster University*.

The pivot to online learning at many Canadian universities amidst the COVID-19 pandemic has amplified the challenge of sustaining student attention during lectures, as students report a decreased ability to focus during online lectures (Hicks et al., 2021). While some research suggests that breaks during lecture videos improve attention and learning (Fenesi et al., 2018), there is limited research examining what types of breaks are effective. We examined the effect of break length and frequency on attention and learning during a 50-minute pre-recorded lecture video in a

simulated virtual classroom. Undergraduate students were randomly assigned to take no breaks, one 6-minute break halfway through, or three 2-minute breaks equally distributed throughout the lecture. We found that participants performed significantly better on the post-lecture quiz in the no breaks condition, compared to the break(s) conditions, and in the one 6-minute break condition, compared to the three 2-minute breaks condition. Consistent with this result, participants in the break(s) conditions retrospectively reported significantly more media multitasking than those in the no breaks condition. This study suggests that not all lecture breaks are beneficial to learning – some may even be detrimental. Future studies should consider the effect of different break activities on learning.

P106 Dual Processes in Recognition Memory. Ver-Se Denga, *McMaster University*, Tamara Rosner, Hanae Davis, Isaac Kinley, Bruce Milliken, *McMaster University*.

According to the desirable difficulty principle, items that are difficult to process in an initial encoding task are often remembered better in subsequent tests of memory. Rosner et al. (2015) reported a result that aligns with this principle: recognition memory was superior for words presented previously with a different word distractor (i.e., an incongruent item) than for words presented previously with an identical word distractor (i.e., a congruent item). Curiously, this sensitivity benefit for incongruent words is not always evident in hit rates and is sometimes carried entirely by false alarm rates, with lower false alarm rates for incongruent words. A dual process account may explain this result. Specifically, more robust encoding of incongruent than congruent words may increase hit rates for incongruent words, whereas more fluent processing at test for congruent than incongruent words may increase hits for congruent words. These counteracting effects could produce the null hit rate effect. We examined this dual process account by re-analyzing several published data sets. As the two focal processes may exert their influence on recognition with different speeds, our re-analysis aimed to determine whether they could be teased apart by examining recognition performance as a function of recognition decision speed.

P107 Sleep and Dreaming During a Pandemic. Samantha Tigchelaar, Hans C. Dringenberg, *Department of Psychology, Queen's University*.

The COVID-19 pandemic has led to profound changes in personal and professional activities, increased levels of stress, and negatively impacted general well-being. These factors and experiences are often related to lower sleep quality and can influence the emotional tone and content of dreaming. Here, we used an online survey to evaluate subjective changes in well-being, sleep quality and timing, as well as dream tone and content during the COVID-19 pandemic. Our results (n = 658) revealed significant changes in sleep timing since the onset of COVID-19, including later bedtimes and later morning waking times. Further, participants reported decreases in well-being and sleep quality, as well as increases in the intensity and negativity of dreams during the pandemic. Interestingly, about half (50.5 %) of the sample reported experiencing specific COVID-related content during dreaming with about a quarter (27.1%) experiencing this content as frequently as once a month or more. Together, our findings document the profound impact of the COVID-19 pandemic on general well-being, sleep, and dream content. Given the well-documented benefits of sleep, the changes in sleep patterns and quality noted here constitute a potential target to improve functioning and health status during periods of elevated stress (e.g., during the pandemic).

P108 Alterations to Genome-Wide DNA Methylation in the Brains of Adult Zebra Finches (*Taeniopygia guttata*) After Single Parenting. Rachel Gibbs, Broderick Parks, Jordan Fisk, Jill Squires, Sean Aitken, Tara Perrot, Leslie Phillmore, *Department of Psychology and Neuroscience, Dalhousie University, Halifax NS, Canada.*

In biparental songbird species (e.g., zebra finches, *Taeniopygia guttata*), both parents play a key role in raising their offspring. Therefore, the removal of either parent could potentially be an adverse experience for the offspring and the remaining parent. While past research on single parenting has focused on offspring outcomes, acute mate pair separation is known to modulate HPA axis regulation in adult songbirds. Previously, we separated paired finches into three conditions in which to raise their offspring; biparental, maternally deprived, and paternally deprived. We found no difference in plasma corticosterone between groups, suggesting that the single parents adapted to the loss of their partner. However, changes could have occurred at the subcellular (i.e., epigenetic) level, as shown in rodent models. Therefore, we measured global DNA methylation in brain regions related to HPA axis regulation and vocal learning in the zebra finch parents (n=16). Preliminary results show region and sex specific methylation differences related to single parenting, particularly in the hippocampus. While these findings require replication in a larger sample, they represent some of the first evidence of genome-wide epigenetic regulation in adult songbirds after single parenting, providing the basis for future research examining the methylation status of specific genes.

P109 Two-Alternative Forced Choice Visual Psychophysics in Unrestrained Wildtype Mice. Nicole M. Michaud, Nathan A. Crowder, *Department of Psychology and Neuroscience, Dalhousie University.*

The mouse has become an important animal model in vision research because of the availability of genetic tools used to explore neural circuits within and between brain areas. However, to link neural circuits to visual perception novel behavioral tasks must be developed. As a starting point to investigate the neural underpinnings of visual size perception, we modified the steering wheel paradigm developed by Burgess et al. (2017) to create a two-alternative forced choice size discrimination task in unrestrained wild-type mice. We assessed the ability of mice to correctly select the larger of two simultaneously presented grating patches, which allowed the creation of psychometric functions from perceptually driven behavior. Mice displayed successful learning and generalization of the task when the reward stimulus size remained constant. However, when the size of the reward stimulus was varied and mice were required to select the relatively larger grating patch task accuracy failed to reach criterion. Next steps for this research include optogenetic experiments in which neural circuits within the primary visual cortex could be altered to probe the importance of various receptive field properties predicted to be involved in the perception of visual size.

P110 Visual and Haptic Identification of Simple and Complex Objects. Aidan Steeves, Erin Green, Genevieve Desmarais, *Associate Professor of Psychology, Mount Allison University, NB.*

Encoding specificity is a well-established phenomenon that applies to object recognition. However, recent research revealed a violation of encoding specificity for individuals who learn to recognize objects by touch – visual identification is as accurate as haptic identification. This violation may result from the kind of objects used: simple objects that can be described easily using verbal labels. We therefore examined the representations created when we learn to recognize objects by sight or by touch, using either simple objects or complex multi-feature objects. Participants learned to

recognize one of the sets of objects by sight or by touch. Some participants completed the task as is, while other participants simultaneously completed a verbal distractor task a visuo-spatial distractor task. Though we were unable to recruit enough participants to detect an impact of distractor tasks, we did replicate the violation of encoding specificity with both object sets. Furthermore, participants produced more errors when learning to recognize complex objects, and confusions were driven by object similarity for both sets of objects. Our findings suggest that the violation of encoding specificity was not specific to the simple objects and may be representative of visuo-haptic processing.

P111 Multiple-object tracking (MOT) interferes differentially with visually guided touch, even when reporting techniques involve different response modalities. Mallory E. Terry, *Department of Psychology, University of Guelph, Ontario, Canada*, Vanessa Amelio, *Department of Biological Sciences, University of Guelph, Ontario, Canada*, Lana M. Trick, *Department of Psychology, University of Guelph, Ontario, Canada*.

In everyday life many tasks require performing coordinated actions towards specific moving items among others (e.g. pointing, touching). This ability to keep track of positions of specific items (targets) among others, referred to as multiple-object tracking (MOT), is proposed to rely on the cognitive mechanisms that are also required for coordinated actions (Pylyshyn, 2001). In support of this, visually guided touch was found to interfere with the MOT task, especially when the touched item was a distractor in MOT (Terry & Trick, 2021). Participants tracked 1-4 targets while touching items in MOT that changed colour (targets, distractors). In the present studies we utilized two different methods to report the targets such that in one experiment they touched the targets to identify them (same modality as during the trial) and in the second experiment letters were presented on the items and the participants used a keyboard to report the targets (different modality than during the trial). The pattern of accuracies and response times were consistent across experiments providing further evidence that the mechanisms employed in MOT are also utilized in coordinated actions.

P112 An Investigation into the Self-Deployment of Reminders. Zion Leatham, Bobby McHardy, Jonathan Fugelsang, Daniel Smilek, *Department of Psychology, University of Waterloo*.

Nudging assumes that people's cognitive abilities and self-control are limited due to the complexity of the world, and structural changes to their environments are often required for them to act in their own best interest. Yet it has drawn critique; nudges usually require public choice architects to predict what people want or need. In the present experiment, we examine 'self-nudging' in which a person implements structural changes to their environment to help optimize their performance. We sought to determine whether people will self-deploy and modulate their visual reminder setting as a function of task demand. Participants completed the 2-back either independently or while a video was simultaneously presented. To determine whether people were sensitive to the impact that a concurrent video had on primary-task performance, individuals in both conditions (No-Video vs. Video) were given the opportunity to set how frequently (0 – 16 min) they would like a visual reminder to appear. Findings indicated that people will self-nudge themselves regardless of the task demand. In addition, participants modulate their reminder setting, although this effect may not be in accordance with the demands of their primary task. These results suggest that people will self-nudge while exercising agency when provided the opportunity.

P113 The Impact of Lunch Timing on Nap Quality. Jennifer Fudge, Emily Peterson, Shae-Lynn Koe, Hans Dringenberg, *Department of Psychology, Queen's University.*

The human sleep-wake cycle follows a regular circadian rhythm, which is controlled by an internal biological clock (the suprachiasmatic nucleus), as well as external cues that aid in maintaining the system's precise rhythmicity. Previous research on one of these external cues, meal timing, has yielded inconclusive results as to whether eating shortly before sleep onset negatively impacts sleep quality. To date, few studies have examined the effect of meal timing on the quality of daytime naps. Here, we used polysomnographic methods (EEG, EOG, EMG) and subjective self-reports of sleep quality and fatigue to examine whether the timing of lunch (1 vs. 2 hour interval between lunch and napping) impacts nap quality. Results revealed that subjective ratings and objective polysomnographic measures (total sleep time, sleep efficiency, sleep onset latency) of sleep quality were higher in the 2-hour condition relative to the 1-hour interval. Together, these findings suggest that a longer time interval between food intake and a subsequent nap can improve sleep quality, leading to more restorative sleep. Future research should continue to identify conditions that improve nap quality, thus maximizing the well-documented beneficial effects of sleep on human health and cognitive functioning.

P114 The impact of cell phone interruptions during class: does controlling when to send a text improve performance?. Laura Schneeberger, *Brain & Mind Institute, Western University,* Abigail Kelson, Nicole Doncaster, Geneviève Desmarais, *Department of Psychology, Mount Allison University.*

Students generally have their cell phones with them throughout the day; the interruptions caused by incoming messages can therefore also happen during class. These interruptions disrupt encoding and impact academic performance. Interestingly, a recent study has shown that receiving texts, but not sending them, predicted academic outcomes – potentially because users can decide to send a text at a time that does not interfere with the class. We tested this possibility by asking students to watch a 16-minute lecture and respond to a multiple-choice test on the material presented. Crucially, some participants gave their cell phones to the experimenter, while others kept their phones. Of these, some participants responded to three prompts sent by the experimenter at specific times during the lecture, while other were provided with the prompts at the beginning of the lecture and responded at a time of their choosing. The analysis of the test scores revealed that participants who kept their cell phones performed more poorly than those who did not keep their cell phones – independently of whether they controlled when to send a text. Our findings are discussed in terms of immediate (shortly after class) vs. delayed testing (at the end of a term).

P115 Statistical reasoning regarding possible adverse outcomes of vaccination. Alexandra van der Valk, Jeremy Gretton, Ethan Meyers, Alexander Walker, Jerika Chuong, Jonathan Fugelsang, Derek Koehler, *Department of Psychology, University of Waterloo, Canada.*

When an AstraZeneca COVID-19 vaccine trial participant developed transverse myelitis, many concluded the vaccine caused the illness, neglecting it could have occurred by chance. We investigate how statistical considerations affect perceptions that vaccines cause adverse outcomes. After learning myelitis occurred in some vaccinated people, participants (N=301) repeatedly rated the strength of evidence that the vaccine causes myelitis as successive information was provided. Participants were told that myelitis occurred in either 10 (the base rate) or 20 out of 1000 vaccine recipients. Strength of evidence that vaccines cause myelitis was perceived as weaker when 10

cases were reported versus 20, though this was only reliably observed among participants higher in numeracy. Participants (even those high in numeracy) did not reliably lower their evidence strength ratings after learning that myelitis is one of many outcomes screened in trial participants, and that doing multiple tests can inflate the false-positive rate. People low in numeracy may believe vaccination causes an adverse outcome even when that outcome occurs at frequencies expected by chance. Even those high in numeracy may have difficulty understanding how multiple testing can inflate the false-positive rate. Communicating statistical information in a way that considers these limitations may help reduce vaccine-related misinformation.

P116 Individual Differences in Media Multitasking and Attentional Breadth. John Knox, Danielle England, Sandra J. Thomson, *St. Thomas University*.

Media multitasking has become an increasingly common practice. Existing research suggests that frequent media multitasking experience in everyday life is associated with negative effects on sustained attention and cognitive control. For example, Ophir et al. (2009) demonstrated that heavy media multitaskers (HMMs) are less able to filter out irrelevant information, suggesting that they are more susceptible to interference. A possible explanation may be that HMMs have a more diffuse attentional state to enable processing of multiple stimuli simultaneously. We investigated this hypothesis by measuring participants' attentional blink and global-local processing. In addition, we computed each participant's media multitasking index (MMI) using a modified version of Ophir et al.'s Media Use Questionnaire (MUQ). In contrast to previous findings (Dale & Arnell, 2010), our results demonstrated a negative association between local interference and AB magnitude. Importantly, neither effect was related to participants' MMI. Our results did not provide evidence of a relationship between self-reported media multitasking as measured by the MUQ and dispositional attentional breadth assessed in the global/local and attentional blink tasks.

P117 Is Gaze-Cuing More Like Endogenous or Exogenous Orienting?. Nicholas Murray, Richard Drake, Raymond Klein, *Department of Psychology and Neuroscience, Dalhousie University*.

Gaze-cuing is a form of visual orienting, in which a shift in one person's gaze triggers onlookers to orient in the same direction. Orienting can be controlled endogenously (i.e., deliberately) or exogenously (i.e., reflexively) (Posner & Cohen, 1984). It is unclear whether uninformative gaze cues invoke endogenous or exogenous orienting (McKee et al., 2007). This study extended two past experiments which double dissociated endogenous and exogenous orienting in the Posner cuing paradigm: Experiment 1 was based on Briand and Klein (1987) and Briand's (1998) studies, which showed that when participants search for a conjunction target amongst an array of similar distractor items, they make fewer illusory conjunctions if they were cued exogenously. Therefore, exogenous orienting enhances feature integration. Experiment 2 was based on Klein's (1994) study, which showed that when one target appears more often than another in a two-alternative-forced-choice task, participants form larger non-spatial expectancy effects only if they were cued endogenously. Therefore, endogenous attention enhances non-spatial expectancies. We swapped the cues in both experiments for uninformative gaze cues. We hypothesized that gaze-cuing would function exogenously (i.e., enhance feature integration but not non-spatial expectancies) because gaze-cuing shares more methodological and quantitative properties with exogenous orienting than endogenous orienting.

P118 Your Best Effort? Study Strategies and Subjective Experience. Caitlin Reintjes, Jeremy Marty-Dugas, Joe Kim, *Psychology, Neuroscience, and Behaviour, McMaster University.*

While retrieval practice is a more effective strategy for long-term retention, rereading course material is a more popular strategy among undergraduates. One possible explanation for this discrepancy is that these strategies may differ in terms of how they are subjectively experienced. In the present study we investigate whether varying study strategy leads to systematic changes in student experience. After an initial reading phase, 264 undergraduate students were randomly assigned to study a passage using either rereading or retrieval. Participants reported on their experience of cognitive effort (assessed via ratings of perceived difficulty, expended effort, and fatigue), as well as their experience of flow (i.e. deep, effortless concentration) while studying. Immediately following these ratings, students completed a knowledge test. In contrast to prior findings, preliminary results suggest that those who used rereading performed significantly better on the memory test than those who engaged in retrieval. Further, perceived difficulty did change as a result of strategy, although flow, expended effort, and fatigue do not appear to differ between strategies. Results indicate that subjective experience may be an important predictor of academic performance. These results could provide rationale for why students select certain strategies, and determine how to encourage better studying techniques.

P119 The effect of target and distractor feature similarity in multiple object tracking. Rachel Eng, Lana M. Trick, *University of Guelph.*

Multiple object tracking (MOT) is the ability to simultaneously track multiple items and is thought to be involved in visual motor coordination. In a standard MOT laboratory task, an observer is asked to track a subset of identical items (targets) among equally identical items (distractors). Some versions of MOT use heterogeneous items, which may better represent real-world situations. However, different theories of MOT, such as the visual index theory and the multifocal attention theory, would predict different effects of item features in MOT. In our MOT study, we created a task with 16 heterogeneous items and manipulated target and distractor similarity. Each item had two features: colour (red, blue, green, or yellow) and shape (circle, triangle, square, or cross), such that each item had a unique combination of features. In one condition, targets shared a single feature that distinguished them from distractors (colour or shape). In another condition, targets did not share any features with each other and the combination of two features was required to distinguish targets from distractors. A final condition with 16 identical items served as a control condition. Results did not support either theory.

P120 How does the symbolic orienting of attention impact actions and their perceived effects?. Jason Ivanoff, Julia Fraiha, Samantha Fader, *Saint Mary's University, Alan Kingstone, The University of British Columbia.*

Central arrows direct our attention, even when they are uninformative. The symbolic orienting effects of arrows are usually measured along with an overt action (e.g., a key-press) and action effects (AEs; e.g., removal of the target and advancement to the next trial). Here we investigate how arrow cues impact movement kinematics using three different computer mouse tasks: (1) an AE compatible task where the movement of the cursor paralleled that of the mouse; (2) an AE incompatible task where the movement of the cursor mirrored that of the mouse; and (3) an AE absent task where the mouse cursor was invisible. Although the absence of the cursor resulted in slower reaction times (RTs) and greater dispersion of target localization, there was no evidence that it impaired the precision of target localization. In contrast, AE incompatibility resulted in

slower RTs, an increased tendency for actions to deviate away from the target, and increased cumulative residual entropy (i.e., increased movement pauses and rapid movements during movement). The arrow cues improved RT across all conditions, but only increased entropy in the AE incompatible condition. These findings suggest that arrows have little impact on actions unless they are recoded according to their effects.

P121 Motivated Memory in Younger and Older Adults: A Comparison of Self-Serving and Prosocial Incentives. Shadini Dematagoda, Julia Spaniol, *Toronto Metropolitan University (formerly Ryerson University)*.

Episodic memory decline is a hallmark of normal aging. Despite this decline, episodic memory in older adults remains sensitive to motivational influences, such as monetary reward. Recent work on motivational changes in adulthood suggests that prosocial motives are more influential in older than younger adults. However, the impact of prosocial reward, or reward earned for others, on episodic memory has not been examined to date. The current experiment investigated the relative impact of self-serving and prosocial reward in younger and older adults using a motivated-encoding paradigm. Participants (88 younger adults and 69 older adults) were randomly assigned to a reward recipient (self vs. charity). They viewed a series of indoor and outdoor scenes associated with high (\$0.25) or low (\$0.01) reward, with reward receipt contingent on successful recognition of the scenes on a subsequent old/new recognition test. Contrary to hypothesis, reward recipient (self vs. charity) did not influence recognition hit rates in either age group. However, in line with previous studies, recognition memory was sensitive to reward magnitude (high vs. low) in both younger and older adults. These findings suggest that the mechanisms of reward-modulated memory may be similar for self-serving and prosocial reward across adulthood.

P122 Investigating the role of attention and concussion history on Item and Associative memory. Adam Cox, Myra Fernandes, *Department of Psychology, University of Waterloo, Canada*.

We explored differences in the ability to remember individual components of memory, as well as how these are linked. We measured memory for single words (Item), as well as pairs (Associative), and investigated the role of attention and a past concussion on performance. People with a history of concussions often complain of ongoing difficulties in focusing attention, and lingering memory problems, but standard neuropsychological testing rarely reveal any actual deficits. Given this, we predicted greater memory deficits in this group when attention is limited during encoding, and on the Associative test. Participants were shown word pairs (e.g. coffee-paper) one at a time for 3-second each, under either full attention or divided with a concurrent digit-monitoring task. We found the expected main effect of test type, with better performance on Item than Associative memory. We also found a main effect of attention with poorer performance under divided than full attention. Preliminary data in those with concussions show that they maintain Item memory but have significantly larger drops in performance when attention is divided, and when the memory test requires linking words. Our work shows that both Item and Associative memory require attention, and a history of concussion compounds this effect.

P123 Improved Visual Working Memory Performance for Real-World Objects is Related to Memorability. Rosa E. Torres, Mallory S. Duprey, Karen L. Campbell, Stephen M. Emrich, *Brock University*.

Although limited in capacity, recent evidence suggests individuals have better visual working memory (VWM) performance for real-world objects compared to simple features (e.g., colours). In the current study, we examined whether this object benefit was due to increased recognizability of real-world objects. To test this question, participants performed a delayed-recall task and provided a 6-point confidence response indicating whether or not the probed item was old. The data was modeled using receiver operating characteristic (ROCs) curves, and fit using the dual-process signal detection (DPSD) model to determine the relative contributions of recollection vs familiarity. In Experiment 1 (n = 50), participants demonstrated greater overall memory performance (d-prime) for the real-world objects compared to colours. In addition, memory for real-world objects relied on recollection, whereas colors relied only on familiarity. Experiment 2 (n = 50) replicated this effect, with greater performance and recollection for real-world objects compared to their scrambled counterparts. Importantly, the likelihood of a specific object being remembered with high confidence was correlated across the two experiments, suggesting that some objects are more recognizable. These results suggest that the object benefit may be partially explained by increased memorability of some objects compared to simple features.

P124 Evidence that individuals modulate study effort consistent with anticipated environmental support. Megan Kelly, Evan Risko, *University of Waterloo*.

Remembering occurs under various levels of environmental support—or the degree to which external stimuli and context at retrieval share features of those at encoding. We examined how expected environmental support influences memorial behavior across two preregistered experiments. We manipulated the degree of support between-participants by varying the degree to which information provided at test reflected the original study items. We tested memory both in the presence and absence of the expected support (i.e., aided and unaided recall, respectively), obtained global memory predictions, and indexed study effort using study time, global effort rating, and reported strategy use. Expecting more support led to better aided recall and but led to poorer unaided recall. Individuals' predictions of aided recall and study time were generally consistent with the influence of environmental support on aided recall. However, individuals appeared less able to predict the influence of environmental support on unaided recall, suggesting that losing the expected environmental support hinders accurate memory prediction. Individuals appear generally metacognitively sensitive to the influence of environmental support on future remembering and can use this information to control present study effort, but a violation of anticipated environmental support may hinder these processes.

P125 Experiences of “acting as one” in group joint action. Anh Hoang Tran, Jorden Cummings, Janeen Loehr, *Department of Psychology and Health Studies, University of Saskatchewan, Canada*.

United agency refers to a sense of ‘acting as one’ or ‘acting together as though a single unit’ that can occur when people engage in joint actions such as group music-making, dancing, or marching. Little research has systematically examined people’s experiences of united agency when they engage in joint actions in their everyday lives. The current study filled this gap by collecting detailed descriptions of united agency experiences from 105 participants using an online survey. The results of this study demonstrated that 1) a majority of the participants experienced united agency at least occasionally, 2) united agency often occurred in sports and exercise-related

activities and musical activities (dancing, playing, or listening to music), and 3) united agency occurred across a variety of group sizes, experience levels, and interpersonal relationships. Furthermore, the frequency of experiencing united agency was correlated with cognitive empathy, extraversion, and agreeableness, and experiencing united agency elicited a variety of cognitive and emotional responses. These findings shed light on the conditions under which united agency is likely to occur as well as its positive social and emotional consequences.

P126 Examining subjective reports of caffeine consumption and attentional engagement in everyday life. Tyler Kruger, Daniel Smilek, Mike J. Dixon, *Department of Psychology, University of Waterloo.*

Caffeine is the most popular psychoactive substance in the world. The present study aimed to investigate how caffeine consumption and the motives for caffeine consumption relate to attentional engagement in everyday life. In a sample of university students (N = 193) we collected reports of caffeine consumption, the motives for caffeine consumption, as well as various reports of attention in everyday life, including experiences of deep and effortless concentration (i.e., “flow”), absent-mindedness, attention lapses, and mind-wandering. We found no relation between the amount of self-reported caffeine consumption and attentional engagement in everyday life (i.e., attention related cognitive errors, attention lapses, mind-wandering, or flow). Interestingly, however, we found that the cognitive motives for consuming caffeine (e.g., consuming caffeine to feel more alert, to help concentration, to help focus attention, etc.) was positively related to inattention (i.e., attention related cognitive errors, attention lapses, and spontaneous mind-wandering) and negatively related to internal flow (i.e., flow while thinking or imagining). Although the present findings cannot address causality, they present the interesting possibility that the very reasons one may use caffeine (e.g., to help concentration) may not have a significant effect on attentional engagement in everyday life.

P127 Hemispheric Asymmetries in Auditory Distraction: A Right-Ear Disadvantage for the Categorical Deviation Effect. Sacha-Michelle Dubois-Sénéchal, *School of Psychology, Université Laval*, Katherine Labonté, *School of Human Nutrition, McGill University*, Hélène St-Cyr, Marlène Bolduc, Francois Vachon, *School of Psychology, Université Laval.*

An unexpected change in the auditory background can impede cognitive performance via attentional capture. Although this deviation effect is typically caused by an irregular change in the acoustic properties of the sound, recent empirical demonstration revealed that a change in (semantic) category within an irrelevant sound stream is also endowed with the power to disrupt ongoing cognitive activity. Yet there is growing evidence that this categorical deviation effect may not be functionally equivalent to its acoustic counterpart. To shed light on the mechanisms underpinning this semantic form of auditory distraction, the present study assessed the effect of manipulating the spatial location of irrelevant speech on the manifestation of the phenomenon. In two experiments, participants performed a visuospatial serial-recall task while ignoring auditory sequences composed of exemplars drawn from the same semantic category. In rare trials, one spoken item was replaced by an exemplar from another category (e.g., a tool among animals). The presence of such a categorical deviant disrupted recall performance, but only when the sound was presented through the right ear. These findings demonstrate a key role for the left hemisphere in the categorical deviation effect, suggesting the phenomenon relies on the (automatic) lexical-semantic analysis of unattended speech.

P128 Examining attention capture effects in complex visual search arrays. Anjali Pandey, Raymond Klein, Gail Eskes, *Department of Psychology and Neuroscience, Dalhousie University.*

We sought to determine whether the presence of an onset distractor in a complex, naturalistic visual search array would incur costs in target detection reaction times that varied with the relative distance of the onset distractor to the target. In an online visual search game, older adults were required to identify a spy (target) among suspects (distractors), all of whom revealed their faces simultaneously with the spy and could share certain features with it. On 50% of the trials, an onset element in the form of another suspect appeared at the time of the face reveal and remained visible until the target was selected. Distractor number and the number of features in common between the distractors and target were varied randomly within and across blocks of trials respectively. Preliminary analyses suggest the presence of an onset distractor cost gradient: not only were mean target detection times slower when an onset distractor was present than when it was absent, but the magnitude of this cost decreased as the relative onset distractor-target distance decreased. Interestingly, the smallest costs were observed either when the target was in the bottom left of the array or when the onset distractor appeared in the bottom right.

P129 Individual difference factors affecting emotional contagion in young adults.. Amanda McQuarrie, Lorna Jakobson, *Department of Psychology, University of Manitoba, Winnipeg, Manitoba,* Stephen Smith, *Department of Psychology, University of Winnipeg, Winnipeg, Manitoba and Department of Psychology, University of Manitoba, Winnipeg, Manitoba.*

Empathy impacts social interactions and moral decision-making. Empathy levels differ in the general population. In an attempt to identify factors underlying individual differences in empathy, we investigated potential links between specific personality traits – alexithymia and sensory processing sensitivity (SPS) – and levels of emotional contagion, an automatic process thought to form the basis for the emotional experience of empathy. Three hundred five adult participants completed self-report questionnaires measuring alexithymia, SPS and mood. Participants then completed an emotional contagion task in which they watched brief affective film clips and rated how strongly each clip made them feel nine different emotions. After controlling for current mood, SPS significantly predicted how strongly participants felt the primary emotion elicited by each film type in the full sample (amusement for positive films; fear for negative films; a mixture of amusement and embarrassment for mixed films; and boredom for neutral films). This “focused” contagion response should lay the foundation for strong affective empathy. In contrast, levels of alexithymia significantly predicted how mixed participants’ emotional responses were. The “fuzzy” emotional contagion experienced by those scoring high in alexithymia may make it more difficult for them to pinpoint their emotional responses and experience affective empathy.

P130 Neural correlates and perceived attractiveness of male and female shoulder-to-hip ratio in men and women: an EEG study. Farid Pazhoohi, *Department of Psychology, University of British Columbia,* Joana Arantes, *University of Minho,* Alan Kingstone, *Department of Psychology, University of British Columbia,* Diego Pinal, *University of Minho.*

While there are studies regarding the neural correlates of human facial attractiveness, there are few investigations considering neural responses for body form attractiveness. Shoulder to hip ratio (SHR), a sexually dimorphic trait in humans is an indicator of men attractiveness. The current study investigated the neurophysiological responses to male and female body forms varying in SHR in healthy heterosexual men and women observers. Electroencephalographic (EEG) signals were acquired while participants completed an attractiveness judgement task. Behavioral results

showed larger SHRs were considered more attractive than smaller SHRs, regardless of stimuli and participants' sex. The electrophysiological results for male stimuli showed differences in the neural responses to SHR variations in both early and late ERP components. The sources of difference in neural activity were observed in regions previously identified for face and body perception in visual cortex, and regions associated with decision making. For female avatars, EEG activity at scalp level was not modulated by SHR, albeit some neural activation differences were localized mainly in visual processing related brain regions at the source level. Therefore, results of the current study highlight the importance of upper body in perception and attractiveness judgement of bodies varying in SHR, especially for male body figure.

P131 Investigating visuo-haptic processing using a matching task: Evidence for shared representations. Young In (Daisy) Song, Tayyab Sohail, Geneviève Desmarais, *Department of Psychology, Mount Allison University, Canada.*

Recent research suggests that visual-haptic memory representations include a verbal component. However, this finding may have resulted from a bias created by the research protocol: participants were asked to name objects, potentially influencing the type of representations created in memory. We therefore examined visual-haptic memory representations using a matching task that did not involve a naming component. Participants were presented with a novel object in one modality (visual or haptic) followed by a second object in the other modality. Participants indicated whether the two objects were the same or not. Some participants completed the task as is, while others were presented with visual or verbal distractors. While we could not recruit enough participants to detect an impact of the distractor tasks, we observed that participants were faster and more accurate in response to incongruent trials, and they were faster and more accurate when responding to a visually-presented object. We also observed that for incongruent trials, reaction times and error rates were modulated by the similarity between the two objects presented: participants were slower and less accurate when the two objects were very similar. Results replicate past findings regarding visuo-haptic processing and indicate a shared representation.

P132 The effects of cannabis use on event-related potential (ERP)-indexes of inhibitory functioning in cannabis users (vs. non-users). Ashley Francis, Jenna Bissonnette, *Department of Psychiatry, Dalhousie University,* Sarah MacNeill, *Department of Psychology, University of Ottawa,* Candice Crocker, *Department of Psychiatry & Department of Diagnostic Radiology, Dalhousie University,* Sherry Stewart, Philip Tibbo, *Department of Psychiatry & Department of Psychology and Neuroscience, Dalhousie University,* Derek Fisher, *Department of Psychiatry and Department of Psychology and Neuroscience, Dalhousie University;* *Department of Psychology, Mount Saint Vincent University.*

Cannabis has psychoactive properties and is thought to be associated with potential structural and functional changes with early and heavy use. Previous research suggests cannabis users (CU) vs. non-users (NU) have deficits on EEG-derived event-related potentials elicited by paired click and visual Go/NoGo paradigms. We used these paradigms to examine inhibitory functioning in CUs (n = 26; 20 male) vs. NUs (n = 22, 8 male). Preliminary findings based on (n = 14 CUs and n = 16 NUs) suggested enhanced P100 amplitudes in CUs (vs. NUs) on the Go/NoGo paradigm. Preliminary analysis suggested there were no other group differences. An analysis between males and females was performed and suggested there was no impact of biological sex on the findings. This study provides novel findings regarding enhanced P100 amplitudes to the Go/NoGo paradigm for cannabis users. an update to these findings will be provided at the conference to reflect changes in sample size.

P133 Complex Mismatch Negativity Deficits in Early Phase Psychosis Elicited by the Dual Rule Paradigm. Jenna Bissonnette, T-Jay Anderson, Candice Crocker, *Department of Psychiatry, Dalhousie University*, Philip Tibbo, *Department of Psychiatry, Dalhousie University*, Dean Salisbury, *Department of Psychology, University of Pittsburgh*, Derek Fisher, *Department of Psychology, Mount Saint Vincent University*.

Using electroencephalogram (EEG) to examine the simple mismatch negativity (sMMN), a marker of auditory cortex function, has been of great interest in the exploration of biomarkers for psychotic illness. Despite many studies reporting sMMN deficits in chronic schizophrenia, there are not reliable reports of sMMN reductions in the early phase of the illness, suggesting the sMMN is not a valid biomarker. Recently, a more computationally complex measure of auditory cortex function (the complex mismatch negativity; cMMN) has been hypothesized to provide a more sensitive marker of illness vulnerability. The current study employed the novel dual rule cMMN paradigm to examine the cMMN in 14 individuals with early phase psychosis (EPP) and 15 healthy controls (HC). We found significant reductions of cMMN amplitudes at the frontal region in EPP ($p = .014$) with large effect sizes ($g = 1.03$), as well as correlations between higher cMMN amplitudes and multiple positive psychosis symptoms indexed by the Scale of Prodromal Symptoms. This study is an early step in the exploration of the cMMN as a biomarker for psychosis risk. Future studies must utilize this paradigm to examine the cMMN in a sample of high-risk individuals to determine its predictive capability.

P134 The effects of imagery ability and handedness on the imagination of fine motor movements: An electroencephalographic investigation. Kathryn Lambert, *Department of Occupational Therapy, University of Alberta, Canada*, Christopher Donoff, Jonah Elke, *Department of Psychology, University of Alberta, Canada*, Christopher Madan, *Department of Psychology, University of Nottingham, United Kingdom*, Yvonne Chen, *Perelman School of Medicine, University of Pennsylvania, United States of America*, Anthony Singhal, *Department of Psychology, University of Alberta, Canada*.

The mu rhythm (8-12 Hz) is a brain rhythm recorded over the human motor regions that reliably suppresses during imagined movements. It is theorized that this suppression varies according to imagery ability and hand dominance. However, most research has focused on imagery of gross motor movements. Further understanding of how these factors affect motor imagery is required to optimize the process' potential clinical applications. We recorded EEG activity while 36 participants (15 left-handed) completed an objective imagery task of fine motor movements. Participants were split into good and poor imagers based on task performance. Patterns of mu activity diverged as a function of task performance and handedness. Good imagers exhibited greater mu suppression than poor imagers. Left-handed participants exhibited more suppression during questions that resulted in a correct response, while right-handed participants exhibited the opposite effect. These results suggest that hand dominance and imagery ability differentially affect neural activity during imagery of fine motor movements. In particular, mu desynchronization may serve as an indicator of imagery ability and level of concentration. It is possible that left-handed individuals require greater concentration to successfully imagine fine motor movements. Clinical applications of motor imagery will thus benefit from taking these factors into consideration.

P135 Automation Reliability and Its Influence on Trust Dynamics. Christopher Holland, *Psychology and Neuroscience, Dalhousie University, Canada*, Ben Rittenberg, Grace Barnhart, Heather Neyedli, *School of Health and Human Performance, Dalhousie University, Canada*.

Automation is at the forefront of many industries as a tool and aid to human counterparts to improve both productivity and quality. With human-automation teams, there is a need to understand how automation reliability affects user trust in the automated system. Both over-trust and under-trust can be detrimental to system performance; however, the temporal dynamics of trust with changing reliability level are relatively unexplored. The purpose of this experiment is to better define how user trust changes over time in conditions of increasing or decreasing reliability of automation. This experiment makes use of a dominant-colour identification task, in which users must decide whether a grid is mostly composed of blue or orange pixels. Automation provides a recommendation to the users, with the reliability of the recommendation either increasing or decreasing over time. Results from this experiment are expected to help better characterize the dynamics of trust in relation to changing reliability of the automation. It is anticipated that differences in trust will arise between the increasing and decreasing conditions, likely caused by the intent of the human to use the automation recommendation in the event that the human identifies that it is reliable or unreliable.

P136 Assessing the interocular delay in amblyopia and its link to visual acuity. Daniel Gurman, Alexandre Reynaud, *McGill University*.

Amblyopes exhibit a neural processing delay between the two eyes. Current methods for assessing said delay are typically not accessible for both mild and severe amblyopia. We adapted a recent protocol developed by Burge & Cormack (2020) based on continuous psychophysics to measure the interocular delay in a wide range of amblyopes. The purpose of our study was to assess the efficacy and accessibility of this protocol and investigate how delay relates to visual acuity. In this protocol, a target undergoing lateral Brownian motion is tracked with the mouse cursor; this is performed in both binocular and monocular viewing conditions. The latency between the target and cursor is then computed using a crosscorrelation; the coefficient is used to estimate target tracking accuracy. We found that all but the most severe amblyopes successfully performed this task. Across our amblyopic subjects, interocular delay was found to some extent, and in most cases, this delay was attributed to the amblyopic eye. Tracking was generally lower in accuracy when performed with the amblyopic eye. Interocular delay was positively correlated with differences in interocular visual acuity. Our results demonstrate the efficacy of this new protocol and further support the link between interocular synchronicity and amblyopia.

P137 Exploring individual-difference factors in distractor devaluation and No-go devaluation effects: Negativity bias and impulsivity. Robyn Mahood, Brooke Pardy, Elizabeth M. Clancy, Mark J. Fenske, *University of Guelph*.

Ignoring or withholding a behavioural response from a stimulus causes it to become affectively devalued. Leading accounts suggest that this results from the interpretation of neurocognitive signals as aversive when inhibition is applied to prevent interference from distracting or otherwise inappropriate stimulus/response representations. Accordingly, the lingering change in stimulus value in these 'distractor devaluation' and 'No-go devaluation' effects occurs because of the intensity of this aversive response, which is thought to become associated with the perceptual details of the inhibited stimulus in memory. Here we ask whether individual differences in cognitive control, impulsivity or the tendency to interpret perceptual signals as negative may help

to explain why there are large individual differences in the magnitude of these stimulus-devaluation effects across participants. Our results ($N = 137$) demonstrated clear distractor- and No-go-devaluation effects, but did not reveal any association between the magnitude of these effects and any of our individual-difference measures. These findings suggest the need to identify different tasks that better reflect variation in the specific processing stages thought to underly the negative affective consequences of neurocognitive inhibition, or the need to update leading accounts of such cognition-emotion interactions.

P138 A Bi-Directional Training Paradigm Examining the Cross-Modal Relationship Between Cognitive Representations of Language and Mathematics. Urvi Maheshwari, Christine D. Tsang, *Department of Psychology, Huron University College at Western University.*

The present research examined the existence of a cross-modal relationship between language and mathematics across three experiments. Experiment 1 assigned participants to one of three linguistic problem-solving conditions (linguistic reasoning, structural priming, or no-training) and tested on mathematical problems to explore whether linguistic training facilitates mathematical performance. No significant difference in mathematical performance was found across training conditions [$F(2, 153) = 1.69, p = .18$]. Experiment 2 examined whether training participants in mathematical problem-solving facilitates linguistic performance. Participants were assigned to one of three mathematical training conditions (mathematical reasoning, structural priming, or no-training) and tested on linguistic problems. Results showed significant differences in linguistic performance across training conditions [$F(2, 142) = 3.86, p = .02$], indicating that mathematical cues are accessed in linguistic performance. Experiment 3 examined whether the explicitness of mathematical training impacts linguistic problem-solving. Participants were assigned to one of three mathematical training conditions (explicit training, structural priming, or no-training) and tested on linguistic problem-solving. A significant difference between training conditions was found [$F(2, 72) = 5.40, p = .006$]. Together, these experiments suggest that there may be shared representations between language and mathematics processes and provide strong evidence for cross-modal transfer between language and mathematics.

P139 Improving behavioural consistency as a function of expectation: Failure is not an inherently negative state. Yajing Zhang, Thi Kim Truc Huynh, Ben J. Dyson, *Psychology Department, University of Alberta.*

Failure is commonly seen as undesired in real-life situations, despite providing opportunities for learning. We argue that failure has repercussions for performance not because of its inherently negative valence but because of the default expectation of success. Across three experiments ($n = 201$), participants engaged in Matching Pennies games (i.e., binary-response games) where they were instructed to perform as well (win maximization) and as poorly (lose maximization) as possible, against two kinds of exploitable opponents (i.e., via alternate and repetitive strategies separately). Our results showed that participants could learn from and exploit opponents' strategies. Furthermore, there a double dissociation in that both win-stay and win-shift behaviours were more consistent than lose-stay and lose-shift behaviours during win maximization, but that both lose-stay and lose-shift behaviours were more consistent than win-stay and win-shift behaviours during loss maximization. This flexibility in the ability to reconfigure fundamental reinforcement learning principles, and the arbitrary nature of positive and negative goal states, point to a wholesale reconfiguration of the way we think about and react to failure.

P140 The Effect of Prosocial Decision Making on Memory for Faces in Younger and Older Adults . Sana Junaid, *Toronto Metropolitan University*.

Recent evidence suggests that prosociality increases in adulthood. However, little is known about the impact of prosocial motivation on cognitive function. The current experiment investigated the effect of prosocial reward on episodic memory in younger and older adults. Participants (76 younger adults and 78 older adults) first completed a financial choice task featuring a series of transfers between their own account and a food bank charity. Prosocial reward was operationalized as the amount going to the charity. On each choice trial, the charity was represented by the face of a food bank client. Participants later received a surprise old-new face recognition test. Older adults were significantly more likely to recognize faces that had been encoded in the context of high vs. low prosocial reward. In contrast, younger adults did not show this effect. These results are the first to suggest that prosocial reward may enhance episodic memory in older adults.

P141 Altogether now! A simultaneous-presentation variant of the Same-Different task. Morgan Garvie, Bradley Harding, *Université de Moncton*.

The conjunctive Same-Different task is a simple cognitive paradigm in which two stimuli are presented in quick succession and participants must decide as rapidly and as accurately as possible whether they are entirely identical or if there exists at least a single difference between them (Bamber, 1969). In this task, "Same" response times are systematically faster than cognitive models predict, an effect since coined the Fast-Same Phenomenon (Bamber, 1972). Recently, Harding and Cousineau (in press) found that priming could play a role in this decision-speed discrepancy; that the first stimulus, S1, potentially primes the second stimulus, S2, when they are completely identical. In this research, we presented all stimuli simultaneously to counteract the priming effect of S1 and see if the Fast-Same Phenomenon is entirely reliant on a complete orthogonal match. Results from distribution analyses and modelling using the EZ diffusion model (Wagenmakers et al., 2007) show that "Same" responses are much slower than the successive-presentation variant of the task yet are still faster than the slowest of the "Different" conditions, indicating that priming does modulate the Fast-Same phenomenon, but that there are likely other factors at play to explain why "Same" responses remain as fast as they are.

P142 Effects of Emotion Regulation on Decisions under Arousal. Adrian Colbert, Julia Spaniol, *Department of Psychology*, Mane Kara-Yakoubian, Margot Sullivan, *Department of Psychology, Toronto Metropolitan University*.

High-stakes decisions are often made under emotional arousal. Arousal has been shown to influence decision processes, sometimes with adverse consequences. The current study examined whether emotion regulation strategies can mitigate the influence of arousal on decision making. Participants (N=85) completed a series of choices between larger-riskier and smaller-safer financial gains. Arousal (high vs. low) was manipulated within-subjects via presentation of sound clips prior to each choice. Emotion regulation instructions (regulate vs. passive listen) varied between task blocks. In Regulate blocks, one group of participants used cognitive reappraisal, whereas another group used expressive suppression. Arousal increased risk avoidance (% safe choices) in the cognitive-reappraisal group but not the expressive-suppression group. For both groups, decision quality (% of optimal choices) was higher in Regulate than in Listen blocks. These findings suggest that emotion regulation strategies may be a cost-effective way to improve decision making under arousal.

P143 Relations between order judgment task performance and arithmetic ability. James Vellan, *Department of Psychology, Carleton University, Canada*, Jo-Anne LeFevre, *Department of Cognitive Science, Carleton University, Canada*.

We attempted to replicate Lyons and Beilock (2009: Experiment 2; L&B)'s order judgment task in an online environment. Participants completed an order judgment task and arithmetic fluency test. In the order judgment task, participants were shown three types of sequences and asked to decide if they were in increasing order, counting (e.g., 1 2 3 vs. 2 1 3), balanced (e.g., 2 4 6 vs. 6 2 4), and skewed (e.g., 1 2 7 vs. 2 7 1). Consistent with L&B, participants responded more slowly to unordered than ordered sequences. Further analyses using linear integrated speed-accuracy scores (LISAS; Vandierendonck, 2017) revealed that participants performed significantly better when responding to ordered counting sequences than to unordered counting sequences, while performance was comparable for non-counting sequences regardless of order. These results suggest the presence of a reverse distance effect. However, neither order judgment task performance nor the magnitude of the reverse distance effect were significantly related to performance in the arithmetic measure. We discuss potential sources of the discrepancies between L&B and the current results in terms of stimuli, task demands, and the online format.

P144 Estimating Travel Times for One-Way and Return Trips. April Pereira, Evan F. Risko, *University of Waterloo*.

We often have to estimate the length of time it will take to complete various tasks in our day-to-day lives, such as how long it will take to travel to a given location. These estimates, however, are subject to systematic biases. For example, individuals often feel that outbound trips are shorter than inbound or return trips (i.e., return trip effect; van de Ven et al, 2011). The goals of the present investigation were to examine whether, when equating for distance, individuals exhibit systematic biases in estimating one-way and return trips. Participants were presented with images and asked to estimate how long it would take to walk at a constant pace to a target (i.e., one-way trip) and/or to a target and back (i.e., return trip). Results revealed mixed evidence for a bias in estimates of these trip types. Implications of this research for our understanding of time estimation will be discussed.

P145 The challenges of assessing bilingual language experience: The impact of contextual and individual variability in self-report data. Esteban Hernández-Rivera, Mehrgol Tiv, Anne Beatty-Martinez, Titone Debra, *McGill University, Department of Psychology, Montreal, Canada*.

Multilingualism research relies upon people's self-evaluations to quantify their own language proficiency and experience. However, self-evaluations can yield a biased picture, depending on the social value attached to specific performance areas, and people's "inner comparison group". Here, 64 French-English bilingual adults evaluated distinct components of their L1/L2 experience (i.e., general ability vs. accentedness) in relation to a ground-truth measure of L1/L2 performance (LexTALE). These self-report data were analyzed via Exploratory Factor Analysis, yielding latent measures reflecting self-evaluative judgements of English and French proficiency, and accentedness. We fit multivariate regression models to each latent measure, indexing group membership and LexTALE scores as independent variables. The models suggest that Francophones' L1/L2 self-evaluations of proficiency were less coupled with LexTALE scores (i.e., overestimation pattern) compared to Anglophones or Simultaneous French-English bilinguals. Interestingly, Anglophones' accentedness judgements of French were less coupled with their general proficiency self-evaluations compared to Francophones (i.e., underestimation pattern).

Thus, people's self-evaluative judgements can yield biased estimates of bilingual language experience, which systematically vary with their sociolinguistic background. We are currently assessing whether these results extend to larger groups, and for self-evaluations that use more objective and less value-laden wording (e.g., self-estimates of the time spent using one's L1 or L2).

P146 Assessing invested effort when selecting items for restudy: Is there a role for cognitive offloading?. Skylar Laursen, Chris Fiacconi, *University of Guelph*.

Cognitive offloading is the act of using physical action and external resources to reduce cognitive demand (Gilbert et al., 2020). In the context of memory performance, previous research has demonstrated that when to-be-remembered information is offloaded to an external store, future memory is impaired if access to that information is denied (Risko et al., 2019). We were interested in whether the act of selecting items for restudy, could be considered as a form of cognitive offloading. Specifically, once an individual makes the decision to restudy a given item, do they then invest less effort when attempting to store that item in memory? In the current series of experiments participants were presented with a list of to-be-remembered words, and were required to select half of the words to later restudy. However, only half of the items selected were ever re-presented. Additionally, half of the items that were not selected were also re-presented. Critically, memory for selected items that were never re-presented was poorer relative to non-selected items that were not re-presented. Moreover, the amount of effort invested by participants, as measured by the time taken to make a restudy decision was significantly greater for non-selected as compared to selected items.

P147 Younger and older participants retain different memories of recently exposed excerpts of music popular over the last six decades.. Corey Collett, Kristen Gallant, Alyssa MacLean, Patrick J. Leath, Amy Simon, Annabel J. Cohen, *University of Prince Edward Island*.

Younger and older adults participants (mean age 22.3 vs 64.5 years) were asked to identify artist, title, and year of popularity and rate their familiarity of excerpts (duration 5 to 6 sec) of 36 songs popular over the last 6 decades. Immediately after, they were asked to choose which of two excerpts (one a foil) had been previously presented for each of the previous 36 songs. Familiarity, estimated year of popularity (absolute and signed error), and artist identification reflected greater knowledge during adolescence, with significant differences associated with age cohort (age x decade effect). Retention performance and confidence in retention judgment followed the age x decade effect for musical knowledge. That different songs were best retained in the short-term for different age groups has two compatible explanations. First, the ability to assign an abstract name code to the excerpt for familiar songs may lead to deeper initial encoding and consequent higher retention. Second, in accordance with our Plasticity Theory of Implicit Music Knowledge Acquisition (PTIMKA), adolescence may be a sensitive period for acquiring musical information and establishing a musical grammar to encode music in that grammar but not in later styles that violate that early grammar. Data collection is ongoing.

P148 A comparative study of exploratory decision-making in mice, monkeys, and humans.

Veldon-James Laurie, Akram Shourkeshti, *Department of Neuroscience, University of Montreal, Quebec*, Cathy Chen, *Department of Psychology, University of Minnesota, Minneapolis*, R. Becket Ebitz, *Department of Neurosciences, University of Montreal, Quebec*.

Every living species must have the capacity to make good decisions in a changing, uncertain world. However, gross differences in the behavioural adaptations across species mean we do not understand how our own ability to navigate uncertain environments evolved over time. Fortunately, there is a classic task we can use to compare decision-making across species within their own behavioural ecologies: the k-armed bandit. This task requires agents to choose between exploiting rewarding options and exploring options that can further develop their models of the environment. Here, we compared exploratory behaviours using this task across 3 species: mice, monkeys and humans. We found that mice responded significantly differently from monkeys and humans. Specifically, mice exploited less and explored more than both primate species. Analysis of the mice's decision-making dynamics suggested that they had a reduced ability to persist in their goals. This comparative study highlights the differences in decision-making abilities between primates and mice and lays the groundwork for studies comparing neurodynamics in this task across species. Even though mice are more commonly used in preclinical neuroscience studies, this data suggests that monkeys may be a better choice for decision-making research since they are more akin to humans in this domain.

Session 2

P201 Knowledge of Popular Music and Singing Ability in North American and Non-North American University Students. . Kristen Gallant, Chinemerem Mbonu, Margaret Orford, Amy Simon, Annabel J. Cohen, *University of Prince Edward Island*.

58 university students (half Non-North American in origin) were presented with excerpts of 36 songs popular between 1962 and 2021. Participants rated familiarity and identified artist, title, and year of popularity of each song. A subsequent surprise recognition task required them to choose which of two excerpts had been previously presented for each song heard earlier. Dependent measures reflected increasingly higher performance for increasingly recent songs. Scores for participants born outside North America overlapped with North-Americans on most recent songs but had significantly steeper trajectories consistent with reported listening 10 hours per week approximately to music from their homeland, indicating knowledge of and close connection to this music. In a further session, a subset of 23 participants carried out a singing test and the Goldsmith Musical Sophistication Index. Singing proficiency (of Happy Birthday) correlated with popular music retention (from Session 1) and with the Gold-MSI (Müllensiefen et al., 2014) suggesting a general music acquisition component associating listening, memory and performance; however, accuracy of singing musical triad elements was not similarly correlated. This study is the first to use a two-alternative forced choice task in a study of retention of popular, and overall sets the stage for comparative studies with adolescents.

P202 Is there a digital age divide in use of emojis for emotional communication on digital platforms?. Eva Sutera, Bozana Meinhardt-Injac, *University of Ottawa*, Charles Collin, *University of Ottawa*, Erin Leigh Courtice, *University of Ottawa*, Isabelle Boutet, *University of Ottawa*.

Introduction: Emojis play a critical role in emotional communication on digital platforms by conveying emotional information and facilitating understanding of nonverbal messages. Because emoji menus are relatively new, and because many emojis convey ambiguous emotions, there may be a digital age divide in emoji use and interpretation among older adults. Objectives: Investigate how aging influences emoji interpretation and use. Methods: Participants (n=252, age range=18-80) were tested on their ability to decode emojis. We also measured feelings of self-efficacy, reasons for using digital technologies, frequency of use, perceived ease of use, and perceived usefulness of emojis. Results: There were no age differences in emoji interpretation. There was a digital age divide: older users were less likely to use emojis, feel self-efficacy when using technology and emojis, and to use technology for social need and social communication. Older users were also more likely to believe that using emojis is effortful and that using emojis would be helpful. We did not find correlations between emoji decoding ability and frequency of emoji use. Conclusions: Overall, our results suggest that the digital age divide in emoji use is due to a lack of confidence and not competence. Implications for digital emotional communication will be discussed.

P203 Exploring Lifestyle Factors as Predictors for Visually Induced Motion Sickness Susceptibility. Narmada Umatheva, *Ryerson University, Toronto, Canada*; KITE-Toronto Rehabilitation Institute, *University Health Network, Canada*, Frank Russo, *Ryerson University, Toronto, Canada*, Behrang Keshavarz, *KITE-Toronto Rehabilitation Institute, University Health Network, Canada*; *Ryerson University, Toronto, Canada*.

Visually induced motion sickness (VIMS), a phenomenon similar to traditional motion sickness, is a common side-effect when using visual devices such as Virtual Reality. The present study explored the association between VIMS susceptibility and lifestyle factors, including video-game usage, physical activity, diet, and substance use. Additionally, the overall prevalence of VIMS as well as the influence of biological sex and ethnic background were investigated. A total of 711 responses to an online survey were collected from adults between the ages of 18-49 years. Results showed that VIMS was a prevalent issue. A majority of participants reported having a least sometimes experienced VIMS-related symptoms when using visual displays, with eyestrain (72%) and headaches (62%), being the most prominent symptoms, followed by fatigue (53%), dizziness (28%), and nausea (23%). Lifestyle factors only minimally contributed to the susceptibility to VIMS. That is, lifestyle factors accounted for approximately 8% of the variance for VIMS susceptibility. The results also showed that females reported significantly higher VIMS susceptibility scores than males. However, there were no significant differences between ethnic groups for VIMS susceptibility. Overall, our findings suggest that lifestyle factors are not prominent predictors for VIMS susceptibility, but that sex might be relevant.

P204 The Learning, Executive, and Attention Functioning (LEAF) Scale correlates consistently with task-derived measures of executive function. Cory Munroe, Jenn Leckey, *Department of Psychology and Neuroscience, Dalhousie University, Canada*, Gail Eskes, *Department of Psychiatry, Dalhousie University, Canada*, Shannon Johnson, Sophie Jacques, *Department of Psychology and Neuroscience, Dalhousie University, Canada*.

Although self-report and task-based executive function (EF) measures aim to assess conceptually similar constructs, they only minimally correlate. Recently, we helped validate a new EF questionnaire, the Learning, Executive, and Attention Functioning (LEAF) scale (Castellanos et al., 2018), in young adults (Munroe et al., 2022). Unlike other EF questionnaires, the LEAF developers claimed to use item wordings that emphasize problems associated with EF-related information processing (vs. behavioral manifestations of poor EFs). Therefore, LEAF subscales may correlate with task-derived EF measures better than other self-reports. Young adults ($n=195$; $Mage=20.74$) completed the LEAF, the Barratt Impulsiveness Scale (BIS-11; Patton et al., 1995), and nine EF tasks. LEAF subscales correlated consistently ($r=.14-.25$, $p<.05$) with measures derived from seven of nine EF tasks. In contrast, BIS-11 subscale scores correlated only with two of several task-based measures of inhibitory control (Stroop and Go/No-Go). Thus, the LEAF may effectively assess a wider range of constructs commonly measured using EF tasks than other self-reports. However, consistent with previous work, the shared variance between EF task measures and LEAF subscales was small. Additional analyses will explore specific patterns of responses across scales and tasks to help isolate what exactly might be shared across different EF measure types.

P205 The impact of personalizing realistic math word problems. Cheryll Fitzpatrick, Brittany Wall, *Psychology, Memorial University of Newfoundland*.

Realistic word problems (WPs) (i.e., requiring one's real-world knowledge to solve) have been shown to be even more challenging than typical WPs (i.e., those found in textbooks). Research examining personalized information in textbook WPs show improved performance but has not been evaluated in realistic WPs. In rare instances when improved performance in realistic WPs has been found, the problem set included all realistic WPs instead of what is more commonly used in the literature (i.e., mixed standard and realistic WPs). We aimed to determine if personalizing realistic WPs increased realistic responses (RRs) compared to non-personalized WPs and we also examined whether RRs increased when all WPs were realistic compared to a mixed set of WPs. Participants also responded to surveys on math, test, and state/trait anxiety, the need for cognition scale, and a measure of general math ability. Across two studies undergraduate students ($N = 252$ and $N = 140$) did not show an improvement in RRs when WPs were personalized, nor when using a set of all realistic WPs. Students' survey responses accounted for between roughly 40-50% of variability in RRs. Perhaps non-academic skillsets are better predictors of RRs than more traditional academic skills.

P206 Role of the morphemic boundary in accessing compound constituents.. Alexander Taikh, *Concordia University of Edmonton*, Christina Gagné, Thomas Spalding, *University of Alberta*.

The constituents of a compound word become activated and facilitate access to the whole word. However, the way in which constituents are detected and activated is unclear. To address this question, we examined whether the morphemic boundary plays a special role in the activation of a compound's constituents. Across two experiments, we examined the effects of transposing or replacing the letters of a masked compound prime (highlight) at the morphemic boundary (highlight vs. higmkight) to transposing or replacing constituent internal letters that were inside of

the first constituent (highlight vs. hbohlight), or inside of the second constituent (highlgiht vs. highlboht), on the recognition of the unaltered compound targets. In Experiment 1, lexical decision responses were slower following primes with a letter replacement (vs. transposition) when the letter manipulation was at the boundary but not inside of the first constituent. Similarly, in Experiment 2, responses were slower following primes with a letter replacement at the boundary but not inside the second constituent. Our findings suggest that replacing letters at the morphemic boundary, but not constituent internal letters, interferes with processing of the compound, suggesting that the boundary plays a key role in morphological decomposition.

P207 Bilinguals Readily Acquire Language Specific Speech Motor Plans. Emma Wheeler, *Department of Psychology, Acadia University*, Imane Hocine, Douglas M. Shiller, *École d'orthophonie et d'audiologie, l'Université de Montréal*, Daniel R. Lametti, *Department of Psychology, Acadia University*.

The degree to which bilinguals can acquire and maintain separate speech motor plans for their first (L1) and second (L2) language remains unclear. Here, we test this question using a sensorimotor adaptation paradigm involving real-time alterations of speech production. Twenty-six L1-English/L2-French bilinguals were recruited. Participants produced English and French sentences into a microphone and heard the sound of their own speech in real-time through headphones. After a baseline period of unaltered speech, the first (F1) and second (F2) formants of the vowels participants heard themselves producing were altered in real-time in a manner that depended on language. Half of the participants experienced a decrease in F1 and an increase in F2 while speaking in English, and the opposite alteration while speaking in French. The remaining participants experienced the manipulation with the opposite language correspondence. Sensorimotor adaptation to altered feedback was measured as the degree of change in speech production that countered the vowel sound manipulation. Changes in production were observed that depended on language and the corresponding vowel sound manipulation. Vowels shared between French and English came to be produced in a markedly different manner. The results suggest that bilinguals can acquire and maintain language-specific speech motor plans.

P208 No Taboo Stroop Effect in Bilinguals' Second Language. Joline Guitard, Annie Roy-Charland, *School of Psychology, Université de Moncton, Canada*.

The Taboo Stroop effect is characterized by slower response times in naming the colour of taboo versus neutral words (MacKay et al., 2004). Recent studies have highlighted possible differences in how taboo words are processed by bilingual individuals in their second language (Incera et al., 2020; Sulpizio et al., 2019; Okada et al., 2019). However, the interaction between the Taboo Stroop effect and bilingualism remains unclear. The goal of the current study was to expand on previous research to better understand the Taboo Stroop effect in individuals' second language. 70 French first language participants (mean age = 20.64 years old; 70% female) who reported having strong mastery of English as their second language completed the original Taboo Stroop task in English (MacKay et al., 2004). Results showed no significant differences between taboo and neutral words regarding reaction times and errors. The current results support the well-established hypothesis that words in one's second language are subjectively experienced with less emotionality than in their first language (Harris et al., 2003). We conclude by discussing broader implications of the subjective experience of emotionally charged words in one's second language, for conducting cognitive research in the multi-cultural (and often multi-lingual) Canadian context.

P209 Comprehension Monitoring in Bilingual and Monolingual Adult Readers. Olivia Ward, *Faculty of Education, University of Western Ontario, Canada*, Prabsimran Gill, *Department of Psychology, University of Western Ontario, Canada*, Deanna Friesen, *Faculty of Education, University of Western Ontario, Canada*.

The present study examined whether University students who learned English as a second language differed from English monolingual students on their ability to detect inconsistent content in short informational texts. Adults completed a self-paced reading task, performed text recalls, and completed a True/False test. Half of the texts contained information in the 5th sentence that contradicted the 2nd sentence's information (inconsistent condition). The other half did not contain any contradictions (consistent condition). Participants also completed language and cognitive tasks as individual differences measures. Results revealed a significant interaction between language group and consistency, wherein monolingual adults spent more time processing the 5th sentence when the text contained a contradiction than when it did not, suggesting that they noticed the conflict. In contrast, bilingual adults did not differ in their processing of the two types of texts. This group difference remained when the groups were equated on English vocabulary knowledge. Findings are discussed in terms of individual differences in encoding and retrieving information during text processing and in terms of the potential impact on educational success.

P210 Validity of Corpus-Based Measures of Idiom Processing in English and Mandarin Chinese. Michelle Yang, Marco S.G. Senaldi, Junyan Wei, Brendan Johns, Debra Titone, *McGill Psychology*.

Idioms are expressions whose meanings differ from that of their component words (e.g., kick the bucket, pay through the nose). According to recent psycholinguistic findings, idioms are processed both holistically and compositionally over different time courses (e.g., Senaldi et al., in revision). In this work, we aimed to understand how previously underexplored corpus-based indices of lexical strength and semantic compositionality can model cognitive measures of idiom processing in English and Mandarin Chinese. Thus, we proposed the use of frequency-based corpus measures (word and phrase frequency, contextual diversity) and meaning-based measures (semantic similarity, neighbourhood overlap) to predict subjects' judgements of idioms. The meaning-based measures are derived from word2vec models trained on English and Mandarin Chinese corpora. We predict that greater frequency and contextual diversity of an idiomatic expression will positively correlate with subjective familiarity judgements. Similarly, greater semantic similarity and neighbourhood overlap between component words of an idiomatic expression should positively correlate with decomposability. These results will shed light on the cognitive reliability of corpus-based measures and the interplay of formal and semantic factors on idiom processing. Also, they will reveal whether current models of idiom processing hold across languages.

P211 Do cognitive biases shape patterns in the world's? Insights from a silent gesture task.. Ashley Yim, Gregory Antono, Daphna Heller, Craig Chambers, *University of Toronto*.

Certain patterns in the world's languages are more common than others. E.g., the ordering of Subject(S), Verb(V), Object(O) is such that S-O-V occurs in 47.5% of languages yet O-V-S is just 0.9%. Psycholinguistic work has suggested these asymmetries arise from cognitive biases and not simply the uneven expansion of genetically-related languages. The present study focuses on more fine-grained orderings (within a Noun Phrase), namely the ordering of Numeral(Num), Measure Word(MW), Noun(N), as in the English "three bags of apples". There are six possible orderings,

and, like the SVO typologies, their cross-linguistic incidence is highly skewed (e.g., extremely few languages order the Noun in the middle). We use a gesture production task to examine if cognitive biases underlie the typological patterning. Participants (N=21) viewed an array of objects on a screen and had to indicate to a partner which objects had been signalled by a red frame. Only silent gesture could be used, and each participant completed 12 critical trials (which were intermixed with filler trials). The ordering of MW, N and Num was scored. Intriguingly, the observed patterns largely diverged from the expected typological frequencies (e.g. noun-medial orderings were not uncommon), suggesting phrase-internal orderings do not arise from cognitive.

P212 To what extent do shared domain-general mechanisms support language processing?.
Sonny Wang, Craig Chambers, *University of Toronto*.

Inferencing and perspective-taking both involve using or generating information beyond “what is said” and are thought to draw on certain domain-general aspects of cognition. The current study explores to what degree inferencing and perspective-taking overlap, using self-paced reading and an individual differences approach. In Experiments 1 and 2 we validated experimental materials. Expt1 (N=36) measured bridging inferences using short stories whose target sentences were either congruent or incongruent with inferences that could be drawn from previous text. Results replicated earlier findings showing participants spontaneously draw inferences during reading. Expt2 (N=72) measured readers’ linguistic perspective-taking in stories where different characters possess distinct knowledge about a particular state-of-affairs. Results similarly confirmed that readers engage in perspective-taking spontaneously. Materials from each task was then used in a large-scale pre-registered correlational study (Expt3). Participants (N=200) read a series of intermixed stories, and we calculated a single composite measure capturing each participant’s performance on bridging inferencing and perspective-taking. Intriguingly, the analysis found no relationship between inference and perspective-taking ($r=-0.06$, $p=0.44$), despite the considerable experimental power, suggesting the mechanisms underlying these two abilities are comparatively distinct. We relate the outcomes to a growing literature that reconsiders traditional ideas about how domain-general cognitive systems support.

P213 Language Coactivation for Interlingual Homographs During Bilingual Reading: The Impact of Semantic Bias and Individual Differences in Language Entropy. Karla Tarin-Murillo, Esteban Hernandez-Rivera, *McGill University*, Veronica Whitford, *University of New Brunswick*, Debra Titone, *McGill University*.

Eye-tracking studies show bilingual adult readers spend more time fixating words that straddle two languages (interlingual homographs, ILHs; e.g., CHAT in French/English), indicative of language coactivation (Libben & Titone, 2009; Pivneva et al., 2014). Interestingly coactivation decreases when ILHs appear in sentence contexts semantically biasing target language meanings (English sentence concerning a conversation). Currently unknown is whether sentence contexts biasing other language meanings of ILHs (English sentence about cats) increase coactivation, and whether bilinguals’ reading habits plays a role. Thus, across two studies, bilingual read ILHs embedded in English sentences that varied in contextual constraint. In Study 1, 87 bilinguals read ILHs when semantic contexts biased target language meanings (CHAT=talking). Here, we found global ILH interference (i.e., coactivation) across sentence contexts for late-, but not early-stage measures. Individual differences in reading habits (language entropy) did not modulate these results. In Study 2, 80 bilinguals read ILHs when semantic contexts biased non-target language meanings (CHAT=cat). Here, language entropy modulated ILH interference (i.e., coactivation) globally for early but not late measures, only for L2-readers. Taken together, these results suggest

that language coactivation is flexibly multidetermined by both text- and person-related experiential factors.

P214 Benchmarks that Computational Accounts of Visual Word Recognition Have Yet to Address. Torin Young, *University of Waterloo*, Melvin Yap, *National University of Singapore*, David Balota, *Washington University*, Derek Besner, *University of Waterloo*.

Additive effects of Stimulus Quality and Word Frequency on RT in the context of lexical decision have been reported nine times in the word recognition literature. More-over, this additivity extends to the distribution of RTs. In contrast, a novel result is that a three-way interaction (stimulus quality x word frequency x vincentiles) is seen when the foils consist of pseudo-homophones (e.g., BRANE from BRAIN). A new experiment addresses the issue of whether this three-way interaction is only seen when the foils consist of pseudo-homophones, or whether a difficult word/nonword discrimination (using transposed letters from a word to make a nonword) suffices to promote this three-way interaction. The same three-way interaction reported previously is again seen. Taken together with other experiments involving the same factors, there are now three distinct RT patterns that appear in the distribution of RTs. These patterns form a formidable challenge for all existing computational accounts. The over-arching take home message is that only considering mean RTs when formulating an account leads to explanations which do not capture the full pattern of results seen when the distribution of RTs is considered.

P215 Ordering patterns in the noun phrase when counting: Insights from an artificial language learning experiment. Gregory Antono, Daphna Heller, Craig Chambers, *University of Toronto*.

Cross-linguistically, some patterns are more common than others: the order Subject(S)-Object(O)-Verb(V) is overwhelmingly more frequent (47.5% of languages) than OVS (0.9%). Psycholinguistic studies have suggested these asymmetries might arise from human cognitive biases, alongside forces like language contact and the spreading-out of genetically-related languages. Here we investigate how speakers spontaneously produce elements associated with counting groups of objects, namely a numeral (Num), classifier (CL), noun(N), as in the English “three piles of sticks”. Cross-linguistically, these orderings are also highly asymmetrical: of the six orderings possible, only four are attested. (No languages have nouns in-between classifier and numeral.) English-dominant participants (n=56) learned a miniature artificial lexicon involving: (i) seven nouns, (ii) four numerals, and two group classifiers (‘neat bunch’ vs ‘messy pile’). At test, each trial displayed an array of objects, e.g., three messy piles of sticks, requiring participants to use a sequence of learned words to describe the array. The observed orderings largely diverged from the expected typological frequencies, e.g., a noun-medial ordering was the second-most frequent. The results that suggest typological patterns in the ordering of less frequently-encountered and more fine-grained constructions, like those involving classifiers (and only a single phrase), might not, in fact, arise from cognitive biases.

P216 Testing an Age-appropriate Theory of Mind Assessment for Multilingual Adults. Justin Feng, *Department of Educational and Counselling Psychology, McGill University, Canada*, Zeel Solanki, *Department of Psychology, McGill University, Canada*, Gigi Luk, *Department of Educational and Counselling Psychology, McGill University, Canada*.

Theory of Mind (ToM), the cognitive ability to infer mental states and perspectives of others (Fletcher et al., 1995), has been studied extensively in children. Tasks used to investigate ToM

among adults were not always age-appropriate. We tested the feasibility of a semi-structured interview (Th.o.m.a.s., Bosco et al., 2019) and whether the coded responses correlate with age of second language acquisition using the adapted Language and Social Background Questionnaire (Anderson et al., 2018). Seventeen multilingual adults were interviewed online but three were excluded resulting in an analytic sample of 14 (10 females, Mage = 22.3 years). Responses were audio-recorded and qualitatively coded according to rubrics established for the four ToM perspectives in Th.o.m.a.s.: I-Me, Other-Me, Me-Other, Other-Self. The Other-Self perspective, considered most relevant to ToM, reveals an individual's ability to mentalize how others see oneself. Partial correlation controlling for age and the I-Other/Other-Me perspectives indicated that second language age of acquisition had a negative correlation with the Other-Self perspective ($r = -0.608$, $p < 0.05$), indicating those who acquired a second language earlier were more aware of how others perceive oneself. Th.o.m.a.s. is a feasible and age-appropriate tool to assess ToM in adults and showed correlation with multilingual experience.

P217 Mapping the Relations between Performance on Various Spatial Tasks and Performance on Various Mathematics Tasks in Undergraduate Students in North America .

Véronic Delage, *School of psychology, University of Ottawa, Canada*, Richard J. Daker, *Department of Psychology, Georgetown University, Washington, DC*, Geneviève Trudel, *School of psychology, University of Ottawa, Canada*, Ian M. Lyons, *Department of Psychology, Georgetown University, Washington, DC*, Erin A. Maloney, *School of psychology, University of Ottawa, Canada*.

One of the most robust relations in cognition is that between spatial and mathematical reasoning. One important question is whether this relation is domain general or if specific relations exist between performance on different types of spatial tasks and performance on different types of mathematical tasks. In this study, we explore how performance on five spatial tasks relates to performance on five mathematical tasks, each thought to index a specific subset of spatial or mathematical reasoning. An exploratory factor analyses conducted on dataset 1 (N=391) yielded a two-factor model, one 'Space' factor and one 'Math' factor with significant cross-domain factor loadings. The general two-factor model structure was replicated in a confirmatory factor analysis conducted in a separate data set (N=364) but the strength of the factor loadings differed by task. Multi-dimensional scaling and network-based analyses conducted on the combined datasets reveal one 'Space' cluster, with a central node and one tighter interconnected 'Math' cluster. Both clusters are interconnected via the math task assessing 'Geometry and Spatial Sense'. These results have theoretical implications for our understanding of the space-math relation and practical implications for our understanding of the limitations of transfer between spatial training paradigms and mathematical tasks.

P218 Visuomotor adaptation of co-speech hand movements is partially tied to speech production. Daniel R. Lametti, *Department of Psychology, Acadia University*, Jeremy I. Skipper, *Department of Experimental Psychology, University College London*.

Hand movements frequently co-occur with speech in the context of gestures that facilitate communication. The extent to which the representations that guide co-speech hand movements are separable from the context of speaking remains unclear. Here we examine this question using a dual-task paradigm involving visuomotor adaptation and speech production. In Experiment 1, ten participants learned to adapt ballistic hand movements to a visuomotor rotation while producing speech (the word "bed") in time with their hand movements. Within participants, visuomotor adaptation was then examined in the context of these co-speech hand movements or in the context of identical hand movements produced without speech. Adaptation was significantly greater when

it was expressed in conjunction with speech. Experiment 2 involved the opposite manipulation: ten participants learned to adapt isolated hand movements to a visuomotor adaptation, and adaptation was then examined in the context of isolated hand movements or in the context of identical hand movements produced with speech. In this case, visuomotor adaptation was greatest when it was expressed on its own without speech. Taken together, the results support the idea that the representations that guide co-speech hand movements are linked to speech.

P219 The spatial-mathematical abilities association: the role of spatial anxiety. Felix Ayesu, Darcy Hallett, *Department of Psychology, Memorial University of Newfoundland and Labrador.*

Spatial and mathematics abilities are robustly related, but the cognitive mechanism underlying the association is not well understood. An emerging spatial representation theory posits a tripartite association between spatial and math abilities and mental number line knowledge (MNL), which is thought to underlie number skills development. Within this framework, strong spatial abilities improve the efficiency of the MNL, leading to enhanced math learning. At the same time, recent studies have found that domain-specific spatial anxiety is negatively related to spatial reasoning and positively correlated with math anxiety (Ferguson et al., (2015). Given that spatial and math abilities are vastly intertwined, the current study examined the nature of the relationship between spatial anxieties and math proficiency. One hundred and fifty-seven (157) undergraduate students were recruited and completed measures of spatial anxieties, math anxiety, number line knowledge and math proficiency tasks. After controlling for general anxiety, math anxiety significantly predicted spatial anxiety. Importantly, highly spatial anxious adults were also more likely to be deficient math achievers in the assessed math domains. We conclude that educators should consider spatial anxiety a potential obstacle to learning math. Further research should test if ameliorating spatial anxiety can improve spatial ability and math performance.

P220 The Science of YouTube: The role of Enjoyment and Mind Wandering. Simon Leger, Aaron Newman, *Department of Psychology and Neuroscience, Dalhousie University, Colin Conrad, School of Information Management, Dalhousie University.*

Publicly-accessible educational videos on streaming services such as YouTube may have both educational and entertainment value. Past research on other learning media that may offer both pedagogical and entertainment value — such as television and digital educational games — have investigated effects on learning and motivation of an explicit learning instruction as opposed to an entertainment instruction (i.e., “For fun”) with mixed results . However, no study has investigated differences in learning between watching YouTube videos for enjoyment and watching to satisfy external learning expectations. We thus conducted a study comparing the effects of instructions to view an educational YouTube video for entertainment versus educational objectives. Our primary objective was to investigate the effects of instruction on learning, and we also investigated interrelationships between instructions, learning, enjoyment, and mind wandering. We found no effect of learning instruction on all measured variables. However, significant positive correlations were found between learning and self-rated enjoyment, which were both negatively correlated with mind wandering. Rates of reported mind wandering were found to increase with time. People who reported prior experience seeking YouTube videos predicted increased learning and enjoyment, and decreased mind wandering. Further studies should be conducted to assess mind wandering in online.

P221 The Power of the Pencil: Examining the impact of drawing on learning and memory.

Celia Briand, Dr. Raymond Klein, Dr. John Christie, *Department of Psychology and Neuroscience, Dalhousie University, Canada.*

Drawing has recently been recognized as an aid to teaching, especially in the sciences. Through drawing, the student engages both their active cognitive system and motor system, and they are more self-reflective, thereby recognizing errors in their understanding of the material. While prior research suggests learning and memory are aided by these processes, few studies have examined the impact of drawing a dynamic visual scene; or simultaneously assessed memory and learning. The present study aimed to address these gaps in the literature, asking, compared to simply looking for an equal amount of time, does drawing a visual scene from observation differentially improve learning and memory?

P222 Qualifying the “quantroversy”: A commentary on working memory training and transfer.

Richard Drake, *Department of Psychology & Neuroscience, Dalhousie University, Canada,* Gail Eskes, *Department of Psychology & Neuroscience and Department of Psychiatry, Dalhousie University, Canada,* Raymond Klein, *Department of Psychology & Neuroscience, Dalhousie University, Canada.*

The cognitive enhancement potential of computerized, game-based working memory training tasks continues to attract researchers and investors alike. Laboratory and commercial endeavours of the past two decades have been both basic and applied, with goals ranging from understanding the mechanisms of learning and transfer to improving academic performance or reducing age-related cognitive decline. Hundreds of scholars have participated in the debate of whether working memory training is effective. Putting aside valid criticisms of the debated question itself (“effective” is not specific and is only meaningful when paired with clearly defined goals), there is evidence to support both sides. However, on the basis of a systematic review of the working memory training meta-analyses, we argue that the controversy has more to do with differences of interpretation, rather than numeric differences. We thus qualify the alleged quantitative controversy (or “quantroversy”) accordingly. In this poster, we will contextualize the results of our review with respect to transfer theories and recent best practice recommendations for cognitive training.

P223 Arousal affects short-term serial recall.. Éric Landry, Dominic Guitard, Jean Saint-Aubin, *École de Psychologie, Université de Moncton, Canada.*

Arousal affects our lives in many ways; it can direct our attention to what is important in the environment and help us remember it more clearly. However, it remains unclear how arousal impacts short-term memory. Here, we addressed this gap in our knowledge by contrasting four hypotheses: the Arousal Hypothesis, the Priority-Binding Hypothesis, the Rehearsal Hypothesis, and the Rapid-Processing Hypothesis. To distinguish between these competing accounts, we conducted two immediate serial recall experiments in which we manipulated arousal (low-arousal words vs. high-arousal words), list composition (pure vs. mixed), and presentation rate (200 ms vs. 1,000 ms). Arousal and list composition were repeated-measure factors, while presentation rate was a between-participants factor with 44 participants per group. In both experiments, great care was given to stimuli selection by controlling over 30 lexical variables. Experiment 2 replicated the design of Experiment 1 with a different set of stimuli to control for potential stimuli specificity effects. The same pattern of results was observed in both experiments. Overall, participants were better at recalling arousing information, regardless of list type or presentation rate. Our results

provide clear evidence in favor of the arousal hypothesis which suggests that arousing information benefits from biologically induced enhancements at encoding.

P224 Anchoring in Time Estimation: The Effects of Explicit Anchoring on Prospective Time Estimates. Mohammed Aswad, Guy Lacroix, *Department of Psychology, Carleton University.*

Numeric estimates can be biased if a guiding value is first provided. This is known as an anchoring effect (Tversky & Kahneman, 1974). Limited research has examined the impact of anchors on duration judgment tasks, however, and only König (2005) has verbally given participants an explicit one. Thus, the goal of the experiment was to investigate the effects of explicitly given anchors on duration estimates. 528 undergraduates kept track of time while playing a Tetris game. The experiment consisted of a 4 (Game Durations: 30 seconds, 1 minute, 2 minutes, 4 minutes) X 3 (Anchoring Ratio: 0.5, 1, 2) between-subjects design. Participants estimated the game's duration and provided a minimum and a maximum estimate. As expected, participants' raw estimates increased linearly with duration. The evidence for anchoring was mixed, however. Overall, large anchors yielded overestimation, but small anchors failed to yield significant underestimation and might have been subject to a floor effect. Further research will be required to address this issue and assess the robustness of explicit anchoring at longer durations.

P225 Does 'RIF' Keep the Doctor Away? Evaluating Health Relevant Cognitive Biases via Retrieval-Induced Forgetting. Maddison Baldwin, Kelsi Hall, Brooke Hiscock, Emily Fawcett, Joshua Rash, Jonathan Fawcett, *Department of Psychology, Memorial University of Newfoundland, St. John's, Newfoundland, Canada.*

Retrieval-Induced Forgetting ('RIF') is a cognitive paradigm demonstrating that retrieval processes can lead to subsequent forgetting of related information. The present experiment used this phenomenon to evaluate whether those with self-reported health anxiety exhibit impaired memory control for health-related and/or neutral material. In the initial phase, participants studied category-word pairs (e.g., HEART-break); after which they practiced retrieving half of the targets from half of the categories, when provided with a word-stem (e.g., HEART-br) generated from the preceding phase. Finally, they were presented with each category (e.g., HEART) and asked to recall as many target words associated with that category as possible. In this context, a RIF effect is defined as worse memory for unpracticed items from practiced categories than for items from unpracticed categories. A reduced RIF effect was observed for health-related (e.g., HEART-blockage) word pairs compared to neutral (e.g., CARD-letter) word pairs. However, this difference was not significantly correlated with scores from a validated measure of health anxiety.

P226 Spatial-manual tapping hinders more backward than forward recall when you know the upcoming recall direction. Danika McIntyre, *Université de Moncton*, Dominic Guitard, *Université de Moncton and University of Missouri*, Jean Saint-Aubin, *Université de Moncton.*

When participants must recall a sequence of verbal items in reverse order just after their presentation, inconsistent findings have been observed relative to when participants must recall a sequence in their presentation order. Recently, the Encoding Retrieval Matching Hypothesis (ERM) has been developed to account for these inconsistencies. Within the ERM hypothesis, the optimal strategy for forward recall would rely on phonological representations and the optimal strategy for backward recall would rely on visuospatial representations. Furthermore, participants could control the number of features of each type they encode to maximize their recall performance. However, to do so, they must have foreknowledge of recall direction. In two experiments, we tested

a key prediction of the ERM hypothesis: In backward recall with foreknowledge of recall direction, the detrimental effect of spatial-manual tapping will be larger in backward than in forward recall, only if participants know the upcoming recall direction. As predicted, the detrimental effect of manual-spatial tapping was larger in backward recall relative to forward recall when recall direction was predictable (Experiment 1), but not when it was unpredictable (Experiment 2). Overall, results support the predictions derived from the ERM hypothesis.

P227 Musical cues enhance the quantity and quality of autobiographical memories. Pelin Tanberg, Ryan C. Yeung, Kristen L. Sullivan, Myra A. Fernandes, *University of Waterloo*.

Hearing music can evoke vivid memories from one's past. Here, we examined the extent to which musical features of a cue (e.g., melody) influence retrieval of autobiographical memories (AMs), above and beyond linguistic features of a song. To do so, we compared, within-subjects, AMs evoked by musical cues (popular songs) and matched nonmusical cues (spoken lyrics). On each trial, participants (N = 84) listened to an auditory memory cue, which was either musical (a clip of the actual song) or nonmusical (neutral voice reading lyrics of the song). While listening, participants indicated via button press whether an AM associated with the cue came to mind – if so, they then described the AM in text, and reported on the AM's properties (e.g., age of memory, reliving of the memory, familiarity with the cue). We found that more AMs were elicited following musical than nonmusical cues. We also found that self-ratings of degree of reliving were significantly higher for AMs cued by musical than nonmusical cues. Finally, we found a linear effect in which older musical cues (e.g., songs released in 2017 vs. 2020) evoked older AMs. Our findings highlight how different qualities of a cue influence how AMs are evoked.

P228 Motoric fluency and metacognitive monitoring: Using typing speed to investigate the impact of motoric fluency on judgments of learning (JOLs). Michelle A. Dollois, Cole J. Poore-Buchhaupt, Chris M. Fiacconi, *University of Guelph*.

The ease with which one processes a stimulus is often implicitly interpreted as a sign of familiarity with that item regardless of prior exposure. This sense of familiarity is thought to boost confidence in one's ability to recognize or recall that item in the future. Here, we probe how the ease of interacting with an item through motor responses can influence these judgments of confidence. Despite research that demonstrates an impact of motoric fluency on metacognition, it is unclear whether people require awareness of the relative differences in motoric fluency to observe differences in their judgments. We sought to answer how differences in motoric fluency outside of explicit awareness impact judgments of learning (JOLs) by surreptitiously manipulating the ease of typing both real words and non-words. We found that in the absence of awareness of the manipulation, JOLs did not differ for motorically fluent and disfluent items. However, linear mixed effect modeling revealed that typing times at the trial level were related to JOLs, and that this relationship was different for words as compared to non-words. Together, these findings suggest that the contribution of motoric fluency to metacognitive monitoring in the absence of explicit awareness is minimal.

P229 Can you spot the bot? Strategies to detect bots in online survey data. Andie Storozuk, Erin A. Maloney, *School of Psychology, University of Ottawa, Canada*.

The Internet is a popular source for data amongst academic researchers, but recently, a new concern associated with online data collection has emerged. Bots (a.k.a., automatic survey-takers or fraudsters) have begun infiltrating surveys, largely threatening the integrity of data collected

online. Alarming, very few researchers report the techniques they use to address bot respondents. We canvassed scientific literature and social media postings and identified 10 possible bot-detection strategies and applied them to our own online surveys. We categorized strategies by level of effectiveness (i.e., most, moderately, least effective) based on the proportion of bots identified by each tactic. The most effective strategies were to (1) screen email addresses for patterns, (2) screen open-ended data for nonsensical or copy-and-pasted responses, (3) monitor survey completion time, and (4) monitor survey completion speed. The new, disturbing, reality is that bot-activity in survey data is inevitable. Researchers must not become complacent or rely solely on automated techniques (e.g., CAPTCHAs) to remove bot-generated data. The sudden shift to online data collection resulting from the on-going COVID-19 pandemic highlights a growing need to educate researchers about bots and to make improvements in bot detection and prevention a priority.

P230 Assessing Dance Expertise Using Temporal Equivalence . Charles-Anthony Dubeau, Élodie Gagné-Pomerleau, Mélodie Massé, Nicola Thibault, Daniel Fortin-Guichard, Simon Grondin, *Laval University*.

The aim of this study is to evaluate the effect of dance expertise on temporal equivalence during mental imagery (MI). Participants, 14 dance experts and 20 controls without any dance experience, had to learn a 30-sec choreography. A video of this choreography was presented ten times, and then participants had to mentally reproduce the choreography, tapping on a computer space bar at the beginning of their MI and tapping once again when they reached one of three target moments (a specific movement in the choreography, indicated before each trial). The targets occurred after a third (T1) of the choreography was elapsed, after two thirds (T2), and at the end (T3). For each target moment, there were 10 trials (10 intervals produced), with the mean interval produced and the variability of the productions being the dependent variables of interest. Results showed no difference between experts and novices for both mean production and variability. However, differences in temporal equivalences were observed for both groups when comparing T1, T2, and T3, with deviations from the target being more important at T1. Furthermore, novices and experts differ when the correlations between the performance in the temporal equivalence task and individual temporal characteristics are analyzed.

P231 Time Perception as a Tool to Study Implicit Biases in an Intergroup Setting. Louis-Charles Reny, Simon Grondin, *Université Laval, Québec, Canada*.

Temporal perception was used to study implicit biases in an intergroup setting, including White, Black, Arab, and Native people. The last three groups are known to experience discrimination in Canada. Considering the nature of this discrimination, we believe that stimuli related to these groups may generate arousal or attentional biases, particularly when we consider the motivation to control prejudice in individuals. Forty white participants completed a temporal bisection task in which words associated with the four aforementioned groups as well as neutral words were presented to participants and used to mark interval lengths to be judged. A two-way mixed ANOVA (2 participant genders X 5 groups of words) reveals a main effect for the group variable, where time is overestimated when neutral words are presented compared to Arab-associated words. Also, correlations between motivation to control prejudice and time perception show no statistical relation. This study corroborates previous findings by asserting that temporal perception can be used as a tool to study implicit biases.

P232 Do Emojis Violate Norms and Decrease Perceived Competence in Professional Settings?. Megan LeBlanc, Charles Collin, Younes El Hamdany, Isabelle Boutet, *School of Psychology, University of Ottawa*.

In face to face communication within a professional context, competence and appropriateness (i.e., to what degree the senders are violating work norms) are often judged based on emotional expression and gender. We examined whether emotionally expressive facial emojis similarly impact competence and appropriateness judgements in an online professional context. In an online study, male ($n = 64$) and female ($n = 58$) participants viewed text messages with emojis that were congruent or incongruent with the emotional valence of the verbal message. Participants were instructed to read and assess the messages as if they were coming from either a male or female co-worker. We measured perceptions of sender competence and perceptions of message appropriateness. Male participants rated senders as less competent when they displayed positivity in the verbal message. Negative emojis were particularly detrimental to competence and appropriateness, while positive emojis' impact depended on the valence of the verbal message. In addition, weak but statistically significant higher order interactions were observed between our IVs. We conclude that users should generally avoid sending emojis in a professional context, particularly negative ones.

P233 Effect of metaphors in processing sexual orientation schemas: A study of eye movements. Élias Patrice Félix Daigle, Marie-Pier Mazerolle, Karolyn Cloutier, Annie Roy-Charland, *École de Psychologie, Université de Moncton*.

During reading, the use of schemas can speed up reading time. However, when schemas are violated, such as in stories featuring characters who go against common schemas related to sexuality (e.g., homosexual couples), the use of schemas slows down reading in what is called the mismatch effect. Thirty-four university students participated in this study. Participants read 60 texts of approximately 4 sentences by 5 lines that included dialogue and answered questions about judgments using a Likert scale (e.g., familiarity, conventionality, reading fluency, etc.) at the end of each text. The results of the fluency judgment questions revealed that people perceived reading text featuring lesbian women more easily, followed by heterosexual people regardless of gender, and finally men regardless of orientation. However, the eye movement results revealed that texts featuring heterosexual men are read more quickly, followed by women regardless of orientation and finally homosexual men. In short, eye movement revealed that a mismatch cost is present in the case of texts featuring homosexual men, in contrast to subjective judgement results.

P234 The Cone of Direct Gaze can be reliably measured online using the Virtual Chin Rest. Sarah McCrackin, Victoria Fratino, Jelena Ristic, *McGill University*.

The Cone of Direct Gaze (CoDG) refers to the range of eye-gaze deviations that an individual perceives as directed at them as opposed to away from them. Typically, the CoDG is measured in controlled settings where participants look at and respond to stimuli with a standardized size and distance. The recent need for online testing poses the question of whether the CoDG can be reliably measured remotely using participants' own computers. To examine this, we used the Virtual Chin Rest procedure (Li et al., 2020) which standardizes the subtended visual angle of stimulus images based on participant screen size and viewing distance. Participants viewed images of faces displaying nine gaze deviations (-12° , -9° , -6° , -3° , 0° , 3° , 6° , 9° , 12°) and indicated whether they were looking left, right, or center. The CoDG was calculated for each participant by fitting two psychometric curves. The curve fitting was successful, indicating that the CoDG can be

reliably measured online. A comparison of the group average with recent laboratory data (Balsdon & Clifford, 2018) indicated that the CoDG was comparable but slightly narrower in our sample. Thus, our data suggest that the virtual chin rest provides a reliable way to measure the CoDG remotely.

P235 The role of gaze direction and mental content in social orienting: An eye tracking investigation. Florence Mayrand, Nada Khalil,, Sarah D. McCrackin, Jelena Ristic, *Department of Psychology, McGill University.*

While it is known that people orient attention towards where others are looking, the nature of this social orienting behavior remains debated. Some maintain that social orienting reflects the computation of the eye gaze directional information while others suggest that it reflects the adoption of a gazer's mental content. Here we examined how the computation of the gazer's eye direction and mental content was reflected in eye movements. Participants were presented with a task in which a central cue was flanked by a target and a distractor. The cue could point towards or away from the target and either share or not share mental content with the observer. Participants were asked to look at the target. Their eye movements were recorded online via webcam. We examined the fate of eye movements when the cue's direction and mental content were dissociated relative to when they were combined. Results showed that accuracy to look at the target was lower in the conditions in which cue direction and mental content dissociated relative to when they combined. Overall, this replicates behavioral work and suggests that both cue direction and mental content contribute to social attention behavior.

P236 Contextual Cues about Reciprocity and Motivation to Lean Impact on Ratings of Smile Authenticity. Adèle Gallant, Annie Roy-Charland, Adèle Belliveau, *Université de Moncton.*

Studies have demonstrated that contextual factors impact on how emotional facial expressions are perceived and categorized. However, few studies have examined the role of context in the judgment of authenticity of the expressions. We exposed participants to authentic or masking smiles while manipulating two kinds of internal contextual cues. In Experiments 1, 60 participants were exposed to the smile variations and learned that the smiler was either someone who always, never or occasionally returned favors. They were then asked to judge the smiles' authenticity using a 7-point Likert scale. In experiment 2, participants were exposed to the same task but learned that the smiler was either someone who was always, never or occasionally motivated to learn. Results revealed that authentic smiles are judged as more authentic than masking smiles. More importantly, results revealed that when the context might have direct impact on the participant (favor reciprocity), smiles were judged more authentic when the person always returns a favor but no difference was found between occasionally and never. However, when the context only has an impact of the encoder (motivation to learn), smiles were judged more authentic when the person was always motivated, followed by occasionally and then, never.

P237 A Virtual Reality Training Program for Volleyball Experts and Time Perception. Marie Dallaire, Laurence Lévasseur, Noémie St-Laurent, Daniel Fortin-Guichard, Nicola Thibault, Simon Grondin, *Laval University.*

This study first focused on testing a virtual reality (VR) training program for volleyball experts. A second objective was to assess perceived duration in VR in experts and novices and how it related to personal temporal characteristics. A group of 50 expert volleyball players was tested in pre- and post-test sessions, with a subgroup of 25 participants receiving a training program in VR, and 25

others receiving no training. The training program consisted of six 10-min sessions in VR where participants observed, from a reception perspective, incoming offensive sequences, which were interrupted shortly before impact (occlusion). Participants then indicated where the ball would go. The results reveal an improvement in anticipation performance only for experts who received the training program in VR. The comparison of the perceived duration in a VR session revealed no difference between the 50 experts and the 50 novices. Finally, among experts, temporal judgments are significantly related to two dimensions of the Time Personality Indicator (TPI), namely respect for deadlines and social temporal beliefs, and to one dimension of the Zimbardo Time Perspective Inventory, that is, orientation toward the future. For novices, time judgments are correlated only with the impatience dimension of the TPI.

P238 Mind wandering, task switching, and the maintenance of task goals. Shikang Peng, Peter Dixon, *University of Alberta*.

In task switching, response time is relatively slow when the task is different from that on the previous trial and relatively fast when the task repeats. However, response time also gradually increases over succeeding trials with the same task. Altmann and Gray (2008) attributed this within-run slowing to a decay in activation of a representation of the current task. In this study, we examined the involvement of mind wandering in this effect. Participants made go/no-go responses to a colour presented on each trial, and the target colour changed every 12 trials. Periodically, participants were interrupted and asked to rate the extent to which they were on task. The results demonstrated a within-run slowing of responses to the target colour, but only for participants who indicated that they were off task. Our explanation is that mind wandering interferes with the maintenance of the current task goals.

P239 Evaluating a novel 6-response zero-sum game against binary and non-binary spaces: Subjective complexity and the expression of stay behaviours. Eunchan Na, Benjamin. J. Dyson, *Department of Psychology, University of Alberta, Canada*.

Does having more choice enrich or impoverish behavioural performance? We compared a novel 6-responses zero-sum game (Dice Dual) with 2, 3 and 5-responses zero-sum games to evaluate the degree to which increased options interrupt optimal performance. Participants ($n = 164$) played zero-sum games with different number of responses (2, 3, 5, 6) against computerized opponent. Participants played against an unexploitable opponent in Experiment 1 ($n = 95$) and against an exploitable opponent in Experiment 2 ($n = 69$). Dice Dual has a structural similarity to Matching Pennies, meaning that participants could perform optimally using less than 6 responses. The participants exhibited higher win-stay than lose-stay behaviour against unexploitable and exploitable opponents. Both stay-behaviours during Dice Dual were positively correlated to that of 2, 3, and 5-responses game. Participants who minimized their response space to less than 5 in Dice Dual exhibited higher stay-behaviours than those with more than 5. These findings reveal that Dice Dual performance was highly correlated to other zero-sum games with respect to core reinforcement learning principles. The paradigm will have future use in studying subjective aspects of decision-making such as analysis paralysis, and the degree to which increasing and decreasing response range reflects success during competition.

P240 Lie to me (if you can): Deception with motion and gaze in a preference task . Dana Hayward, Helen Ma, Sarah Janssens, *University of Alberta*.

In social attention and communication research, gaze is fundamental; a two-way street that both passively receives and actively produces social information. Likewise, motion is a fundamental, yet often overlooked, aspect of social communication, shown to project decision information. Prior work shows that individuals' gaze patterns differ significantly when being truthful compared to deceptive, and further that viewers of such gaze patterns found deceptive gaze harder to discern compared to truthful gaze. We aimed to determine whether motion produces similar patterns as gaze in social communication and deception. This study has two phases. Phase 1 was a preference task with eye and mouse tracking. Phase 2 asked new participants to view gaze and mouse patterns of Phase 1 participants and guess their preference. Results from Phase 1 (n=61) show that gaze and motion are not equal, highlighting the importance of studying motion as a marker of cognition. Further, results indicate that people do change both their gaze and movements with different communication goals. Preliminary results for Phase 2 will also be discussed. Our findings suggest motion, like gaze, can be used to deceive, yet it appears as though the two are not aligned.

P241 Getting back to nature: Preference for spaces featuring natural elements. Ruby S. Prinsen, Mae Pacificar, Dana A. Hayward, *Department of Psychology, University of Alberta*.

Classical cognitive research often controls for specific environmental factors in laboratory experiments. In contrast, emerging research suggests architectural elements affect emotion and cognition (Jelic et al. 2016). Thus, we took an ethological approach, exploring how people interact with real-world spaces, how their decisions were determined by a specific goal, and how these preferences vary across individuals. In the first online experiment, participants looked at images of campus spaces varying in specific features (e.g., lighting, seating) and rated them based on the likelihood of using the spaces for given activities (i.e., studying, socializing, relaxing). We found participants preferred photos featuring natural light or being near a window regardless of activity, and preferred images featuring greenery for socializing and relaxing. Moreover, higher scores on the Perceptual Curiosity scale correlated with higher ratings for socializing and studying activities across all features, suggesting that highly-curious people tend to rate their surroundings more favourably when choosing where to socialize or study. These findings will inform our study's next phase, where participants will physically navigate campus areas with portable eye trackers to determine whether ratings hold when participants can explore the physical environments.

P242 Same items, different bias: Recognition memory for words, drawings, and photos representing common objects. Kaitlyn Fallow, D. Stephen Lindsay, *University of Victoria, Canada*.

Our lab has repeatedly observed a conservative response bias in old/new recognition memory for complex images that are novel to participants, including paintings, photos of scenes, and faces. This contrasts with the neutral or liberal biases observed when common English words were used as stimuli in the same procedure. The mechanism underlying these bias differences remains unclear, and efforts to identify the source are complicated by the numerous differences between the words and images in these stimulus sets. Here we report a study in which we compared recognition memory for words, line drawings, and grayscale photos representing the same items (e.g., "bird" vs. a drawing of a bird vs. a photo of a bird). Materials were manipulated between groups (Ns = 100 each) while all other elements of the procedure were held constant. Response bias was markedly conservative for the photos only. We confirmed this pattern in a direct replication. These results suggest novelty is insufficient as an explanation for conservative

responding to images (because the line drawings were also novel), and point toward visual rather than semantic characteristics as a more plausible source of the observed materials-based bias differences.

P243 Individual Differences in Processing of Threat Cues in Faces Displaying Direct and Averted Gaze. Reegan McCheyne, *Faculty of Graduate Studies, University of Manitoba, Canada*, Lorna Jakobson, *University of Manitoba, Canada*, Pauline Pearson, *University of Winnipeg, Canada*.

Integrating information about others' expressions and gaze influences how we direct our attention, form impressions of others, and assess threats. This study was designed to explore how people with certain personality traits such as alexithymia and sensory processing sensitivity (SPS) integrate gaze and expression cues when viewing faces signaling two different kinds of "threat" cues. Participants $N = 74$ (49 female; $M_{age} = 20.45$ years, $SD = 4.64$) with varying degrees of alexithymia and SPS completed two tasks requiring speeded judgments of gaze direction (looking at me, looking away) and facial expression (fear, anger). Results revealed that lower accuracy and needing more time to correctly assess gaze direction in fearful faces was seen in people scoring higher in SPS. In contrast, alexithymic traits were stronger in those who were less accurate and needed more time to correctly judge gaze direction in angry faces. Finally, viewers who needed more time to correctly judge expressions of faces with strongly averted (but not slightly averted or direct) gaze reported more difficulties describing their feelings than those who needed less time. This research furthers our understanding of individual difference factors that may influence the form of gaze-by-expression interactions that help shape one's social perception.

P244 Does pronunciation affect the morphological decomposition of pseudo-compound words?. Juana Park, *American University of Sharjah*, Christina Gagné, Thomas Spalding, *University of Alberta*

In English, compound words (e.g., blueberry) consist of two unbound morphemes. Pseudo-compound words, on the other hand, are words that look like compound words but actually do not have a compound structure (e.g., the pseudo-compound word hippie has the words hip and pie embedded, but they do not function as morphemes inside that word). In this project, we examined whether the pronunciation of a pseudo-compound word affects its morphological decomposition during a written production task that analyzed typing times at the pseudo-constituent boundary. We found that when the pseudo-constituents of a pseudo-compound word keep their pronunciation (e.g., the pronunciation of both kid and nap is kept in the word kidnap), there were significantly elevated inter-letter typing times across the pseudo-constituent boundary, compared to when one or both pseudo-constituents lost their pronunciation (the pronunciation of pie is lost in the word hippie). In sum, when the pseudo-compound contained pseudo-constituents that kept their original pronunciation, there was a pseudo-boundary typing effect similar to that usually found with compound words, but this effect disappeared when one or two of the pseudo-constituents lost their pronunciation.

P245 Approaching metaphor comprehensibility from a computational perspective. Parastoo Harati, Rachel Mustaklem, Chris Westbury, *Department of Psychology, University of Alberta, Canada*.

Although metaphors are structurally complex, language users do not face any difficulty comprehending metaphorical language in comparison to literal language. In fact, metaphorical words comprise around twenty percent of everyday language. Despite this ubiquity, psycholinguistic research on how people comprehend metaphors is far from conclusive.

Computational accounts of human judgment of metaphor comprehensibility and ease are even further behind in modeling metaphor comprehension. In a previous study, we enhanced Kintsch's (2000) computational model of metaphor comprehension to model human judgment of goodness of metaphors (Harati et al. 2021). In the current study, we used the developed model to extrapolate a measure of comprehensibility. We selected 129 metaphors from our battery of nominal metaphors. These metaphors are rated using best/worst scaling based on their comprehensibility for the participants. We used linear mixed-effects modeling to analyze the data. We observed that participants were significantly quicker to respond to metaphors that were estimated by the model to be more comprehensible (i.e., easier to comprehend). We concluded that our results were indicative of our model's ability to provide a reliable extrapolation of human judgments of comprehensibility.

P246 Does TV Priority for Emotional Public Events Still Exist in the Online World? Cheryl Techentin, Malinda Desjarlais, Naomi Phung, David Cann, *Mount Royal University*.

TV priority (Neisser et al., 1996) refers to the vividness of memories for public events that are first learned about on television versus other sources. The current study examined differences in the phenomenological experience of memories for highly emotional public news events in older (>40 yrs) and younger (<30 yrs) as a function of where they obtained the news, the time since the event occurred, and their news source preference. 458 participants were asked to report their memory for an emotional public event using the Autobiographical Memory Questionnaire. They also completed a News Survey, and the MEQ. Overall, older adults were more interested in the news and preferred to obtain their news from television sources whereas younger adults tended to rely on online media sites (e.g., twitter, Apple news, etc.). Older adults described more traditional public events (e.g., 9-11) whereas younger adults described more recent events (death of Kobe Bryant). Older adults scored higher on almost all dimensions of the MEQ including vividness supporting TV priority for older but not younger adults. Discussion focusses on the impact that online news sources may have on the existence of flashbulb memories for public events going forward.

P247 Perceived Coherence of Crossed Moving Gratings obeys Gestalt laws.. Alan Ho, *Department of Social Sciences, Ambrose University, Calgary, AB, Canada*, Stuart Anstis, *Department of Psychology, UCSD, San Diego, CA, USA*.

Two superimposed gratings moving across one another at directions differing by angle may be perceived either as moving coherently as a 2D plaid, or else as component motions sliding on two transparent planes. We found that when a $< 90^\circ$ (wide squat diamonds moving slowly along their short axes) observers tended to report a plaid in coherent motion, changing steadily to two sliding gratings as a approached 135° (long pointed diamonds moving rapidly along their long axes). Is a motion-based perceptual principle at work here? We presented our viewers, either dichoptically or monocularly, with four identical crossed gratings, all moving at the same speed in different directions, in the form of two separated, dissimilar 2D plaids whose α 's were varied systematically over different trials. When these were superimposed, viewers reported that the two stimulus plaids would instantly morph into two different plaids moving with a different set of speeds and directions, in a way that minimized the relative velocity of the two plaids. This surprising grating "re-pairing" phenomenon showed that the four moving gratings reorganized themselves adaptively to minimize the Gestalt property of "common fate" motion and spatial "proximity".

P248 Physical Disability Affects Women's but Not Men's Perception of Opposite-Sex Attractiveness. Farid Pazhoohi, Francesca Capozzi, Alan Kingstone, *Department of Psychology, University of British Columbia.*

Physical appearance influences our perceptions, judgments, and decision making about others. While the current literature with regard to the perceptions and judgments of nondisabled people's attractiveness is robust, the research investigating the perceived physical attractiveness and judgments of physically disabled individuals is scarce. Therefore, in the current study, we investigated whether people with physical disabilities are perceived by the opposite sex as more or less attractive relative to nondisabled individuals. Our results, based on over 675 participants, showed a positive effect for women's attractiveness ratings of men with physical disabilities, but not men's attractiveness ratings of physically disabled women. Moreover, social desirability bias was positively associated with attractiveness ratings of physically disabled individuals, meaning those with higher tendency to be viewed favorably by others rated physically disabled individuals more attractive. Finally, our results revealed that attractiveness ratings of individuals with physical disabilities are positively associated with extroversion and empathy in both men and women, and positively with agreeableness and negatively with neuroticism in women. In conclusion, our study showed women rate men with physical disabilities as higher on attractiveness than nondisabled men, which is also influenced by their social desirability bias.

P249 Natural Disaster as Transitional Event and Well-being Consequence. Eamin Heanoy, *University of Alberta, Canada*, Elena Nicoladis, *University of British Columbia-Okanagan, Canada*, Tilmann Habermas, *Goethe University Frankfurt, Germany*, Connie Svob, *Columbia University, United States*, Norman Brown, *University of Alberta, Canada.*

This project aimed at investigating the transitional properties of natural disasters and the relationship between disaster-induced transition and well-being. Data was collected from the residents of Southern Alberta, British Columbia, and Western Germany who had experienced wildfires or floods at different time-points. All participants responded to an online survey that included 12-item Transitional Impact Scale (TIS), 21-item DASS, and 8-item PCL-5. In all three samples, psychological subscale of TIS yielded a higher score than material subscale of TIS. The level of depression, anxiety, stress among the respondents ranged from mild to moderate, and although their PTSD rating was quite high, the average did not fall under the diagnostic criteria. PTSD was strongly associated with both material and psychological TIS and DASS, but DASS had a varying degree of correlation with TIS subscales across the samples. Overall, the results indicate that people's well-being is largely determined by the level of disaster-related life changes individuals experience over time. These findings might be useful in documenting the short and long-term effects of disaster-specific transition by demonstrating a variable impact on people's lives and their well-being, and the possible transitional impact on the content and organization of autobiographical memory.

Schedule At a Glance

Day 1: July 18		Room	Day 2: July 19	Room	Day 3: July 20
<p>CSBBCS2022 will be held on the Convention level of the Halifax Convention Centre.</p> <p>Registration will be open from noon - 7PM on July 18 and from 8AM - noon on July 19.</p> <p>Keynotes are in Blue</p> <p>Symposia are in Red</p> <p>Regular talk sessions are in Gold</p> <p>Lunches are "on your own". There are many nearby restaurants</p> <p>Posters can be put up after noon on the day of your session and can stay up till noon the next day.</p>		C4	Symposium 2: Metacognition Reading & Language	C4	Symposium 6: Language Processes Technology & Cognitive Science
8:30-10		C102	Memory 1	C103	Memory 3
		C104	Attention 1	C104	Attention 3
10-10:30		C109	Cognitive Neuroscience	C109	Symposium 7: Well... we didn't see that coming
			Refreshments		Refreshments
10:30-noon		C4	Symposium 3: The Production Effect Metacognition		Executive's Symposium From the Lab to Classes Around the World: An Infusion Approach for Mobilizing Psychological Research Steve Joordens, Dwayne E. Paré & Nidhi Sachdeva
		C102	Cognitive Development	C4	
		C103	Thinking & Decision Making		
		C104	Clinical Cognitive Neuroscience		
12-1:45			Lunch		Lunch
1:45-3		C4	Hebb Award Lecture Rob Sutherland	C4	DiLollo Early Career Award Brendan Johns
3-3:30			Refreshments		Refreshments
		C4	Symposium 4: Reasoning & Metareasoning Individual Differences	C4	Symposium 8: Memory in the Elderly Language & Music
3:30-5		C102	Memory 2	C102	Social Cognition
		C103	Attention 2	C103	Teaching and Learning
		C104	Symposium 5: Animal Models	C104	Learning, Brain & Behavior
5-7		C5	Posters 2 + Cash bar	C109	NSERC & Business
7-9:30				C4	Banquet
9-12			Student Social Event Freeman's Little NY 1726 Grafton St	C3	

Floor Plan of Convention Level of the HCC

