2023 CSBBCS ANNUAL MEETING PROGRAM

MONDAY - WEDNESDAY JULY 17-19, 2023

University of Guelph
50 Stone Rd E.
Guelph, Ontario, Canada

ACKNOWLEDGEMENTS

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Briana Renda (logo design)

The Organizing Committee would like to extend an extra special thanks to the University of Guelph Conference Services team who have been instrumental in helping to organize the 2023 CSBBCS Meeting.

We hope you enjoy the conference!

SPONSORS

We are grateful for the generous support of our sponsors for the 33rd Annual Meeting of the CSBBCS

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TRAVEL TO GUELPH

PLANE

Although Guelph does not have an airport with domestic flights, the region is served by the **Region of Waterloo International Airport (YKF)**, located in nearby Breslau, ON, and by **Toronto Pearson International Airport (YYZ)**. The University of Guelph is located approximately 20 min from YKF, and approximately 45 min from YYZ via taxi.

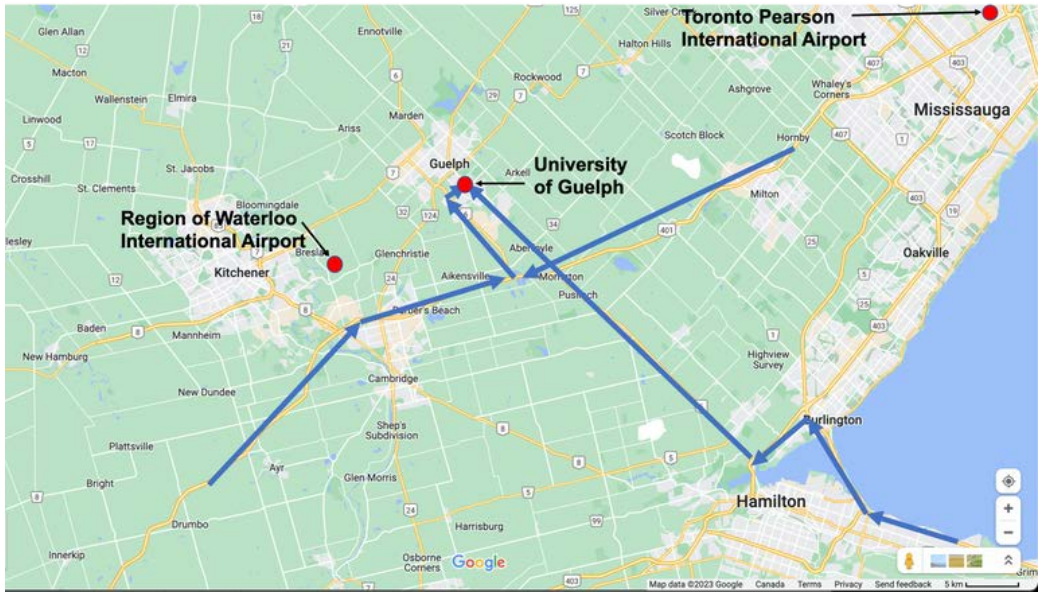
CAR

Guelph is centrally located within Southwestern Ontario, with easy driving access from other major centres including Windsor, London, Kitchener/Waterloo, Niagara, and the Greater Toronto Area (GTA). If arriving from Windsor, London, Kitchener/Waterloo, or the GTA and points east, the easiest access to the University of Guelph is from Highway 401. Take Exit 295 (Highway 6 North) until you reach the intersection with Stone Road. Turn right onto Stone Road and proceed until you reach the university. If arriving from Niagara, follow the QEW Toronto and exit onto Highway 403 west toward Brantford. Follow the 403 west to the interchange with Highway 6 North and head north until you reach the city limits of Guelph. Once in Guelph, keep heading north on Gordon Street until you reach the university.

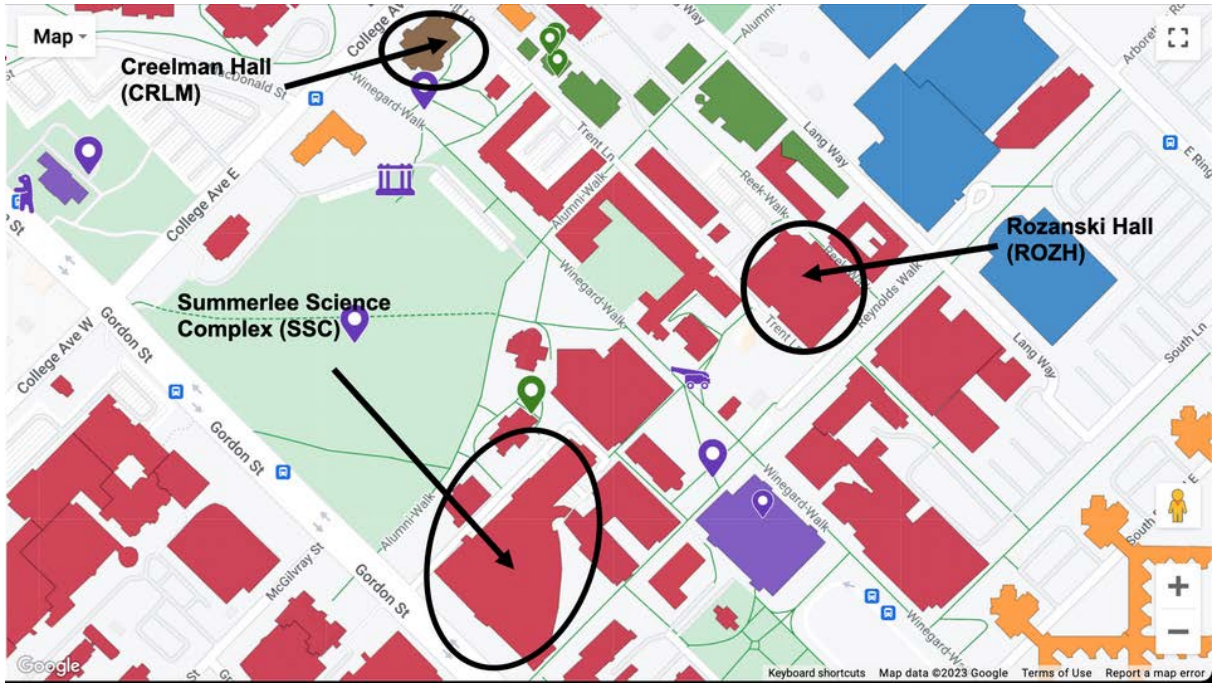
TRAIN

Guelph is also easily accessible from other major cities in Southern Ontario using the VIA Rail network. The train station is located in downtown Guelph and is a short taxi ride from the university (https://www.viarail.ca/en/explore-our-destinations/stations/ontario/guelph).

MAP



CAMPUS MAP - CONFERENCE LOCATIONS



CONFERENCE LOCATIONS

ROZANSKI HALL (ROZH)

Talks/Symposia

Talks and Symposia will be held in Rozanski Hall (ROZH) along with coffee breaks and light breakfast (pastries/fruit)

SUMMERLEE SCIENCE COMPLEX (SSC)

Posters

Poster sessions will be held in the Summerlee Science Complex

CREELMAN HALL (CRLM)

Banquet

The CSBBCS banquet will be held in Creelman Hall (CRLM)

ACCOMMODATIONS

DELTA (50 STONE RD. W. GUELPH, ON)

Located kiddie corner to the University of Guelph, the Delta hotel provides off-campus accommodations only steps away from the conference. We have reserved a block of 20 rooms for conference attendees at a discounted rate of $199 CAD/night.

DAYS INN (785 GORDON ST. GUELPH, ON)

Located just south of the University of Guelph along the Gordon St. corridor is the Days Inn. The Days Inn is approximately a 10-15 minute walk from the conference. We have reserved a block of 20 rooms for conference attendees at a discounted rate of $149 CAD/night.

UNIVERSITY OF GUELPH RESIDENCE

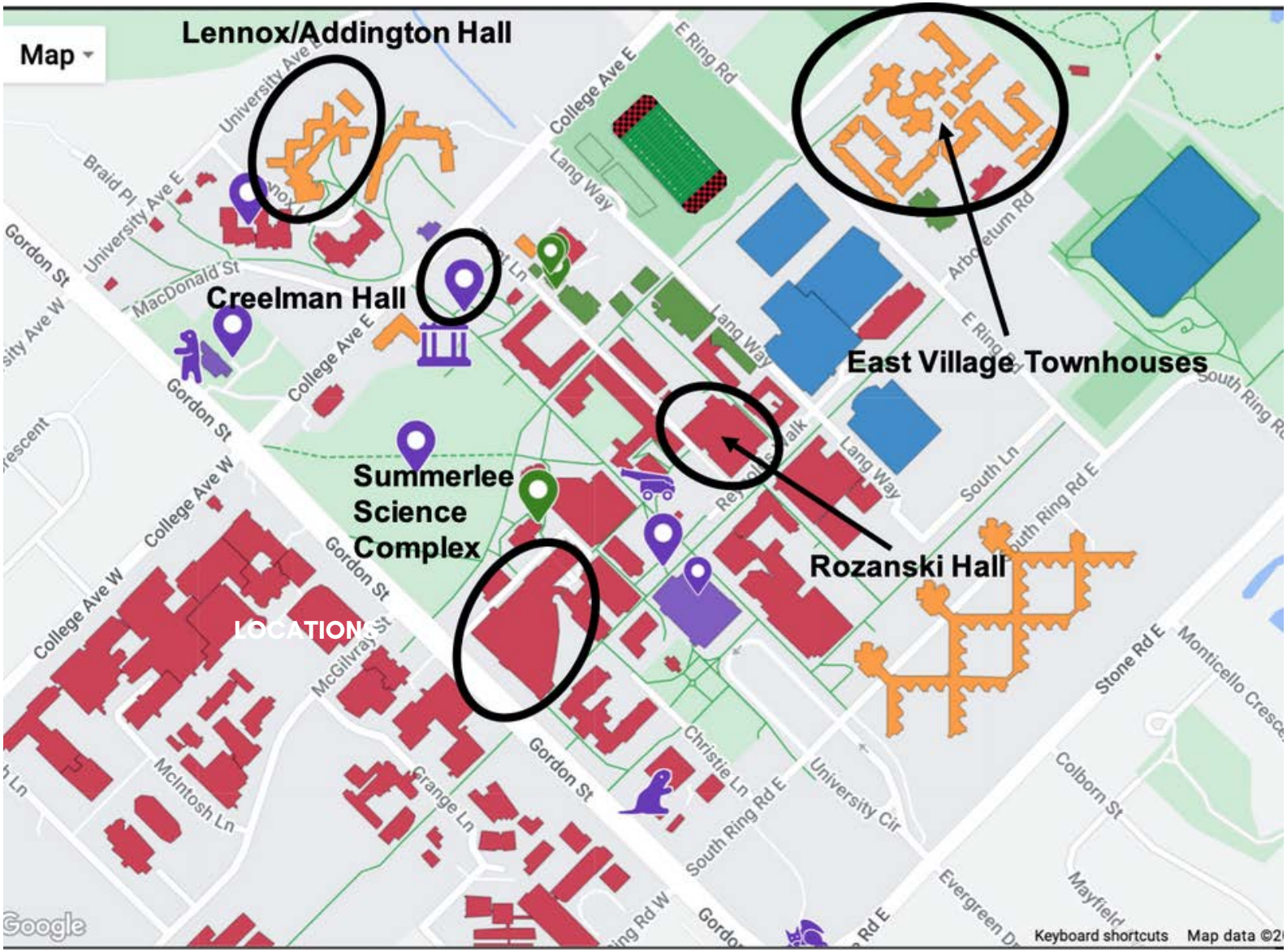
Located directly on the University of Guelph campus, conference attendees can choose between a traditional style dorm room ($49.69 CAD/night) or a townhouse-style suite (between $91.03 -$109.23 CAD/night).

Traditional-style dorm rooms will be located in Lennox/Addington Hall on the north side of campus (across College Ave). Townhouse-style suites are located in the East Village Townhouses on the east side of campus. See map on next page for more detailed location information.

LENNOX/ADDINGTON HALL

EAST VILLAGE TOWNHOUSES

RESIDENCE/CAMPUS MAP

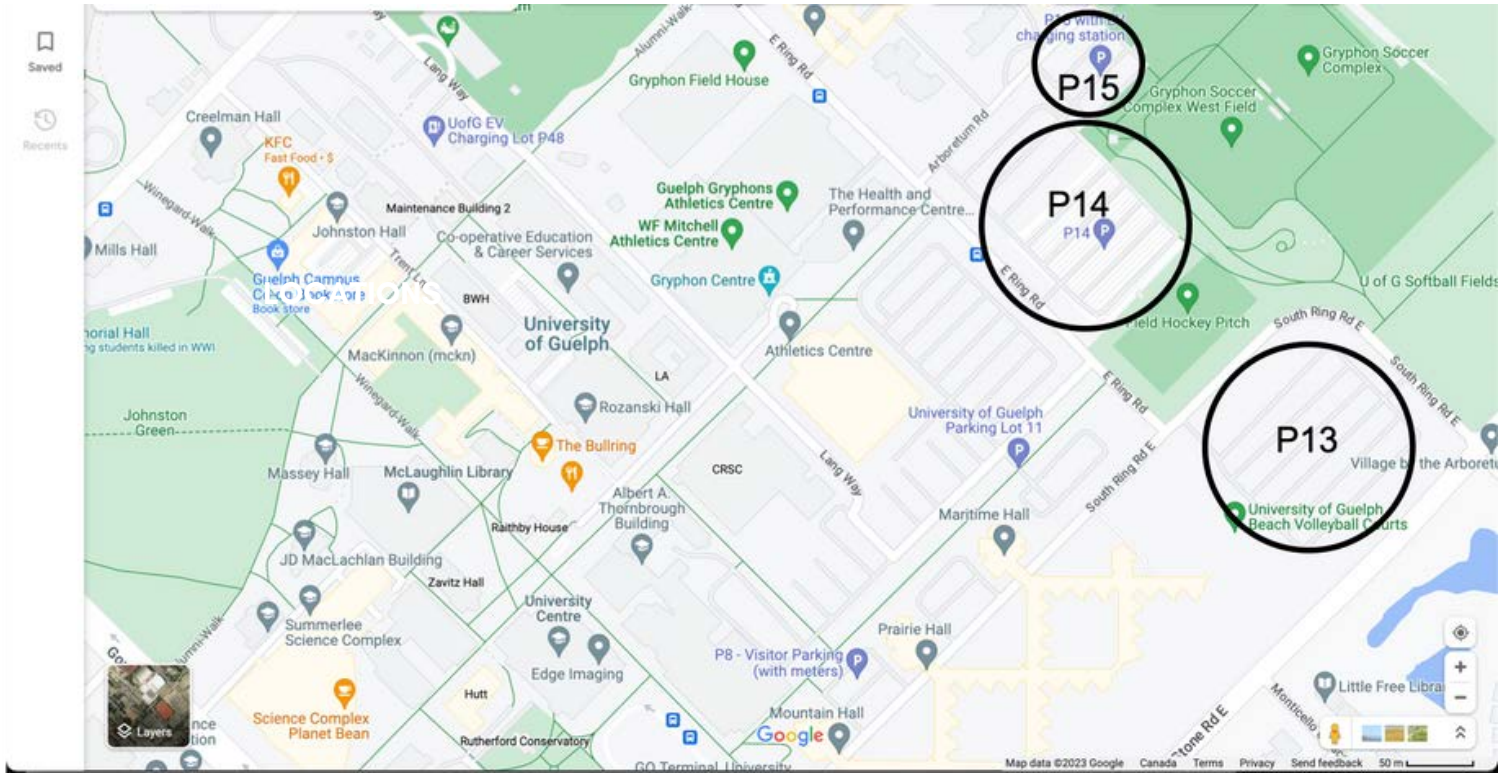


ON-CAMPUS PARKING

Discounted Day passes can be obtained at the following link:
https://confreg.uoguelph.ca/registration/Register/default.aspx?code=C000190

These passes are valid in lots P13/14/15 (P13 near the beach volleyball courts, P14/15 near alumni house/soccer complex)
More info for each lot can be found below:
P13 - https://www.parking.uoguelph.ca/find-parking/parking-map/overview-parking-zones/parking-lots-11-20/p13
P14 - https://www.parking.uoguelph.ca/find-parking/parking-map/overview-parking-zones/parking-lots-11-20/p14
P15 - https://www.parking.uoguelph.ca/find-parking/parking-map/overview-parking-zones/parking-lots-11-20/p15

Guests staying in residence get a complimentary parking pass (received at check-in)



REGISTRATION

On-Site:
The Registration Desk is located within Rozanski Hall. Attendees can pick up their Conference Kit between 8:30 am to 3:00 pm each day of the conference.

Online:
To register, please use the following link: https://www.csbbcs.org/2023-meeting
Scroll to the "Register HERE" link. To register you'll first need to login to your CSBBCS account.

A current, dues-paid membership in CSBBCS is required to be able to Register for the conference. Please use this link (https://www.csbbcs.org/membership-1) to purchase/renew your membership.

Registration fees:
Student: $180 CAD
Faculty: $220 CAD

Registration includes: Conference Kit, one drink ticket for the opening night reception and poster session on Monday, light breakfast on Tuesday and Wednesday, coffee breaks, & lunch each day.

SESSION INFORMATION

SPEAKER SESSIONS
Talks will be 15 minutes (12 minutes + 3 minutes for questions per speaker).

Please bring your presentation to your assigned room and session on a USB. A PC computer is available in each room.

Presentations for each session should be loaded onto this computer, in your assigned room, prior to the start of your session. If you are a MAC user, please bring your own connection cable and dongle for your laptop.

POSTER SESSIONS
Your poster can be affixed to the corresponding board listing your assigned number. Maximum poster size is 5' X 4'.

Poster Session #1: Please have your poster mounted anytime after 2:00 pm, and remove your poster by 7:15pm

Poster Session #2: Please have your poster mounted anytime after 9:00 am, and remove your poster by 5:00 pm.

Poster Session #3: Please have your poster mounted anytime after 9:00 am, and remove your poster by 12:30pm.

INTERNET ACCESS

Wireless Internet access will be available via the **eduroam** network. Login with the credentials from your home university.

Example:

Username: johnsmith@uoguelph.ca
Password: XXXXXXX

FOOD/BEVERAGE RECOMMENDATIONS

ON-CAMPUS:

THE UNIVERSITY CENTRE (UC) CAFETERIA
The UC cafeteria (first floor) is open Monday to Friday from 8:00 am - 5:00 pm.

BRASS TAPS CAMPUS PUB
Open Monday to Friday from 10am - 11:30pm; Located on 2nd floor of the UC.

OFF-CAMPUS:

SHAKESPEARE ARMS (NEAR CAMPUS)
English-style pub located within Harvard Plaza - 10 min walk south (35 Harvard Rd.)

BEERTOWN (NEAR CAMPUS)
Located near Stone Road Mall - 20 min walk west (433 Stone Rd. W)

MANHATTANS (NEAR CAMPUS)
Located on Gordon St. just south of campus - 20 min walk (951 Gordon St.)

EARTH TO TABLE: BREAD BAR (DOWNTOWN)
Located on Gordon St. near downtown - 15 min walk north (105 Gordon St.)

MIIDJIDAA CAFE & BISTRO (DOWNTOWN)
Hip local spot for locally-sourced food and drink - 25 min walk north (37 Quebec St.)

BUON GUSTO (DOWNTOWN)
Upscale Italian restaurant - 25 min walk north (69 Wyndham St. N)

ROYAL ELECTRIC (DOWNTOWN)
Vibrant nightclub - 25 min walk north (52 Macdonell St.)

BROTHERS BREWING COMPANY (DOWNTOWN)
Popular local brewery - 25 min walk north (15 Wyndham St. N)

CONFERENCE OVERVIEW

July 17	ROZH Atrium	ROZH 104	Science Complex
10:30-noon		Past-President's Symposium	
noon-1:00	Lunch		
1:00-2:00		Early-career Award talk	
2:00-3:00		Mid-career Award talk	
3:00-3:15	Coffee		
3:15-5:00		WiCSC Session	
5:00-7:00			Welcome & Poster Session #1
9:00-midnight	Student (19+) event		

July 18	ROZH Atrium	ROZH 101	ROZH 102	ROZH 103	ROZH 104	ROZH 105	Science Complex
8:00-8:30	Pastries						
8:30-9:30		Parallel Talks #1	Parallel Talks #1	Parallel Talks #1	Symposium 1	Parallel Talks #1	
9:30-10:30		Parallel Talks #2	Parallel Talks #2	Parallel Talks #2	Symposium 2	Parallel Talks #2	
10:30-10:45	Coffee						
10:45-noon		Parallel Talks #3	Parallel Talks #3	Parallel Talks #3	Symposium 3	Parallel Talks #3	
noon-1:00	Lunch	Lunch (RZOH)					
1:00-2:00		Parallel Talks #4	Parallel Talks #4	Parallel Talks #4	Symposium 4	Parallel Talks #4	
2:00-3:00		Parallel Talks #5	Parallel Talks #5	Parallel Talks #5	Symposium 5	Parallel Talks #5	
3:00-3:15							Coffee/Refreshments
3:00-4:45							Poster Session #2
4:45-6:00				Hebb-award Talk			
6:30-9:00	CSBBCS Banquet (Creelman Hall)						

July 19	ROZH Atrium	ROZH 101	ROZH 102	ROZH 103	ROZH 104	Science Complex
9:00-9:30	Pastries					
9:30-10:30		Parallel Talks #6	Parallel Talks #6	Parallel Talks #6	Symposium 6	
10:30-10:45						Coffee
10:30-12:15						Poster Session #3
12:15-1:15	Lunch					
1:15-2:15		Parallel Talks #7	Parallel Talks #7	Parallel Talks #7	Parallel Talks #7	
2:15-3:15		Parallel Talks #8	Parallel Talks #8	Parallel Talks #8	Parallel Talks #8	
3:15-3:30	Coffee					
3:15-4:15				CSBBCS General Meeting		
4:15-5:30					NSERC Session	

WOMEN IN COGNITIVE SCIENCE - CANADA (WICSC)

SCHEDULE OF TALK SESSIONS AND SYMPOSIA

Monday, July 17th, 2023

10:30am – noon	***Past-President's Symposium:*** ***A new look at Autobiographical and Narrative Memories*** **(ROZH 104)**
	Buddhika Bellana (York University) Stories as a window into human memory and spontaneous thought **Signy Sheldon (McGill University)** Beyond the detail: Assessing autobiographical memory content to understand differences in remembering **Donna Rose Addis (University of Toronto & Rotman Research Inst. at Baycrest)** A lifetime of autobiographical memory
1:00 – 2:00 pm	***CSBBCS Vincent Di Lollo Early Career Award Talk:*** **Daniela Palombo (University of British Columbia)** Bringing to mind the best and worst: The role of emotion in memory (and imagination) **(ROZH 104)**
2:00 – 3:00 pm	***CSBBCS Mid-career Award Talk:*** **Jelena Ristic (McGill University)** Glimpses into the social mind: Decoding messages from faces and eyes **(ROZH 104)**
3:15 – 5:00 pm	***WiCS-Canada Session*** **(ROZH 104)**

SCHEDULE OF TALK SESSIONS AND SYMPOSIA

Tuesday, July 18th, 2023

	Attention Control & Capture (ROZH 101)	*Music Cognition I (ROZH 102)*	*Perception & Social Cognition (ROZH 103)*	*Symposium I: Emotional Context & Communication (ROZH 104)*	*Memory I (ROZH 105)*
8:30-9:30 am	**Galan et al.** Restricted attention creates a necessity for conscious perception in the attentional blink paradigm	**Cooke et al.** The neurophysiology of metre perception in music across the lifespan	**Xiao et al.** Emotional vocal sounds reinstated infants' recognition of other-race faces	**Penny Pexman** The role of emotion in acquisition of abstract verb meaning	**Tanberg et al.** Forgotten No More: To-Be-Forgotten Information as Retrieval Cues Improve Memory
	Feltmate et al. Mini-Countryman's "Union Jack" taillights: patriotic or chaotic?	**Simal et al.** Electrophysiological index of tone informativeness for sequence temporal pattern	**Pereira et al.** Using machine learning to categorize facial emotions during online video communications	**Veena Dwivedi** ERPs, affective context and sentence processing	**Gionet et al.** Disentangling the Role of Social Factors and Cognitive Processes in the Production Effect.
	Landry et al. Differential and overlapping effects between exogenous and endogenous attention shape perceptual facilitation during visual processing	**Satkunarajah et al.** Decoding Timbre Perception from EEG Data	**Shoura et al.** The other-race effect: a multivariate EEG investigation	**Marc Pell** How does the voice guide interpersonal communication?	**Ensor et al.** Testing the generality of the distinctiveness account of picture superiority
	Joubran et al. Attentional control settings determine not only what captures attention, but where attention goes once captured.	**Owusu et al.** Priming with musical rhythm enhances verbal working memory	**Kavanagh et al.** How Extraneous Facial Markings Affect Face Recognition	**Roxanne Itier** Semantic emotional context impacts face emotion and gaze processing differently.	**Dauphinee et al.** A Critical Test of the Role of Rehearsal in the Production Effect in Immediate Serial Recall

SCHEDULE OF TALK SESSIONS AND SYMPOSIA

	Real World Decision-Making (RZOH 101)	*Methods & Models (RZOH 102)*	*False Memory (RZOH 103)*	*Symposium II: Numerical Cognition: Remembrance of Dr. Jamie I.D. Campbell (RZOH 104)*	*Autism, Language & Audition (RZOH 105)*
9:30-10:30 am	**Budge, J.** Who's more biased? Motivated cognition and COVID-19 research.	**Hovhannisyan et al.** An Embodied Cognition Framework of Trait Function	**Mak et al.** Sleep (versus wake) increases both veridical and false memory in the DRM paradigm: A registered report	**Jo-Anne LeFevre** Numerical Cognition: Symposium Overview	**Manning, S.** Characteristics of Decreased Sound Tolerance in Autistic and Non-Autistic People
	Schoenherr, J.R. Ours or Theirs? Perceived Responsibility and Trust and the Country-of-Origin of Explainable AI	**Park et al.** Comparing Measures of Cognitive Performance: A Factor Analysis Approach	**Chang et al.** Integrating Distributed Semantic Models with an Instance Memory Model to Explain False Recognition	**Liyoumei Zhang** Math Anxiety and Predictors that Influence Arithmetic Fact Storage	**Hannah et al.** Autistic women have similar, but subtly different, pragmatic language error profiles compared to non-autistic women
	Johnson, S. The role of narratives in decision-making under uncertainty	**Ganesh et al.** An Autocatalytic Network Model of Cognitive Change in Psychotherapy	**Wang et al.** False memory in the DRM effect: Cognitive failure or effective language-based inferencing?	**Shuyuan Yu** Operand-order Specificity in Single-digit Multiplication and Addition: An Eye Movement Study of Chinese-educated Adults	**Hamilton et al.** Examining differences in native (L1) vs. non-native (l2) processing in neurodivergent populations: Are language impairments more pronounced in L1 than L2?
	Halilova et al. Delay discounting predicts COVID-19 vaccine booster hesitancy	**Barnett-Cowan, M.** Questioning our own work: A Case Study in Fall Perception Research Through Falsification and Methodological Improvement	**Bulatova et al.** The Robustness and Malleability of Prediction-Based False Memory	**Aryn Pyke** Operation Sense for Fractions: When Multiplication Makes Things Larger	**Sasal et al.** Prosody Perception in Autistic Persons Under Conditions with Auditory Background Noise

SCHEDULE OF TALK SESSIONS AND SYMPOSIA

	Training/Learning (RZOH 101)	*Perception: Basic & Applied (RZOH 102)*	*Attention, Mind wandering & Affect (RZOH 103)*	*Symposium III: Embodiment in Higher-Order Cognition (RZOH 104)*	*Episodic & Autobiographical Memory (RZOH 105)*
10:45-noon	**Xie et al.** Manipulating category-relevant visual information to alter learning and memory	**Ristic et al.** Social perception beyond dyads	**Pardy et al.** Mind-wandering while driving: The impact of individual differences in boredom and visual working memory	**Penny Pexman** Bodily Grounding and Abstract Meaning	**Mak et al.** Episodic memory and sleep are involved in the maintenance of context-specific lexical information
	Heffernan et al. Attentional flexibility in the face of new information improves learning	**Schneeberger et al.** Age-related differences in multisensory gain may be a by-product of inverse effectiveness	**Kruger et al.** Examining caffeine consumption and attention during an auditory attention task	**Udichi Das** Neuroplasticity in Eye Dance Learning	**Fisher et al.** Quantifying memory transformation with scrambled narratives
	Johnson et al. Transferable Skills from Eccentric-Viewing Training in Low Vision: The Effect on Reading, Balance and Posture	**He et al.** Neural substrates for fast numerical and non-numerical magnitude averaging	**Ayers-Glassey et al.** On the association between flow and performance in a sustained-attention task	**Liane Gabora** Are Ideas Invented or Discovered?	**Trikha et al.** Agency of Choice and Its Effect on Memory Throughout The Lifespan
	Golshan et al. Attention as a Component of Affliction and a Key to Rehabilitation in Migraines: Introducing Neurofeedback Mindfulness Meditation as a Treatment for Migraines	**Tharmaratnam et al.** Average Temperature can be Extracted from Visual Scene Ensembles without Reliance on Colour	**Crawford et al.** The relation between boredom and mind-wandering remains constant across adulthood, despite both occurring much more frequently in younger than older adults.	**Frank Russo** The case for embodiment in the perception of vocal communication	**Bain et al.** Take a flight or be at the airport? The influence of event versus location cues on chained-event sequences when spontaneously thinking about your future and past.
			Yeo et al. Exploring the influence of incentives and situational factors on age-related differences in mind wandering	**Steven Brown** Why “innovation” is a better way to think about “creativity”	**Yeung et al.** The curse of imagery: Trait object and spatial imagery relate to trauma and stress outcomes

SCHEDULE OF TALK SESSIONS AND SYMPOSIA

	Social Cognition I (RZOH 101))	*Music Cognition II (RZOH 102)*	*Interactions with Technology (RZOH 103)*	*Symposium IV: Memory, Attention, and Cognition: In honour and recognition of Dr. John R. Vokey (RZOH 104)*	*Neurodiversity in Language and Attention (RZOH 105)*
1:00-2:00 pm	**Ostrega et al.** Topic Analysis Reveals First Impressions of Voices	**Robichaud et al.** The relationship between brain responses to musical scale degree and goodness-of-fit ratings	**Makani et al.** How the feeling of presence affects motion sickness in virtual environments	**William Hockley** About Face: Unconfounding a Mirror Effect	**Byers et al.** Schizotypal Traits and Reading-Related Skills in Adult Developmental Dyslexia
	McCrackin et al. Eyes on the clock: How emotional gaze cues make time slow down	**Darakjian et al.** Exploring Cannabis, Music Absorption, and Auditory Perception	**Austin et al.** The influence of Sensory Sensitivities on Motor Control across different Sensory Environments	**Bruce Milliken** Recognition memory and immediate stimulus repetition: A mirror effect?	**Matthews et al.** Oculomotor Markers of Text Reading Difficulty in Schizophrenia and Dyslexia: A Comparison
	Sheen et al. Cybersecurity as a Social Dilemma	**Zendel et al.** Can musical cues aid in understanding speech-in-noise?	**Kress et al.** Effects of Central vs Peripheral Attentional 'Exercise' on Reading and Graphical Tasks	**Randall Jamieson** A Computational Model of Serial Recall	**Murray, N.** Schizophrenia and the Attention Network Test: A Meta-Analysis
	Mayrand et al. Social communication in dyadic interactions: Familiarity increases the prevalence of eye-to-eye mutual gaze	**Gabora et al.** Modeling Discontinuous Cultural Evolution: The Impact of Cross-Domain Transfer	**Tsang, M.** Psycho-physical and Subjective Predictors of Positive Affect in Videogaming	**Matthew Crump** Extending global-matching models to pictures and the Vokey effect.	**Cheema et al.** Positive impact of Skill and Goal-based Training in Adults with Dyslexia: A Randomized Intervention Trial

SCHEDULE OF TALK SESSIONS AND SYMPOSIA

	Metacognition in Memory (ROZH 101)	***Action & Attention (ROZH 102)***	***Language and Multilingualism I (ROZH 103)***	***Symposium V: Reasoning & Decision Making (ROZH 104)***	***Visual Search and Decision Making (ROZH 105)***
2:00–3:00 pm	**Laursen et al.** Metacognitive reactivity following restudy decisions: Does what you decide impact future memory?	**Bolzon et al.** Standing at Attention: Postural Effects on Attention	**Call et al.** Language Background and Interpretation of Noisy Speech Input	**Valerie Thompson** Feelings of Rightness and Feelings of Error in Two Reasoning Task	**Fallah et al.** Target-distractor competition effects on saccade trajectories reflect decision-making processes
	Lalla et al. Remembering what was not chosen: The influence of option similarity and strategy	**Terry et al.** Does touching items in multiple-object tracking (MOT) increase their likelihood of later being reported as targets?	**Charanek et al.** Visuospatial serial order recall in bilinguals vs. monolinguals vs. chimpanzees	**Maggie Toplak** Measuring Rational Thinking in Adolescents	**Laderoute et al.** An Exploration of Conceptual Similarity in Multiple Target Visual Search
	Kelly et al. Can a "bit" of help go a long way? Examining how individuals benefit from the metacognitive information of nonhuman agents using recognition memory	**Olenick et al.** Reference Frames Underlying Target-Distractor Competition in Oculomotor Processing	**Hendal et al.** The role of eye movements and attention on language intrusions during bilingual reading	**Alexander Walker** Partisan Language Provides Reputational Benefits to Individuals while Intensifying Partisan Divides	**Ritz et al.** Neural and computational evidence for independent cognitive control over target enhancement and distractor suppression
	Churey et al. Judgment of learning (JOL) reactivity in order memory performance: A temporal bias analysis	**Ivanoff et al.** How does exogenous attention impact actions and their perceived effects?	**Hachez et al.** Affective processing in non-native speech: Examining the effect of specific emotional states	**Kaiden Stewart** On Trudging: A Framework for Leveraging Metacognition to Improve Decisions	**Narkar et al.** The face behind the task: Using affective ratings of emotionally expressive distractors to test competing accounts of attention under perceptual load.
4:45 – 6:00 pm	***Donald O. Hebb Distinguished Contribution Address:*** **Jo-Anne LeFevre (Carleton University)** Forty years of research on mathematical cognition: Summing it up **(ROZH 104)**				

SCHEDULE OF TALK SESSIONS AND SYMPOSIA

Wednesday, July 19th, 2023

	Memory II (RZOH 101)	*Language & Multilingualism II (RZOH 102)*	*Cognition & Education (RZOH 103)*	*Symposium VI: Attention & Perception in 3D Space (RZOH 104)*
9:30-10:30 am	**Denga et al.** Dual Processes in Recognition Memory: Opposing Influences of Perceptual (Dis)fluency on Recognition Memory Decisions.	**Lametti et al.** Sensorimotor Planning and Linguistic Context in Bilingual Speech Production	**Tharumalingam et al.** The Effects of Playback Speed Alteration	**Laurence Harris** Updating During Lateral Self-Motion is Dependent on Object Eccentricity and Range of Movement
	DiMarco et al. Source misattribution: Does repeated retrieval practice mitigate conjunction errors?	**Smirnova-Godoy et al.** Bilingualism and Non-native Language Learning: Is Language Aptitude a Stable Construct?	**Marty-Dugas et al.** Does lecturer enthusiasm influence attentional engagement and learning during online lectures?	**Karolina Krzys** Scene Processing and Attention Across Depth
	Ferguson et al. People flexibly use different exploration strategies across learning environments	**Morales et al.** Word Age of Acquisition Effects on Eye Movement Reading Behaviour in Linguistically Diverse Children and Adults	**Richardson et al.** Some students should take class notes with a computer: evidence for the external storage benefit to academic notetaking	**Tasfia Ahsan** Perceived depth modulates attention allocation
	Steeves et al. Preliminary study on the impact of cognitive styles on visuo-haptic object identification	**Rivard et al.** The Multilingual Advantage in Language Learning: Contributions of Multilingualism and Programming Knowledge on Artificial Grammar Learning	**Simionescu et al.** Toward Resilient Design: Examining how Video Quality Impacts Learning from Video Lectures	**Noah Britt** Modulation of spatial attention across depth: Near-advantage for localization and far-advantage for discrimination

SCHEDULE OF TALK SESSIONS AND SYMPOSIA

	Cognitive Modelling (RZOH 101)	*Neuroscience of Memory (RZOH 102)*	*Social Cognition II (RZOH 103)*	*Cognition, Emotion, & Motivation (RZOH 104)*
1:15-2:15 pm	**McRae et al.** Network science measures predict human rankings and ratings of centrality and standardness of activities within events	**Marlatte et al.** The effect of hippocampal damage on integrating information across time	**Latif et al.** Naturalistic media exposure: How faces become familiar	**Storozuk et al.** What's math got to do with it?: Establishing nuanced relations between math anxiety, financial anxiety, and financial literacy
	Dollois et al. Modelling recognition memory decisions: Investigating sequential dependencies using MINERVA 2	**Collett et al.** GABAergic inhibition may contribute to object category representation refinement in the mouse perirhinal cortex	**Koca et al.** Are expectations of obstructed facial features accurate?	**Souliere et al.** Using a novel Stroop paradigm to measure emotional interference
	Reid et al. A Computational Framework of Orthographic, Phonological, and Semantic False Recognition	**Abouelnaga et al.,** From Fear to Fearless: Activating M1 muscarinic receptors promotes destabilization of strongly-encoded fear memories	**Mendoza et al.** Face Mask Wearing Might Elicit a Gender-driven Negativity Bias in Theory of Mind	**Vogel et al.** Tendencies to experience boredom are linked to aspects of emotion regulation that are mediated by attentional difficulties and memory failures
	Aujla, H. Signal detection in the ideal observer: The case for d_o	**Ozubko et al.** Stereotypical hippocampal clustering predicts navigational success in virtualized real-world environments	**Yan et al.** Search advantage for facing social groups is sensitive to group size	**Pardy et al.** Manipulating load and assessing individual-differences in capacity to examine the role of visual working memory in distractor devaluation.

SCHEDULE OF TALK SESSIONS AND SYMPOSIA

	Self-Control & Effort (RZOH 101)	*Language Comprehension (RZOH 102)*	*Memory & Working Memory (RZOH 103)*	*Semantic Memory (RZOH 104)*
2:15–3:15 pm	**Smith et al.** Investigating how using 'the pill' relates to self-control	**Simovic et al.** Evaluating the strength of perspective information in pronominal reference resolution	**Whitridge et al.** Is it the same old song? Further investigations of the "singing superiority effect"	**Sidhu et al.** Is Molly more hireable than Katie? Effects of name sound symbolism on mock hiring tasks.
	Safati et al. Mind wandering on command: Can people adjust their mind wandering to match a required amount?	**Matheson et al.** Does sensorimotor expertise shape language comprehension? A replication attempt	**Printzlau et al.** Learning-dependent modulation of representations in working memory	**Antal et al.** The effect of contextual and semantic diversity in word recognition: Evidence from a dichoptic lexical decision task with anaglyphs
	Rumble-Tricker et al. Hard work for easy listening: Using physical exertion as an objective index of listening effort.	**Vongpaisal et al.** Fictional and autobiographical storytelling in children with cochlear implants	**Retanal et al.** Exploring the impact of verbal and visuospatial WM load on numerical comparison tasks: Simultaneous Comparison vs Comparison to a Standard	**Boland et al.** The Quebec Semantic Battery (Batterie Sémantique du Québec): Development, validation, and standardization of a semantic battery in French
	Klein et al. Mental effort, pupil size, task difficulty and endogenous spatial attention	**Robinson et al.** Objective & Subjective Measures of Narrative Engagement in Children		**Johns et al.** Computing word meanings by aggregating individualized distributional models: Wisdom of the crowds in lexical semantic memory

POSTER SESSIONS

SUMMERLEE SCIENCE COMPLEX (SSC)

Poster sessions will be held in the Summerlee Science Complex

POSTER SESSION I: MON., JULY 17 (5:00 - 7:00 PM)

PRESENTING AUTHOR

1. Kale Scatterty
2. Andrew Ethan Huff
3. Ethan Hagen
4. Miranda Chan
5. Martin Geraets-Rose
6. Noah Britt
7. Erisa Davoudi
8. Mae Pacificar
9. Alain Carlson
10. Samantha Barbosa
11. Jason Ivanoff
12. Allison C. Drody
13. Andrew King
14. Angeline Redford
15. Anvita Gopal
16. Austin Hurst
17. Claudia Morales Valiente
18. Fariya Zaheer
19. Hannah Makar
20. James Siklos-Whillans
21. Jamie Nettinga
22. Jessica Kespe
23. Justine Yick
24. Katherine Bak
25. Alexandra van der Valk
26. Bradley Harding
27. Fraulein Retanal
28. Hanbin Go
29. Johnny Dubois
30. Mallory Earnshaw
31. Amelia Luzy-Kocher
32. Joline Guitard
33. Alex Snow
34. Katherine Estabrooks
35. Lauren McBay
36. Amanda Carvalho
37. Brian Kim
38. Derrick Bourassa
39. Élias Daigle
40. Emily Shiu
41. Irys-Amelie Champagne
42. Katherine White
43. Kirkland Johnston
44. Ana Miranda Guimaraes
45. Sebastian D'Amario
46. Sevda Montakhaby
47. Emily Minard
48. Jackie Spear
49. Léonie Girard
50. Logan Goldring
51. Lydia Hanna

POSTER SESSION II: TUE., JULY 18 (3:00 - 4:45 PM)

PRESENTING AUTHOR

1. Kristen Jardine
2. Matthew M. M. Harper
3. Olivia O'Neill
4. Noah Britt
5. Rachel Eng
6. Jackie Heitzner
7. Dana R. Murphy
8. Marco A. Sama
9. Kiera Leon
10. Michelle Wong
11. Natalia Van Esch
12. Polina Andrievskaia
13. Remy Cohan
14. Rita Bishai
15. Ryan Verbitsky
16. Sagana Vijayarajah
17. Severina Ferreira-Lopes
18. Suesan MacRae
19. Tegan Hargreaves
20. Yadurshana Sivashankar
21. Jasmine Lee
22. Kamila Kolpashnikova
23. Kristina Wu
24. Alex McArthur
25. Jenna Rice
26. Liza Kahwaji
27. Seyed Mohammad Mahdi
28. Wei Fang
29. Adelaide Jensen
30. M. Maziyah Mohamed
31. Naima Mansuri
32. Nicolas Laham
33. Olessia Jouravlev
34. Paul Stan
35. Ashley Avarino
36. Yasushi Hino
37. Skylar Laursen
38. Shadini Dematagoda
39. Julianna Salvatierra
40. Khushi Patel
41. Mohammed Aswad
42. Molly MacMillan
43. Pelin Tanberg
44. René-Pierre Sonier
45. Sophie Kudryk
46. Anthony Cruz
47. Sean A. Gilmore
48. Alessandro La Serra
49. Amy Flannery
50. Arijit De
51. Benjamin Zendel
52. Adèle Gallant
53. Alexandra Deck
54. Carolyn Stone
55. Florence Mayrand
56. Mane Kara-Yakoubian

POSTER SESSION III: WED., JULY 19 (10:30 - 12:15 PM)

PRESENTING AUTHOR

1. Hamidreza Ramezanpour
2. Siobhon-Elora Weber
3. Ana Leticia Simal
4. Dana R. Murphy
5. Vanessa Dadzie
6. Jackie Chau
7. Hala Rahman
8. Patricia V. Aguiar
9. Rafael Almeida
10. Adelaide Jensen
11. Evi Myftaraj
12. Ze Lin Chen
13. Imola MacPhee
14. Kate MacGregor
15. *poster withdrawn*
16. Matthew J. Sargent
17. Keanna Rowchan
18. Maryum Khan
19. Silvia Shiwei Zhou
20. Seth Winward
21. Carmen Dang
22. Chelsea McKenzie
23. Kate Van Kessel
24. Dogukan Demircioglu
25. Merron Woodbury
26. Swiya Murti
27. Andie Storozuk
28. Elora Wales
29. Delica Leboe-McGowan
30. Niki Sinha
31. Yiannie Lin
32. Katherine White
33. Sébastien Gionet
34. Khushi Patel
35. Jeremy Marty-Dugas
36. Ashley Avarino
37. Meyha Chhatwal
38. Vanessa Cunha
39. Victoria A. Bernardo
40. Astrid Coleman
41. Michelle A. Dollois
42. Maria Orlando
43. Amie Durston
44. Danial Gonsalves
45. Claire Kryska
46. Keira Dyck
47. Nora Pourhashemi
48. Siyavash Sokhtabandani
49. Michelle Jarick
50. Michelle Yang
51. Sarah McCrackin
52. Zehra Sasal

2023 CSBBCS AWARD WINNERS

CSBBCS VINCENT DI LOLLO EARLY CAREER AWARD

Daniela Palombo, University of British Columbia

The following is excerpted from the letter Dr. Rebecca Todd wrote in support of Dr. Palombo's nomination for the Vincent Di Lollo Early Career Award.

Dr. Palombo received her PhD from University of Toronto in 2013, where she worked with Brian Levine at the Rotman Research Institute. After completing postdoctoral research with Dr. Mieke Verfaellie at the Boston University Memory Disorders Centre, she took up a position as a tenure-stream Assistant Professor at University of British Columbia in 2018. Dr. Palombo is an exceptional researcher whose contributions have made an enormous contribution to her field of memory research.

Dr. Palombo has consistently demonstrated a strong commitment to research excellence throughout her career, which has resulted an exceptional number of well-cited papers published in top-tier journals, yielding an impressive H-index of 27. She published 12 peer reviewed papers in 2022 alone, and has now published a total of over 57 peer reviewed papers, 24 as first author, and 11 as senior author with trainees as lead authors. These have appeared in an array of journals that includes Psychological Science, Trends in Cognitive Sciences, Alzheimer's and Dementia, Cognition, Journal of Cognitive Neuroscience, Neuropsychologia, Hippocampus, Cognitive, Affective and Behavioral Neuroscience, Clinical Psych Science and many more. Since starting her own lab she has been the recipient of seven major grants as principal investigator, and five more as coinvestigator. As a result of her exceptional contributions she was named an APA rising star in 2018.

Dr. Palombo is internationally respected for her pioneering research program that spans autobiographical memory, imagination, and decision-making, using a variety of sophisticated research methodologies. She is an expert on memory in general but her research focuses on autobiographical memory – the form of memory that constitutes our sense of who we are. Her empirical and theoretical work has contributed hugely to our understanding of emotion in autobiographical memory, both in healthy adults as well as in various clinical and neurodiverse populations. Spurred by the challenges posed by her subject matter, Dr. Palombo has developed novel approaches using an impressive combination of cognitive, neuropsychological, and neuroimaging methods. She has developed paradigms using virtual reality and other naturalistic stimuli to optimize ecological validity. She has evolved rigorous, state-of-the-field brain imaging approaches in a rapidly evolving field. She also maintains the highest standards of open, replicable science, using preregistration, data transparency, large samples, and in-house replications. Beyond her impressive empirical contributions, Dr. Palombo has also made substantial theoretical contributions to the field. One of these has focused on role of the hippocampus-centred episodic memory system in decision-making. She has proposed that this system is especially critical whenever choices involve novel experiences for which there is no direct prior experience in memory to lean on.

In addition to her scholarly achievements, Dr. Palombo has shown a superlative commitment to mentoring and teaching the next generation of researchers. She has supervised several graduate students and numerous undergraduates, providing them with invaluable guidance and support as they pursue their own research projects. Her leadership activities are numerous, but notably she has created, organized, and helped teach a week-long fMRI boot camp at UBC, which is now going into its second year. This boot camp has served to bring together a dispersed neuroimaging community and provide strong methodological grounding for graduate students across departments and faculties at UBC.

Dr. Palombo's outstanding contributions to research, her generosity and dedication to excellence, and her commitment to mentoring make her an outstanding recipient of the Vincent Di Lollo Early Career Award.

2023 CSBBCS AWARD WINNERS

CSBBCS MID-CAREER AWARD
Jelena Ristic, McGill University

The following is excerpted from the letter Dr. Debra Titone wrote in support of Dr. Ristic's nomination for the CSBBCS Mid-career Award

Although Professor Ristic earned her PhD just sixteen years ago, she has already distinguished herself internationally as an expert in human attention and social cognition and is widely recognized as a pioneer of the social attention field. Her scholarly contributions have transformed how researchers think about human cognition. Her educational approach has yielded an extraordinary number of highly qualified trainees who transitioned to advanced positions in academia, industry, and the government. Her leadership is influential in shaping the future of Canadian education, University governance, and the field of cognitive neuroscience more broadly.

Professor Ristic's contribution to the advancement of scientific knowledge is outstanding. She has published over 100 journal and conference articles in invited, senior, and first author roles. These contributions appear in eminent outlets such as Nature Reviews Psychology, Annals of the New York Academy of Sciences, Journal of Experimental Psychology: Human Perception & Performance, Psychonomic Bulletin & Review, Cognition, and Current Directions in Psychological Science. The overarching vision to connect the traditionally 'cold' study of human cognition with the traditionally 'warm' study of human social behavior is evidenced in Professor Ristic's sustained and systematic pursuit of the difficult 'why' questions regarding the nature and utility of human cognition. Indeed, Professor Ristic's work is highly innovative in demonstrating that our cognitions are fundamentally shaped by our social experiences. This realization has changed the direction of the field and paved the way for new research paradigms for studying human attention.

Professor Ristic's training and mentoring record is outstanding; she has mentored over 140 trainees in her laboratory since its inception in 2009. Her students have achieved great success. Over 80% of her publications are co-authored by one or more trainees, with publications often involving multiple undergraduate, graduate, and postdoctoral trainees. Her success in student training was formally recognized by a Mentorship award from Women in Cognitive Science (WiCS). This training has been supported by over $1 million dollars Professor Ristic has won in operating and equipment funds from national (NSERC and SSHRC) and institutional sources.

Professor Ristic is also leading the field through her active role as an Associate Editor of the Journal of Experimental Psychology: Human Perception & Performance and Visual Cognition, and as an external reviewer for the major Canadian granting agencies. She has contributed to conference program and organizations leadership by co-organizing and serving as the program committee chair at the Montreal CSBBCS meeting in 2021. Professor Ristic is a Fellow of the Canadian Society for Brain, Behaviour and Cognitive Science nationally and the Psychonomic Society internationally and has been nominated for the membership in the Royal Society's College of New Artists, Scientists and Scholars.

Professor Jelena Ristic is a trailblazing woman scientist who keeps setting new norms for the field. Her research is impactful with staying power and creates stellar training opportunities for trainees of different levels. She is a leader and a role model for women scientists in Canada. In short, she is an exceptional choice for the CSBBCS Mid-Career award.

2023 CSBBCS AWARD WINNERS

DONALD O. HEBB DISTINGUISHED CONTRIBUTION AWARD

Jo-Anne LeFevre, Carleton University

The following is excerpted from the letter Dr. Erin Maloney wrote for Dr. LeFevre's nomination for the Donald O. Hebb Distinguished Contribution Award

Dr. Jo-Anne LeFevre is the Chancellor's Professor of Cognitive Science and Psychology, and the Chair of the Department of Cognitive Science at Carleton University. She is also the Director of the Centre for Applied Cognitive Research. She earned her B.Sc., M.Sc., and Ph.D. at the University of Alberta. In 1987 she accepted a position as an Assistant Professor at the University of Winnipeg. In 1988 she then moved to Carleton University which she has continued to call home ever since.

Dr. LeFevre is a world-leading expert in the field of mathematical cognition and learning, having published over 90 articles in refereed journals and an H-index of 50. Her work on numerical and mathematical cognition, which has been cited more than 16000 times, laid the groundwork for the emerging field. Dr. LeFevre has published in the top journals in our field (e.g., JEP:LMC, JEP:G, JEP:HPP, Cognition) and including grants on which she is either the PI or a Co-I, has been the recipient of a whopping $38,000,000+ in competitive research funding. These grants have come from, among other sources, NSERC, SSHRC, and CFI. In addition to being a leader in theory development, Dr. LeFevre has mobilized her many theoretical advances into deliverables with relevance to the K-12 education system within Canada. Indeed, based on her 40 years of research, Dr. LeFevre has created an early numeracy screener (the EMA@school), used in 2021 and 2022 in the province of Alberta to help screen children at risk of mathematical delays at kindergarten entry. To date, tens of thousands of Canadian children have completed, and benefited from, the screener.

In addition to her global recognition for her ground-breaking science in the field of mathematical cognition and learning, Dr. LeFevre also has an extensive track-record for training Highly Qualified Personnel, having trained 5 Post-Doctoral Fellows, 24 Ph.D., 29 Masters, and 83 Honours thesis students since 1988. Not only has Dr. LeFevre supervised a large number of HQP's, she is also recognized as an exceptionally strong mentor, having won two awards for mentorship, one from Carleton University and one from Women in Cognitive Science - Canada. It is not at all surprising that she has been the recipient of mentorship awards as a quick look at her track record indicates that her students have been successful both within and outside of academia.

Dr. LeFevre has maintained a close connection to CSBBCS throughout the entirety of her career. She has authored 6 articles in the Canadian Journal of Experimental Psychology, served as a guest Editor (with M. Sénéchal) of a special issue of the Canadian Journal of Experimental Psychology on Early Literacy and Early Numeracy, and has been invited to again serve as a guest Editor on a special issue in memory of Dr. Jamie I.D. Campbell. Dr. LeFevre has authored 66 presentations at annual meetings of the CSBBCS - often in symposia that she herself organized. Dr. LeFevre has also served as the Representative of the CSBBCS on the board of the Canadian Psychological Association (CPA) from 2012 - 2014. Thus, not only has Dr. LeFevre been a leader within the field of numerical and mathematical cognition, she has been a leader within cognitive science in Canada.

Dr. Jo-Anne LeFevre's career is one to be respected and celebrated. She is a pillar of scientific research in Canada, a lighthouse to many junior scholars, and is undoubtedly deserving of the honour of the Donald O. Hebb Distinguished Contribution award.

2023 CSBBCS AWARD WINNERS

RICHARD C. TEES DISTINGUISHED LEADERSHIP AWARD

William (Bill) Hockley, Wilfred Laurier University

The following is excerpted from the letter Pelin Tanberg and Dr. Tyler Ensor wrote in support of Dr. Hockley's nomination for the Richard C. Tees Distinguished Leadership Award

Dr. Hockley is a nationwide recognized leading researcher in the field of human cognition and memory. In a career spanning more than four decades, Dr. Hockley has made numerous important contributions to our field and supervised 5 PhD students, 10 Master's students, and 48 Honours students.

Dr. Hockley earned his Honours Bachelor of Arts degree in 1973 from Queen's University. He then moved to the University of Toronto for graduate school, where he worked with Dr. Bennett B. Murdock, Jr., on the topic of memory. Since then, his contributions to academic research include more than 70 articles in top journals, over 100 conference presentations, and nine book chapters in high-profile edited volumes. In addition to his research career, Dr. Hockley was instrumental in establishing undergraduate and graduate training in cognitive psychology at Wilfrid Laurier University, ultimately paving the way for the Laurier Centre for Cognitive Neuroscience program.

Dr. Hockley's research program focuses on human memory, associative learning, intentional forgetting, context-dependent memory, the picture superiority effect, and the mirror effect. His research program at Wilfrid Laurier University has been uninterruptedly supported by NSERC since 1990. As highlighted in the general overview, he has published several articles in different top-tier journals. Dr. Hockley has also been named a Fellow in several societies in recognition of his contributions and dedication to the discipline of human cognition.

Dr. Hockley served as the President of the CSBBCS from 2018-2020, Member-at-Large of CSBBCS from 2007-2009, and has served as editorial board member for several journals, including Canadian Journal of Experimental Psychology, Psychonomic Bulletin & Review, and Memory & Cognition. He has been honoured as a fellow of the American Psychological Association in 2006, a fellow of the Psychonomic Society in 2014, a fellow of the Association for Psychological Science in 2015, and was an inaugural fellow of the CSBBCS in 2017. He has also served on Executive committees of the American Psychological Association.

Dr. Hockley served as the Consulting Editor of Canadian Journal of Experimental Psychology from 2009-2012. In addition, Dr. Hockley frequently supported his students to submit to CJEP. One of his recent articles in CJEP was awarded the CJEP Best Article Award for 2020 (Ensor et al., 2020) and another recent article in CJEP was featured in Psynopsis: Canada's Psychology Magazine, Volume 43(2), 2021, p.30. He has been a strong contributor and supporter of Canadian journals of psychology.

In summary, Dr. Hockley is extremely deserving of this award. Dr. Hockley is an exceptionally welcoming mentor who always has his door open for colleagues, students, and researchers around the country, and worldwide. Overall, Dr. Hockley's dedication to the Society, significant contributions to the field, and wholehearted leadership and dedication to his students are very deserving of recognition by the Richard Tees Distinguished Leadership Award.

SYMPOSIA ABSTRACTS

SYMPOSIUM I - EMOTIONAL CONTEXT & HUMAN COMMUNICATION

THE ROLE OF EMOTION IN ACQUISITION OF ABSTRACT VERB MEANING

Penny Pexman, University of Calgary; Emiko Muraki, University of Calgary

There is ample evidence to suggest that children's earliest acquired words are often learned through sensorimotor experience, but it is less clear how children learn the meanings of abstract words (that is, words whose referents are less associated with sensorimotor experience). The Affective Embodiment Account postulates that children use emotional experience to learn abstract word meaning. In the present study, we tested this proposal in the context of verb acquisition, as verbs are generally considered to be both more abstract and more difficult for children to acquire relative to nouns. Our analyses showed that more positive and negative abstract verbs are acquired at an earlier age than neutral abstract verbs. However, when sensorimotor information is operationalized as how embodied a verb is (e.g., the extent to which its meaning involves the human body) rather than concreteness, we did not observe an interaction between verb embodiment and valence when predicting age of acquisition. Our findings suggest that emotional information may play a role in acquisition of abstract verb meanings, consistent with the Affective Embodiment Account, though less embodied verbs do not seem to be easier to acquire if they are more emotional, demonstrating limits to Affective Embodiment.

ERPS, AFFECTIVE CONTEXT AND SENTENCE PROCESSING

Veena D. Dwivedi, Brock University

While it is uncontroversial in neurocognitive models of sentence processing to include context as a crucial piece of the puzzle, in this talk I argue that 'context' should extend to the affective and emotional state of the individual. Work in my lab builds on recent work in psychology and neuroscience where it has been shown that affective states influence how information is processed. Previous work has shown that more positive individuals use a global processing strategy (they see the forest rather than individual trees), whereas those who are less positive tend to focus on more local information (they see individual trees rather than the forest). Applying these ideas to language, we hypothesized that more positive individuals would focus on contextual meaning, whereas those less positive focus on linguistic details, such as grammatical inflection. Our results show that Event-Related Potential (ERP) components typically associated with sentence processing of meaning and grammar are indeed modulated by dispositional affect. Our findings point to a view in which affect is tuned to different levels of sentence perception. Along with other evidence, our research suggests that to understand sentence processing mechanisms, we need to take individuals' affective states and goals into account.

HOW DOES THE VOICE GUIDE INTERPERSONAL COMMUNICATION?

Marc Pell, McGill University

Speakers provide salient vocal cues to communicate their affective disposition towards topics or other people during interpersonal communication. For example, speakers use their voice to mark their (im)polite attitude toward the listener when making a request, or to signal that a compliment is meant to be interpreted as sincere or ironic (i.e., critical or sarcastic). How and when does the neurocognitive system register affective information in the voice that refers to the speaker's stance? This talk will introduce this topic and provide neurophysiological evidence that the brain rapidly detects the speaker's vocal stance and uses this information to form a mental representation of what is actually meant by the speaker's utterance.

SEMANTIC EMOTIONAL CONTEXT IMPACTS FACE EMOTION AND GAZE PROCESSING DIFFERENTLY
Roxane Itier, University of Waterloo

Faces are unique and complex social stimuli that require accurate decoding to successfully navigate our social world. In particular, facial expressions of emotion and eye gaze direction provide nonverbal communicative cues critical for social interactions. Yet, whether their processing is impacted by semantic emotional context remains largely unclear. I will present behavioural and electrophysiological data suggesting that the valence of sentences presented visually as contextual primes interacted with the processing of eye gaze. The time course and outcome of this interaction varied with participants' task. In contrast, while both facial expressions and face-prime congruency affected neural responses, the processing of facial expressions did not interact with prime congruency nor with task at the neural level. These results suggest the processing of facial expressions might be impacted by semantic emotional contextual cues only later during the course of processing, at the behavioural outcomes. Thus, different non-verbal communicative cues seem differentially impacted by semantic emotional context and task demands. The reliability of these results will be discussed in the context of the replicability crisis in the ERP field driven by small sample sizes, low trial numbers and non-robust statistics.

SYMPOSIUM II - NUMERICAL COGNITION: REMEMBERANCE OF DR. JAMIE I.D. CAMPBELL

NUMERICAL COGNITION: SYMPOSIUM OVERVIEW
Jo-Anne LeFevre, Carleton University

The field of numerical cognition was very limited until the 1980s but since then, it has become a flourishing and productive research area in Canada and across the world (LeFevre, 2016). Dr. Jamie Campbell was a founding researcher in numerical cognition with his work on how multiplication is mentally represented (e.g., Campbell, 1987). For 30 years, his work on mental arithmetic greatly influenced theoretical and empirical advances in the field. In this symposium, three recent empirical studies that have drawn on Dr. Campbell's work will be presented. Liyoumei Zhang, Dr. Campbell's last graduate student, will discuss her work on how various factors such as math anxiety and attachment anxiety influence the storage and processing of multiplication facts. Aryn Pyke will describe how a visuospatial intervention for fraction multiplication supported adults' operations sense (i.e., the understanding that multiplication sometimes can make things smaller). Shuyuan Yu will discuss work on how the mental representation of adults' multiplication and addition continues to reflect processes and strategies used during learning. As discussant, Jo-Anne LeFevre will provide a brief overview of Dr. Campbell's legacy and its continuing influence on the field of numerical cognition.

MATH ANXIETY AND PREDICTORS THAT INFLUENCE ARITHMETIC FACT STORAGE
Liyoumei Zhang, University of Saskatchewan; Jamie Campbell, University of Saskatchewan

Previous work investigated the negative consequences of math anxiety with an in-depth focus on the cognitive aspect. The current study aimed to fill the gap from multiple perspectives (developmental, cognitive, anxiety-related) and explored predictors influencing arithmetic fact storage in long-term memory. Participants (N = 202) performed two memory interference tasks (multiplication, picture-word agreement; each contains true, related, and unrelated problems), a working memory capacity task (backward digit-span), and a questionnaire task that measured negative emotionality, math anxiety, insecure and secure attachment. As a result, working memory capacity and math anxiety predicted math performance but not picture-word performance. Working memory differences mediated the relationship between math anxiety and math performance. Participants showed considerable memory interference effects in multiplication and picture-word tasks in terms of response time and accuracy, and this effect was found to be larger for the problems involved in math than for picture-word. In contrast to absolute math performance, the multiplication interference effect did not vary with working memory or math anxiety measures, but attachment anxiety was positively related weakly to both multiplication and picture-word task interference. Overall, the results imply some degree of independence between predictors of absolute math (i.e., multiplication) and associative interference effects in multiplication retrieval.

OPERAND-ORDER SPECIFICITY IN SINGLE-DIGIT MULTIPLICATION AND ADDITION: AN EYE MOVEMENT STUDY OF CHINESE-EDUCATED ADULTS
Shuyuan Yu, Carleton University; Chaoyue Zhao, Carleton University; Jo-Anne LeFevre, Carleton University

Chinese-educated adults are faster to solve multiplication with the smaller operand on the left (e.g., 6 * 8) than those with the reversed order (e.g., 8 * 6), likely because they are taught to only memorize the preferred order. Here we compared addition and multiplication to determine whether addition also reflected learning history. Forty-three Chinese-educated participants solved single-digit multiplication and addition and were measured in response time and eye movements. We hypothesized that the preferred order for addition is large operand first because students are taught to decompose the smaller digit to make 10. As anticipated, participants responded faster when addition and multiplication were presented in the preferred order. This dissociation was also reflected in eye fixation patterns. For addition, the fixation time on the right operand was longer in the unpreferred operand order (e.g., 6 + 8) than in the preferred operand order (e.g., 8 + 6), whereas for multiplication, the fixation time at the right operand was longer in the preferred order (e.g., 6 * 8) than the opposite (e.g., 8 * 6). Results show that dissociations between operations and strategies reflect the learning experiences of these participants, providing useful constraints on mechanisms of memory encoding and retrieval.

OPERATION SENSE FOR FRACTIONS: WHEN MULTIPLICATION MAKES THINGS LARGER
Aryn Pyke, United States Military Academy, West Point; Michael Ianelli, United States Military Academy, West Point; William Frangia, United States Military Academy, West Point; Ellison Makena Ciullo, United States Military Academy, West Point; Ryan Riesing, United States Military Academy, West Point

An area of math where conceptual understanding is often poor is fractions, even among college students. We specifically targeted the operation of multiplication, and the phenomenon that the overgeneralization of whole number properties can lead to an incorrect belief that multiplication always makes things bigger. Specifically, although multiplication by 2 yields a product larger than the other operand (2*6=12, 12>6), when the first operand is a proper fraction (1/2 * 6 = 3), the product, 3, is less than the second operand 6. Understanding the impact of an operation on magnitude is part of operation sense (specifically in our example: the relations to operands principle). In our endeavor to improve operation sense, we developed and assessed an intervention which consisted of a visuospatial multiplication task. The visuospatial representation made magnitudes more salient, and could encompass both whole number and fraction operands, to better bridge understanding across different types of numbers. Relative to a control intervention involving symbolic multiplication practice, our visuospatial multiplication intervention led to higher scores on a conceptual understanding test. Our representation and results will be discussed.

SYMPOSIUM III - EMBODIMENT IN HIGHER-ORDER COGNITION

BODILY GROUNDING AND ABSTRACT MEANING
Penny Pexman, University of Calgary

Abstract concepts like equality, evaluate, and friendship, are central to our mental and social lives and yet they cannot be directly experienced through the senses. As such, they pose a challenge for cognitive models that assume a central role for sensorimotor information in the way we learn and understand concepts. In a series of studies, my colleagues and I have explored the role of bodily or sensorimotor information in the acquisition and processing of abstract meaning. In particular, we have considered the possibility that abstract meaning could be embodied through emotional experience (affective embodiment). In support of this possibility, we have found that children tend to acquire emotional abstract meanings before neutral abstract meanings. Further, children show sensitivity to emotion information in their memory for and processing of abstract word stimuli. While emotion information might help children to acquire some abstract meanings, it cannot be the mechanism for neutral or nonemotional meanings. Our recent findings provide evidence that language experience is also important to abstract meanings. I will describe that research and its implications for our understanding of the role of sensorimotor experience in human cognition.

NEUROPLASTICITY IN EYE DANCE LEARNING

Udichi U Das, York University; Ashkan Karimi, York University; Royze Simon, York University; Mustafa Muhammad, York University, Canada; Joseph FX DeSouza, York University

Learning and practicing motor tasks can improve neuroplasticity, which has implications for preserving brain health and functioning, especially for the elderly, and populations susceptible to neurodegenerative disorders such as Alzheimer's and Parkinson's disease. This study builds on pre-existing research on learning and visualization of dance and associated neuroplasticity, seen through patterns in brain activation. Changes in brain regions' activation levels for repeatedly performing the same task indicate neuroplasticity, as the brain areas get more competent in performing those tasks. Participants were taught an eye dance choreography over 3-4 sessions to examine the brain-behaviour relationships of learning using eye-tracking technology and fMRI. This provides insight into the changes in the activation of relevant brain regions at different stages of learning an eye dance. Significant differences in activation levels were found in the SMA/SEF, auditory cortex, medial occipital lobe, and right putamen, across pre-learning and post-learning eye dance performance conditions. This study helps to understand whether this may be a brain exercise intervention that can significantly contribute to neuroplasticity and overall brain health. This may lead us to discover a preventative neurodegeneration-inhibiting intervention that can be easily utilized for the preservation of brain health and quality of life through old age.

ARE IDEAS INVENTED OR DISCOVERED?

Liane Gabora, University of British Columbia

The honing theory of creativity posits that the mind is a second level of self-organized, self-mending, self-reproducing, 'autocatalytic' structure, and like the body, it is the hub of an evolutionary process; it is to cultural evolution what the body is to biological evolution. Innovation is the generative component of this second evolutionary process, ensuring that continuity is balanced with creativity. I will present an agent-based model of two cognitive transitions en route to the capacity for strategic creativity and cultural evolution. I will show how creative restructuring is modeled using a quantum cognition framework, and how externalizing one's intermediate (half-baked) thoughts (e.g., as sketches or prototypes) can catalyze the next step of a reiterated honing process. The quantum approach is used to model how cognitive networks relax during incubation, and reform anew in a context-sensitive manner, enabling new ideas to emerge. The quantum approach suggests that ideas are invented with respect to consensus reality, which reflects the totality of human knowledge to this point, but discovered with respect to a more encompassing reality, which additionally reflects knowledge we have not (yet) attained. I will present evidence for honing theory from empirical studies with musicians, artists, creative writers, dancers, and comedians.

THE CASE FOR EMBODIMENT IN THE PERCEPTION OF VOCAL COMMUNICATION

Frank Russo, Toronto Metropolitan University

In this paper I will consider behavioural, electrophysiological and clinical evidence for the role of sensorimotor simulation in the perception of vocal communication. In behavioural studies, we have found that it is possible to eliminate the vocal-memory advantage by having participants actively engage in a task that creates vocal-motor interference during perceptual encoding. These same effects don't arise for control tasks involving non-vocal activity. In electrophysiological studies, we have found that compared to neutral speech, emotional speech elicits greater mu event-related desynchronization (a proxy for human mirror neuron system activity). In clinical studies involving Parkinson's patients, we have found that deficits in the classification of emotional speech can be predicted by capacity for facial mimicry. These various lines of evidence suggest that human perception of vocal communication involves an automatic sensorimotor simulation of observed activity. These simulations appear to be more than epiphenomena, at least in the context of remembering vocal melodies.

WHY "INNOVATION" IS A BETTER WAY TO THINK ABOUT "CREATIVITY"
Steven Brown, McMaster University

There is a strong tension between, on the one hand, the psychological study of "creativity" and, on the other, the more systems-oriented approach to "innovation". To a first approximation, creativity typically focuses on the individual creator, whereas innovation generally emphasizes collaborative creativity in groups. But the differences are far deeper than that. I want to argue that innovation is the more useful concept in thinking about creativity, in large part because innovation creates a clear connection with culture and with cultural evolution in a way that standard psychological theories of creativity refuse to. Innovation focuses on functional products (not just ideas), how these products are parts of cultural categories that vary across domains (e.g., cars, symphonies, clothing styles), that existing products are the major source of creative ideas, and that creative products evolve culturally – typically in an incremental manner – thereby generating stylistic lineages. The psychology of innovation does not seek to explain "divergent thinking" but rather how creative cognition is conditioned by the cultural nature of creative products and the institutional domains they emanate from.

SYMPOSIUM IV - MEMORY, ATTENTION, AND COGNITION: IN HONOUR AND RECOGNITION OF DR. JOHN VOKEY

ABOUT FACE: UNCONFOUNDING A MIRROR EFFECT
William Hockley, Wilfrid Laurier University

The mirror effect is observed when a manipulation both decreases the hit rate and increases the false alarm in the less memorable experimental condition, a pattern of results that provides a challenge to familiarity-based accounts of recognition memory. I illustrate John Vokey's strengths as an empiricist, a modeller, and a theoretician by describing the "behind the scenes" story of his exploration and interpretation of the mirror effect for normal and obscured faces where he uncovered and leveraged a confound in the literature to reveal the two-component nature of this effect.

RECOGNITION MEMORY AND IMMEDIATE STIMULUS REPETITION: A MIRROR EFFECT?
Bruce Milliken, McMaster University; Tamara Rosner, McMaster University; Shanur Syed, McMaster University

The mirror effect is a well-studied regularity in recognition memory—when two experimental conditions differ in recognition sensitivity, the condition with higher sensitivity typically has both higher hit rates and lower false alarm rates than the condition with lower sensitivity. Dual process accounts of the mirror effect have a long history (Vokey & Read, 1992), and generally assume that items low in familiarity tend to be high in memorability. We will describe a study that aimed to use immediate stimulus repetition to increase familiarity and decrease memorability, and thus produce a mirror effect. Some interesting challenges arose; implications for dual process accounts of the mirror effect will be discussed.

A COMPUTATIONAL MODEL OF SERIAL RECALL
Randall Jamieson, University of Manitoba; Dominic Guitard, Cardiff University; Nick Reid, University of Manitoba; Jean Saint-Aubin, Université de Moncton

Serial recall is better for semantically related than semantically unrelated word lists; however, that difference is nullified in serial reconstruction. The empirical dissociation has evaded computational explanation and thus presents a productive foil for re-thinking our theoretical accounts of memory. We present a computational model to explain the dissociation that embeds structured word representations within a process model of memory. The explanation locates the dissociation in decision: reporting words in serial in serial recall imposes constraints that serial reconstruction does not. The explanation requires that the model has a scaled mental lexicon. So, we conclude that other modern accounts of serial recall have failed at explaining the relatedness dissociation in serial recall and serial reconstruction because they have neglected to include a scaled mental lexicon. The demonstration intersects with Dr. John Vokey's insights that computational theories must address memory and memory performance that integrates articulate accounts of both knowing and remembering.

EXTENDING GLOBAL-MATCHING MODELS TO PICTURES AND THE VOKEY EFFECT
Matthew J. C. Crump, Brooklyn College and Graduate Center of CUNY

Computational global-matching models of memory like MINERVA 2 (Hintzman, 1984, 1986, 1988) account for an impressive range of cognitive abilities and support the idea of a domain-general framework for cognition (Newell, 1973) based on instance theory (Jamieson, Johns, Vokey, Jones, 2022). However, these models usually represent to-be-remembered items in terms of random feature vectors devoid of surface similarity relationships. Following John Vokey's work applying principal components analysis to sets of patterned stimuli, I describe insights gleaned from applying MINERVA-style architectures to non-random feature vectors, such as pixel maps from pictures of natural scenes. In my concluding remarks I further describe the Vokey effect, and my attempts to replicate it over the past twenty years.

SYMPOSIUM V - REASONING AND DECISION-MAKING

FEELINGS OF RIGHTNESS AND FEELINGS OF ERROR IN TWO REASONING TASK
Valerie Thompson, University of Saskatchewan; Taylor Spock, University of Sasktachewan; Kailyn Phillips, University of Sasktachewan; Emilie Moellenbeck, University of Sasktachewan

Feelings of Rightness and Error (FOR and FOE) are two types of judgments that have been proposed to monitor higher -order reasoning processes. Thompson et al. have consistently observed that FORs accompanying an intuitive responses consistently predict the probability and extent of subsequent deliberation, but that they are poorly calibrated with accuracy. This means that deliberative processes can be frequently misdirected to answers that are already correct. By contrast, there is a small amount of evidence (Fernandez Cruz et al., 2016) suggesting that FOEs are better calibrated with accuracy. They hypothesis is that asking people to make judgments about errors makes them less overconfident than judgments about rightness. However, the type of task used by Fernandez-Cruz was much simpler than typically used by Thompson and colleagues, so that comparisons are difficult. Here, we report the data from two large scale studies using standard reasoning tasks (base rate and syllogisms) that directly compare FOR and FOE judgments on calibration as well as cue use.

MEASURING RATIONAL THINKING IN ADOLESCENTS
Maggie Toplak, York University

Several developmental studies have demonstrated that rational thinking is measurable in children and youth. In this study, we examined five measures of rational thinking in an adolescent sample. The mean age of the participants was 15.4 years (SD=1.2 years; range 13-18 years of age). The rational thinking tasks included probabilistic and statistical thinking, scientific thinking, knowledge calibration, avoidance of framing and rational temporal discounting. Indirect measures of rational thinking were examined as predictors, including cognitive reflection, probabilistic numeracy, actively open-minded thinking and rejection of superstitious thinking. Cognitive abilities were also assessed to measure the cognitive decoupling requirements of these tasks. Consistent with studies on parallel tasks that have been examined in adult samples on the Comprehensive Assessment of Rational Thinking (CART; Stanovich, West & Toplak, 2016), performance on the five rational thinking tasks were positively correlated. Consistent with data patterns from developmental studies, individual differences in indirect measures of rational thinking and cognitive abilities displayed stronger effect sizes than age in explaining rational thinking performance. The effect size of these correlations varied across the rational thinking tasks, which were predictable from the processing and knowledge requirements of each task.

PARTISAN LANGUAGE PROVIDES REPUTATIONAL BENEFITS TO INDIVIDUALS WHILE INTENSIFYING PARTISAN DIVIDES
Alexander Walker, University of Waterloo; Jonathan Fugelsang, University of Waterloo; Derek Koehler, University of Waterloo

Describing an event necessitates that people make linguistic choices. When describing politically contentious events partisans may benefit from using self-serving language that supports event interpretations favourable to their viewpoints. Across two studies, we show that individuals describing polarizing events using partisan language (e.g., "radical leftist") receive reputational benefits when communicating with like-minded audiences. Additionally, we demonstrate that the use of partisan language when describing an action polarizes the action evaluations of Democrats and Republicans, particularly when actions are described in an ambiguous manner. Specifically, Democrats evaluated actions in a more liberal manner when action descriptions replaced a politically neutral term with one that was judged to feature a liberal-bias, with the same pattern of results being observed for Republicans evaluating actions described with conservative-biased language. Overall, our findings suggest that individuals receive reputational benefits from using partisan language when communicating with like-minded individuals, reinforcing the use of such language within homogenous social networks. Furthermore, we find that exposure to the language of one's in-group strengthens in-group consistent attitudes. Thus, while the political attitudes of Democrats and Republicans may often diverge, this divergence may be exacerbated when issues are described using language that is biased in favour of partisan's existing viewpoints.

ON TRUDGING: A FRAMEWORK FOR LEVERAGING METACOGNITION TO IMPROVE DECISIONS
Kaiden Stewart, University of Waterloo; Jonathan Fugelsang, University of Waterloo

In the present talk, I will discuss an empirical framework by which we can study the possibility of increasing deliberation by artificially inducing feelings of difficulty (what we call "Trudging"). Current work on this topic is undiagnostic as to whether this is even possible. By identifying and proposing the study of the theoretical composite stages involved in such a process, I provide a blueprint for researchers to produce the knowledge of 1) whether it is possible to materially improve real-world decisions through metacognitively-activated deliberation, and 2) if so, how one might do it.

SYMPOSIUM VI - ATTENTION AND PERCEPTION IN 3-D SPACE

UPDATING DURING LATERAL SELF-MOTION IS DEPENDENT ON OBJECT ECCENTRICITY AND RANGE OF MOVEMENT
Laurence Harris, York University; John Kim, York University

Spatial updating, the ability to track the egocentric position of surrounding objects during self-motion, is fundamental to navigating around the world. However, people make systematic errors when updating after linear self-motion. To determine the source of these errors, we measured errors in remembered target position before and after passive lateral translations visually in virtual reality and physical on a 6-DOF motion platform. People perceived targets as less eccentric in general. After translated laterally, the remembered target positions were found to be closer to the positions participants perceived before moving when: 1) visual and physical cues were available, 2) targets did not cross the midline and 3) when participants knew they could physically move i.e., that they were sitting on a moving platform, despite the fact they were only translated visually via optic flow of the virtual scene. Cognitive influences and inter-hemispheric re-mapping of perceived space will be discussed.

SCENE PROCESSING AND ATTENTION ACROSS DEPTH
Karolina J. Krzyś, Queen's University; Monica S. Castelhano, Queen's University

When you walk into a large room, you perceive visual information that is both close to you and farther in the background. Here, we investigated whether scene representations and attention are affected by information presented at different depths. Stimuli were scenes composed of different categories (e.g., kitchen and bathroom) in the foreground and background. With these scenes, we found when briefly presented and categorized, scene representations were strongly influence by the foreground. Moreover, when we examined attentional deployment, we consistently found an advantage for the foreground. When pitted against semantic consistency of the target, we found semantic effects were significantly reduced for foreground targets. Across a number of studies, the pattern of results suggests that participants applied an exhaustive search strategy on the foreground space, despite manipulations that may disadvantage this strategy. Taken together, these findings suggest that scene information closer to the observer is initially prioritized for attentional deployment and in scene representations.

PERCEIVED DEPTH MODULATES ATTENTION ALLOCATION
Tasfia Ahsan, York University; Erez Freud, York University

Recent studies suggest that objects perceived as closer to an observer are associated with better perceptual abilities. In my talk, I will present new evidence linking the close-advantage effect to attentional processes. We observed that attentional resources are allocated more effectively to closer objects, supporting the role of attention in shaping visual perception in 3D space.

MODULATION OF SPATIAL ATTENTION ACROSS DEPTH: NEAR-ADVANTAGE FOR LOCALIZATION AND FAR-ADVANTAGE FOR DISCRIMINATION
Noah Britt, McMaster University; Hong-jin Sun, McMaster University

Previous literature has well established a division between the dorsal and ventral visual processing streams. In addition to the well-known distinction between the dorsal stream vision-for-action and the ventral stream vision-for-perception, two separate lines of neuroscience research have established additional bases for the dissociation. Research has shown the dorsal stream is responsible for target localization and near-space processing, and the ventral stream is responsible for target discrimination and far space processing. However, little research examined whether behaviours (localization and discrimination) can be differently affected by target distances (near and far). In this study, participants (n = 58) underwent a modified spatial cueing procedure in a virtual 3D space. The responses revealed a near/far-localization/discrimination interaction. For target localization, responses were facilitated for near-depth targets and the Inhibition of Return (IOR) effect was attenuated when orienting attention toward the observer. In contrast, for target discrimination, responses were facilitated for far-depth targets and IOR was no longer attenuated. These results support that task type and object depth provide insight into the functional specificity of dorsal and ventral stream processing.

TALK SESSION ABSTRACTS

ATTENTION CAPTURE & CONTROL

RESTRICTED ATTENTION CREATES A NECESSITY FOR CONSCIOUS PERCEPTION IN THE ATTENTIONAL BLINK PARADIGM

Mickenzie Galan, University of Regina; Chris Oriet, University of Regina

In attentional capture, a target is identified poorly when presented 200-500 ms after a previously attended distractor. Literature conflicts regarding the role of conscious perception in this paradigm. Some suggest that the distractor must be consciously perceived for capture to occur, while others suggest that capture occurs regardless of conscious perception. We hypothesized that this discrepancy was the result of a restricted attention mechanism, such that as task difficulty increases attention restricts, resulting in additional conditions that must be met for a distractor to capture attention. We proposed that spatial tasks and the use of feature search mode increase task difficulty. Our results indicate that conscious perception of a distractor is necessary for capture to occur if the distractor is task-irrelevant or if a spatial task is completed. Further, we found that if feature search mode was used, only task-relevant distractors could capture attention, regardless of whether they were consciously perceived. Thus, we provided support for the existence of a restricted attention mechanism which explains why past literature had obtained differing results when examining the same phenomenon. Our findings suggest that researchers should carefully choose their experimental design when examining attention capture.

MINI-COUNTRYMAN'S "UNION JACK" TAILLIGHTS: PATRIOTIC OR CHAOTIC?

Brett Feltmate, Dalhousie University; Fiona Burns-Hemingway, Dalhousie University; Raymond Klein, Dalhousie University

In the "Union Jack" style taillights installed in some Mini-Countryman models, signaling to turn involves illuminating an inward-facing arrow. We asked: what occurs in a driver's mind when observing a vehicle signaling a leftward turn, but via a right-facing arrow? When viewed through a stimulus-response (SR) compatibility lens, the incongruency of the signal's irrelevant spatial shape (i.e, right-facing arrow) and its relevant spatial location (i.e, left-located) ought to impair one's ability to efficiently interpret drivers' intentions. This concern is compounded by the use of arrows as directional markers in turn-signs on roads, presumably leading drivers to adopt an attentional set biasing them towards interpreting the shape of arrows. To test this, we had participants make keypress responses (left, right) indicating the task-relevant property of arrows when presented as turn-signs (shape, ignoring location), or turn-signals (location, ignoring shape) within a mock highway display. For turn-sign responses we replicated the classic Spatial-Stroop effect (performance costs due to incongruency between arrows' task-relevant shape and irrelevant location). For turn-signal responses, we observed a "converse" Spatial-Stroop effect wherein performance suffered when arrows' task-relevant location was incongruent with their irrelevant shape. These results suggest that the "Union Jack" style taillights are detrimental to road safety.

DIFFERENTIAL AND OVERLAPPING EFFECTS BETWEEN EXOGENOUS AND ENDOGENOUS ATTENTION SHAPE PERCEPTUAL FACILITATION DURING VISUAL PROCESSING

Mathieu Landry, Université de Montréal; Jason Da Silva Castanheira, McGill University; Karim Jerbi, Université de Montréal

Visuospatial attention is comprised of at least two distinct systems – exogenous and endogenous – but how they interact to facilitate perception remains unclear. To address this question, we employed spatial cueing of attention, electroencephalography (EEG), and multivariate pattern analysis (MVPA) to examine their differential and overlapping effects on visual processing. Our results showed that these attention systems operate both similarly and distinctively, as evidenced by the decoding accuracy of MVPA classifiers trained on cueing effects for one attention system predicting cueing effects for the other. Moreover, we identified three distinct EEG components that mediate the effects of exogenous and endogenous attention on perception, suggesting a complex interplay between these systems. Specifically, our findings indicate that exogenous and endogenous attention have distinct effects early during visual processing and then operate similarly later, while these effects facilitate perception. Overall, our study sheds new light on the neural mechanisms underlying visuospatial attention and has important implications for understanding how these systems work together to facilitate perception.

ATTENTIONAL CONTROL SETTINGS DETERMINE NOT ONLY WHAT CAPTURES ATTENTION, BUT WHERE ATTENTION GOES ONCE CAPTURED.
Samantha Joubran, University of Guelph; Anna Kazatchkova, University of Guelph; Fatima Abboud; Naseem Al-Aidroos, University of Guelph

Is attention automatically captured to the location of salient stimuli, or is capture under our control? An example of control is contingent capture: When looking for a visual target (e.g., a red target), distracting stimuli only capture attention if they resemble the target (e.g., a task-irrelevant red pre-cue). Put differently, what observers do in the target display determines which types of features capture attention in the cue display. However, what participants do in the target display may also determine where attention goes in response to the cue. In the present experiments, participants completed a cueing task where targets were presented to the left and right of fixation, and a separate, coloured stimulus indicated which target to report (e.g., red meant report left target; green report right). Thus, the target display created an association between colours and shifting attention left or right. Across three experiments, task-irrelevant, non-predictive pre-cues captured attention to the cue's colour associated location regardless of where the cue physically appeared in space. Ruling out spatially specific attentional control settings and colour priming, present findings provided evidence that attentional control settings do not only determine what types of stimuli capture attention, but also define where attention goes once captured.

MUSIC COGNITION I

THE NEUROPHYSIOLOGY OF METRE PERCEPTION IN MUSIC ACROSS THE LIFESPAN
Stephen Cooke, Faculty of Medicine, Memorial University of Newfoundland, St. John's; Jon B. Prince, School of Psychology, Murdoch University, Perth, Australia; Dominique T. Vuvan, Psychology Department, Skidmore College, Saratoga Springs, USA; Benjamin Rich Zendel, Faculty of Medicine, Memorial University of Newfoundland, St. John's

Metre is the subjective and hierarchical organisation of stronger and weaker beats in music. Although metric perception is subjective, acoustic features can impact it. Interestingly, pitch-based acoustic cues are preferred to time-based cues for metric perception when used simultaneously, after equalising their strength in baseline conditions. Metric interpretation and acoustic cues are observable in oscillatory brain activity, but this has not been applied to conflicting acoustic cues. Also, there is growing evidence that unlike other aspects of auditory cognition, music perception seems to be relatively preserved in older adults. Accordingly, the goal of this study was to explore how conflicting acoustic cues are represented in oscillatory brain activity, and if there are age-related differences. Participants were presented with a series of nine sequences containing pitch and/or duration cues for a triple (0.67 Hz) or duple (1Hz) metric interpretation, and asked to rate each sequence's metre. Consistent with previous work, participant metre ratings were more closely related to pitch cues rather than time cues in younger adults' metric perception. Furthermore, for conflicting cues, oscillatory brain activity was consistent with frequency of the pitch cue, rather than frequency of the time cue. Preliminary data for older adults are consistent with these findings.

ELECTROPHYSIOLOGICAL INDEX OF TONE INFORMATIVENESS FOR SEQUENCE TEMPORAL PATTERN
Amour Simal, University of Montreal, BRAMS; Robert Zatorre, Montreal Neurological Institute, McGill, BRAMS; Pierre Jolicoeur, University of Montreal, BRAMS, CRIUGM;

Learning and detection of regularities allows us to make predictions and process stimuli more efficiently. Using EEG and ERPs, we aimed to find an electrophysiological signature linked to how the brain uses and interprets auditory information in the time domain. We used three types of five-tone sequences with distinct temporal regularities. They were designed so the second tone carried information, by being presented after a short, medium, or long ISI, allowing recognition of the regularity, and prediction. Participants heard two tone sequences (same temporal regularity) and had to indicate if the pitches were identical. In one experiment, the three types of regularities were randomly intermixed, while they were blocked in a control experiment. We found an increase in positivity at frontal and frontocentral electrodes for the first set of the first experiment (when temporal pattern was not previously known), compared to that same set in the control experiment (pattern known), starting around the earliest time the second tone could be presented, and peaking shortly after tone onset. Although temporal patterns were task irrelevant, and overlooked by most participants, our results suggest the brain actively, rapidly, pre-attentively, and automatically encodes them to predict future tone events.

DECODING TIMBRE PERCEPTION FROM EEG DATA

Praveena Satkunarajah, Memorial University of Newfoundland; Sarah Power; ,Memorial University of Newfoundland; Benjamin Zendel, Memorial University of Newfoundland

Many users of hearing aids report challenges when listening to music. In the future, it may be possible to develop hearing aids that have an electrode which monitors brain activity in real-time and adapts the filters on the hearing aid to match the volitions of the user. In music, this could mean amplifying the sound of the instrument the listener wants to hear. In this research we attempt to determine if a machine learning algorithm can identify to which instrument an individual is listening based only on a brief EEG signal. To test this possibility, participants were presented with a series of brief tones that varied in timbre (trombone, clarinet, cello, piano and pure tone) while their ongoing EEG was recorded from 73 electrodes. We explored different groups of features: The mean amplitude and latency of N1 and P2 for each trial, the power around each of the harmonic frequencies in the FFT of each trial, and the spectral entropy and periodicity of the FFT. Gradient Boosting Classifier was used, and the classifier performed 13% above chance for 5-way classification. We observed that the best performance was obtained when harmonics-based features were used.

PRIMING WITH MUSICAL RHYTHM ENHANCES VERBAL WORKING MEMORY

Bre-Anna Owusu, McMaster University; Elisabet Service, McMaster University

Priming language tasks with predictable rhythms may be used as an intervention strategy for children and adults with atypical language. Previous research has shown a relationship between meaningless pseudoword repetition and word form learning. We have also demonstrated that word learning can be predicted by nonsense sentence repetition skill. Here we investigated how priming with rhythmic stimulation of varying predictability affects musicians' and non-musicians' short-term memory for nonsense sentences. Sound primes were presented for ˜30 s before auditory nonsense sentences containing pseudowords. The primes were either predictable musical rhythms or unpredictable environmental noise. After listening to the prime and the nonsense sentence that followed, participants repeated the sentence orally. Repetition accuracy was coded for whole pseudowords and their syllables for adults aged 18-46 (n = 27 musicians; 30 non-musicians). After listening to predictable musical rhythms, compared to unpredictable noise, both musicians and non-musicians showed higher repetition accuracy. The two groups did not significantly differ. Results suggest that listening to predictable musical rhythms may help both trained musicians and non-musicians to enhance memory for unfamiliar rhythmical structures, such as novel language material. Predictable musical rhythms may provide intervention tools for supporting the linguistic skills and verbal memory of children and adults.

PERCEPTION & SOCIAL COGNITION

EMOTIONAL VOCAL SOUNDS REINSTATED INFANTS' RECOGNITION OF OTHER-RACE FACES

Gabriel (Naiqi) Xiao, McMaster University; Carie Guan, McMaster University; Naomi Geller, McMaster University

Perception undergoes substantial development in infancy. One of the well-established phenomena that index early perceptual development is perceptual narrowing in face recognition, where infants gradually lose the ability to recognize faces of unfamiliar categories (e.g., other-race faces). While perceptual narrowing is believed to manifest reorganization in perceptual systems, recent studies showed that infants' reorganization of other-race faces could be reinstated by emotional signals. However, previous findings were limited to visual emotional information, which shared sensory modality with face identity information, therefore unable to specify the underlying mechanism. The current study used emotional vocal sounds to examine the generalizability of emotion's impact on infants' face processing.Seventeen infants (13 White and 4 Asian) participated in the study (8 females, range: 204-411 days). Their recognition of other-race faces was measured by a familiarization (50s) and visual paired comparison (VPC) paradigm. During familiarization, infants heard vocal sounds (10 clips, 1.5s/sound). No sound was played during the VPC phase. Face recognition was tested in 3 conditions: happy, sad, and neutral vocal sounds. Infants' face recognition was significantly better in the two emotional conditions than in the neutral condition. The finding suggests that emotional signals, regardless of their modality, reinstated infants' once-lost perceptual capacity.

USING MACHINE LEARNING TO CATEGORIZE FACIAL EMOTIONS DURING ONLINE VIDEO COMMUNICATIONS

Effie Pereira, University of Waterloo; Samantha Ayers-Glassey, University of Waterloo; Lydia Hicks, Lakehead University; Bruno Korst-Fagundes, University of Waterloo; Daniel Smilek, University of Waterloo

The accurate detection and categorization of facial emotions is vital for everyday functioning. Although emotion recognition is typically rapid and effortless, categorizing facial emotions during data analysis can be time-consuming and laborious, particularly in the context of communication, where facial emotions continuously change and dynamically fluctuate over time. In these contexts, computational algorithms can prove beneficial for accurately and efficiently categorizing emotions. To examine the utility of this approach, we created an online video-communication platform that allowed for full experimenter control, and had participants (N=120; 91 women, 29 men; M=21 years) use the platform to engage in a 10-minute semi-structured conversation with a confederate research assistant. Participants' self-video was either visible to themselves or not. Faces were first detected within the videos using a feature-based classifier, and positively and negatively valenced emotions were then categorized from faces using a convolutional neural network. Preliminary analyses demonstrated that faces were detected with 89% accuracy, with emotions categorized well above chance. A broad range of positive and negative emotions were found that dynamically varied over time and across individuals. Further analyses will illustrate differences across self-video conditions, highlighting the broad utility of computational approaches for categorizing facial emotions in dynamic

THE OTHER-RACE EFFECT: A MULTIVARIATE EEG INVESTIGATION

Moaz Shoura, University of Toronto Scarborough; Marco Sama, University of Toronto Scarborough; Arijit De, University of Toronto Scarborough; Adrian Nestor, University of Toronto Scarborough

The advantage of recognizing faces of one's own race relative to other races is referred to as the other-race effect (ORE). The behavioral underpinnings of ORE have been extensively researched. However, a multivariate account of its neural underpinnings and temporal dynamics is largely missing from the field. The current study addresses this challenge via pattern analysis of EEG data in East Asian and Caucasian neurotypical adults. Specifically, we aimed to assess the neural representation of race and identity for own- and other-race faces. Our results demonstrate clear decoding of facial race and identity information over occipitotemporal channels. Notably, decoding of own-race faces outperforms decoding of other-race faces in both groups of participants. Facial identity within each race exhibited a similar time course and capitalized on the visual dissimilarity of the face stimuli. Finally, behavioral estimates of ORE yielded significant correlations with decoding performance across participants. Thus, our results speak to the neural basis of facial race representations, its temporal dynamics, and its relationship with ORE.

HOW EXTRANEOUS FACIAL MARKINGS AFFECT FACE RECOGNITION

Victoria Kavanagh, Memorial University of Newfoundland; Kathleen Hourihan, Memorial University of Newfoundland

Most facial recognition research focuses on recognition through intrinsic facial features (e.g., eyes, nose, and mouth). In the current study, human recognition for faces containing extraneous features (e.g., moles, scars, tattoos) was tested. In Experiment 1, participants studied a series of faces, some of which were altered to include a mole or a scar, and then completed an old/new recognition task. Results showed that unaltered faces were more discriminable than faces in either altered condition; there were no differences between the altered conditions. Experiment 2 used a similar study phase but tested memory using two-alternative-forced-choice. Results once again showed better discriminability for unaltered faces compared to faces with scars but only marginal differences compared to those with moles. Experiment 3 compared unaltered faces to faces with moles and faces altered to be more traditionally distinct (e.g., altered eye size); an old/new recognition test was used. Better discriminability was found for the distinct faces in comparison to the other conditions; no difference was found between the other conditions. Finally, in Experiment 4, using a different set of face stimuli, we compared old/new recognition for faces with and without tattoos. Preliminary results indicate similar discriminability between faces with tattoos and those without.

MEMORY I

FORGOTTEN NO MORE: TO-BE-FORGOTTEN INFORMATION AS RETRIEVAL CUES IMPROVE MEMORY

Pelin Tanberg, Department of Psychology, University of Waterloo; Colin M. MacLeod, Department of Psychology, University of Waterloo

It is impossible, even undesirable, for us to remember everything, thus intentional forgetting is an essential process for cognitive efficiency. Intentional forgetting signifies our ability to voluntarily control the contents of our memory. In the laboratory, intentional forgetting is commonly studied using an item-method directed forgetting paradigm, where we observe that to-be-remembered (R) and to-be-forgotten (F) items are encoded differently, with R items better represented than F items in long-term memory. Consequently, we predicted that the well-established part-list cuing impairment of recall caused by re-exposure of part of the learned material should be greater when R items rather than F items serve as the part-list cues prior to test. In Experiment 1, we found that relative to no part-list cues, R items reduced recall performance for the remaining R items, but F items improved recall performance for the remaining F items. In Experiment 2, we incorporated a two-stage recall test where we removed the part-list cues on the second recall test, where we eliminated the memory benefit to F items without part-list F item cues. We interpret this finding as evidence that, F items disrupt the retrieval strategy less than R items, and propose a context differentiation account.

DISENTANGLING THE ROLE OF SOCIAL FACTORS AND COGNITIVE PROCESSES IN THE PRODUCTION EFFECT

Sebastien Gionet, Université de Moncton; Dominic Guitard, Cardiff University; Jean Saint-Aubin, Université de Moncton

When some words within a list are read aloud (or produced) and others are read silently, produced items are better recalled. According to the Revised Feature Model, producing an item generates additional features increasing its distinctiveness relative to silently read items (Saint-Aubin et al., 2021). Because forgetting would be due to retroactive interference at the feature level, produced items would be better recalled when followed by a silently read item than by another produced item. On the other hand, Forrin et al. (2019) suggested a cost for silently read items. This cost would derive from social anxiety and performance anticipation arising when participants silently read an item while knowing that the next word would be read aloud in front of the experimenter. We tested these two hypotheses in 4 experiments in which 200 participants completed an immediate or delayed free recall task with 10-word lists. Produced and silent items were presented in two blocks of various lengths and participants knew which words had to be said aloud. The presence of the experimenter was also manipulated but had no effect. Results provide full support to the Revised Feature Model, but only partial support to the performance anticipation hypothesis.

TESTING THE GENERALITY OF THE DISTINCTIVENESS ACCOUNT OF PICTURE SUPERIORITY

Tyler M. Ensor, California State University, Bakersfield; Kate F. Higdon, California State University, Bakersfield; Aimée M. Surprenant, Virginia Tech; Ian Neath, Virginia Tech;

The picture-superiority effect refers to the typical finding that pictures are remembered better than words. A long-standing explanation for this effect is dual-coding theory (Paivio, 1991), according to which pictures are more likely to be verbally labelled than words are to be imaged, resulting in two traces for the pictures versus only one for the words. In contrast, distinctiveness accounts (Mintzer & Snodgrass, 1999) hold that the greater physical and conceptual variability of pictures compared to words is responsible for their mnemonic advantage. By enhancing the distinctiveness of words (varying font style, font colour, and capitalization pattern) and reducing the distinctiveness of pictures (presenting them in black and white), Ensor et al. (2019) eliminated the picture-superiority effect in item recognition. They interpreted the results as consistent with distinctiveness and inconsistent with dual coding. Here, we present additional experiments that extend Ensor et al.'s paradigm to free recall and associative recognition. We argue that dual-coding theory is no longer tenable as an explanation of the picture-superiority effect.

A CRITICAL TEST OF THE ROLE OF REHEARSAL IN THE PRODUCTION EFFECT IN IMMEDIATE SERIAL RECALL
Ian Dauphinee, Université de Moncton; Mathis Roy, Université de Moncton; Dominic Guitard, Cardiff University; Jean Saint-Aubin, Université de Moncton

In a memory task where all words are read aloud or silently, words read aloud, i.e, produced, are better recalled at the end of the list and less well recalled at the beginning of the list. According to the Revised Feature Model (Saint-Aubin et al., 2021), producing the items would add modality dependent features improving recall of the last list items. However, the production of the items would interfere with rehearsal which is more important for the first list items. Here, we tested the rehearsal account by manipulating presentation speed. With a rapid presentation rate, rehearsal would not be possible. Therefore, the disadvantage of produced items at initial serial positions should disappear while the advantage at later serial positions should remain. Seventy-two participants performed an immediate serial recall task with lists of six words. Presentation speed was manipulated across participants (500, 1000, and 2000 ms/word). As predicted, the advantage of produced items on the recency portion of the curve was the same for all three presentation speeds. Critically, the disadvantage of produced items at early serial positions was present only at the two slowest presentation speeds, but not at the fastest speed.

REAL-WORLD DECISION MAKING

WHO'S MORE BIASED? MOTIVATED COGNITION AND COVID-19 RESEARCH
Josh Budge, Department of Psychology, University of Waterloo, Canada

Motivated cognition helps to create and maintain the division in opinions surrounding polarizing topics such as COVID-19 policy decisions. The purpose of our research was to investigate the presence of people's motivated assessment of COVID-19 policy research, and whether the presence of motivated cognition changed based on political orientation or open-mindedness. Participant's read through and rated two studies of equivalent methodological and scientific quality, with differing results: one study showed that COVID restrictions are effective in reducing COVID transmission (pro-restriction), and the other showed that restrictions are not effective (anti-restriction). Participants rated the support each study provided for its conclusions, as well as the validity of a criticism of each study. We found significant evidence of motivated cognition. Firstly, participants rated pro-restriction studies higher than anti-restriction studies, and criticisms of anti-restriction studies higher than pro-restriction studies. Additionally, participant's prior belief of restriction efficacy significantly correlated with their differential ratings of the studies. When investigating the role of political orientation, we found that liberal and pro-restriction respondents displayed motivated cognition, but not conservative respondents. Finally, participant's higher in open-mindedness showed more motivated cognition in favor of restrictions.

OURS OR THEIRS? PERCEIVED RESPONSIBILITY AND TRUST AND THE COUNTRY-OF-ORIGIN OF EXPLAINABLE AI
Jordan Richard Schoenherr, Concordia University, Carleton University

Artificial intelligence (AIs) are no longer confined to laboratories. They constitute sociotechnical systems defined by data subjects, designers, manufactures, distributors, and users. It is unrealistic to assume that users will understand the physical, social, and virtual networks that create and sustain these systems. The present study examines factors that affect perceptions of trust and responsibility in AI. Participants were provided with scenarios that describe (un)successful operations of an AI system and varied the degree of autonomy that operators had in the situation. Participants then provided ratings of trust and responsibility for human operators, software developers, and AI. Results demonstrated that a) different explanations were used for successful and unsuccessful scenarios, b) responsibility for human operators depending on whether the systems was virtual or physical, and c) ratings of responsibility and trust were only somewhat related.

THE ROLE OF NARRATIVES IN DECISION-MAKING UNDER UNCERTAINTY
Sam Johnson, University of Waterloo

Many real-world decisions are made under uncertainty (where probabilities cannot be assigned to outcomes) rather than risk (where they can). Extant normative and descriptive approaches to decision-making are poorly suited to analyzing such choices, yet people often act adaptively in the world. How do people manage this feat? My recent work on Conviction Narrative Theory (CNT; Johnson, Bilovich, & Tuckett, in press, Behavioral & Brain Sciences) suggests a solution to this puzzle: Narratives, rather than probabilities, are the currency of thought that mediates between the external world and our internal choices to act. Put differently, people build *narratives* to explain a situation, by coordinating causal, temporal, analogical, and valence information. These narratives in turn are projected into the future to simulate what might happen given a potential choice, with our affective systems then used to evaluate these choices and guide action. These choices are typically adaptive due to two feedback loops: First, we retain narratives that are useful and lead to positive outcomes, and second, we pick up narratives from the social environment, which are themselves subject to cultural evolutionary pressures.In this talk, I describe the key propositions of CNT, summarizing evidence for them recently produced by my lab.

DELAY DISCOUNTING PREDICTS COVID-19 VACCINE BOOSTER HESITANCY
Julia Halilova, York University; Samuel Fynes-Clinton, Rotman Research Institute; Donna Rose Addis, Rotman Research Institute; R. Shayna Rosenbaum, York University

Widespread vaccination has been critical to containing the COVID-19 pandemic, with booster doses necessary for durable immunity responses. Vaccine hesitancy threatens the ongoing efficacy of this approach. Thus, we examined whether delay discounting (one's tendency to choose smaller immediate rewards over larger later rewards) is a useful behavioural marker of booster uptake in a sample of 1,731 participants from a larger multinational study. In June-August 2021, participants completed an intertemporal choice task (a measure of delay discounting) and were asked questions about vaccination status, demographics (e.g., age, level of education, essential worker status, income), and distress level (symptoms of anxiety and depression). Those participants who reported being vaccinated (and thus eligible to receive booster doses) were invited to report their vaccine booster status one year later. After controlling for demographic variables and distress level, steeper discounting of delayed rewards (i.e., more short-sighted decision-making) was associated with reduced willingness to receive a booster dose of the vaccine. The results suggest that delay discounting, a personal characteristic known to be modifiable through cognitive interventions (e.g., cueing individuals to think about the future), is a contributing factor to decisions to comply with public health recommendations regarding booster doses.

METHODS & MODELS

AN EMBODIED COGNITION FRAMEWORK OF TRAIT FUNCTION
Garri Hovhannisyan , Duquesne University

The enactive approach to cognitive science views embodied interaction with the environment, rather than information-processing, as the underlying basis of cognition. This approach has garnered significant interest amongst cognitive scientists and has been used extensively to model the interactional dynamics of simpler lifeforms, such as paramecia. However, a dynamical model of human cognitive life has been lacking in enactivist research. The present research sought to bridge this gap by generating a dynamical model of person-situation interaction—first, by adopting the five-factor model of personality and, second, by conceptualizing individual differences in traits as differences in how individuals construct, perceive, and participate in the world along the five major dimensions of personality functioning. The study adopted an amalgam of a case-study approach, individualized assessment, and empirical phenomenology (n=4). We find that when situational demands exceed the adaptive reach of one's traits, psychological dysfunction is bound to ensue. We discuss these findings in reference to individual differences in cognition and perception.

COMPARING MEASURES OF COGNITIVE PERFORMANCE: A FACTOR ANALYSIS APPROACH

Sarah V. Park, York University, York University; Bernard M. t Hart, York University; Ji Yeh Choi, York University; Denise Y.P. Henriques, York University

We aimed to validate a battery of cognitive tasks and to compare two sets of indices of performance, reaction time and performance accuracy data compared to more complex measures of performance, such as sensitivity (d') and regression slope. We conducted an EFA on data from participants (NEFA = 915, Mage = 23yrs, SD = 7.18) who completed an online series of cognitive tasks (e.g., n-back, task-switching). The complex measures model was superior in model fit and represents a more parsimonious model, in addition to being rooted in theory. We then tested the chosen complex model on a new set of participants (NCFA = 226, Mage = 24.5yrs, SD = 8.01) using a CFA to test the derived factor structure. The CFA fit was acceptable, but more modifications and respecifications are needed. Our work shows that our instantiation of tasks was valid, in addition to representing the theoretical latent constructs. Further work will involve adding more complex items to the models including relationships with lifestyle measures (e.g., sleep, stress, affect) to address the complex nature of cognition.

AN AUTOCATALYTIC NETWORK MODEL OF COGNITIVE CHANGE IN PSYCHOTHERAPY

Kirthana Ganesh, University of British Columbia; Liane Gabora, University of British Columbia

This project aims to both formally describe and visually depict how an individual's integrated mental model of the world, or worldview, takes shape, so as to facilitate the identification and alleviation of features associated with psychological distress. Applying tools from network science, we model cognitive change during psychotherapy, showing how, over repeated sessions, dysfunctional beliefs can transition into healthy ones. To mathematically describe and illustrate the formation and dissolution of network structure, we use autocatalytic networks, an abstract framework for modeling how new network structures emerge out of earlier ones. We consider a hypothetical albeit representative psychotherapeutic interaction, and model four distinct ways in which therapists facilitate change in a client's worldview: (1) challenging the client's negative interpretations of events, (2) providing direct counter-evidence to the distressing beliefs, (3) using self-disclosure to provide examples of strategies to diffuse a negative conclusion, and (4) reinforcing the client's attempts to assimilate such strategies into their own ways of thinking. We discuss this method's potential to capture more complex cognitive changes within psychology, and its pedagogical implications. We hope this method will invigorate efforts to understand the mechanisms underlying therapeutic change, leading to improvements in mental health.

QUESTIONING OUR OWN WORK: A CASE STUDY IN FALL PERCEPTION RESEARCH THROUGH FALSIFICATION AND METHODOLOGICAL IMPROVEMENT

Michael Barnett-Cowan, University of Waterloo

Scientific progress depends on fostering vigilance, rigour, reproducibility, and falsification in research. Falsification prioritizes disproving hypotheses over mere confirmation, promoting skepticism, self-scrutiny, and continuous questioning. However, these principles are often overshadowed by the pursuit of novel findings. In this talk, I will illustrate the importance of falsification using my lab's fall perception studies as an example. Our initial research suggested that fall perception was slow, with perturbation onset needing to precede an auditory stimulus by ~44ms to appear coincident (Lupo&Barnett-Cowan,2017). A subsequent study replicated this result with new participants, and also showed older adults required ~88ms (Lupo&Barnett-Cowan,2018). Instead of accepting these findings, my lab critically examined the methodology, refining it by initiating computer-controlled perturbation onsets to address unbalanced stimulus onset asynchrony distribution concerns. This refinement led to experiments revealing no significant delays in perceived fall onset, challenging our own previous results (McIlroy&Barnett-Cowan,2023). I will discuss how falsification and methodological rigour led to a more accurate understanding of fall perception, impacting fall prevention strategies and rehabilitative training exercises. By emphasizing the importance of questioning one's own work and continuous improvement, I hope this talk can inspire researchers to use vigilance, rigour, reproducibility, and falsification.

FALSE MEMORY

SLEEP (VERSUS WAKE) INCREASES BOTH VERIDICAL AND FALSE MEMORY IN THE DRM PARADIGM: A REGISTERED REPORT

Matthew HC Mak, University of York, UK; Alice O'Hagan, University of York, UK; Aidan Horner, University of York, UK; Gareth Gaskell, University of York, UK

Human memory is known to be supported by sleep. However, less is known about the effect of sleep on false memory. In the laboratory, false memories are often induced via the Deese-Roediger-McDermott (DRM) paradigm where participants are presented with semantically related words like nurse, hospital, and sick. Subsequently, participants are likely to falsely remember that a lure word like doctor was presented. Multiple studies have examined whether DRM false memories are influenced by sleep, with contradictory results. A recent meta-analysis suggests that sleep may increase DRM false memory when short lists are used. We tested this in a registered report (N=488) with a 2 (Interval: Immediate vs. 12-hr Delay) x 2 (Test Time: AM vs. PM) between-participant DRM experiment, using short DRM lists (8 words/list) and free recall. We found that (i) completing free recall in the evening (vs. morning) led to a selective increase in intrusions (i.e., neither studied nor lure items) but not total responses, (ii) the Sleep (vs. Wake) participants produced more false memories (when intrusions were controlled for) and recalled more studied items. Our findings support the view that sleep may facilitate gist abstraction and/or spreading activation, alongside strengthening/protecting encoded memories.

INTEGRATING DISTRIBUTED SEMANTIC MODELS WITH AN INSTANCE MEMORY MODEL TO EXPLAIN FALSE RECOGNITION

Minyu Chang, McGill University; Brendan Johns, McGill University

In this paper, we simulated true and false recognition in the Deese/Roediger/McDermott (DRM; Deese, 1959; Roediger & McDermott, 1995) paradigm by incorporating word embeddings derived from distributed semantic models (word2vec) into an instance memory model (MINERVA2). Previously, Arndt and Hirshman (1998) demonstrated that MINERVA2 (Hintzman, 1984) could capture multiple classic false recognition findings with randomly generated word representations. However, as randomized representations deviate systematically from semantic representations learned from the natural language environment, there remains uncertainty about whether MINERVA2 can capture the false memory illusion when scaling up to real-life complexity in word representations. To address this uncertainty, we used word2vec embeddings that are derived from large corpora of natural language instead of randomized representations in MINERVA2. Our results showed that MINERVA2 can still capture the standard true and false recognition, and it can also accommodate the true and false recognition effects of various classic manipulations (e.g., associative strength, number of associates, divided attention, retention interval).

FALSE MEMORY IN THE DRM EFFECT: COGNITIVE FAILURE OR EFFECTIVE LANGUAGE-BASED INFERENCING?

Sonny Wang, University of Toronto; Craig Chambers, University of Toronto; Keisuke Fukuda, University of Toronto;

In the Deese-Roediger-McDermott (DRM) paradigm, participants erroneously report recognizing words that were not present in a study list (e.g., sleep), yet are semantically associated with words that WERE there (e.g., bed, pillow). In the memory literature, this is interpreted as "cognitive failure". But could it instead reflect spontaneous inferencing accompanying everyday language comprehension? (e.g., we infer a BRUSH when reading 'John painted the...)? Here, we used an individual-differences approach, testing for a relation between instrument inferencing and DRM in a high-powered preregistered study. If a relation is found, the two phenomena likely stem from the same underlying process.Expt 1 (N=53) validated a self-paced reading task measuring instrument inference, where stories contained target sentences that were congruent/incongruent with instrument inferences implied by preceding sentences. Results replicated previous work showing participants readily draw instrument inferences during reading. In Expt 2 (N=30), we implemented the standard DRM recognition task, and replicated the so-called false memory effect. Materials from Expts 1&2 were then used in Expt 3 (N=200) where participants completed both tasks, and scores on the two tasks were correlated. Results showed a strong relation between instrument inferencing and DRM ($r=0.27$, $p<.001$) suggesting the DRM effect indeed arises from routine psycholinguistic processing.

THE ROBUSTNESS AND MALLEABILITY OF PREDICTION-BASED FALSE MEMORY
Olya Bulatova, University of Toronto Mississauga; Keisuke Fukuda, University of Toronto Mississauga

Visual memories are constructive in nature, thus making them vulnerable to changes even after encoding. In this study, we tested whether they can also be manipulated by the actions we take prior to encoding. In a series of experiments (total n = XXX), young adults were presented with a real-world object along with three characters and predicted which character the object belonged to. Upon making predictions, participants received either visual, verbal, or no feedback. In the visual feedback condition, either the predicted or a non-predicted (foil) character showed that they owned the item, thus either confirming or rebutting participants' prediction. In the verbal feedback condition, either the predicted or a foil character verbally confirmed or rebutted the prediction without actually showing the item. Lastly, in the no feedback condition, no character provided any feedback. When their memory was tested, participants were more likely to falsely remember their predicted character showing the item than the other characters even when no feedback was provided. Furthermore, this prediction-based false memory was strengthened when confirmed only by verbal feedback, and it was not eliminated despite verbal or visual rebuttal. Taken together, our visual memories can be robustly manipulated even before encoding through predictions.

AUTISM, LANGUAGE & AUDITION

CHARACTERISTICS OF DECREASED SOUND TOLERANCE IN AUTISTIC AND NON-AUTISTIC PEOPLE
Silas Manning, Wilfrid Laurier University

Decreased sound tolerance (DST) is a hearing disorder that is characterized by increased sensitivity to sound at levels that would not bother most people. DST appears to be more prevalent in autistic people, yet how DST varies across autistic and non-autistic people is unclear. This study used online surveys to investigate the characteristics of DST in 77 autistic and 94 non-autistic adults, as well as the relationship between DST and mental health, quality of life, and autism characteristics. The results of this study indicated that misophonia, an aversion to human produced sounds, was both more prevalent and more severe in autistic people. Similarly, hyperacusis, a reduced tolerance to everyday sounds at volumes that would not be distressing to most people, was also more prevalent in the autistic sample. Across the entire sample, misophonia symptoms were associated with more autistic traits and higher anxiety, while hyperacusis symptoms were associated with more autistic traits, higher anxiety and depression symptoms, and poorer quality of life. Thus although misophonia and hyperacusis appear to be more prevalent in autistic samples, these forms of DST may have a similar impact on both autistic and non-autistic people.

AUTISTIC WOMEN HAVE SIMILAR, BUT SUBTLY DIFFERENT, PRAGMATIC LANGUAGE ERROR PROFILES COMPARED TO NON-AUTISTIC WOMEN
Kara E. Hannah, University of Western Ontario; Ken McRae, University of Western Ontario; Ryan A. Stevenson, University of Western Ontario

Autistic women experience social communication difficulties, although they may camouflage their traits in social situations. Research comparing autistic and non-autistic women's pragmatic language skills is limited, and as such, it would be beneficial to compare not only overall test scores, but also distinguish their communication profiles. We investigated whether autistic and non-autistic women's pragmatic errors differ. Nineteen autistic women and 15 non-autistic women aged 18-25 completed tests of inferencing and conversation skills. Test scores were compared between groups, whereas errors were compared within groups. Autistic women scored lower than non-autistic women on total and subtest scores ($ps<.05$). For inferencing, both groups made multiple choice errors relating to missing key situational elements, and produced vague/incomplete responses more frequently than committing other errors ($ps<.05$). For conversation skills, autistic women made significantly more awkward responses than all other errors ($ps<.05$). Non-autistic women made a similar number of responses that were awkward or contained semantic deviations ($p=.11$). Overall, autistic and non-autistic women showed subtle differences in error patterns, which likely is related to how autistic women display differences in communication characteristic of autism, despite potentially camouflaging their autistic traits. Underlying pragmatic difficulties may be more noticeable when making conversation compared to making inferences.

EXAMINING DIFFERENCES IN NATIVE (L1) VS. NON-NATIVE (L2) PROCESSING IN NEURODIVERGENT POPULATIONS: ARE LANGUAGE IMPAIRMENTS MORE PRONOUNCED IN L1 THAN L2?

Arthur Hamilton, Carleton University; Synthia Guimond, The Royal's Institute of Mental Health Research; Olessia Jouravlev, Carleton University

Bilinguals often receive clinical care in their second language (L2), but little research has compared how neurodivergent traits manifest in bilinguals' L2 vs. their first language (L1). A small literature indicates that bilinguals with schizophrenia (SZ) show more symptoms in L1 than L2. Given the genetic and phenotypic similarities between SZ and autism spectrum disorder (ASD), bilinguals with ASD may show analogous L1/L2 differences. However, it remains unknown whether L1/L2 differences extend to the cognitive deficits associated with SZ and ASD. We conducted an online pilot study on bilinguals from the general population, aiming to determine the utility of a similar study in people with SZ and/or ASD. This study assessed the relationship between 1) L1/L2 differences in linguistic cognition and 2) sub-clinical schizotypal and autistic traits. Participants completed tasks measuring performance in four domains of linguistic cognition, each in English and French, as well as three non-linguistic control tasks. Participants also completed questionnaires on sub-clinical schizotypal and autistic symptoms and their demographic and linguistic background. We present findings on the relationship between symptom levels and L1/L2 differences in linguistic task scores, the impact of L2 proficiency, and the relationship to performance on non-linguistic tasks.

PROSODY PERCEPTION IN AUTISTIC PERSONS UNDER CONDITIONS WITH AUDITORY BACKGROUND NOISE

Zehra Sasal, Wilfrid Laurier University; Victoria Caranfa, Wilfrid Laurier University; Jeffery Jones, Wilfrid Laurier University

People rely on various cues for successful communication, including prosody, which conveys information regarding the speaker's emotions. Pitch and intonation are important components of prosody. Individuals with autism may experience difficulties in perceiving prosody, and these difficulties may be exacerbated when they have to perceive speech in noisy conditions. In this study, we tested 196 neurotypical and 21 autistic persons in their ability to perceive the prosody of six universally accepted emotions in three levels of speech background noise. We found that the high-functioning autistic individuals perceived prosody as well as those who were non-autistic. However, fear was the hardest emotion to identify with increasing levels of background noise for autistic persons. They could also identify the visual representations as well as their neurotypical counterparts. Based on our results, we recommend future studies test more complex emotions under the same noise conditions.

TRAINING/LEARNING

MANIPULATING CATEGORY-RELEVANT VISUAL INFORMATION TO ALTER LEARNING AND MEMORY

Yongzhen Xie, University of Toronto; Michael Mack, University of Toronto

Our ability to categorize real-world objects is often rapid and accurate. These rapid categorizations are supported by a perceptual system focused on diagnostic visual information: We attend to category-relevant features and build structured category knowledge to represent commonalities among category members. Such a system, however, comes with a trade-off; focusing on category-diagnostic features may lead to the loss of details important for encoding rich item-specific memories. Here, we asked if this trade-off could be selectively tipped in favor of categorization or item-specific recognition during category learning. Participants (N=120) learned real-world bird categories (i.e., warbler subspecies), and available visual information in the bird images was manipulated throughout learning. Specifically, we leveraged a simple vision model to identify category-diagnostic information and either retained or removed such information by selectively masking the bird images. We found that the removal of diagnostic information hampered category learning but shifted individuals' emphasis from extracting common features among category members to encoding specific items. Our findings support that the mnemonic process in category learning depends on the availability of category-diagnostic visual information. When such information is lacking, we are promoted to form detailed memories of individual exemplars to construct category knowledge.

ATTENTIONAL FLEXIBILITY IN THE FACE OF NEW INFORMATION IMPROVES LEARNING

Emily Heffernan, University of Toronto; Xuan Zhang, University of Toronto; Marian Wang, University of Toronto; Michael Mack, University of Toronto

Attentional tuning (learning to focus on task-relevant details while ignoring irrelevant information) is a key component of category learning. Prominent learning theories formalize attentional tuning as an incremental process with gradual strengthening of category-relevant information; however, numerous eye-tracking studies instead indicate that rapid shifts in attention occur in the face of errors. To investigate this discrepancy, we designed a mouse-tracking category learning task that encouraged rapid changes to attention. Category structure was initially one-dimensional, with only one feature predictive of category membership. After participants reached a learning criterion, exceptions were introduced that required learners to focus on three category-relevant dimensions. Participants who fixated more on the category-relevant dimension during the one-dimensional phase initially had worse accuracy in the three-dimensional phase, but this accuracy difference disappeared by the end of the task. Notably, change in entropy of mouse-tracking patterns immediately before and after exception introduction was positively predictive of end-of-learning accuracy, with greater shifts corresponding to improved performance. It seems that, in the face of surprising information, one's capacity to dramatically shift attentional weights facilitates optimal learning. The transient impact of such shifts on existing knowledge should be characterized in future work.

TRANSFERABLE SKILLS FROM ECCENTRIC-VIEWING TRAINING IN LOW VISION: THE EFFECT ON READING, BALANCE AND POSTURE

Faly Golshan, University of Saskatchewan; Marla Mickleborough, University of Saskatchewan, Canada

Fixation stability is frequently targeted and trained in low vision rehabilitation practices to improve reading accuracy and speed. Previous researchers have shown that fixation stability is a visual parameter that can contribute to the control of balance. Here, we quantified fixation stability before and after a 6-week eccentric viewing rehabilitation training program, and determine if this could lead to improved reading and balance. Tests included reading ability using the Pepper Visual Skills Reading Test (PVSRT) and fixation stability using the Optos Scanning Laser Ophthalmoscope. Balance was assessed via Timed Up-and-Go (TUG), Dynamic Gait Index (DGI), Activities Specific Balance Confidence Scale, and postural control via the Nintendo Wii Balance Board. Presently, 16 clients have successfully completed the program, with fixation stability improving in all but one. Reading speed did not improve, but accuracy did ($g = 0.657$). TUG performance improved post-training, with a medium effect, $g = 0.428$. Improvement post-training was also true for the DGI, $g = 0.489$. However, postural control showed a minimal effect of training, $g = 0.035$. These results show that improvement in fixation stability through eccentric-viewing training can lead to improvements in reading accuracy and balance performance, though it has little impact on postural control.

ATTENTION AS A COMPONENT OF AFFLICTION AND A KEY TO REHABILITATION IN MIGRAINES: INTRODUCING NEUROFEEDBACK MINDFULNESS MEDITATION AS A TREATMENT FOR MIGRAINES

Faly Golshan, University of Saskatchewan; Marla Mickleborough, University of Saskatchewan, Canada

Migraine headache disorders are one of the most well-known causes of disability worldwide, but there is still a need for understanding the cognitive aspect of this pain affliction and how cognitive-based treatments could at all be useful. We primarily provide evidence that migraine is closely associated with attentional processing. Based on our cognitive approach to migraine disorder, we firstly explain the event-related potentials (ERP) study of cortical hyperexcitability followed by visual oddball cues in migraineurs. Our ERP findings show that in response to an oddball, migraineurs have increased N2 and P3 components compared to non-migraine headache sufferers. Subsequent to our evidence for attentional deficiency in migraine headaches, we introduce our longitudinal randomized controlled trials (RCT) of neurofeedback mindfulness meditation compared to a simple attention task (i.e., listening to an audiobook) in migraineurs. We discuss our findings of how 8 weeks of neurofeedback mindfulness meditation change headache characteristics of migraine sufferers. Both quantitative and qualitative explanations are provided to support that neurofeedback mindfulness meditation is an efficient treatment that decreases migraine characteristics especially in chronic migraineurs. We provide evidence for two forms of attentional switch and affective processing that could be facilitated through neurofeedback mindfulness to improve pain experience in migraineurs.

PERCEPTION: BASIC & APPLIED

SOCIAL PERCEPTION BEYOND DYADS

Jelena Ristic, McGill University; Clara Colombatto, University College London

The human brain has evolved in environmental conditions favoring social group interactions. Thus, perception should be tuned to represent interactive groups, as exemplified by recent results showing a visual search advantage for facing (vs. nonfacing) groups of two (or dyads). Here, in a series of experiments, we investigated whether our perceptual system may also be tuned to represent social groups larger than two. Experiment 1 found that facing triads (or groups of three) were found faster than nonfacing triads. Experiments 2-4 further indicated that the search advantage for facing triads did not reflect perceptual grouping of dyads within triads, as impaired grouping as well as enhanced individuation (a classic signature of perceptual grouping) were found with disruption of triad but not dyad unity. Finally, Experiment 5 indicated that directionality may be one of the principles behind social grouping, as the search advantage for facing triads persisted even in inverted displays. Thus, our perception efficiently represents larger complex interactive social groups, reflecting the evolutionary advantages of social groups in humans.

AGE-RELATED DIFFERENCES IN MULTISENSORY GAIN MAY BE A BY-PRODUCT OF INVERSE EFFECTIVENESS

Laura Schneeberger, Western University; Alyssa Lynn, Western University; Vanessa Scarcelli, Western University; Ryan Stevenson, Western University

Older adults experience a greater benefit from multisensory integration than their younger counterparts, but it is unclear why. One hypothesis is that age-related sensory decline weakens unisensory stimulus effectiveness, causing a boost in multisensory gain through inverse effectiveness. Notably, many previous studies present stimuli at the same intensity for both younger and older adults (i.e., stimulus-matched), as opposed to accounting for each participant's unique perceptual level (i.e., perception-matched). This makes it difficult to discern the source of age-related differences in multisensory gain. Therefore, we evaluated multisensory gain across four standard audiovisual tasks using both stimulus- and perception-matched conditions. Three tasks including detection, speech-in-noise, and discrimination were stimulus-matched, with the expectation that older adults would show worse unisensory performance, inducing inverse effectiveness. The fourth task was a perception-matched detection task; stimuli were presented at each participant's 50% detection threshold, identified via an adaptive psychophysical staircase, eliminating inverse effectiveness. Consistent with previous findings, older adults exhibited greater multisensory gain in stimulus-matched detection ($\eta 2$=0.122), speech-in-noise ($\eta 2$ =0.040), and discrimination ($\eta 2$=0.177) tasks. However, in the perception-matched detection task, older and younger adults exhibited comparable multisensory gain ($\eta 2$=0.002). Together, these findings suggest that greater multisensory gain among older adults may be attributable to inverse effectiveness.

NEURAL SUBSTRATES FOR FAST NUMERICAL AND NON-NUMERICAL MAGNITUDE AVERAGING

Chenxi He, University of Western Ontario; Daniel Ansari, University of Western Ontario; Blake Butler, University of Western Ontario

Humans show a remarkable ability to quickly average both groups of symbolic numbers and physical properties of objects. Additionally, distribution characteristics like skewness may bias these judgments. However, little is known about the neural basis of fast averaging for either numerical or non-numerical magnitudes. In this fMRI study, participants quickly estimated and compared mathematical averages of two sets of 8 numbers or average sizes of two sets of 8 dots. Neural activities were compared to those elicited when participants compared magnitudes of 2 single numbers or sizes of 2 single dots. Moreover, number and dot distributions were manipulated to contain no-skew, low-skew or high-skew. Results (N=39) revealed overall stronger activations specific to number groups in bilateral lingual gyrus and calcarine, and stronger activations specific to dot groups in right lateral occipital cortex and inferior parietal lobe. Multivariate pattern analysis revealed multiple lateral and medial frontal areas, and anterior cingulate specific to number groups vs. single numbers, and bilateral middle occipital gyrus specific to dot groups vs. single dots. No skewness effect was observed. The results suggest that while fast numerical averaging relies more on executive functions implemented in frontal areas, non-numerical averaging involves more magnitude perception supported by parietal regions.

AVERAGE TEMPERATURE CAN BE EXTRACTED FROM VISUAL SCENE ENSEMBLES WITHOUT RELIANCE ON COLOUR
Vignash Tharmaratnam, University of Toronto Scarborough; Dirk B. Walther, University of Toronto; Jonathan S. Cant, University of Toronto Scarborough

Summary statistics for groups (i.e., ensembles) of faces or objects can be rapidly extracted to optimize visual processing, without reliance of visual working memory (VWM). Recently, Tharmaratnam and colleagues (VSS 2019) demonstrated that average scene content and spatial boundary of scene ensembles can also be extracted. Furthermore, Jung and Walther (2021) have shown that non-visual attributes (i.e., apparent temperature: how hot or cold a scene would feel) of single scenes are represented in the prefrontal cortex and are accurately rated by observers. Here we examine if temperature summary statistics can be extracted, and whether colour mediates this process.Participants rated the average temperature of scene ensembles, with either coloured (Exp. 1) or gray-scaled stimuli (Exp. 2). In both experiments, we varied set size by randomly presenting 1, 2, 4, or 6 scenes to participants on each trial, and measured VWM capacity using a 2-AFC task. Participants were able to accurately extract average temperature in both experiments, with all 6 scenes being integrated into their summary statistics. This occurred without relying on VWM, as less than 1.2 scenes were remembered on average. These results reveal that computing cross-modal summary statistics (average temperature) does not rely on lower-level visual features (colour).

ATTENTION, MINDWANDERING & AFFECT

MIND-WANDERING WHILE DRIVING: THE IMPACT OF INDIVIDUAL DIFFERENCES IN BOREDOM AND VISUAL WORKING MEMORY
Brooke Pardy, University of Guelph; Lana M. Trick, University of Guelph

Mind-wandering describes a cognitive state in which an individual's attention is brought away from a task at-hand and is instead directed towards more personal thoughts. This study investigated individual differences in boredom proneness and visual working memory (storage and attentional control, respectively) using self-report and experimental measures, as well as thought-probes during two 25-minute drives. Thought-probes during the drive involved participants reporting whether they were thinking about driving; the proportion of trials participants reported mind-wandering intentionally or unintentionally was used as an index of mind-wandering. In the post-task questionnaires, participants were asked to estimate the percentage of time they engaged in either intentional or unintentional mind-wandering. Speed, steering variability, and standard deviation of the lateral position were also measured. The results indicate that individual-difference factors may yield insight into variability in mind-wandering while driving and point to the need for additional research on individual-difference factors. Attentional control, in particular, was identified as a significant predictor of unintentional mind-wandering, such that those with greater levels of attentional control experienced less unintentional mind-wandering while driving. Further, the inconsistency in reports of mind-wandering from self-report measures and thought-probes underscores the need for more covert measures of attention while driving.

EXAMINING CAFFEINE CONSUMPTION AND ATTENTION DURING AN AUDITORY ATTENTION TASK
Tyler Kruger, University of Waterloo; Daniel Smilek, University of Waterloo; Mike J. Dixon, University of Waterloo

Caffeine is the most popular psychoactive substance in the world. The present study aimed to investigate how caffeine versus placebo may affect attention on an auditory attention task. Participants completed one session of the attention task, consumed 200mg of caffeinated chewing gum or regular chewing gum, and then completed a second session of the same attention task. Participants also answered questions regarding their mood, arousal levels, boredom, and sleepiness before and after completing each session of the attention task. During the attention task, participants were pseudo-randomly interrupted to assess whether their thoughts were on-task, spontaneously mind-wandering, or deliberately mind-wandering. Following each session, participants also rated how much mental effort was required to stay on-task. Preliminary results suggest that following the second session of the attention task, participants who consumed caffeine reported significantly greater arousal levels, less sleepiness, and required less mental effort to stay on-task than the participants who consumed the regular chewing gum. The preliminary results also suggest a trend whereby those who consumed caffeine reported being more on-task and less spontaneous mind-wandering than the participants who consumed regular chewing gum. Taken together these results suggest that consuming caffeine may benefit attention.

ON THE ASSOCIATION BETWEEN FLOW AND PERFORMANCE IN A SUSTAINED-ATTENTION TASK

Samantha Ayers-Glassey, University of Waterloo; Jeremy Marty-Dugas, McMaster University; Daniel Smilek, University of Waterloo

The state of 'flow' – characterized by deep, effortless concentration – has been found to correlate positively with performance on the sustained attention to response task (SART). We sought to further assess the relation between trait- and state-level flow and SART performance, and how this relation changes over time-on-task. Participants reported their trait levels of flow prior to the experiment; during the experiment, participants completed the SART online, responding to self-reported flow probes at five equally timed points throughout the task. We found further evidence for a positive relationship between state (but not trait) flow and performance on the SART. Furthermore, we observed the additional specificity of a linear decrease in state flow and a quadratic increase in SART errors across time on task. However, we did not replicate prior findings regarding an increase in the strength of the relationship between state flow and SART performance as time-on-task increased. Together, our findings suggest that when individuals experience more flow in the moment (whether they typically experience flow more in their daily lives or not), they typically perform better during the SART. Furthermore, as time-on-task increases, the experience of flow declines and attention errors become more likely.

THE RELATION BETWEEN BOREDOM AND MIND-WANDERING REMAINS CONSTANT ACROSS ADULTHOOD, DESPITE BOTH OCCURRING MUCH MORE FREQUENTLY IN YOUNGER THAN OLDER ADULTS

Carolyn Crawford, University of Guelph; Gurjit Singh, University of Toronto, Toronto Metropolitan University; Mark Fenske, University of Guelph

While much is known about the impact of age on goal-directed, task-focused cognitive functions, less is known about spontaneous task-unrelated cognitive processes (e.g., mind-wandering) and their affective correlates (e.g., boredom). Here we address this gap in understanding by directly comparing the prevalence of mind-wandering and boredom in younger (M = 18.9 years) and older (M = 64.6 years) adults, as well as the relation between these factors. This builds on growing evidence that boredom is an aversive yet adaptive state that motivates individuals to abandon their current focus to pursue something more engaging, with the lapses of task-focused attention that comprise unintentional mind-wandering a likely trigger or manifestation of boredom's call for change. If mind-wandering and boredom are indeed linked in such a fundamental way, then the strength of that connection may remain stable over time, even if there are age-related changes in their prevalence. Our results support this theoretical framework. We replicate prior observations that self-reported levels of spontaneous mind-wandering and boredom proneness both decrease with age (total N = 1,250). Despite dramatic differences in their occurrence, the strength of boredom/mind-wandering correlations were similar for younger and older adults, consistent with a preserved functional connection across the human lifespan.

EXPLORING THE INFLUENCE OF INCENTIVES AND SITUATIONAL FACTORS ON AGE-RELATED DIFFERENCES IN MIND WANDERING

Nicholaus Brosowsky, University of Manitoba; Liam Yeo, University of Manitoba

Mind wandering is when an individual's attention shifts from on-task, goal directed thoughts towards task-unrelated thoughts. These shifts are common in our everyday life and occurs throughout our lifespan. Surprisingly however, older adults tend to report less mind wandering than younger adults. Some attribute this effect to differences in situational factors, such as fewer current concerns or higher motivation, or to differences in incentives, with older adults typically being paid to participate while younger adults typically volunteer for course credit. In the current study, we sought to further understand age-related differences in mind wandering. In Exp. 1, we used paid online samples and found no differences in mind wandering between older (65+) and younger (23-35) adults. In Exp. 2, we compared paid and unpaid young adults (18-22) and failed to find an effect of incentives on mind wandering. Across both experiments, however, the youngest adults (18-22) mind-wandered significantly more than older adults (23-35 and 65+), which suggests that age-related differences may be influenced by the use of very young age groups that border on adolescence. Individual differences in mind wandering across all age groups were primarily explained by situational factors, including current concerns, motivation, and perception of task demands.

EPISODIC & AUTOBIOGRAPHICAL MEMORY

EPISODIC MEMORY AND SLEEP ARE INVOLVED IN THE MAINTENANCE OF CONTEXT-SPECIFIC LEXICAL INFORMATION

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Familiar words come with a wealth of associated knowledge about their variety of usage, accumulated over a lifetime. How do we track and adjust this knowledge as new instances of a word are encountered? A recent study (Gaskell, Cairney & Rodd, 2019, Cognition) found that, for homonyms (e.g., bank), sleep-associated consolidation facilitates the updating of meaning dominance. Here, we tested the generality of this finding by exposing participants to (Experiment 1; N = 125) non-homonyms (e.g., bathtub) in sentences that biased their meanings towards a specific interpretation (e.g., bathtub-slip vs. bathtub-relax), and (Experiment 2; N = 128) word-class ambiguous words (e.g., loan) in sentences where the words were used in their dispreferred word class (e.g., "He will loan me money"). Both experiments showed that such sentential experience influenced later interpretation and usage of the words more after a night's sleep than a day awake. We interpret these results as evidence for a general role of episodic memory in language comprehension such that new episodic memories are formed every time a sentence is comprehended, and these memories contribute to lexical processing next time the word is encountered, as well as potentially to the fine-tuning of long-term lexical knowledge.

TAKE A FLIGHT OR BE AT THE AIRPORT? THE INFLUENCE OF EVENT VERSUS LOCATION CUES ON CHAINED-EVENT SEQUENCES WHEN SPONTANEOUSLY THINKING ABOUT YOUR FUTURE AND PAST.

Mackenzie Bain, University of Western Ontario; Ken McRae, University of Western Ontario

Involuntary autobiographical memory studies suggest that environmental cues prompt associated memories. When multiple related memories are produced in immediate succession, they are described as chained-event sequences. Despite overlap between autobiographical memory and episodic future thinking, whether future thoughts occur in chains has not been studied. We investigated the degree to which future thoughts occur in chains, and how cue type may influence future event chained and non-chained sequences. Participants completed a boring vigilance search task that prompted spontaneous thoughts by presenting either event (take a flight) or location cues (airport) every six trials. Across 300 trials, there were 10 interruptions, and participants' audio recorded any off-task thoughts. The pattern of responses differed for event (39% future, 36% past, 8% present, 17% atemporal) versus location cues (28% future, 56% past, 3% present, 13% atemporal). When participants produced response sequences, for future thoughts, locations resulted in 54% chained and 46% non-chained sequences. In contrast, sequences for event cues were predominantly chained (71%). For memories, 66% of responses were chained for locations, and 74% were chained for events. Therefore, spontaneous future thoughts occur in chained-event sequences, and related future thoughts are produced more frequently when people are prompted by event than location cues.

AGENCY OF CHOICE AND ITS EFFECT ON MEMORY THROUGHOUT THE LIFESPAN

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Most studies measure episodic memory under passive conditions where participants have little to no control over what they learn. Past research has found that encoding manipulations that promote active learning enhance memory among younger adults (Schutte & Malouf, 2019; Markant et al., 2016; Murty et al., 2015). In this study, we examined the effects of agency at encoding on episodic memory among healthy younger and older adults. In two experiments, participants were told that they were learning the meaning of novel stimuli (meaning of Japanese Hiragana figures in Experiment 1; meaning of rare English words in Experiment 2). During each trial of the encoding phase, two stimuli were presented side-by-side (Hiragana figures or rare words) and participants could either pick which one they wanted to learn the meaning of (Choice condition) or were told which to pick (Fixed Condition). Participants then completed a recognition test for the meanings 24 hours later. Older adults performed better on Choice relative to Fixed trials in Experiment 2, showing a benefit of agency. In contrast to past findings, we did not find any memorial benefit of agency among younger adults. Results are discussed in terms of reward-based learning, curiosity, and lifelong learning.

QUANTIFYING MEMORY TRANSFORMATION WITH SCRAMBLED NARRATIVES

William Fisher, York University, Glendon Campus; Buddhika Bellana, York University, Glendon Campus; Rotman Research Institute, Baycrest; Andrée-Ann Cyr, York University, Glendon Campus

Memories transform over time, both neural representations and experiential qualities (Winocur & Moscovitch, 2011). This qualitative transformation has been characterized as memories becoming less episodic and more schematic over time (Wiltgen & Silva, 2007). We propose a new experimental paradigm for quantifying memory transformation. Participants read a short story with the order of events randomly scrambled. Participants then reorder brief descriptions of each story event based on their memory. We hypothesized that a memory becoming more 'schematized' could be quantified as the Spearman correlation between the order of participants' recalled events and the original order of events before scrambling. Higher correlations indicate a greater reliance on the understanding of how stories tend to unfold (i.e., schematic), rather than the order it was presented (i.e., episodic). Results revealed that participants can reliably recall the story in the order it was presented, and infer its original order before scrambling. Upcoming data collection will test whether memory performance after a delay is better characterized by the original story order than the presented order, as would be predicted by accounts of memory transformation.

THE CURSE OF IMAGERY: TRAIT OBJECT AND SPATIAL IMAGERY RELATE TO TRAUMA AND STRESS OUTCOMES

Ryan C. Yeung, Rotman Research Institute, Baycrest Health Sciences; H. Moriah Sokolowski, Rotman Research Institute, Baycrest Health Sciences; Carina L. Fan, Rotman Research Institute, Baycrest Health Sciences; Myra A. Fernandes, Department of Psychology, University of Waterloo; Brian Levine, Rotman Research Institute, Baycrest Health Sciences

Imagery is integral to autobiographical memory (AM). Past work has particularly highlighted the benefits of high trait imagery on episodic AM, such as faster, more detailed retrieval and greater feelings of vividness and reliving. However, these advantages can also come with drawbacks: following stressful or traumatic events, strong imagery could promote the intrusive memories and flashbacks characteristic of PTSD. We examined relationships between trait object imagery (e.g., imagery for form, size, shape, etc.), spatial imagery (e.g., imagery for spatial relations, locations, etc.), and PTSD symptoms (e.g., intrusive memories) using self-report measures in online studies with two independent samples: undergraduates (n = 493) and trauma-exposed adults (n = 787). Controlling for depression symptoms, regressions indicated that higher object imagery was associated with more PTSD symptoms in both samples (βs = 0.18–0.20, ps < .007). In contrast, spatial imagery was associated with fewer PTSD symptoms, although this effect interacted with gender such that it was present in men (βs = 0.18–0.25, ps < .03) and not women. These findings suggest that different forms of imagery have different (or even opposing) relationships with remembering, which in turn impacts outcome following exposure to trauma and stress.

SOCIAL COGNITION I

TOPIC ANALYSIS REVEALS FIRST IMPRESSIONS OF VOICES

Jessica Ostrega, McMaster University; David Feinberg, McMaster University

When people hear a novel voice they rapidly form a first impression of the speaker. A well-known theory of first impressions proposes that faces vary on the dimensions of valence and dominance. Many studies using orthogonal factor rotations have found a third dimension in perceptions of faces of youthfulness/attractiveness. However, in most of these studies participants are provided the same questionnaire. Free-form and unconstrained descriptions of female voices and faces have been studied but have relied on researchers' opinions to organize descriptions. We used machine learning to categorize participants' free responses to shift the degrees of freedom away from category membership. Participants provided free form responses of 50 female and 50 male voices speaking the word 'hi'. A rich set of features that people used to categorize voices were found. These features did not include valence or dominance, suggesting that while these are important traits to researchers, they may not be important when forming first impressions. An overly reductionist approach to understanding the cognitive complexity of voice perception tends to underrepresent the rich set of features conveyed by the voice.

EYES ON THE CLOCK: HOW EMOTIONAL GAZE CUES MAKE TIME SLOW DOWN
Sarah McCrackin, McGill University; Alice Zhang, McGill University; Florence Mayrand, McGill University; Jelena Ristic, McGill University

Humans automatically follow where others are looking, especially if the gazing face displays an emotional expression. Does following gaze of an emotional face impact how we perceive the gazed-at object's time duration? Participants viewed face images that shifted their gaze towards a response target or an opposite peripheral location and either remained neutral or reacted emotionally with a happy or fearful expression. Target duration varied in time between 900 and 1500ms and participants were asked to indicate whether the target duration was closer to the short or long duration. The results indicated that participants were more likely to judge that gazed-at targets were presented for the long time duration and only when faces displayed emotional but not neutral facial expressions. This suggests that targets gazed-at by emotional faces are perceived to last longer, which may reflect an adaptive function of gaze following to improve target processing.

CYBERSECURITY AS A SOCIAL DILEMMA
Jordan Sheen, Concordia University; Jordan Richard Schoenherr, Concordia University, Carleton University

Cybersecurity research has typically considered only computer hardware, networks, and the technical aspects of software. Users' beliefs and attitudes have only become the focus of cybersecurity research recently. The current study presented participants with cybersecurity scenarios that defined three kinds of social dilemmas: Assurance Dilemma, Chicken Dilemma, and Prisoner's Dilemma. Within each social dilemma participants were asked if they would cooperate by performing three cybersecurity tasks: report a suspicious email, run an antivirus scan, and take a cybersecurity course. The results of the present study revealed that while social dilemma type affected cooperation rate, the cybersecurity tasks did not. We additionally found that individual differences were important mediators of the cooperation rate.

SOCIAL COMMUNICATION IN DYADIC INTERACTIONS: FAMILIARITY INCREASES THE PREVALENCE OF EYE-TO-EYE MUTUAL GAZE
Florence Mayrand, McGill University; Jessica Haight, University of Alberta; Yedda Lam, McGill University; Jelena Ristic, McGill University

Human eyes convey a wide array of social messages, with mutual looks between two people representing one of the hallmark social gaze behaviors. Although mutual gaze is important for human social interactions, little remains known about whether it requires eye-to-eye contact or can also occur during general face-to-face looking patterns. To address this question, while measuring gaze behavior in live interacting dyads using dual mobile eye trackers, we examined how often participants engaged in mutual gaze as a function of looking towards the top (i.e., the Eye region) and bottom half of the face (i.e., the Mouth region). Additionally, we manipulated the familiarity level of the dyad, such that dyads of strangers and dyads of friends completed the study. The data indicated that, overall, participants engaged in mutual gaze in a variety of looking combinations (top and bottom face) but proportionately spent little time engaging in mutual looking combinations throughout the interaction. Friends spent significantly more time engaging in Eye-to-Eye mutual gaze while strangers engaged more in Eye-to-Mouth mutual gaze. Thus, mutual gaze appears to involve differential looking patterns toward the face, with the prevalence patterns affected by familiarity.

MUSIC COGNITION II

THE RELATIONSHIP BETWEEN BRAIN RESPONSES TO MUSICAL SCALE DEGREE AND GOODNESS-OF-FIT RATINGS

Danica Robichaud, Memorial University of Newfoundland; Sarah Sauvé, University of Lincoln, UK; Heath Matheson, Memorial University of Newfoundland; Benjamin Zendel, Memorial University of Newfoundland

The tonal hierarchy is the perceptual organization of the twelve pitches that divide the octave in the Western tonal system. Listeners tend to rate chord notes as being the best fit, followed by diatonic notes, while non-diatonic notes are rated the lowest. The relationship between neural responses to musical scale degree and goodness-of-fit ratings remains poorly understood. To explore this relationship, we used a probe tone-method while recording EEG. Participants listened to a chord progression followed by one of the 12 notes of the chromatic scale and rated the goodness-of-fit for each tone. Ratings were consistent with previous research. ERPs were generated by averaging EEG data to the 12 probe tones. Amplitude and latency of the N1 and P2 responses were analyzed. N1 and P2 amplitude and N1 latency were impacted by the tonal context of the probe tone, but were not related to goodness-of-fit ratings. P2 latency was not impacted by the tonal context of the probe tone, but was correlated with goodness-of-fit ratings. This suggests that earlier ERP responses are associated with the incoming stimuli, while the latency of the P2 is associated with a judgement on that stimuli.

EXPLORING CANNABIS, MUSIC ABSORPTION, AND AUDITORY PERCEPTION

Lena Darakjian, Toronto Metropolitan University; Chi Yhun Lo, Toronto Metropolitan University; Frank Russo, Toronto Metropolitan University

Systematic research examining the neurological underpinnings between cannabis, cognition, and auditory perception has been limited. However, the widespread consumption of cannabis supports the need for research on the effects of cannabis. This study aims to understand how the auditory world is experienced while under a cannabis-induced state of consciousness. Fifty-seven experienced recreational cannabis users (Mage = 26 years; 35 females; 22 males) completed an online questionnaire that covered: (1) demographics, (2) cannabis use, (3) auditory experience under a cannabis-induced altered state, and (4) music experience while in a cannabis-induced altered state. Findings from the questionnaire revealed that 60 percent of participants reported cannabis influenced their hearing, such as greater sound clarity and attentiveness ($p<0.001$*). Forty-six percent of respondents reported better hearing sensitivity, such as the ability to detect subtle changes in sounds under the influence of cannabis ($p=0.013$*). State music absorption increased while stoned or high ($p = 0.001$*, Mpre-post = 1.04, SD = 1.41). Although auditory experiences are highly idiosyncratic, better hearing sensitivity is prominent. Notable auditory enhancements following cannabis use included greater acoustic precision, lyric comprehension, and overall greater pleasure associated with sound and music. State music absorption also increased while high, suggestive of an induced flow state.

CAN MUSICAL CUES AID IN UNDERSTANDING SPEECH-IN-NOISE?

Benjamin Rich Zendel, Memorial University of Newfoundland; Liam Robbins, Memorial University of Newfoundland

Difficulty understanding speech when there is loud background noise is one of the most commonly reported hearing issues in older adults. One potential approach to improve the ability to understand Speech-in-Noise (SPiN) could be through rehabilitation programs that scaffold SPiN tasks onto a different cognitive ability that is relatively preserved in aging. Interestingly, it has been shown that unlike SPiN perception, music perception is relatively preserved in older adults. Accordingly, the goal of this study was to determine if adding musical features to speech could improve understanding SPiN. To test this possibility, participants completed an adaptive SPiN test to determine the 50% signal-to-noise ratio threshold. The target speech (i.e., signal) was presented in 4-talker babble noise, and manipulated across four conditions: Spoken, Sung, Rapped (i.e., musical/isochronous rhythm, spoken prosody), and Melodic (i.e., spoken rhythm, musical melody/prosody). Compared to Spoken, thresholds were higher (i.e., worse) for Sung, similar for Rapped, and lower (i.e., better) for Melodic. These findings suggest that melodic features alone are used by listeners to aid in their understanding of SPiN. Furthermore, these results provide support for using melodic prosody as a foundation to develop scaffold-based forms of auditory rehabilitation focused on improving SPiN.

MODELING DISCONTINUOUS CULTURAL EVOLUTION: THE IMPACT OF CROSS-DOMAIN TRANSFER
Liane Gabora, University of British Columbia; Kirthana Ganesh, University of British Columbia

We present a study that set out to investigate and formally model cultural discontinuities using a new modelling approach. Nine creators generated music, prose, poetry, and visual art inspired by the oldest-known uncontested example of figurative art—a sculpted figurine of the Hohlenstein-Stadel Löwenmensch (lion-human). Their artworks thus entailed cross-domain transfer from inspirational source (figurine) to creative product (music, prose, poetry, or visual art). The creators also answered questionnaires about the process. This data revealed four through-lines by which they expressed the Löwenmensch in an alternative art form: (1) lion-human hybrid, (2) subtracting from the whole to reveal the form within, (3) deterioration, and (4) waiting to be found with a story to tell. Since autocatalytic networks are uniquely suited to model cumulative, generative network growth, they were used to model how these four spontaneously derived through-lines form a cultural lineage from Löwenmensch to artist to audience. These threads of cultural continuity formed the backbone of this Löwenmensch-inspired cultural lineage, enabling culture to evolve even in the face of discontinuity at the level conventional categories or domains. We know of no other theoretical framework for modelling cultural evolution that accommodates cross-domain transfer or other forms of discontinuity.

INTERACTIONS WITH TECHNOLOGY

HOW THE FEELING OF PRESENCE AFFECTS MOTION SICKNESS IN VIRTUAL ENVIRONMENTS
Aalim Makani, Toronto Metropolitan University; Sonja Givetash, Toronto Metropolitan University; Raheleh Saryazdi, KITE-Toronto Rehabilitation Institute, University Health Network; Behrang Keshavarz, KITE-Toronto Rehabilitation Institute, University Health Network And Toronto Metropolitan University

Virtual Reality (VR) applications are increasingly being utilized for research, healthcare, and education. Despite their benefits, many VR users report motion sickness-like sensations (VR sickness), such as headache, disorientation, or nausea. Previous studies suggested that the sense of presence (“being there”) in the virtual world may contribute to the severity of VR sickness experienced; however, results have been contradictory, with some studies reporting a negative or a positive relationship between the two. The goal of the current study was to further investigate how presence and VR sickness are linked by manipulating the level of presence while measuring VR sickness. Participants were exposed to a VR scene presented on a head-mounted display showing a 15-minute-long passive movement through space. The level of presence was varied by having a self-avatar (astronaut suit with hand-tracking) present or absent. VR sickness was recorded every minute during stimulus presentation and thereafter via subjective ratings. Preliminary results (n = 32) showed that participants reported more presence in the avatar than in the no avatar condition. At the same time, the avatar condition also reduced the severity of VR sickness, suggesting that the user’s experience in VR can be improved when they feel more present.

THE INFLUENCE OF SENSORY SENSITIVITIES ON MOTOR CONTROL ACROSS DIFFERENT SENSORY ENVIRONMENTS
Sydney Austin, Wilfrid Laurier University; Anahid Pourtousi, Western University; Kaylena Ehgoetz Martens, University of Waterloo; Bernice Leung, Western University; Kara Hannah, Western University; Carolynn Hare, Western University; Carolynn Hare, Western University; Nichole Scheerer, Wilfrid Laurier University; Ryan Stevenson, Western University

Sensory information plays a fundamental role in the brain's ability to learn and regulate movements. This study aims to investigate how endogenous sensory processing differences alter motor output. Using virtual reality (VR) technology, we explore how varying levels of sensory information influences motor control, while controlling for varying levels of sensory sensitivities. Wearing a VR headset, participants were asked to stand and walk on a 16-foot pressure-sensitive walkway. Our VR environment simulated both sparse and crowded naturalistic environments, which were paired with silence and crowd noise to create low and high visual, auditory, and auditory and visual sensory conditions. We hypothesized that greater visual and auditory stimulation would leave fewer cognitive resources available for people to monitor and regulate their posture and gait patterns, resulting in poorer motor control. These impairments were expected to be increasingly marked with heightened sensory sensitivities. The results of this study will allow us to better understand if sensory sensitivities render individuals unable to perform simple motor tasks (e.g., standing, walking), which may interfere with both social and occupational success.

EFFECTS OF CENTRAL VS PERIPHERAL ATTENTIONAL 'EXERCISE' ON READING AND GRAPHICAL TASKS
Shaylyn Kress, University of Saskatchewan; Josh Neudorf, Simon Fraser University; Ron Borowsky, University of Saskatchewan

Background. Recent research suggests action video games may improve reading ability in children (Franceschini et al., 2017; Pasqualotto et al., 2022). We extended this work to adults and observed peripheral demands in video games were associated with faster reading speeds, which may indicate that these visual demands exercise oculomotor control ability (Kress et al., 2023). Methods. The current study manipulated within-experiment peripheral and central demands to evaluate the immediate effects of visual demands on task performance. Our study included two tasks: a text-based lexical decision task (LDT), and a novel graphic-based healthbar task. The stimuli were presented centrally in one block and peripherally in another block to manipulate visual demand location. The benefits of visual demands were assessed by computing difference scores for each task and comparing the between-subjects effect of Order (central-first vs peripheral-first).Results. The 95% CIs of block 1-2 difference scores showed significant benefits for peripheral-first participants in both tasks, and costs for central-first participants that were significant in the LDT.Conclusion. This series of studies is the first experimental demonstration of reading benefits due to peripheral attentional exercise. These findings help elucidate the relationship between visual demands and reading ability.

PSYCHO-PHYSICAL AND SUBJECTIVE PREDICTORS OF POSITIVE AFFECT IN VIDEOGAMING
Monica Tsang

Our study examined how arousal and flow predicted levels of positive affect in 58 videogame players using the desktop arcade game Winterbells. While arousal and flow are frequently examined in video game research, this study examined their combined effects in accounting for positive affect variance. We used an ABBA experimental design, where "A" and "B" denoted the control and game epochs respectively, to assess gamers' psychophysiological reactions during video gameplay while participants' heart rate (HR) and skin conductance levels (SCL) were recorded. SCLs were significantly higher in the game epochs compared to the control epochs. Surprisingly, HR failed to mirror these effects. Using a hierarchical multiple regression framework, we showed that while both subjective and objective arousal (HR) during game epochs predicted positive affect, flow significantly added to the ability to predict positive affect. Based on this research, measurement of HR, SCL and flow can aid in the predictions of positive affect for future videogame development.

NEURODIVERSITY IN LANGUAGE & ATTENTION

SCHIZOTYPAL TRAITS AND READING-RELATED SKILLS IN ADULT DEVELOPMENTAL DYSLEXIA
Narissa Byers, University of New Brunswick; Dr. Gillian. A. O'Driscoll, McGill University; Dr. Debra Titone, McGill University; Dr. Veronica Whitford, University of New Brunswick

Although dyslexia and schizophrenia are clinically distinct conditions, they share genetic and pathophysiological overlap, as well as similar perceptual/neurocognitive impairments (e.g., executive functioning, oculomotor control, language, reading). Moreover, elevated schizotypal traits (a continuum of subclinical symptoms akin to those experienced in schizophrenia-spectrum disorders) have been reported in dyslexia (Barkus et al., 2022; Richardson, 1994; Richardson & Stein, 1993), including increased magical ideation (Richardson & Stein, 1993), unusual perceptual experiences (Richardson, 1994; Richardson & Stein, 1993), and disorganized traits, such as odd or eccentric behaviour (Barkus et al., 2022). However, whether and how these traits relate to reading abilities in dyslexia has been unexplored. Thus, the current study assessed schizotypal traits, namely, the three factors of the Schizotypy Personality Questionnaire (SPQ) - Brief: (1) cognitive-perceptual; (2) interpersonal; and (3) disorganized factors (Raine, 1991), as well as reading abilities (using standardized and experimental measures of reading) in adults with dyslexia (n = 19) compared to matched controls (n = 17). Results revealed elevated schizotypal traits (disorganized factor, total score), as well as a positive association between the cognitive-perceptual factor and reading abilities in the dyslexia sample. Ultimately, our results provide some additional evidence of a common neurodevelopmental basis between dyslexia and schizophrenia.

OCULOMOTOR MARKERS OF TEXT READING DIFFICULTY IN SCHIZOPHRENIA AND DYSLEXIA: A COMPARISON

Victoria Matthews, University of New Brunswick; Gillian A. O'Driscoll, McGill University; Debra Titone, McGill University; Veronica Whitford, University of New Brunswick

Growing evidence suggests that schizophrenia (a psychiatric disorder characterized by perceptual and neurocognitive impairments) and developmental dyslexia (a learning disorder characterized by disfluent word reading) may share a common neurodevelopmental basis (Whitford et al., 2018). Support for this notion comes from research reporting genetic and pathophysiological overlap, as well as similar deficits in reading and reading-related processes (e.g., phonological processing, oculomotor control, executive functioning). Surprisingly, however, no empirical studies have directly compared naturalistic reading performance between these disorders. To address this issue, the current eye-tracking study examined text-level reading performance in adults with schizophrenia (n = 20) and psychiatrically healthy adults with dyslexia (n = 18). A number of eye movement reading measures were examined (e.g., average reading rates, average number of fixations). Our main findings were threefold: (1) more effortful reading behaviour in the schizophrenia group versus matched controls (e.g., slower reading rates, more/longer fixations); (2) comparable reading behaviour between the dyslexia group and matched controls, indicative of a potentially sub-optimal reading strategy; and (3) comparable reading behaviour between the schizophrenia and dyslexia groups. Taken together, our study suggests that text-level reading performance is indeed similar in schizophrenia and dyslexia, providing some additional support for a common neurodevelopmental basis.

SCHIZOPHRENIA AND THE ATTENTION NETWORK TEST: A META-ANALYSIS

Nicholas Murray, Dalhousie University

Schizophrenia is characterized by attentional deficits in executive control, as measured by the Wisconsin Card Sorting Test (Prentice et al., 2008). This is consistent with findings that schizophrenia patients have difficulty endogenously disengaging attention, as assessed via inhibition of return (Mushquash et al., 2012). Schizophrenia patients may also experience hypervigilance (Freedman et al., 1991). Fan et al.'s (2002) Attention Network Test (ANT) can measure scores for the alerting, orienting, and executive control networks of attention. Two previous meta-analyses have compared network scores of healthy controls and people with attention deficit hyperactivity disorder (Arora et al., 2020), and autism spectrum disorder (Good et al., 2022). The present project meta-analyzed six studies comparing attention network scores of schizophrenia patients ranging from (N = 261) and healthy controls (N = 245). Aside from discussing differences in network scores between healthy controls and schizophrenia patients, the presentation will also discuss how network score differences may change by sex, and how the available literature is limited primarily by unreliable symptamatological considerations, and inconsistent inclusion/exclusion criteria.

POSITIVE IMPACT OF SKILL AND GOAL-BASED TRAINING IN ADULTS WITH DYSLEXIA: A RANDOMIZED INTERVENTION TRIAL

Kulpreet Cheema, University of Alberta; Jacqueline Cummine, University of Alberta; Bill Hodgetts, University of Alberta

Intervention programs for a learning-based disorder, Dyslexia, mainly target the component skills of reading and writing while ignoring the psychosocial outcomes of low motivation and high anxiety. This study fills this gap by investigating the impact of two intervention programs on literacy, psychosocial outcomes and goal attainment in adults with Dyslexia. Twenty-one adults with Dyslexia participated in an online intervention program for eight weeks: Skill-based (N= 12, mean age = 25.3 years) and Goal-based (N= 9, mean age = 29.0 years). In Skill-based training, participants watched video lessons and completed assignments targeting four core reading skills. In the Goal-based training, participants completed strategies & activities to achieve their personalized goals. Before and after the intervention, participants completed a series of behavioural measures of reading, spelling, comprehension, reading motivation, self-efficacy, and anxiety. A significant positive impact of the intervention on reading fluency (effect size = 0.59), decoding (ES = 0.85) and comprehension (ES = 0.46) was found for both training groups. In addition, goal-based participants also completed a person-centred outcome measure called Goal Attainment Scaling, which revealed significant attainment of goals by the participants. We discuss these findings in light of the previous evidence and future directions for reading rehabilitation research.

METACOGNITION IN MEMORY

REMEMBERING WHAT WAS NOT CHOSEN: THE INFLUENCE OF OPTION SIMILARITY AND STRATEGY

Azara Lalla, McGill University; S. Sheldon, McGill University

The aim of our study was to identify how the similarity between choice options affects memory. Specifically, we tested the hypothesis that deliberating between similar options evokes a relational choice strategy (in which both options are compared), improving memory for unchosen items. Three online behavioural experiments were conducted to test this hypothesis. In Experiment 1, participants described what strategy they used when making choices between similar (e.g., an apple versus a pear) and dissimilar (e.g., waffles versus camera) options, revealing a tendency to use a relational strategy more in the similar than dissimilar condition. In Experiment 2, a new sample of participants chose between similar or dissimilar options and then completed a recognition memory test for all options 24-hours later, revealing a memory benefit for the unchosen option in the similar compared to dissimilar condition. Finally, in Experiment 3 a new group of participants reported their strategy while choosing between similar and dissimilar options, and had their memory tested for the items 24-hours later. We confirmed that participants were more likely to use a relational strategy when choosing between similar than dissimilar items, and that memory for the unchosen items was higher on similar compared to dissimilar choice trials.

METACOGNITIVE REACTIVITY FOLLOWING RESTUDY DECISIONS: DOES WHAT YOU DECIDE IMPACT FUTURE MEMORY?

Skylar Laursen, University of Guelph; Chris M. Fiacconi, University of Guelph

Previous research on metacognitive reactivity, the finding that explicitly requiring individuals to provide a metacognitive judgment (e.g., restudy decisions) changes future memory performance, has primarily considered conditions in which individuals are and are not required to provide such metacognitive judgments (Mitchum et al., 2016). It is yet unknown whether the contents, and future ramifications of the judgment made may also induce decision-driven metacognitive reactivity. The current series of experiments sought to answer this question and shed light on potential reasons for this type of decision-driven metacognitive reactivity. Across our experiments participants were presented with a list of to-be-remembered words, and were required to select half of the words to later restudy. Critically, 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 the non-selected items that were never re-presented was consistently better than selected items that were not re-presented. Here, we provide evidence that this decision-driven reactivity effect is not due solely to item-difficulty confounds, and test whether the mere expectation of re-presentation can elicit such reactivity.

CAN A "BIT" OF HELP GO A LONG WAY? EXAMINING HOW INDIVIDUALS BENEFIT FROM THE METACOGNITIVE INFORMATION OF NONHUMAN AGENTS USING RECOGNITION MEMORY

Megan Kelly, University of Waterloo; Evan Risko, University of Waterloo; Aaron Benjamin, University of Illinois Urbana-Champaign

As we gain increased access to increasingly sophisticated cognitive supports, interesting questions arise with respect to how individuals make decisions during their engagement with these tools and how performance might be optimized. We explore whether humans can benefit and learn from metacognitive information (i.e., confidence and confidence-accuracy calibration) of agents in the context of human-agent teams during a recognition memory task. Participants were presented a set of to-be-remembered words and then, for each item during recognition testing, were given the agent's response and associated confidence. Critically, the agents exhibited equal accuracy, but one was calibrated (positive confidence-accuracy relation) and one was not (no accuracy-confidence relation). Participants gave their own responses to each test item on the recognition test before (pre-agent) and after (post-agent) seeing the agent response. Humans that worked with a calibrated agent were more likely to adopt the agent's advice, particularly when highly confident. Human-agent teams roughly approximated an optimal metacognitive strategy in which the teammate with the higher confidence determined the team response though this actual performance was lower than theoretical performance under this strategy. Clearly, the degree and success of interaction with agents is determined in part by the metacognitive information provided by agents.

JUDGMENT OF LEARNING (JOL) REACTIVITY IN ORDER MEMORY PERFORMANCE: A TEMPORAL BIAS ANALYSIS

Katherine Churey, University of Guelph; Skylar Laursen, University of Guelph; Chris M. Fiacconi, University of Guelph

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 within a particular temporal context originally occurred, such than individuals may begin their recall with their most recent experiences (i.e., recency effect) or with the first events they experienced (i.e., primacy effect), or they may recall events together that were originally experienced close together in time (i.e., temporal contiguity effect; TCE). Interestingly, some encoding task manipulations – including those commonly used when studying metamemory – have been found to affect how information is initially processed which, in turn, may influence the patterns observed in later recall performance. Indeed, we recently found that the presence of metacognitive monitoring tasks (i.e., making judgments of learning; JOLs) at the time of encoding reduced the TCE observed in delayed recall, though the magnitude of this effect was inflated by the presence of other serial position effects (i.e., primacy, recency). Nevertheless, these findings add to the growing body of research suggesting that measuring metamemory is not an inert process insofar as the simple act of making metacognitive judgments can affect the patterns observed in later memory performance.

ACTION & ATTENTION

STANDING AT ATTENTION: POSTURAL EFFECTS ON ATTENTION

Jenna Bolzon, Trent University; Liana Brown, Trent University; Michael Reynolds, Trent University

A recent trend in the workplace is to use standing desks and workstations, which are thought to improve productivity and cognitive processing (Straub et al. 2022). Initial research observed that standing improved our ability to selectively attend to items in our environment (Rosenbaum et al., 2017; 2018; Smith et al., 2019). However, multiple replication attempts have failed to find these same effects of posture on attention, particularly in the Stroop task (Caron et al., 2020; Caron et al., 2022; Straub et al., 2022). Here, we examined whether the beneficial effects of posture on attention would be replicated with stronger manipulations of posture and search difficulty. Search difficulty was increased by increasing the number of distractors (Experiment 1) and by combining conjunction and variable-mapping search manipulations (Experiment 2; Schneider & Shiffrin, 1977; Treisman & Gelade, 1980). The difficulty of the posture manipulation was increased by having participants stand on a slant board (Experiment 3). The implications of posture on attention will be discussed.

DOES TOUCHING ITEMS IN MULTIPLE-OBJECT TRACKING (MOT) INCREASE THEIR LIKELIHOOD OF LATER BEING REPORTED AS TARGETS?

Mallory Terry, University of Guelph; Olivia Woodward-Smith, University of Guelph; Lana M. Trick, University of Guelph

Many tasks require performing coordinated actions towards specific moving items among others. This ability to keep track of the positions of a subset of items (targets) among identical others (distractors), referred to as multiple-object tracking (MOT), is thought to employ 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). Here we investigated if touching items during MOT increased the likelihood of those items being later reported as targets, and if this differed for targets as compared to distractors. Participants tracked 4 targets in MOT while touching targets or distractors in MOT that changed colour. At the end of the trial an item was probed, and the participant was asked to identify if this item was a target in MOT or not. As predicted, touched items were more likely to be reported as targets during the final target report vs. items that were not touched, especially when the touched item was a distractor in MOT. Findings support the contention of a shared mechanism employed in tracking and visually guided actions.

REFERENCE FRAMES UNDERLYING TARGET-DISTRACTOR COMPETITION IN OCULOMOTOR PROCESSING
Coleman Olenick, University of Guelph; Heather Jordan, University of Guelph; Mazyar Fallah, University of Guelph

Saccade planning to target objects is impacted by the presence of distractor objects leading to competition between them. Recently, the spatial relationship between the target and distractor has been shown to impact the trajectory of the saccade. We investigated the effects of independently varied target and distractor eccentricity on saccade trajectories. Using a visual search task, we recorded saccadic responses that were separated by saccadic response time (SRT) based on the curvature relative to the distractor. Short SRTs led to curvature towards the distractor, evidence of spatial averaging between the objects. At lower eccentricities, the relative weights of the objects increased, consistent with eccentricity-based salience-driven representations. Long SRTs led to trajectories curved away from the distractor, supporting the notion that the distractor is subject to top-down attentional inhibition after competition resolution. Additionally, the eccentricity effects were attenuated at longer SRTs, suggesting a shift from egocentric, salience-driven, representations to allocentric representations, integrating task goals. Both SRTs showed evidence of a spatial suppress surround suggesting that the interactions between object representations are complex even while competition is being resolved. These results indicate that there is a shift in both the reference frame and driving influence on saccade planning after competition resolution.

HOW DOES EXOGENOUS ATTENTION IMPACT ACTIONS AND THEIR PERCEIVED EFFECTS?
Jason Ivanoff, Saint Mary's University; Brooklyn Pike, Saint Mary's University

A sudden onset cue elicits an exogenous shift of attention, given the right circumstances. Despite decades of research on exogenous attention, we know surprisingly very little about how it impacts the perceived, and anticipated, effects of an action. To bridge this gap, the current study examined the effect of an uninformative peripheral cue on computer mouse movements directed to targets under different mouse-cursor conditions. In an ideomotor compatible (IC) block, the mouse movement and cursor movement occurred in spatial synchrony. In an ideomotor incompatible (II) block, the mouse movement and cursor movement were inverted along the x-axis. Finally, in a no-cursor (NC) block, the mouse cursor was invisible (and potentially imagined) during movement. Expectedly, the cue facilitated reaction times across all conditions. Although the cue tended to attract early phase movements in all conditions, the impact of the cue was delayed, and prolonged, in the NC block than it was in the IC block. These results suggest that there is a tight coupling between exogenous attention and the early visual consequences of an action.

LANGUAGE & MULTILINGUALISM I

LANGUAGE BACKGROUND AND INTERPRETATION OF NOISY SPEECH INPUT
Tyler Call, Carleton University; Olessia Jouravlev, Carleton University;

Speech is often noisy, as it might contain grammatical or semantic mistakes. Listeners can “fix” noisy speech by inferring the intended meaning or can refuse to interpret it. Gibson et al. (2017) demonstrated that listeners are more likely to interpret noisy speech as making sense when speakers have a foreign accent vs. no accent. Thus, a linguistic background of speakers contributes to the likelihood that communication will proceed successfully when speech is noisy. We further explored whether a linguistic background of a listener (i.e., whether they are native (L1) or non-native (L2) speakers of English) might also be a factor contributing to the likelihood that noisy speech is deemed plausible. L2 speakers have more experience with noisy speech overall. Therefore, L2 speakers might be more likely to “fix” noisy speech input compared to L1 speakers, especially when noisy speech is spoken with a foreign accent. Indeed, we observed a significant effect of listeners’ English status: L2 speakers were more likely to infer intended meanings of ungrammatical utterances compared to L1 speakers.

VISUOSPATIAL SERIAL ORDER RECALL IN BILINGUALS VS. MONOLINGUALS VS. CHIMPANZEES

Nadine Charanek, Carleton University; Panos Athanasopoulos, Lancaster University; Olessia Jouravlev, Carleton University

Chimpanzees have been shown to outperform humans in visuospatial serial order recall (Matsuzawa, 2003). According to the cognitive trade-off hypothesis (Matsuzawa, 2007), chimpanzees are superior to humans in this task because humans sacrificed the robust working memory system to accommodate the complex system of language. Building on the premises of the cognitive trade-off hypothesis, we hypothesized that acquiring multiple languages might be associated with additional costs in the visuospatial working memory that bilinguals incur. To testthis hypothesis, we compared the performance of monolinguals vs. bilinguals (and vs. data from chimpanzees reported in Matsuzawa, 2003) as they engaged in a limited-hold masking task. In this task, visual stimuli (numerals or nonverbal pictures) are briefly displayed on the screen before being masked by white boxes. Participants memorized the location of the stimuli in the order of their appearance. Consistent with prior research, we found that chimpanzees outperformed humans. Further, there were indications that bilinguals with a particular language background history (balanced; need to use 2 languages on daily basis) differed from monolinguals in their performance in the visuospatial serial order recall.

THE ROLE OF EYE MOVEMENTS AND ATTENTION ON LANGUAGE INTRUSIONS DURING BILINGUAL READING

Emalie Hendel, Université de Moncton; Dominic Guitard, Cardiff University; Annie Roy-Charland, Université de Moncton; Jean Saint-Aubin, Université de Moncton

For a reason which is yet unknown, bilinguals produce more unintentional language switches on function words than on content words. In six experiments, we aimed to evaluate the role of attention processes on the production of these errors. In Experiment 1, 48 English-French bilinguals performed a classic mixed-language read aloud task in which they produced the most intrusions on 3-letter English function words. In Experiment 2, French-English bilinguals demonstrated the same word function effect. Importantly, measures of eye movements revealed that function words were no more likely to be skipped than content words. Therefore, language switch cannot be attributed to simple guessing or lack of perceptual information. In Experiments 3 and 4, we computerized the continuous mixed-language reading task and had participants use their computer mice to detect language switches. Once again, 3-letter function words were most susceptible to being missed by English and French L1 bilinguals. Finally, to control eye movements, we used an RSVP procedure and found that 3-letter English words (Exp. 5) and function words remained the most susceptible to detection errors by English L1 (Exp. 5) and French L1 (Exp. 6) bilinguals. We conclude that the word function effect among bilinguals is related to attentional deployment.

AFFECTIVE PROCESSING IN NON-NATIVE SPEECH: EXAMINING THE EFFECT OF SPECIFIC EMOTIONAL STATES

Sandrine Hachez, Carleton University; Olessia Jouravlev, Carleton University

The question of reduced emotionality during non-native (L2) processing is a topic of debate. Whereas some researchers find decreased emotional responses to L2 vs. L1, others fail to find such differences. In prior research, the effect of words' valence and arousal was examined. In addition, words could be described as being related to a particular emotional state. However, processing of this facet of emotional semantics in L1 vs. L2 has not been examined yet. In our study, native and non-native speakers of English completed a lexical decision task where emotionally laden and emotionally neutral words were presented. Emotionally-laden words were selected in such a way that there was an equal number of words with high-ranking values for 5 emotional states (i.e., happiness, sadness, disgust, fear, and anger). Whereas we did not find that words' valence or arousal impacted performance of native vs. non-native speakers differently, we did find group differences for effects of words' happiness, anger, and disgust. Specifically, native speakers were faster to process words with high vs. low happiness or anger values. In contrast, they were slower to process words with high vs. low disgust values. In non-native speakers, these effects were reduced compared to native speakers.

VISUAL SEARCH & DECISION-MAKING

TARGET-DISTRACTOR COMPETITION EFFECTS ON SACCADE TRAJECTORIES REFLECT DECISION-MAKING PROCESSES

Mazyar Fallah, University of Guelph; Caroline Giuricich, York University; Heather Jordan, University of Guelph

To understand target-distractor competition, we varied the distance between and the similarity of complex target and distractor objects in a delayed match-to-sample task and measured their effects on saccade trajectories. When target-distractor competition is still active, i.e. trials with short saccadic reaction times (SRTs), both the target and distractor are attractive causing saccade trajectories to the target to also deviate towards the distractor. We found that the competition was dependent both on spatial distance and distance in object-space. When there was sufficient time for competition between the objects to complete (longer SRTs), saccade trajectories deviated away from the now repulsive distractor. Post-decision-making competition was also dependent on spatial distance, but was modulated by a spatial suppressive surround as predicted by the Selective Tuning model of attention. Overall, saccade trajectories reflect target-distractor competition that is affected independently by both spatial and object-space suppressive surrounds. The differences in saccade trajectories at short and long SRTs distinguish between active and completed decision-making processes which can be used to estimate the time to completion of decision-making processes.

AN EXPLORATION OF CONCEPTUAL SIMILARITY IN MULTIPLE TARGET VISUAL SEARCH

Lee-Amber Laderoute, University of Regina; Chris Oriet, University of Regina

Studies that find poor performance for multiple target visual search typically only include 2-target trials. In our previous study, we manipulated the number of items being searched for (2, 6, or 18), and the perceptual similarity between targets. Per-item search times decreased as the number of targets increased, but manipulating the perceptual similarity of targets had no effect. However, since the conceptual similarity of the targets remained constant and high (e.g., all were pills), perceptual similarity may have been irrelevant. Here, we varied the number of targets and the conceptual similarity between targets in naturalistic scenes. In each image, all targets were perceptually unique instances of the same item, items belonging to the same narrow conceptual category, or items belonging to the same broad conceptual category. In each trial, observers searched for 2, 6, or 18 items in 1 of 3 different backgrounds (e.g., 6 hair accessories in a suitcase scene). Total response time, proportion of targets found, and average response time per item were measured. Search efficiency increased as target set size increased, and there was a search benefit for same-item targets. The results are interpreted in the context of the current multiple target visual search literature.

NEURAL AND COMPUTATIONAL EVIDENCE FOR INDEPENDENT COGNITIVE CONTROL OVER TARGET ENHANCEMENT AND DISTRACTOR SUPPRESSION

Harrison Ritz, Princeton Neuroscience Institute Amitai Shenhav, Brown University

It takes 50 muscles to use a pair of chopsticks. This kind of complex coordination problem has been at the heart of computational theories of motor control for nearly a century. Like our physical actions, our cognitive actions are complex, goal-directed, and effortful. Are they coordinated in similar ways?To develop a framework for cognitive coordination, we explored how people control attention across multiple streams of information (targets and distractors). First, over a series of psychophysical experiments (N=158), we found that people independently and dynamically enhance target processing and suppress distractor processing. These attentional dynamics were recapitulated in a feedback-controlled neural network model of top-down attention. Next, using fMRI (N=29), we found strong evidence for independent encoding of target and distractor intensity in parietal cortex. These intensity-encoding subspaces were aligned with functional connectivity to prefrontal cortex and were absent during a perceptually-matched task with minimal control demands, consistent with their role in top-down attention. These findings suggest that the brain can dynamically coordinate attention across multiple information sources, with implications for core theories of mental effort. Moving forward, computational frameworks like optimal feedback control may provide harmonized accounts of effortful, goal-directed actions across motor and cognitive domains.

THE FACE BEHIND THE TASK: USING AFFECTIVE RATINGS OF EMOTIONALLY EXPRESSIVE DISTRACTORS TO TEST COMPETING ACCOUNTS OF ATTENTION UNDER PERCEPTUAL LOAD.

Niyatee Narkar, University of Guelph; Natasha M. Saccon, University of Guelph; Rashmi Gupta, Indian Institute of Technology, Bombay; Mark J. Fenske, University of Guelph

The emotion expressed by a face, though irrelevant to the task, can provide a salient signal that captures attention away from task-relevant objects in the environment. How we deal with such task-interfering distractions may provide important information about the attentional mechanisms involved in prioritizing stimulus processing. Does the influence of distractors depend solely on the availability of processing resources that can enhance their mental representations (load theory), or does it depend on whether an inhibitory mechanism is engaged to actively suppress their representations (inhibition theory)? Here we test between these competing accounts by asking participants (N = 141) to affectively rate happy and sad distractor faces that appeared on easy (low-load) or hard (high-load) visual-search displays. Because previously inhibited stimuli tend to be rated more negatively than previously unseen stimuli, we used the extent to which faces in each condition were devalued from novel faces as an index of the potential involvement of inhibition. We obtained no evidence of the involvement of inhibition in any condition, yielding support for the load hypothesis. Our results underscore the importance of considering the interplay between attention and emotion in better understanding how we prioritize the processing of the people and objects we encounter.

MEMORY II

DUAL PROCESSES IN RECOGNITION MEMORY: OPPOSING INFLUENCES OF PERCEPTUAL (DIS)FLUENCY ON RECOGNITION MEMORY DECISIONS.

Ver-Se Denga, McMaster University; Shanur Syed, McMaster University; Isaac Kinley, McMaster University; Bruce Milliken, McMaster University

A key finding in recognition memory experiments is that difficult-to-process stimuli are often remembered better than easy-to-process stimuli. In prior work, we have manipulated processing-difficulty by asking participants to name one of two interleaved word pairs that were either congruent (perceptually fluent) or incongruent (perceptually disfluent). In line with the desirable difficulty principle, we have found that recognition sensitivity (d') is greater for incongruent items. However, it has been puzzling to some that this sensitivity difference is often not reflected in hit rates. We propose that a dual process account can explain this absence of a hit rate effect. While disfluency at study leads to better item encoding, a separate influence of processing fluency occurs at test. Items at test that are perceptually fluent lead to a well-known illusion of memory, where participants mistake the ease of processing of these items with prior experience. We report the results of a study in which separate manipulations of processing fluency at study and test point to these two influences on recognition memory decisions.

SOURCE MISATTRIBUTION: DOES REPEATED RETRIEVAL PRACTICE MITIGATE CONJUNCTION ERRORS?

Donnelle DiMarco, University of Guelph; Daniel Perlmutter, University of Guelph; Harvey Marmurek, University of Guelph

The objective of the current study was to explore a form of misattribution errors known as conjunction errors. Conjunction errors reflect a failure of source monitoring that leads to the false recognition lures composed of fragments of previously experienced 'parent' stimuli. For example, studying the parent words "airstream" and "passport" increases the likelihood of false recognizing the conjunction word "airport" relative to foils unrelated to the parent words (Jones & Jacoby, 2001; Reinitz, et al., 1992). Specifically, to determine whether retrieval practice and review repetitions minimize the frequency of conjunction errors. The results found that there was a benefit of retrieval practice over restudying for once presented studied items but not for twice presented items. For the discrimination of the two types of new items, it was found that review testing led to higher discrimination compared to restudying. This was found regardless of whether the studied items were presented once or twice during review. The current study provides novel evidence that retrieval practice facilitates the discrimination of conjunction errors and foils more than does restudying regardless of the number of review trials. In summary, retrieval practice promotes meta-cognitive awareness of the potential for conjunction errors during the final recognition test.

PRELIMINARY STUDY ON THE IMPACT OF COGNITIVE STYLES ON VISUO-HAPTIC OBJECT IDENTIFICATION
Aidan Steeves, Mount Allison University; Geneviève Desmarais, Mount Allison University

Haptic and visual object representations rely on similar processes, creating a memory trace that is accessible to both modalities. Past research has demonstrated the presence of a visual as well as a verbal component in these shared memories. The variability in past findings suggest other factors might be at play, for example stimulus characteristics or idiosyncratic variations in participant abilities. We therefore examined how stimulus complexity (simple vs. complex objects) and cognitive styles (preferred method for obtaining and applying information) impacted visual and haptic object learning. Participants completed a self-report measure of cognitive style, followed by an object identification task that required them to learn to identify simple or complex objects, either by sight or by touch. Two-thirds of participants simultaneously completed a verbal or visuospatial distractor task. Participants who completed the task without distraction displayed better identification performance compared to those who completed a visuospatial distractor task, especially when identifying complex objects. Furthermore, performance can be associated with one's cognitive style – at least in some experimental conditions. Our findings suggest that memory representations may not be fixed and may depend on context as well as individual differences.

PEOPLE FLEXIBLY USE DIFFERENT EXPLORATION STRATEGIES ACROSS LEARNING ENVIRONMENTS
Thomas Ferguson, University of Alberta; Alona Fyshe, University of Alberta; Adam White, University of Alberta; Olave Krigolson, University of Victoria

When learning, people must balance sampling from different options (exploration) and switching to select the best option (exploitation) at appropriate times. Previous work has revealed that people can use different exploration strategies to learn effectively. However, it remains unclear whether exploration strategy use is consistent across different learning environments. Using a within-subjects design, we investigated whether participants (n = 30) flexibly use different exploration strategies and whether exploratory behaviour generalizes across tasks. In the first task, a non-stationary multi-arm bandit, the reward values of the options changed slowly per a random walk formula. In the second task, a stationary multi-arm bandit, the reward values of the options remained fixed. We then classified participants' exploration strategies by comparing a series of computational models. In the non-stationary multi-arm bandit, participants' choices were best fit by a behavioural heuristic, the Win-Stay, Lose-Shift strategy. In the stationary multi-arm bandit, participants' choices were best fit by a reinforcement learning strategy. Thus, humans flexibly apply exploration strategies depending on environmental demands. In addition, exploration frequency was positively correlated between the two tasks, suggesting aspects of exploration do generalize across tasks. We speculate that our results reflect the hierarchical control of exploration strategies by frontal brain regions.

LANGUAGE & MULTILINGUALISM II

SENSORIMOTOR PLANNING AND LINGUISTIC CONTEXT IN BILINGUAL SPEECH PRODUCTION
Daniel R. Lametti, Acadia University

A long-standing problem in motor control relates to how motor memories for different skills resist interference. For instance, learning to hit a golf ball does not jeopardize other consolidated motor skills like the swing of a squash racquet. Contextual inference has recently been proposed as the mechanism that enables the maintenance and recall of distinct motor repertoires (Heald, Lengyel, & Wolpert, 2021). Research on the relationship between context and motor memory has primarily focused on reaching movements. But psycholinguists have long noted that many linguistic phenomena are highly context-dependent. Here, we bring together linguistics and motor control to examine the extent to which bilingual speakers can use linguistic context to learn, remember, and apply two different motor plans for producing the same speech sounds. In three studies, we demonstrate that language can be used as a contextual cue to acquire dramatically different sensorimotor plans for producing speech. We also show that these language-specific speech motor memories are largely confined to the linguistic level (sentence production) in which they are acquired. The results provide evidence that different aspects of language can be used to acquire and maintain highly specific motor plans for producing speech.

BILINGUALISM AND NON-NATIVE LANGUAGE LEARNING: IS LANGUAGE APTITUDE A STABLE CONSTRUCT?

Irina Smirnova-Godoy, Carleton University; Marina Panfilova, Carleton University; Hafsa Ahmed, Carleton University; Olessia Jouravlev, Carleton University

Language aptitude (i.e., our ability to learn languages) was traditionally viewed as a stable ability for learning languages. Modern research, however, proposes that language aptitude can be dynamic and trainable. Several studies showed that bilingual individuals differ from monolingual individuals in several cognitive processes and experiences. Specifically, there is a claim that it is easy to learn a foreign language if you already had such experience (i.e., you are bilingual). However, most of this evidence is anecdotal. In the current study, we investigated the effects of bilingualism on language aptitude using two complimentary paradigms. First, we trained a group of monolinguals and bilinguals in a miniature artificial language task. Second, the same participants completed Meara's (2005) LLAMA test, a standardized test of language aptitude. We found some evidence that bilinguals performed better in language aptitude tests due to their language learning experience and proficiency in two grammar systems.

WORD AGE OF ACQUISITION EFFECTS ON EYE MOVEMENT READING BEHAVIOUR IN LINGUISTICALLY DIVERSE CHILDREN AND ADULTS

Erika Guedea Morales, University of New Brunswick; Sarah MacIsaac, University of New Brunswick; Marc F. Joanisse, University of Western Ontario; Veronica Whitford, University of New Brunswick

Relatively little experimental research has examined the moment-to-moment cognitive processes that support reading in children, especially those from different language backgrounds, although reading is a crucial neurocognitive skill for children's academic success (Jared, 2015). To help address this gap in the literature, the current study employed temporally-sensitive eye movement measures of paragraph reading to examine how different language backgrounds (English monolingual, English-French bilingual) and developmental stages (early childhood, young adulthood) influence both first-language (L1) and second-language (L2) eye movement reading behaviour for naturalistic texts. We had a particular focus on word age of acquisition (AoA) effects, which reflect how easily words are retrieved from semantic memory based on when they were learned. Using newly collected English and French word AoA norms, linear mixed-effects models revealed robust word AoA effects, where earlier-learned words (e.g., dog) were processed more easily than later-learned words (e.g., pity), as evidenced by shorter fixation durations. However, the magnitude of these effects was larger in bilinguals vs. monolinguals, L2 vs. L1 among bilinguals, and children vs. adults. Our findings suggest that word AoA strongly influences eye movement reading behavior, particularly during conditions of reduced lexical entrenchment (e.g., among developing child readers, when reading in a weaker language).

THE MULTILINGUAL ADVANTAGE IN LANGUAGE LEARNING: CONTRIBUTIONS OF MULTILINGUALISM AND PROGRAMMING KNOWLEDGE ON ARTIFICIAL GRAMMAR LEARNING

Alex Rivard, Carleton University; Kasia Muldner, Carleton University; Olessia Jouravlev, Carleton University

Knowing more than one language is claimed to make learning additional foreign languages easier. It is unknown how knowledge of an artificial language, such as a programming language (e.g., Python, Matlab, Java), fares within this equation. Some researchers have claimed that programming and natural languages may be processed in a similar manner. In this perspective, knowledge of a programming language might confer similar benefits to knowing another natural language, including a superior ability to learn new foreign languages. To test this prediction, we examined performance of (1) monolingual speakers, (2) multilingual speakers, and (3) people with extensive programming experience on an artificial grammar learning (AGL) task. Our results revealed limited evidence that multilingual individuals were better in the AGL task than monolinguals. In contrast, participants who reported knowledge of a programming language performed significantly better than non-programmers in this task. Therefore, knowing a programming language may provide an advantage in learning new artificial grammars.

COGNITION & EDUCATION

THE EFFECTS OF PLAYBACK SPEED ALTERATION

Theepan Tharumalingam, University of Waterloo; Evan Risko, University of Waterloo

Video lectures are increasingly used as an educational resource, and they provide learners with a greater degree of control over their learning experience. One element of this control is the ability to alter the playback speed of the video. We conducted a survey to understand how widespread this behavior is. We found that altering the playback speed of video lectures is very common, with 90% of respondents reporting that they frequently utilize this option, and 96% of those reporting that they commonly increase the playback speed. This naturally raises questions of whether viewing content at an increased speed affects learning. To answer this question, we conducted a meta-analysis of the available literature. Pooling the results of 19 studies with 82 effect sizes, we found that speeding video lectures does reduce test performance. However, this effect depends on the format of the test and the speed selected.

DOES LECTURER ENTHUSIASM INFLUENCE ATTENTIONAL ENGAGEMENT AND LEARNING DURING ONLINE LECTURES?

Jeremy Marty-Dugas, McMaster University; Maya Rajasingham, McMaster University; Joe Kim, McMaster University; Daniel Smilek, University of Waterloo

We examined the impact of instructor enthusiasm on students' engagement during an online lecture, as well as their memory for lecture content. 139 participants were randomly assigned to watch an a 22-minute lecture on sleep and circadian rhythms delivered either with high or low energy and enthusiasm. Perceptions of the instructor's energy/enthusiasm as well as student engagement were assessed using thought probes delivered intermittently during the lecture. Memory was assessed using a post-lecture quiz. There was a large effect of condition on ratings of instructor's energy/enthusiasm, indicating our manipulation was successful. The results indicated there was a small, significant effect of enthusiasm on student engagement, such that those in the enthusiastic condition reported significantly more immersion, absorption and deep, effortless concentration during the lecture. Further, using time-based analysis, we found this effect was stable over the course of the lecture—those in the enthusiastic condition were consistently more engaged that those in the unenthusiastic condition. However, there was no significant effect of enthusiasm on quiz performance, suggesting that greater engagement did not translate into better memory for lecture content for the enthusiastic condition.

SOME STUDENTS SHOULD TAKE CLASS NOTES WITH A COMPUTER: EVIDENCE FOR THE EXTERNAL STORAGE BENEFIT TO ACADEMIC NOTETAKING

Lindsay Richardson, Carleton University; Guy Lacroix, Carleton University

Many guides to academic success argue that students ought to take notes by hand rather than type them, oftentimes citing Mueller and Oppenheimer's (2014) handwriting superiority effect. However, some researchers have failed to replicate the effect (e.g., Mitchell & Zheng, 2019; Morehead et al., 2019; Urry et al., 2021) and others have found support for a laptop superiority effect (e.g., Bui et al., 2013). The present experiment aimed to re-examine the effect of notetaking modality (i.e., handwriting vs. typing) and method (i.e., transcription vs. paraphrasing) on memory. As such, 465 participants were either instructed to take notes by hand or with the assistance of a keyboard during a 20-minute neuroscience lecture. Moreover, half of them were asked to transcribe the lecture while the other half were instructed to put it into their own words. After 24 hours, participants completed a comprehension test. While working memory capacity and note quantity predicted performance, transcription did not. Moreover, no evidence was found to suggest that typing led to transcription in notetaking. It might be, then, that a subset of students would benefit from transcribing their lecture notes to capitalize on the external-storage benefit of in-class notetaking.

TOWARD RESILIENT DESIGN: EXAMINING HOW VIDEO QUALITY IMPACTS LEARNING FROM VIDEO LECTURES
Isabelle Simionescu, University of Waterloo; Julianna Salvatierra, University of Waterloo; Evan Risko, University of Waterloo

Learning from multimedia requires the integration of information from audio and visual channels. In the present investigation we examine how the synchronization of audio and visual information in a multimedia presentation impacts learning. We ask this question using one of the most common modes of information transmission in postsecondary education – the video lecture – and a manipulation of video quality – audio/video desynchronization – sometimes encountered when individuals consume content online. Participants were tasked with learning from a short video lecture that was presented with the audio and visual information synchronized or desynchronized. We examined the effect of this manipulation on affect, effort, metacognition, and learning. Overall, participants in the desynchronized video condition tended to like the experience of watching the lecture less compared to those in the synchronized condition. They also believed video quality had affected their ability to learn from the lecture. Interestingly, we found participants' learning only suffered when the test questions required participants to integrate the lecture's audio and video content (i.e., audio-video integration dependent questions). Implications of these results for understanding learning from multimedia and for instructional design will be discussed.

COGNITIVE MODELLING

NETWORK SCIENCE MEASURES PREDICT HUMAN RANKINGS AND RATINGS OF CENTRALITY AND STANDARDNESS OF ACTIVITIES WITHIN EVENTS
Ken McRae, University of Western Ontario; Martha Valmana Crocker, University of Western Ontario; Beatrice Valmana Crocker, University of Western Ontario; Kara E. Hannah, University of Western Ontario; Kevin S. Brown, Oregon State University

People's knowledge of common events is important for many aspects of cognition and perception. In event cognition, measures of centrality and standardness have been used to investigate the importance of activities within events, such as "peel apples" when "baking an apple pie." We used network science to construct temporally-structured graphs for 80 events, based on people's production and ordering of event activities. For each activity within each event, we computed six network measures of centrality from the graphs. We tested whether these measures map onto human assessments of centrality and standardness. In Study 1, participants ranked activities with respect to centrality and standardness within an event, and in Study 2, participants rated them. We correlated human rankings and ratings with the six network centrality measures, and conducted stepwise regressions. CheiRank, a measure of the influence of an activity on ensuing activities within an event, was highly correlated with, and the strongest predictor of, human rankings and ratings of centrality and standardness. Results were strongest for the rankings. Thus, network science measures of centrality capture human estimates of centrality and standardness. In particular, psychological centrality is related to the degree to which an activity temporally leads to other influential activities.

MODELLING RECOGNITION MEMORY DECISIONS: INVESTIGATING SEQUENTIAL DEPENDENCIES USING MINERVA 2
Michelle A. Dollois, University of Guelph; Randall K. Jamieson, University of Manitoba; 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 sequential dependencies. Though limited, previous research has consistently found that responses tend to repeat across consecutive trials. Our lab has replicated this response carryover effect and expanded it to demonstrate that trial content carries across trials to influence responding as well. More specifically, we have found that similar items occurring sequentially at test increase "old" responding. To better understand these sequential dependencies and whether they may occur through the same mechanism, we here attempt to model these effects using a MINVERA 2 framework. This talk will present several potential mechanisms through which sequential dependencies during recognition memory may occur, allowing us insight into whether responses and content cross trials through the same means.

A COMPUTATIONAL FRAMEWORK OF ORTHOGRAPHIC, PHONOLOGICAL, AND SEMANTIC FALSE RECOGNITION

Nick Reid, University of Manitoba; Dominic Guitard, Cardiff University; Huilan Yang, Zhejiang Gongshang University; Randall Jamieson, University of Manitoba

One of the major questions in computational models of memory is how items, such as words, are represented. Recently, researchers have incorporated techniques from distributional semantics to represent the conceptual features of words in memory models. These hybrid models capture false recognition findings in the Deese-Roediger-McDermott paradigm for lists made up of semantic associates. However, words are also represented in terms of their perceptual properties, namely, their spelling and sound, and these features can also elicit false memories. In this study, we drew upon three modelling frameworks to derive structured representations of semantics (Latent Semantic Analysis; Landauer & Dumais, 1997), phonology (Parrish, 2017), and orthography (SERIOL2; Whitney & Marton, 2013) and employed a common data reduction technique (singular value decomposition) so that the representations could be compared more directly. We then imported these representations into the MINERVA 2 memory model to simulate false recognition for lists composed of semantic associates, phonologically similar words, and orthographically similar nonwords. The combined model was able to capture false recognition across all three psycholinguistic dimensions. Our approach provides a common framework for imbuing process models of memory with conceptual and perceptual knowledge, both of which are crucial for a complete account of memory.

SIGNAL DETECTION IN THE IDEAL OBSERVER: THE CASE FOR D_O

Harinder Aujla, University of Winnipeg

Signal detection theory (SDT) metrics have traditionally assumed that observers detect a signal against background noise under conditions in which the signal and noise stimuli are drawn from normal distributions. Furthermore, the interpretation of SDT measures assumes, implicitly, that typical scenarios involve equal numbers of trials in which a signal is present or absent. The success of SDT is evidenced by the broad application of its core principles to various perceptual tasks as well as recognition memory. However, traditional SDT measures of of sensitivity, such as d', fail to reflect true sensitivity in scenarios that violate SDT assumptions. A number of SDT measures have been developed to provide robust estimates in cases where particular SDT assumptions are violated. I present a new approach to assessing sensitivity which continues in this tradition and is grounded in the simple assumption that observers act in accordance with minimizing the number of errors committed in decision task. I propose a new measure, d_o, and discuss how it compares to other sensitivity measures across a range of scenarios in which the base rates of signal and noise stimuli, as well as the variance of their underlying distributions, are manipulated.

NEUROSCIENCE OF MEMORY

THE EFFECT OF HIPPOCAMPAL DAMAGE ON INTEGRATING INFORMATION ACROSS TIME

Hannah Marlatte, Rotman Research Institute, Baycrest Health Sciences; Zorry Belchev, Rotman Research Institute, Baycrest Health Sciences; Madison Fraser, Rotman Research Institute, Baycrest Health Sciences; Asaf Gilboa, Rotman Research Institute, Baycrest Health Sciences

Introduction: A recent model of hippocampal (HPC) function supposes that the HPC alone can support the integration of information across time. We tested this model in hippocampal patients using two of their paradigms: associative inference (AI) and statistical learning (SL). Methods: We tested four patients with varying degrees of bilateral HPC damage and matched healthy controls. During AI, participants studied overlapping paired associates (AB, BC) then were tested on premise pairs (AB, BC) and indirect associations (inferred AC). During SL, participants passively viewed a continuous picture sequence that contained an underlying structure to be recognized. Results: For AI, patients with localized HPC damage could infer the indirect associations as well as controls when premise pair performance was equated. For SL, we determined above chance performance at the individual level. None of the patients exhibited above chance statistical learning, however neither did many of the controls. Conclusions: Consistent with this model, inference may be possible even with HPC damage as long as premise pairs are learned. For SL, patient performance is consistent with previous amnesia studies, where many controls also performed at chance. We believe it is premature to infer SL ability in a small group of patients with this task.

GABAERGIC INHIBITION MAY CONTRIBUTE TO OBJECT CATEGORY REPRESENTATION REFINEMENT IN THE MOUSE PERIRHINAL CORTEX
Heather Collett, University of Guelph; Kristen Jardine, University of Guelph; Samantha Creighton, University of Toronto Mississauga; Jamie Fournier, University of Guelph; Raiva Pandit, University of Guelph; Cassidy Wideman, University of Guelph; Boyer D. Winters, University of Guelph

Object category recognition (OCR) may rely on generalized category representations which could be refined with inhibitory GABAergic signaling. Parvalbumin-containing GABAergic interneurons (PVINs) have been implicated in the cortical representation refinement and provide inhibitory control in the perirhinal cortex (PRh), which is necessary for object recognition. To determine the role of GABAergic transmission in the refinement of object category representations, male C57/BL6 mice were administered a GABAA receptor antagonist (bicuculline) prior to exposure to category exemplars. When tested on an OCR task, mice administered bicuculline failed with a 1-h retention delay, which requires pre-exposure to category objects. Additional exposure to learned categories 1h prior to sacrifice revealed greater c-fos activation vs control mice in the PRh of mice administered bicuculline. This suggests that OCR may be supported by sparser representations in the PRh. Chemogenically disrupting PRh PVINs, prior to object category exposure through inhibition or excitation impaired OCR task performance with a 1-h, but not a 30-min, retention delay. With a 30-min delay, performance was also disrupted by pre-sample PVIN inhibition or stimulation. Previous object category familiarity ameliorated this deficit. These findings suggest that GABAergic signalling and PVINs in the PRh play an essential role in refinement of object category representations.

FROM FEAR TO FEARLESS: ACTIVATING M1 MUSCARINIC RECEPTORS PROMOTES DESTABILIZATION OF STRONGLY-ENCODED FEAR MEMORIES
Karim Abouelnaga, University of Guelph; Andrew E. Huff, University of Guelph; William S. Messer, University of Guelph; Boyer D. Winters, University of Guelph

Destabilization of previously consolidated memories places them in a labile state in which they are open to modification. However, strongly encoded fear memories tend to be destabilization resistant. We have shown that exposure to novelty during memory reactivation destabilizes strongly encoded object location memories, and that activity at muscarinic cholinergic receptors is critical for this. In the current study, we aimed to overcome boundary conditions that cause fear memories to resist destabilization and modification. We, therefore, hypothesized that exposure to novelty at the time of reactivation would induce destabilization of strongly encoded fear memories in a muscarinic receptor-dependent manner. Firstly, we showed that relatively weak contextual fear memories readily destabilize upon memory reactivation. Next, we established a strong fear conditioning protocol which promoted the formation of destabilization-resistant strongly encoded contextual fear memory. Next, we introduced salient novelty during the reactivation session, which destabilized the strongly encoded contextual fear memories. We then showed that this novelty-induced destabilization is muscarinic receptor-dependent. Lastly, we mimicked the effect of novelty on destabilization by promoting it pharmacologically using CDD-0102A, an M1 muscarinic receptor agonist. These findings provide a possible therapeutic mechanism for disorders characterized by persistent, maladaptive fear memories such as PTSD and phobias.

STEREOTYPICAL HIPPOCAMPAL CLUSTERING PREDICTS NAVIGATIONAL SUCCESS IN VIRTUALIZED REAL-WORLD ENVIRONMENTS
Jason Ozubko, SUNY Geneseo; Madelyn Campbell, SUNY Geneseo; Abigail Verhayden, SUNY Geneseo

Structural differences along the long-axis of the hippocampus have long been believed to underlie meaningful functional differences. Recent findings show that data-driven parcellations sub-divide the hippocampus into a 10-cluster map with anterior-medial, anterior-lateral, and posteroanterior-lateral, middle, and posterior components. We tested whether task and experience could modulate this clustering using a spatial learning experiment. Subjects were scanned while they learned to virtually navigate a novel neighborhood in a Google Street View-like environment over a two-week period. Using the 10-cluster map as the ideal template, we found that subjects who eventually learn the neighborhood well have hippocampal cluster-maps consistent with the ideal—even on their second day of learning—and their cluster mappings did not change over the two week training period. However, subjects who eventually learn the neighborhood poorly began with hippocampal cluster-maps inconsistent with the ideal, though their cluster mappings became more stereotypical by the end of the two week training. We conclude that hippocampal clustering is not dependent solely on anatomical structure, and instead is driven by a combination of anatomy, task, and importantly, experience. Nonetheless, while hippocampal clustering can change with experience, efficient navigation depends on stereotypical clustering, highlighting optimal divisions of processing along the hippocampal anterior-posterior and medial-lateral-axes.

NATURALISTIC MEDIA EXPOSURE: HOW FACES BECOME FAMILIAR

Menahal Latif, Psychology, Toronto Metropolitan University; Margaret Moulson, Psychology, Toronto Metropolitan University

Few studies have investigated the process of familiarization in a naturalistic setting. In the current study, we use the popular television series New Amsterdam to investigate how increased exposure can improve human recognition performance as faces transition from unfamiliar to familiar. Participants were asked to complete two old/new recognition tasks, 1 week apart. At Time 1, participants were shown ambient images of celebrities from the show New Amsterdam, one at a time, for 5 seconds each. After a distractor task, participants completed an old/new recognition task with new images of the New Amsterdam celebrities and of new celebrities. Participants were randomly assigned to one of two conditions: a) exposure, in which they were asked to watch five episodes of New Amsterdam; and b) control, in which they were asked to watch five episodes of Greys Anatomy. At Time 2, participants completed a second old/new recognition task with different images. Preliminary data from 31 adult participants reveal that participants showed similar recognition accuracy when in the exposure condition (mean % = 76.5) versus the control condition (mean % = 72.2). We are currently recruiting 100 participants. These results will offer insight into how faces become familiar through short-term naturalistic exposure.

ARE EXPECTATIONS OF OBSTRUCTED FACIAL FEATURES ACCURATE?

Yaren Koca, University of Regina; Magdalyn Derow, University of Regina; Chris Oriet, University of Regina

When encountering a partially obstructed unfamiliar face, like one wearing a mask, the holistic processing of faces allows an expectation of the missing facial information to be generated. To test whether this expectation is accurate, 122 observers were shown a face's top half and were asked to toggle between two bottom halves and pick the one that best matched the top half. All faces were morphs of either two photos of the same identity (sID) or different identities (dID), and were Photoshopped to minimize reliance on superficial characteristics like skin texture or nose alignment. Four between-subjects conditions involved combinations of sID/dID top halves and bottom halves to create different degrees of "match" between the bottom half and the top half. The pattern of accuracy in matching the bottom half to the top half reflected the degree of match between the two halves, and performance was above chance in all conditions. This suggests that observers can accurately match the bottom half of a face when presented with its top half when reliance on superficial characteristics is limited.

FACE MASK WEARING MIGHT ELICIT A GENDER-DRIVEN NEGATIVITY BIAS IN THEORY OF MIND

Hector Leos Mendoza, McGill University; Fernanda Pérez-Gay Juárez, McGill University; Ian Gold, McGill University

By systematically obscuring parts of our faces, face masks interfere with Theory of Mind, our ability to infer other people's mental states. To assess this interference, we ran an experiment with human subjects measuring perceived valence and arousal using a stimuli set of a female actor expressing 45 mental states (masked and unmasked). We found that masks caused positive mental states to be perceived as less positive and less intense, whereas negative expressions were perceived as more intense, suggesting an overall ToM negativity bias associated with face mask wearing. We then repeated our experiment using a larger stimuli set including two male and two female actors, replicating the effect in positive mental states, but not the one in negative expressions. Additional analyses of the interaction between face masks and actor gender suggest that the initially reported negativity bias may be driven by gender, as the negative shift in perception of facial expressions is more pronounced for female actors. The results of this project provide quantitative data to help explain how the COVID-19 pandemic could have exacerbated pre-existing gender disparities in human interactions, accentuating the importance of developing strategies to promote equitable social exchanges in future global health crises.

SEARCH ADVANTAGE FOR FACING SOCIAL GROUPS IS SENSITIVE TO GROUP SIZE
Luowei Yan, McGill University; Clara Colombatto, University College London, UK; Jelena Ristic, McGill University

The human visual system is sensitive to a variety of social cues. Recent studies show that our perception is also attuned to detect social interactions, with a perceptual advantage for finding facing (vs. non-facing) and meaningfully interacting dyads. In real life, however, humans gather in groups of various sizes, with group size and group interactive complexity found to influence both social (e.g., simple dyad vs. crowd) and perceptual (e.g., individuation vs. crowding) processing. Thus, it is possible that search for social groups may differ based on group size. We tested this idea in two preregistered experiments by presenting participants with search displays containing different-sized groups (2-8 persons) and measuring their performance to detect a facing group among non-facing distractors (and vice versa). We found that overall, facing groups were detected faster than nonfacing ones. However, this effect interacted with group size such that facing group search advantage was largest for smaller groups of two and three and diminished thereafter for larger groups of four or more. Thus, perception is attuned to detect groups larger than two, with this process modulated by social group size.

COGNITION, EMOTION, & MOTIVATION

WHAT'S MATH GOT TO DO WITH IT?: ESTABLISHING NUANCED RELATIONS BETWEEN MATH ANXIETY, FINANCIAL ANXIETY, AND FINANCIAL LITERACY
Andie Storozuk, University of Ottawa; Erin A. Maloney, University of Ottawa

Financial literacy is globally recognized as a vital life skill. We investigate the relations between math anxiety, financial anxiety, and financial literacy while extending previous research in three ways. First, we examine the distinct subconstructs that comprise financial literacy (i.e., financial knowledge, confidence, attitudes, and behaviour). Second, we distinguish between financial knowledge items that are confounded with numeracy versus items that are not. Third, we control for trait anxiety. Using survey data from Canadian adults (N = 241), we demonstrate that math anxiety is negatively related to mathematical financial knowledge but is not related to conceptual financial knowledge, financial confidence, or financial behaviour. Financial anxiety, conversely, is negatively related to both mathematical and conceptual financial knowledge, financial confidence, and ideal financial behaviour. Our data suggest that, when considering financial literacy holistically, financial anxiety is more important than previously thought. These findings highlight the importance of distinguishing between the subconstructs that comprise financial literacy when attempting to understand individual differences that relate to financial literacy. Educators and policy makers looking to improve financial literacy would seemingly benefit from employing a targeted approach to decrease anxiety towards math and finances.

USING A NOVEL STROOP PARADIGM TO MEASURE EMOTIONAL INTERFERENCE
Stephanie Souliere, University of Manitoba; Nicholaus Brosowsky, University of Manitoba

Our attention may be biased towards emotional stimuli, where emotional stimuli tend to be processed automatically and can even be prioritized over other stimuli. The emotional Stroop task aims to measure this prioritization and is thought to capture differences in resolution of interference caused by irrelevant but salient emotional dimensions of a stimuli. Some have argued, however, that the emotional Stroop task lacks the fundamental properties necessary to measure emotional interference resolution (e.g., semantic relation between dimensions/features, response competition, congruency conditions, etc.). In the current study, we developed a novel emotional interference paradigm that exhibited the characteristics of a true Stroop task, maintaining multiple conflict types, such as semantic overlap, response-set conflict, and dimensional overlap, while controlling for linguistic features of the stimuli. On every trial, participants simultaneously viewed a word on screen, and heard a word spoken aloud. Participants were tasked with typing the word they heard while ignoring the visual word. Across trials, we manipulated word valence and their congruency. Importantly, each word was only presented a single time in the experiment, preventing low-level learning biases across trials. We discuss the methodological and theoretical implications of adopting such a paradigm for measuring emotional interference resolution.

TENDENCIES TO EXPERIENCE BOREDOM ARE LINKED TO ASPECTS OF EMOTION REGULATION THAT ARE MEDIATED BY ATTENTIONAL DIFFICULTIES AND MEMORY FAILURES

Natasha Vogel, University of Guelph; Mark J. Fenske, University of Guelph

The association between boredom proneness and elevated rates of problematic substance abuse, gambling, and smartphone use has been taken as evidence that difficulties with emotion regulation can lead to maladaptive attempts to cope with high levels of negative affect. However, much of the extant literature on emotion regulation focusses on mechanisms for managing high-intensity emotional states, such as anger or sadness, rather than routine day-to-day experiences such as boredom. To address this surprising lack of boredom/emotion-regulation research, we sought to identify specific aspects of emotion regulation that may be helpful for predicting individual differences in boredom proneness. Undergraduate students (N = 201) completed a battery of self-report scales regarding their boredom proneness, emotion regulation abilities, and cognitive abilities, including attentional control, cognitive flexibility and memory. Results indicated a strong positive relation between difficulties in emotion regulation and boredom proneness that is mediated by attentional difficulties and memory failures. For specific aspects of emotion regulation, individual differences in frequency of emotion-suppression and rumination were predictive of boredom proneness, but the use of distraction was not. Our results underscore the importance of specific cognitive-affective mechanisms of emotion regulation for better understanding the tendency to experience boredom and its long-term consequences.

MANIPULATING LOAD AND ASSESSING INDIVIDUAL-DIFFERENCES IN CAPACITY TO EXAMINE THE ROLE OF VISUAL WORKING MEMORY IN DISTRACTOR DEVALUATION

Brooke Pardy, University of Guelph; Mark J. Fenske, University of Guelph

Stimuli appearing as distractors in visual-search tasks subsequently receive more negative affective ratings than novel stimuli or targets of attention. By demonstrating this 'distractor-devaluation effect' is eliminated with a concurrent visual working-memory load, Goolsby et al. (2009) provided evidence that visual working memory resources may be important for encoding links between the perceptual details of a distractor and cognitive-affective processes that lead it to receive negative evaluations. The current project provides a conceptual replication and extension of Goolsby et al. by using a similar within-participant experimental manipulation of concurrent working-memory load during the measurement of distractor devaluation, while also varying whether visual distractors were held in visual working memory or not. An individual-difference approach was also applied as a test of the involvement of working-memory resources in distractor devaluation. Furthermore, by using a battery of different working-memory capacity measurement tasks to assess individual-differences, 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 during working-memory maintenance. We discuss our results (N=187) based on the extent to which the affective consequences of selective attention are robust across experimentally induced and participant trait-level differences in working-memory resources.

SELF-CONTROL & EFFORT

INVESTIGATING HOW USING 'THE PILL' RELATES TO SELF-CONTROL

Alyssa C. Smith, University of Waterloo; Daniel Smilek, University of Waterloo

Oral contraceptives (OCs) have been available to women for more than 60 years but only recently has interest grown in examining the potential cognitive effects of OC use. In two studies we asked undergraduate women using OCs and naturally cycling women not using any form of hormonal contraceptives to complete self-report measures of self-control. Self-control was assessed using the Brief Self-Control Scale (BSCS), which indexes inhibition of impulses, and the Regulatory Mode Scale (RMS), which measures the propensity to reflect on one's goals and to assess the progress made towards those goals (self-regulatory assessment), and the propensity to take steps towards goal completion (self-regulatory locomotion). Results revealed that, compared to women not using OCs, women using OCs reported significantly higher levels of self-regulatory locomotion, and that this relation was present even after depression symptoms and the semester of data collection were statistically controlled. Furthermore, there were no notable differences between OC and non-OC groups in terms of their levels of inhibition of impulses or self-regulatory assessment. These results indicate that OC use moderately influences only specific aspects of self-control.

MIND WANDERING ON COMMAND: CAN PEOPLE ADJUST THEIR MIND WANDERING TO MATCH A REQUIRED AMOUNT?
Adrian Safati, Department of Psychology, University of Waterloo; Daniel Smilek, Department of Psychology, University of Waterloo

Daily experiences require us to balance our attention between our wandering thoughts and the world around us. It is clear from prior research that we have a capacity to shift the balance of our attention in response to changing environmental demands, but it remains an open question to what extent individuals can modulate their mind wandering to match a prescribed amount while environmental demands are held constant. To test individuals' capacity to control the amount of mind wandering during a task, 150 participants were asked to perform 4 blocks of a simple metronome response task, in which they pressed a spacebar in sync with a steady audio tone. At the start of each block participants were given instructions to try mind wandering either 20, 40, 60, or 80% of the time. Participants were randomly assigned to receive their mind wandering instructions in ascending (20→40→60→80%), descending (80→60→40→20%) or random order. Thought probes were distributed throughout the task to sample participants' experiences of spontaneous and deliberate mind wandering. Across all conditions reports of both deliberate and spontaneous mind wandering changed corresponding to instructions. In the ascending and random conditions response time variability increased when participants were instructed to mind wander more.

HARD WORK FOR EASY LISTENING: USING PHYSICAL EXERTION AS AN OBJECTIVE INDEX OF LISTENING EFFORT
Carson Rumble-Tricker, University of Guelph; Gurjit Singh, Phonak Canada, University of Toronto, & Toronto Metropolitan University; Mark J. Fenske, University of Guelph

Attending to and understanding speech in noisy environments can be challenging. Being able to measure the corresponding increases in listening effort in such situations is important for investigating the cognitive mechanisms involved in speech perception, and for assessing the effectiveness of interventions aimed at addressing hearing impairments. Here we examined the usefulness of a novel measure of listening effort based on prior evidence in the visual domain that individuals will readily exert physical effort in exchange for conditions that minimize perceptual difficulty. We found that participants (N = 127) would repeatedly press a key to minimize background noise while listening for the last word in a spoken sentence, and that the level of this physical exertion increased as needed to minimize perceptual difficulty. Individual differences in trait boredom, absorption, and mind-wandering, however, did not affect task performance nor levels of key-pressing. These findings provide converging support for the notion that understanding speech in noise is an effortful process, and establishes that the costs of such cognitive effort in the hearing domain are readily exchanged for increases in physical effort. Measures of physical exertion may therefore provide a path towards a useful objective index of listening effort.

MENTAL EFFORT, PUPIL SIZE, TASK DIFFICULTY AND ENDOGENOUS SPATIAL ATTENTION
Raymond Klein, Dalhousie Univeristy; Dawson Sutherland, Dalhousie University; Austin Hurst, Dalhousie University

Does mental effort, as measured by pupil dilation, adjust for task difficulty (Kahneman & Beatty, 1966) and matter for task performance in an endogenous cuing task (Posner, Snyder & Davidson, 1980)? We monitored eye movements and measured pupil size while participants responded to peripherally presented targets preceded by informative central cues. The colour of the central fixation stimulus provided information about whether the task would be easy (simple detection) or harder (simple detection followed by the report of the colour of the target) and none of the events during a trial would involve the kind of change in luminance that might confound our use of pupil size as a measure of mental effort. Extending Kahneman's finding from memory to perception, the hard task elicited a greater investment of mental effort (greater pupil dilation) than the easy task. Cuing effects, which decreased monotonically with practice, were relatively unaffected by mental effort but early in practice larger pupils (greater effort) resulted in reduced costs on invalid trials. Implications of these findings will be discussed.

LANGUAGE COMPREHENSION

EVALUATING THE STRENGTH OF PERSPECTIVE INFORMATION IN PRONOMINAL REFERENCE RESOLUTION

Tiana Simovic, University of Toronto; Craig Chambers, University of Toronto

Psycholinguistic accounts of pronoun resolution have emphasized the role of fairly-shallow discourse-level and lexical cues (e.g., first-mention bias/implicit causality/coherence relations) to referent identity. However, recent work suggests that sentences with subject pronouns show strong sensitivities to pragmatic perspective-taking (comprehenders' reasoning about the mental states of story characters). E.g., in "Max [asked Jerome if]/[told Jerome that] he loves cooking new dishes", readers interpreted the pronoun as co-referring with Jerome (main-clause object) when Max asks about the subordinate clause information and co-referring with Max (main-clause subject) when Max tells Jerome the information. The present study explores the robustness of this effect by assessing interpretations of OBJECT pronouns, which are often described as governed by a different weighting of constraints. Expt1 used sentences like "Max [asked Jerome if]/[told Jerome that] mosquitoes bother him in the summer" to elicit readers' judgments for antecedents of ambiguous pronouns. The results corroborated the subject pronoun findings: Participants picked the "perspectivally-congruent" antecedent 99.3% of the time, with no order-of-mention effect (which would predict stronger effects for TELL, where the antecedent is the first-mentioned character). Expts2-4 (self-paced-reading and stops-making-sense-tasks) identified the precise point at which the effects emerge. The results highlight the role of pragmatics in incremental referential interpretation.

DOES SENSORIMOTOR EXPERTISE SHAPE LANGUAGE COMPREHENSION? A REPLICATION ATTEMPT

Heath Matheson, Department of Psychology, Memorial University of Newfoundland and Labrador

Embodied theories of language posit that sensorimotor reactivations partially underly our ability to comprehend sentences. A critical hypothesis is that sensorimotor expertise should be especially relevant for the comprehension in the domain of expertise. Evidence for this comes from research using a picture-sentence matching task in which participants read a sentence and make judgements about a subsequent picture. Critically, reaction times are faster when the object shape matches the shape implied by the sentence, suggesting that visual information is reactivated during comprehension. We seek to conceptually replicate this effect in people with (N= 20) and without (N=100) hockey-related sensorimotor experience. Participants read general and hockey-specific sentences and made judgments of pictured objects. Critically, on half the trials the shape of the object matched the shape implied by the sentence. In general, participants were faster when the object matched the shape implied by the sentence regardless of content. There was some evidence for a stronger matching effect for hockey-specific sentences in hockey experts. This replication attempt supports the hypothesis that sensorimotor expertise shapes language comprehension.

FICTIONAL AND AUTOBIOGRAPHICAL STORYTELLING IN CHILDREN WITH COCHLEAR IMPLANTS

Nicole Walklin, MacEwan University; Tara Vongpaisal, MacEwan University

Storytelling provides unique insight into children's developing linguistic and grammatical abilities in the context of social communication. Sixteen children with cochlear implants (CIs) (age: M = 10.7 years, SD = 5.9 to 15.5 years) and age-matched normal hearing (NH) controls were assessed on their narrative abilities in two genres: fictional and autobiographical. Children selected sentence prompts from each genre and were encouraged to continue the idea by telling a story. Narratives were analyzed using a high-point analysis scoring method that assessed overall structure in narratives and use of grammatical elements, including conjunctions and referents. While CI and NH children scored similarly with respect to each other, greater variability in scores were evident in the autobiographical storytelling in both groups. In autobiographical narratives, CI children achieved higher scores in their use of conjunctions and referents in comparison to those in overall narrative structure. By contrast, scores were similar across all criteria for both hearing groups in fictional narratives. In short, CI children demonstrated similar grammatical and structural proficiencies in fictional storytelling, while grammatical abilities exceeded structural abilities in autobiographical storytelling. The findings highlight the importance of considering the social and linguistic context in the assessment of CI children's developing narrative skill.

OBJECTIVE & SUBJECTIVE MEASURES OF NARRATIVE ENGAGEMENT IN CHILDREN

Sophia Robinson, Western University; Sarah Bobbitt, Western University; Stephen C. Van Hedger, Western University; Blake E. Butler, Western University

The degree to which a listener engages with an auditory narrative often depends on motivation (i.e., their level of interest) and intelligibility. Engagement can be measured both objectively and subjectively in adults; however, little is known about how children engage with narratives despite rapid growth in popularity of child-directed podcasts and audiobooks. Thus, in the current experiment children aged 9-12 heard three short stories (two designed to appeal to this age group and an unappealing control narrative) and rated how engaged they were by each using a modified Story World Absorption Scale (SWAS; Kuijpers et al., 2014). Additionally, children completed a direction judgement task while listening, with reaction times taken as a dynamic and objective measure of engagement. Appealing stories were rated more engaging and were associated with longer reaction times than the control narrative, suggesting more resources were dedicated toward interesting stories. Fluctuations in engagement across the duration of each story, and the degree to which fluctuations correlate across listeners will be discussed in detail. Together, we provide the first measures of narrative engagement in children, and establish methods by which engagement can be contrasted across development and between groups of listeners (e.g., children with and without sensory loss).

MEMORY & WORKING MEMORY

IS IT THE SAME OLD SONG? FURTHER INVESTIGATIONS OF THE "SINGING SUPERIORITY EFFECT"

Jedidiah Whitridge, Memorial University of Newfoundland; Mark Huff, The University of Southern Mississippi; Jason Ozubko, State University of New York at Geneseo; Chelsea Lahey, Memorial University of Newfoundland; Jonathan Fawcett, Memorial University of Newfoundland

The production effect refers to a phenomenon wherein participants exhibit better memory for words read aloud relative to words read silently. The dominant theoretical account of this effect states that producing items renders them distinctive by appending additional sensorimotor features to the memory trace associated with the item. This distinctiveness account has been supported by evidence that the production effect for singing is larger than that for reading aloud (i.e., a singing superiority effect); because singing is thought to involve additional sensorimotor processing (e.g., of tonal information) relative to reading aloud, singing should append additional sensorimotor features to the memory trace that can be leveraged to guide retrieval. However, our own conceptual replications have provided evidence against the superiority of singing, suggesting instead that the benefit is of similar magnitude to that observed for reading aloud. The present study extends these findings to a pure-list paradigm, an exact replication of paradigms that have reported singing superiority effects and an updated Bayesian meta-analysis of all known experiments investigating production effects for singing. Considered in aggregate, our investigation suggests that the singing superiority effect is unreliable and thereby does not support the distinctiveness account to the extent that previous research has claimed.

LEARNING-DEPENDENT MODULATION OF REPRESENTATIONS IN WORKING MEMORY

Frida Printzlau, University of Toronto & University of Toronto Mississauga; Athanasios Bourganos, University of Toronto; Keisuke Fukuda, University of Toronto Mississauga; Michael Mack, University of Toronto

Working memory (WM) is the ability to temporarily hold information in mind for a future action. WM representations are not 1:1 copies of sensory information but vary depending on context and task demands. Categorical biases are well-established in WM, but studies to date have focused on familiar feature spaces with established category structure (colour or orientation). Here, we asked whether WM is similarly biased by new category learning across three experiments. Participants learned to group novel shapes into two categories. Following learning, they performed a 2-item WM task where category was irrelevant. We found that new category learning biased WM representations when the training regime emphasised category prototypes (Experiment 1), but not when training emphasised the category boundary (Experiment 2), compared to a control experiment with no category learning (Experiment 3). Representations were biased toward the centre of the category only when memory items belonged to separate categories, and bias scaled with distance from the category boundary. WM may rely on a combination of category knowledge and inter-item interactions to guide behaviour when memory is uncertain. Our results show that even newly learned categories may act as priors for WM, but biases depend on the shape of the prior distribution.

EXPLORING THE IMPACT OF VERBAL AND VISUOSPATIAL WM LOAD ON NUMERICAL COMPARISON TASKS: SIMULTANEOUS COMPARISON VS COMPARISON TO A STANDARD

Fraulein Retanal, University of Ottawa; Diya Kamineni, University of Ottawa; Veronic Delage, University of Ottawa; Evan Risko, University of Waterloo; Erin Maloney, University of Ottawa

The symbolic numerical distance effect (NDE) is an important tool for probing the nature of symbolic numerical representation. In two experiments, we explore the impact of increased verbal and visuospatial WM loads on symbolic numerical comparison. In Experiment 1, participants compared simultaneously presented digits under a verbal (Exp 1A) or a visuospatial (Exp 1B) WM load. In Experiment 2, participants compared numbers to a standard under a verbal (Exp 2A) or a visuospatial (Exp 2B) WM load. The effect of WM load differentially impacts the two numerical comparison tasks, evidenced by the modulation of the size of the NDE. Specifically, when comparing simultaneously presented numbers, the size of the NDE decreases as a function of an increased verbal or visuospatial WM load. When comparing numbers to a standard, the size of the NDE is not affected by either an increased verbal or visuospatial WM load. The implications of these data for our understanding of symbolic numerical comparison tasks and numerical cognition more generally will be discussed.

SEMANTIC MEMORY

IS MOLLY MORE HIREABLE THAN KATIE? EFFECTS OF NAME SOUND SYMBOLISM ON MOCK HIRING TASKS

David Sidhu, Carleton University; Timothy Wingate, Wilfred Laurier University; Joshua Bourdage, University of Calgary; Penny Pexman, University of Calgary

Sound symbolism refers to an association between certain sounds and certain features (e.g., the sounds in 'maluma' and round shapes). This has been shown to extend to real names and personality traits: in simple ratings and forced-choice tasks individuals associate "rounder" names like Molly with traits like kindness, sensitivity, and diligence; and "spikier" names like Kate with traits like outgoingness. In the present studies we tested whether these associations generalize to a more complex context, in particular, a mock job hiring context. Participants were given job ads that described an ideal candidate based on three traits (Experiment 1) or one trait (Experiment 2) from the HEXACO model of personality. Participants chose between candidates with a round or a spiky name for each job. We found that participants preferred candidates with round names for jobs that highlighted Emotionality and Agreeableness, and those with spiky names for jobs that highlighted Extraversion and Conscientiousness. In subsequent experiments we found that name sound also has an effect when participants are shown videotaped interviews (Experiment 3) and pictures of candidates (Experiment 4). Together these results demonstrate a potential real-world consequence of name sound symbolism, and that the effect persists in the presence of multimodal information.

THE EFFECT OF CONTEXTUAL AND SEMANTIC DIVERSITY IN WORD RECOGNITION: EVIDENCE FROM A DICHOPTIC LEXICAL DECISION TASK WITH ANAGLYPHS

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

Contextual and semantic diversity models, derived from large language-usage corpora, provide better fits to lexical behaviour data than word frequency. Most of these effects have been obtained from simple lexical decision and naming tasks. We employed data from a masked lexical decision task with a dichoptic presentation of three word types: compounds (e.g., football), pseudo-compounds (words with potentially two constituents; shamrock) and monomorphemic words (e.g., jeopardy). Dichoptic presentation involved coloring different segments (constituents or pseudo-constituents) in red or blue while participants wore red/blue anaglyph glasses. We computed four social usage measures of lexical strength for words and their (pseudo-)constituents: word frequency (WF), contextual diversity (CD), user contextual diversity (UCD), and user contextual diversity with a population-based Semantic Distinctive Model modification (UCD-SD). These measures were based on a Reddit corpus of 55.4 billion words. We found that words with greater contextual and semantic diversity yielded faster responses: compounds were faster than pseudo-compounds and monomorphemics, demonstrating the effect of constituents on word recognition. UCD and UCD-SD explained a greater proportion of variance than WF and CD, suggesting that the early moments of word recognition are sensitive to social usage properties, possibly reflecting how morphemes are organized in the mental lexicon.

THE QUEBEC SEMANTIC BATTERY (BATTERIE SÉMANTIQUE DU QUÉBEC): DEVELOPMENT, VALIDATION, AND STANDARDIZATION OF A SEMANTIC BATTERY IN FRENCH
Laura Monetta, Université Laval; Angela Boland, University of Ottawa; Joël Macoir, Université Laval; Christine Sheppard, Bruyère Research Institute; Vanessa Taler, University of Ottawa

In aphasia, semantic memory (SM) is commonly impaired, involving degraded knowledge about objects, facts, places, and people. In French-speaking Quebec, there exist few complete SM tests that assess a wide range of semantic functions, recruit multiple input channels (oral, written, and pictographic), and are standardized to French-speaking Quebecers' cultural and linguistic profile. The present study sought to: 1) develop a novel French-language battery: la Batterie Sémantique du Québec (BSQ), 2) validate the BSQ, and 3) establish norms. We developed six tasks of associative matching, semantic feature knowledge, and picture naming. Next, we conducted a validation pilot study where six neuropsychologists and speech-language pathologists assessed tasks' administration, psycholinguistic variables, and instructions. Ten healthy French-speaking Quebecers aged 19-50 completed the preliminary BSQ. Lastly, we collected normative data from 93 healthy, French-speaking Quebecers aged 19-99. We explored connections between sociodemographic variables and task scores and established a cut-off indicating impaired SM. Younger age was associated with higher scores on most BSQ tasks. Males also outperformed females on one task. A task score below the 5th percentile was established as below normal performance. Overall, the BSQ permits brief, accessible, and complete SM evaluation. Our normative data may help clinicians detect SM impairments in aphasia.

COMPUTING WORD MEANINGS BY AGGREGATING INDIVIDUALIZED DISTRIBUTIONAL MODELS: WISDOM OF THE CROWDS IN LEXICAL SEMANTIC MEMORY
Brendan Johns, McGill University

Linguistic experience varies across individuals and is impacted by both demography and personal preferences, leading to differences in word meanings across people. An active area of study in the cognitive sciences that examines the impact of varied knowledge across individuals is the wisdom of the crowd effect, where it is found that the aggregate judgement of a group of individuals is often better than the judgement of the best individual. The goal of this talk is to demonstrate a wisdom of the crowd effect in lexical semantic memory, such that the aggregated word similarity values from many individual language users exceeds the fit of the best fitting individual. This was accomplished by training 500 different distributional models from 500 high-level commenters on the internet forum Reddit. By deriving aggregated word similarity values across individuals, a strong wisdom of the crowd effect was found where the aggregated similarity values exceeded the performance of the best fitting individual for each dataset tested. Additionally, it was found that even aggregating only a small number of users provided a large increase in fit relative to the individual corpora, but with the best fitting measure including word similarity values from all possible users.

POSTER ABSTRACTS

POSTER SESSION I: MONDAY, JULY 17 (5:00 - 7:00 PM)

THE AVERSIVE EFFECTS OF INFRASOUND ON WILD-TYPE ZEBRAFISH IN AN OPEN FIELD TEST

Kale Scatterty, MacEwan University; Taylor Pitman, MacEwan University; Tristan Eckersley, MacEwan University; Rodney Schmaltz, MacEwan University; Trevor Hamilton, MacEwan University

Many aquatic species are able to detect infrasound (sub-20 Hz frequencies), making anthropogenic infrasound a possible source of pollution with negative environmental consequences for fish and potentially other animals, including humans. Negative behavioural effects have been found through experiments with marine species and self-reports in humans have indicated that infrasound may be anxiogenic, but thus far no generalizable model of the effects of infrasound on anxiety has been established. This study exposed wild-type zebrafish (Danio rerio), a recently established model organism for anxiety behaviours, to brief periods of infrasound (5 Hz vs. 10 Hz vs. 15 Hz vs. 20 Hz) and compared responses to a 0 Hz control group. Motion tracking was used to quantify zebrafish movement in an open field test, measuring both locomotor and place-preference variables as behavioural indicators of aversion and anxiety. A significant effect was found in fish exposed to 15 Hz frequencies, causing them to avoid the infrasound source. Fish in the 20 Hz group also spent less time near the infrasound source but displayed a less distinct aversion response. There were no significant differences in locomotion. These findings indicate that 15 Hz infrasound has aversive effects and infrasound sources should be identified and mitigated.

CHOLINERGIC SYSTEM ACTIVATION DURING MEMORY REACTIVATION ALLEVIATES OBJECT LOCATION MEMORY DESTABILIZATION DEFICITS AND ALLOWS FOR MEMORY UPDATING IN AGED MALE C57 MICE

Andrew Ethan Huff, University of Guelph; Kristen Jardine, University of Guelph; William Messer, University of Toledo; Boyer Winters, University of Guelph

Following consolidation, memories can be reactivated by exposure to reminder cues. This can initiate destabilization, where the labile memory can then be weakened or updated, following which it must be re-stabilized through the process of reconsolidation. Our lab has previously shown that muscarinic cholinergic activation is critical for spatial memory destabilization, however the cholinergic system becomes dysfunctional during aging. This co-occurs with spatial memory deficits and cognitive inflexibility in aged humans and rodents, and specifically, aged mice do not display reactivation-dependent memory updating. We hypothesized that object location (OL) memory destabilization would be impaired in aged mice, but could be alleviated by enhancing activity at muscarinic cholinergic receptors. Here, we show that in young (3 months-of-age), but not aged (10 months-of-age) mice, destabilization of OL memories readily occurs. Next, we demonstrate that this destabilization deficit in aged mice could be alleviated by activating the cholinergic system during memory reactivation using CDD-0102A (selective M1 mAChR agonist; 0.3 mg/kg), physostigmine (acetylcholinesterase inhibitor; 0.1 mg/kg) or exposure to contextual novelty. This research enhances our understanding of the role of acetylcholine in long-term memory dynamics and suggests implications for the understanding and treatment of cognitive inflexibility that can occur in the normal aging process.

TAKING A DIP INTO THE PSYCHEDELIC WATERS: THE EFFECTS OF MICRODOSING LSD ON ANXIETY-LIKE BEHAVIOUR IN ZEBRAFISH

Ethan Hagen, University of Alberta; Melike Schalomon, MacEwan University; Yanbo Zhang, University of Alberta; Trevor Hamilton, MacEwan University

Repeated consumption of sub-threshold doses of psychedelic drugs (i.e. microdosing) could treat various mental health conditions. Human studies report positive impacts via anecdotal reports; however, experimentally controlled studies are lacking. Zebrafish are becoming a popular and reliable model organism for this type of experimentation. In this study, zebrafish were first exposed to acute LSD doses (0, 1.5, 15, or 150 µg/l) for 30 minutes to establish an effective dose, then repeated LSD exposure for 10 days, using the same doses. We used EthoVision to record, track, and analyze the movement patterns of fish in an open-field test and a novel object approach test. Fish were either tested after acute dosing, or after 10 days of exposure followed by withdrawal testing 7 days after repeated LSD exposure. We found a significant difference in behaviour with acute LSD, primarily as a decrease in high mobility. No significant differences existed between the control and LSD groups for the repeatedly exposed fish. There was a small but significant difference in anxiety-like behaviour following the withdrawal period between LSD groups, but not in comparison to controls. Overall, this suggests a low probability of unwanted side effects with repeated microdosing of LSD in the zebrafish model.

THE IMPACT OF DIVIDED ATTENTION AND DELAY ON THE TRANSFER OF TEST-ENHANCED LEARNING

Miranda Chan, University of Guelph; Donnelle DiMarco, University of Guelph; Harvey Marmurek, University of Guelph

The testing effect occurs when practice at retrieving material enhances subsequent memory of that material more than does simply restudying the material. The effortful processing account of the testing effect predicts that dividing attention (DA) should negatively impact retrieval leading to a smaller testing effect under DA than under full attention (FA). However, Buchin and Mulligan (2017) found that DA negatively impacted restudy yielding a larger testing effect under DA than under FA. The current study investigated the impact of DA in a transfer task where the test format changed between the interim test and the final test. During an encoding phase, participants studied 16 word-pairs (e.g., mother-CHILD). During a review phase, participants restudied the word pairs (e.g., mother-CHILD) or attempted to recall the target word on a cued-recall test (e.g., mother-_____). During the review phase, DA participants also completed a secondary digit classification task. After a 30 sec or 5 min delay, participants completed a free recall test of the target words. The results showed that the benefit of interim testing increased with delay but did not depend on attention. Additionally, there was a cost to secondary task performance for DA during retrieval.

HOW DOES TOUCHING TARGETS AND DISTRACTORS IN MULTIPLE OBJECT TRACKING IMPACT PERFORMANCE?

Martin Geraets-Rose, University of Guelph; Mallory Terry, University of Guelph; Lana Trick, University of Guelph

In everyday activities such as driving we track and interact with multiple moving objects. Multiple object tracking (MOT) is a laboratory task that is used to simulate these real-world scenarios. The task involves tracking multiple target objects as they move amongst identical distractors. According to Pylyshyn (2001), MOT and touching a moving item use the same cognitive mechanism. Terry and Trick (2021) found that visually guided touch shared the same mechanism as MOT. We used a dual-task design to determine whether mentally directed touch also shared this mechanism. We did this by comparing single-task (MOT alone) and dual-task (MOT while touching an item when cued to by a sound). We also tested whether participants could accurately touch items based on whether they were targets or distractors. Touching items interfered with MOT performance, this was especially true when participants were touching distractors as opposed to targets. Touching distractors resulted in a lower percentage of correctly reported targets and higher (slower) touch latencies. Overall, lower performance in the dual task was to be expected if both tasks required the same limited resource. The detrimental effect of touching distractors suggests that MOT and mentally directed touch share the same cognitive mechanism.

CONTEXT-DEPENDENT MODULATION OF ATTENTION: A SIMULATED DRIVING TASK

Noah Britt, McMaster University; Jackie Chau, McMaster University; Brian Wong, McMaster University; Hong-jin Sun, McMaster University

Spatial cueing has been shown to elicit more sensitive changes in attention across the visual field. However, typical experiments have been conducted using basic 2D displays with abstract target stimuli (e.g., red square) and without an ecologically valid context. To better observe realistic modulations in spatial attention across space, it is critical to integrate real-life behaviours into experimental manipulations. In the current study, participants underwent a simulated driving task where they functionally operated a gas pedal and responded using a steering wheel device. Participants were required to follow a lead car stimulus through a virtual 3D environment composed of pictorial depth information. While driving, a modified spatial cueing paradigm was produced where an abstract spatial cue could appear on either side of the roadway, followed by a roadside pedestrian either oriented towards or away from the road. Compared to non-driving conditions, pedestrian stimuli that were oriented toward the road compared to those oriented away from the road resulted in two major findings: i) significantly faster pedestrian discrimination (i.e., overall reaction times), and ii) significantly increased spatial cueing effects (facilitation). These findings suggest increased vigilance while driving, specifically resulting in heightened attention for potential upcoming dangers such as a crossing pedestrian.

THE ROLE OF THE VESTIBULAR SIGNALS IN UPDATING SPATIAL SELECTIVE AUDITORY ATTENTION (SSAA) DURING HEAD MOTION

Erisa Davoudi, Western University; Ewan A. Macpherson, Western University

Spatial Selective Auditory Attention (SSAA) allows individuals to selectively attend to a desired sound source location in a noisy environment. Our research project investigated whether individuals can effectively update their allocation of SSAA to maintain attention on a sound source location while moving their heads and whether vestibular and/or proprioceptive signals are sufficient for this updating.In a behavioural auditory selective attention task, three frontal loudspeakers (spanning 45 degrees horizontally) generated random sequences of four spoken digits, and subjects were asked to attend to the middle (target) loudspeaker and verbally report the sequence heard. The task was conducted in three different movement conditions that manipulated the availability of vestibular and proprioceptive signals: Static (no movement and therefore no updating is required), Active head rotation (both vestibular and proprioceptive signals are available), and Passive whole-body rotation (only vestibular signals are available). Our findings suggest that people can effectively update their SSAA while their heads move. Additionally, participants' performance in the Passive condition, was almost equal to the Active condition, indicating that they rely on vestibular signals, and proprioceptive signals are not essential for SSAA updating. Moreover, analyzing the incorrectly reported digits reported revealed a frontal bias of the SSAA.

THERE'S NO PLACE LIKE...?: INVESTIGATING WHETHER LOOKING BEHAVIOUR AND PREFERENCES FOR SPACES VARY ACROSS ACTIVITIES AND ONLINE VS IN-PERSON EXPOSURE

Mae Pacificar, University of Alberta; Ruby S. Prinsen, University of Alberta; Dana A. Hayward, University of Alberta

Although classic cognitive research has specifically controlled for environmental factors, our everyday life involves interacting with various built spaces, such as our homes, schools, and workplaces. To parallel emerging research outside of laboratories, we took an ethological approach to investigate how people's gaze and preferences are influenced by built spaces and how these vary in two contexts: online and in-person. Participants rated campus spaces varying in features (e.g., lighting) based on the likelihood of using them for three activities (studying, socializing, and relaxing) and provided a rationale per rating. Online, 53 participants' gazes were recorded via webcams while viewing images of these spaces. In-person, 21 participants' gazes were recorded via a mobile eye tracker while navigating a subset of campus spaces. Online, spaces with natural lighting were preferred for all activities, and windows and views of greenery for relaxing and studying. Participants did look for similar features online and in-person, like desirable lighting; however, spaces with features such as good seating orientation and interesting views mattered more for different activities across contexts. Altogether, these findings further our understanding of how features and design of spaces influence cognition while demonstrating how cognitive research can be brought beyond the walls of laboratories.

DISTRACTIBILITY OF SPEECH VARYING IN EMOTIONAL PROSODY IN YOUNGER AND OLDER ADULTS

Cathy Shaw, Nipissing University; Alain Carlson, Nipissing University; Mark Wachowiak, Nipissing University; Dana R. Murphy, Nipissing University

In previous research, we have found that older and younger adults, alike, are more distracted by irrelevant speech spoken in an angry emotional prosody than a happy prosody. In this study, we attempted to replicate and extend this finding by including another emotional prosody: fear. Younger and older participants completed a visual task (Star Counting Task) while ignoring spoken numbers and sentences spoken in happy, angry, and fearful tones. We presented the different conditions randomized across 80 trials and assessed how much the speech distractors slowed counting speeds compared to trials without distraction. Based on the literature, we expected more interference from angry and fearful speech than from happy speech; however, we found the three emotional prosodies were equally distracting with no differences found between the distractibility of the younger and older adults. While these findings do not indicate that different emotional prosodies influence distractibility to a greater degree, they do show that younger and older adults demonstrated similar levels of distraction from irrelevant speech and similar inhibitory abilities in this cross-modal attention task.

WHO REMEMBERS WHAT? CHILDREN AND ADULTS' MEMORY AND SOURCE MONITORING OF ONLINE SOURCES

Samantha Barbosa, Wilfrid Laurier University; Kim Roberts, Wilfrid Laurier University; Victoria Lacquaniti, Wilfrid Laurier University; Sumana Merali, Wilfrid Laurier University

Even with an abundance of online experience, individuals can struggle with identifying and consuming reliable internet-based information. As such, memory and source monitoring are activated to weigh the credibility of online sources and make decisions about accuracy and relevance. Across two studies, we measured children and adults source monitoring and memory accuracy of two online sources with embedded advertisements. We investigated whether the groups differed in their ability to accurately source-monitor and recall pertinent information. Novel media sources and surveys (e.g., internet usage, advertisement knowledge, and internet safety) were utilized. Children (ages 7-12, N =30) and adults (ages 18 and older, N = 32) participated in two online sessions. Participants viewed two separate media sources (i.e., website, video) containing embedded advertisements. After 2-3 days, participants completed a battery of source-monitoring and memory questions regarding the online content. We anticipated that adults would be significantly more accurate in their source monitoring and memory recall. The adult sample was more accurate at source-monitoring for both online sources and the advertisements embedded on the website. Likewise, the adults had higher memory accuracy for the website. This demonstrates the developmental differences in memory and source monitoring while incorporating novel sources and explicit distractions.

DOES L-TYROSINE SUPPLEMENTATION IMPROVE THE TEMPORAL DYNAMICS OF INFORMATION PROCESSING IN CONFLICT TASKS?

Jason Ivanoff, Saint Mary's University; Brandon Read, Saint Mary's University; Nicholas Blake, Saint Mary's University; Navya Kesavan, Saint Mary's University; Mary Sheppard, Saint Mary's University; Alexander Laird, Saint Mary's University; Alexander Laird, Saint Mary's University; Sarah Ainsworth, Saint Mary's University

The amino acid l-tyrosine is a precursor to the catecholamine neurotransmitters noradrenaline and dopamine. A number of studies have demonstrated that dietary supplementation of l-tyrosine has positive effects on cognitive processes such as working memory, response inhibition, convergent thinking, and attention. These effects are believed to be the result of increased dopaminergic prefrontal activity. Some of the varied effects of tyrosine might be explained by an improvement in the accumulation of evidentiary information under stressful conditions. Here we test this hypothesis using speed-accuracy trade-off functions from Simon and Eriksen flanker conflict tasks. We used a placebo-controlled, double-blind, randomized cross-over design to maximize interpretability and statistical power. Contrary to expectations, we did not find evidence that l-tyrosine supplementation improved conflict processing, response inhibition, or the temporal dynamics of information processing. We argue that cognitive enhancements from l-tyrosine supplementation is unlikely to be ubiquitous. To answer the question in our title: not that much, if at all.

DOES MOTIVATION ATTENUATE TEMPORAL INCREASES IN MEDIA MULTITASKING?

Allison C. Drody, University of Waterloo; Effie J. Pereira, University of Waterloo; Brandon C. W. Ralph, University of Waterloo; James Danckert, University of Waterloo; Daniel Smilek, University of Waterloo

Media multitasking (i.e., simultaneously completing multiple media-based tasks) is a pervasive behaviour known to impair task performance. It has also been shown to increase with time-on-task, highlighting the importance of understanding how to reduce temporal increases in media multitasking. Across two studies, we investigated whether increasing motivation attenuates temporal increases in media multitasking. Our first study investigated this by re-analyzing data from Ralph and colleagues (2021). In this study, participants completed a sustained attention task during which they could media multitask by simultaneously playing a video lecture. The task was completed in a control condition or a condition intended to increase participants' levels of motivation. Media multitasking increased, while performance decreased, over time-on-task; however, these changes were more gradual in the motivated condition compared to the control condition. The second study was identical to the first, except for the addition of thought probes assessing motivation throughout the task. Results from the second study were consistent with the first, and additionally revealed that motivation decreased over time. This decrease was less pronounced in the motivated condition than in the control condition. Our findings suggest that increasing motivation might improve sustained attention by reducing engagement in off-task behaviours such as media multitasking.

USING TOOLS AS CUES FOR DUAL ADAPTATION TO OPPOSING VISUOMOTOR ROTATIONS IN VIRTUAL REALITY
Andrew King, York University

Humans are experts at designing and utilizing unique tools to accomplish various tasks, like an axe for chopping wood. While much is known about motor adaptation with changed visual feedback of the hand, our knowledge is limited regarding how tool-related learning translates to novel situations requiring differential movement patterns. Here we test whether having two tools that require opposite movements would serve as sufficient cues for dual-tool adaptation, akin to lead-in movements in dual motor adaptations. We ran an immersive virtual reality experiment where 40 participants used 2 different tools to launch a ball towards a target; a paddle (forward motion) or slingshot (backward motion). Participants swapped between tools every 8 trials. After a familiarization phase, we added visually opposite perturbations to the ball after contact with the tool (30o clockwise or counterclockwise rotation). Participants in a control group learned to use each tool with perturbed ball movements separately. We found that participants could form distinct motor memories for both tools, adapting their movements to the opposing perturbations. However, errors following exposure to the perturbation remained above baseline, indicating that complete dual motor adaptation did not occur. These findings suggest separate motor memories form more slowly in dual-tool adaptation.

EXAMINING THE LINK BETWEEN VOCAL VARIABILITY AND VOCAL MOTOR CONTROL
Angeline Redford, Wilfrid Laurier University; Kiera Leon, Wilfrid Laurier University; Zehra Sasal, Wilfrid Laurier University; Natalia Van Esch, Wilfrid Laurier University; Rita Bishai, Wilfrid Laurier University; Jaclyn Young, Wilfrid Laurier University; Jaclyn Young, Wilfrid Laurier University; Nichole E. Scheerer, Wilfrid Laurier University

Vocal motor control is regulated by auditory feedback driven closed-loop control (feedback control), and sensorimotor representation driven open-loop control (feedforward control). However, the factors that dictate the relative weighting of these two control systems are unclear. This study aimed to investigate the relationship between vocal variability and the relative weighting of feedback versus feedforward control. In this study, participants produced vocalizations while they heard their unaltered auditory feedback or the vocal pitch of their auditory feedback persistently shifted downward a semitone. Participants' vocal pitch was measured at the start of each vocalization to index the extent to which previous exposure to deviant auditory feedback influenced subsequent vocalizations. This served as an index of open-loop control. Vocal pitch was also measured across each vocalization to index the extent to which ongoing vocalizations were modified by deviant auditory feedback. This served as an index of closed-loop control. We then examined the relationship between open and closed-loop control and the variability of participants' habitual fundamental frequency. The results of this study will help us to better understand the role of vocal variability in the weighting of feedback versus feedforward control.

INVESTIGATING THE RELATION BETWEEN BOREDOM PRONENESS AND PRODUCTIVITY DURING THE COVID-19 PANDEMIC
Anvita Gopal, University of Waterloo; Allison Drody, University of Waterloo; Lydia Hicks, Lakehead University; Daniel Smilek, University of Waterloo; James Danckert, University of Waterloo

During the COVID-19 pandemic, restrictions aimed at reducing the spread of the virus increased the time individuals spent at home, disrupting their daily routines and potentially increasing distraction. These changes raise questions about whether the pandemic impacted behaviors related to productivity and procrastination. Based on prior work linking boredom proneness to procrastination and a difficulty initiating meaningful tasks, boredom proneness may be a key-factor predicting pandemic-related changes in these behaviors. In data collected in the Summer of 2021, we investigated how individuals perceived their productivity-related experiences (i.e., procrastination, difficulty getting started on important tasks, productivity, and motivation) to have changed compared to these experiences prior to COVID-19. We further explored whether boredom proneness predicted these perceived changes.Participants reported experiencing more procrastination and difficulty starting important tasks than they did prior to the pandemic. Surprisingly, participants also perceived increases in motivation and productivity. Boredom proneness positively predicted these perceived changes, even after controlling for age, gender and self-control. Our results suggest that finding adaptive ways of coping with boredom could reduce procrastination, especially during unusually constraining events.

DOES THE MENTAL REHEARSAL OF MOVEMENT INVOLVE MAPPING ACTIONS TO SPECIFIC MUSCLES?
Austin Hurst, Dalhousie University; Shaun Boe, Dalhousie University

Motor imagery (i.e. the mental rehearsal of movement) has been found to improve motor performance in a wide range of contexts, from laboratory tasks to professional athletics (Hurst & Boe, 2022). Despite its effectiveness, the cognitive mechanisms behind motor imagery remain poorly understood, including the extent to which imagery activates the same neuromotor pathways as actual movement.To examine this issue, we designed a study to test whether motor imagery rehearses effector mapping (the mapping of specific muscle movements to specific outcomes), which occurs late in the motor process. Participants performed three blocks of a fine-motor pointing task using a joystick: a brief familiarization block, a training block consisting of either physical practice (PP), motor imagery (MI), or a control task (CC), and a final test block where the joystick's y-axis was inverted from its original mapping. The more the original effector mapping was rehearsed in the first two blocks, the larger the performance impairment we would expect in the final block relative to the first.Preliminary analyses indicate that the MI group was less impaired by the inverted axis than the PP group, suggesting a notable neural divergence between motor imagery and physical practice with important practical applications.

PERSONAL LIKELIHOOD AND EVENT FAMILIARITY INFLUENCE THE SIMULATION OF FUTURE EVENTS
Claudia Morales Valiente, University of Western Ontario; Ken McRae, University of Western Ontario; Stefan Köhler, University of Western Ontario

Episodic future thinking (EFT) is the ability to project the self forward in time to pre-experience a potential future event. EFT combines at least two core processing components. One component activates the event's associated relevant knowledge, and the other places the event in a coherent autobiographical context. We studied these two components through a person's familiarity with an event, and their belief in the likelihood of that event's future occurrence in their life. We predicted that high event familiarity and likelihood would enhance simulations, making them clearer and more detailed, but both components would have distinctive roles. Using two norming studies, we developed participant-specific sets of events that participants then simulated and rated phenomenological aspects. We also analysed their event descriptions. We found that both components are relevant for EFT and play combined and distinctive roles during EFT. High levels of familiarity enhanced the perceptual information produced and perceived during the simulation of likely future events. Contextual spatial and temporal information felt more real in likely events. Finally, high levels of familiarity independently enhanced temporal information.

DISRUPTIONS OF BECLIN 1 CAUSE ENHANCED NOCICEPTIVE HYPERSENSITIVITY IN A MOUSE MODEL OF CHRONIC NEUROPATHIC PAIN IN MALE MICE
Fariya Zaheer, University of Guelph; Gabriel Levine, University of Guelph; Paige Reid, University of Guelph; Reza Fatemi, University of Guelph; Janan Shoja Doost, University of Guelph; Tami Martino, University of Guelph; Tami Martino, University of Guelph

1 in 4 Canadians over the age of 15 experience chronic pain. Our current understanding of the molecular mechanisms promoting the development of chronic pain remains inadequate. BECLIN 1 is responsible for the delivery of autophagosomes to lysosomes for intracellular degradation to promote autophagy. Impaired BECLIN-1 function has been implicated in the development of several neurodegenerative diseases but its role in the nervous system in the state of chronic pain is yet to be investigated. This project investigated the role of autophagy in the development of chronic neuropathic pain by utilizing the BCL2 AAA transgenic mouse (C57BL/6 background). These animals carry a mutation that prevents dissociation of the BCL2-BECLIN-1 complex, so they have normal levels of baseline autophagy but are deficient in stimulus- induced autophagy. They contain knock-in mutations at 3 phosphorylation sites which prevent stimulus-induced disruption of the BCL2-BECLIN-1 complex and autophagy activation. Our findings confirm that baseline nociceptive thresholds are similar in male BCL2 AAA transgenic and wildtype C57Bl/6 mice; however, BCL2 AAA mice who received the spared nerve injury model of neuropathic pain displayed potentiated pain hypersensitivity, whereby they expressed mechanical allodynia and hyperalgesia at a stronger rate than the wildtypes in the SNI cohort.

DURATION OF ABSTINENCE REQUIRED FOR RECOVERY OF ATTENTION DEFICITS IN LONG-TERM CANNABIS USERS: A SYSTEMATIC REVIEW

Hannah Makar, Wilfrid Laurier University; Lydia Hanna, Wilfrid Laurier University; Nina Hedayati, Wilfrid Laurier University; Jeffery A. Jones, Wilfrid Laurier University

Purpose: The purpose of this systematic review was to determine the duration of abstinence required for the recovery of attention deficits in long-term cannabis users, to match the performance of non-cannabis using controls. Methods: A comprehensive search was conducted on PubMed, PsycINFO, and Web of Science, using inclusion criteria such as randomized control trials, case-control, cohort, and cross-sectional studies, featuring long-term cannabis users who had been abstinent for a minimum of 7 hours and non-cannabis using controls. Title/abstract screening, full-text review, and extraction were performed using Covidence. Results: Twelve studies met the inclusion criteria. The study findings indicated that verbal, sustained, and selective attention recovered after 3 weeks to a month of abstinence. However, other attention domains, such as divided, visual, complex, and constant attention, as well as attentional impulsivity, processing speed, and reaction time, did not fully recover even after a month of abstinence. Conclusion: Further research is needed to assess differences in attention domains and the necessary abstinence periods for their recovery, as well as the impact of early-onset cannabis use on recovery.

FACE SIZE DIFFERENTIALLY IMPACTS GENDER DISCRIMINATION AND FACE RECOGNITION.

James Siklos-Whillans, University of Waterloo; Roxane Itier, University of Waterloo

The impact of size on face perception remains understudied despite its importance in social interactions. Face size has been examined using tasks investigating holistic face processing. Instead, we examined how size influences face perception across two everyday tasks, namely gender discrimination and face recognition. Participants (N=107) viewed blocks of faces of various sizes and discriminated their gender (male/female). After each block they performed an old/new face recognition judgement at the same face size. Reaction times (RTs) and accuracy scores (AS) were compared across tasks and face sizes using a linear mixed effect model analysis. While both RTs and AS showed significant main effects of task and size, task-size interaction only impacted RTs. In the recognition task, RTs remained constant across face size whereas in the gender task RTs shortened as face size increased. Both AS and RTs peaked for the middle face size (5.5° horizontal or 1.58m viewing distance), suggesting an optimal size for face processing. AS were lowest yet still above chance level at the smallest face size (1° or 13m), for both tasks. Contrary to previous studies, our results suggest that face size matters for face processing, however differently depending on the task and variable examined.

THE POVERTY OF BOREDOM: EXPLORING THE INFLUENCE OF INCOME ON BOREDOM PRONENESS

Jamie Nettinga, University of Waterloo; James Dankcert, University of Waterloo

Boredom proneness is often studied in the context of individual differences such as self-control, attention, and agency with little focus given to factors external to the individual that may be important. Data collected at the beginning of the COVID-19 pandemic (April/May 2020) explored the extent to which boredom proneness would influence adherence to the norms of social distancing. As a part of this larger study, a number of external factors were measured including income, household makeup, caretaking duties, and availability of activities. Results show that boredom proneness was significantly related to income in that those higher in boredom proneness tended to be in lower income brackets. In data collected a year later (May 2021), replicated this finding. These data indicate that external factors such as income, contribute to boredom proneness and warrants further investigation into the factors external to the individual that may exacerbate the experience of boredom.

MEMORY-DRIVEN ATTENTIONAL CONTROL AND DECISION MAKING DURING VISUAL SEARCH

Jessica Kespe, University of Guelph; Niytatee Narkar, University of Guelph; Naseem Al-Aidroos, University of Guelph

When searching the environment for a visual target, observers adopt an attentional template—an internal representation of the target they are searching for. One open area of study in attention research is to understand where these templates are stored and how they guide attentional capture. Across five experiments, participants used long-term memory (LTM) to learn a set of objects with specific colours and were then asked to find the objects amongst new or old distractors. We showed that with and without invoking VWM, participants found the targets faster when presented in their memorized colour, and slower when a distracting object matched that colour. It is possible, however, that these effects emerged during post-perceptual processes like decision-making. To test this idea, we used a probe-dot detection paradigm to measure attentional effects separately from those on decision making. For VWM-based templates, probe RTs were significantly affected by the previously learned colour association, suggesting that LTM indirectly tunes the attentional template in VWM. Instead, when search is guided directly by LTM, the effects on search time are likely related to a post-perceptual process rather than attention. Altogether, this work clarifies the interactive roles of VWM and LTM in controlling attentional capture during visual search.

THE TEMPORAL DYNAMICS OF GROUNDED CONCEPTS: AN EVENT-RELATED POTENTIAL ANALYSIS OF SENSORIMOTOR ACTIVATION DURING PICTURE AND WORD CATEGORIZATION

Justine Yick, Memorial University of Newfoundland; Heath Matheson, Memorial University of Newfoundland

Research has demonstrated that when engaging in reading comprehension and visual recognition we reactivate multiple brain areas that are active during physical interactions with the depicted items. The present study sought to identify the timing of this reactivation process using event-related potentials (ERPs). As such, 17 participants categorized either pictures or words of manipulable objects. To encourage reactivations of different types of motoric information, we had participants complete this task while pressing up or down on a table. We analyzed participants' ERPs to see if brain activity during categorization varied depending on object manipulability and participant body posture. Overall, ERP components were greater in response to pictures of highly manipulable objects, compared to items with low manipulability. But when categorizing words, object manipulability began to show an influence on ERPs approximately 275 ms after stimuli exposure. As such, it appears that when categorizing, the visual features of manipulable objects may readily cue reactivations of motoric information. But when reading words, these reactivations appear to be delayed. The influence of manipulability also interacted with body posture – suggesting that the timing of reactivation may also be primed with bodily movements. Overall, these results shed light on the temporal dynamics of categorization.

EXAMINING LISTENING EFFORT USING FUNCTIONAL NEAR-INFRARED SPECTROSCOPY IN OLDER AND YOUNGER ADULTS

Katherine Bak, The University of Toronto and KITE, Toronto Rehabilitation Institute - University Health Network; George SW Chan, Toronto Metropolitan University, Canada; Rhiannon Ueberholz, Toronto Metropolitan University; Michael Zara, Toronto Metropolitan University; Joseph Rovetti, The University of Western Ontario; William Zhang, The University of Toronto and KITE, Toronto Rehabilitation Institute - University Health Network; William Zhang, The University of Toronto and KITE, Toronto Rehabilitation Institute - University Health Network; Frank A Russo, Toronto Metropolitan University; Jennifer L Campos, KITE, Toronto Rehabilitation Institute - University Health Network and The University of Toronto

Age-related hearing loss often negatively affects communication, particularly in noisy environments when listening becomes more effortful. Studying the underlying neural processes of listening effort using fMRI and EEG can be costly and time-consuming. Functional near-infrared spectroscopy (fNIRS) is a quiet, non-invasive, and portable way to understand the neural basis of listening effort. However, very few studies have used fNIRS to measure listening effort in older adults during conversational speech-in-noise. Therefore, the current study will examine how listening effort during conversational speech is affected by age and background noise using fNIRS to measure changes in oxygenated/deoxygenated blood in the prefrontal cortex. Younger (18-35) and older (65+) participants with normal hearing and cognition completed the Connected Speech Test presented at low and high signal-to-noise (SNR) ratios while fNIRS measures were collected. Preliminary results from six younger and five older adults demonstrated that, overall, younger adults performed better on both SNRs than older adults and both groups of participants performed more poorly in the lower SNR compared to the higher SNR condition. Future analyses of oxygenated/deoxygenated blood will be conducted. Findings provide important fundamental knowledge of how age and speech intelligibility influence pre-frontal neural responses associated with listening effort.

SELECTION BIAS AND PERCEPTIONS OF POLITICAL GROUP BELIEFS

Alexandra van der Valk, University of Waterloo; Jonathan Fugelsang, University of Waterloo; Derek Koehler, University of Waterloo;

How do we infer the distribution of beliefs held by an entire group (e.g. Democrats) after being exposed to beliefs of a sample of individuals from that group that we know to be biased (e.g. extremely partisan Democrats)? We tested whether people could correct for sample bias when they were explicitly told about it. Participants read statements that most members of a political party (e.g. Democrats) tended to agree with, and were shown ratings of how strongly five members of that party agreed with the statements. In the biased sample condition, the five sample Democrats were selected from among the top 10% most partisan of all Democrats, and participants were informed of this sample bias. In an unbiased sample condition, the five sample Democrats were representatively sampled from among all Democrats. Participants then estimated mean agreement (0–100) with each statement of all Democrats. We found that estimates of group belief from the biased sample condition were higher than those of the unbiased sample condition, showing that participants were not able to completely correct for the sample bias. Yet, their mean estimate was considerably lower than the mean of the biased sample they had been shown, suggesting some attempt at correction.

EXPLORING (AND REVISITING) THE DISJUNCTIVE VARIANT OF THE SAME-DIFFERENT TASK

Bradley Harding, Université de Moncton; Marise Michaud, Université de Moncton; Vanessa Boudreau, Université de Moncton; Noémie LeBouthillier, Université de Moncton

The Same-Different Task (Bamber, 1969; Harding & Cousineau, 2022) is a simple paradigm that assesses our ability to compare stimuli. In the conjunctive task, participants must judge as accurately and quickly as possible whether two stimuli are entirely identical or if there is at least a single difference between them. Although there have been many variations of the task over the years, one that has garnered little to no attention is the disjunctive variant in which participants must detect if there is at least a single similarity between stimuli, or if they are entirely different. This subtle shift in the decision rule has been shown to affect overall task performance (Farrell, 1985), yet the question remains: are the cognitive processes between conjunctive and disjunctive variants shared, or distinct. In this study we built two variants of the disjunctive task containing 768 trials apiece and recruited 56 participants. Results indicate that “same” decisions are always made faster than their “different” counterparts, identical to what has been found in the conjunctive task. Furthermore, preliminary modelling of the task’s results using the EZ diffusion model (Wagenmakers et al., 2007) led us to posit that similar decision-making processes underlie both conjunctive and disjunctive variants.

EXPLORING PARENTAL BELIEFS ABOUT PRODUCTIVE AND UNPRODUCTIVE STRUGGLE IN MATH LEARNING

Fraulein Retanal, University of Ottawa; Elora Wales, University of Ottawa; Helena P. Osana, Concordia University; Erin A. Maloney, University of Ottawa

Productive struggle is the process of effortful learning through challenging problems. It is thought to foster deep understanding of the content but only when the problems are appropriately matched to the child's current skill level. Presenting students with overly difficult problems that are outside of their capabilities can lead to frustration and may undermine the positive impact of struggle (i.e., unproductive struggle). Previous research has shown that fathers more than mothers believe that struggling in mathematics is beneficial for their child’s learning, but no known measure of parental belief in the efficacy of struggle differentiate between productive and unproductive struggle. We surveyed 237 parents (119 women) of children aged 10–15 and found that when presented with a scenario where children have the necessary skills to tackle challenging math problems (productive struggle), there were no significant gender differences in parental belief in the efficacy of struggle. In contrast, when presented with a scenario where children lack the required skills (unproductive struggle), fathers believed more strongly than mothers that struggling in math is beneficial for their child. Our findings suggest that mothers are just as likely as fathers to endorse productive struggle but show a lower level of endorsement for unproductive struggle.

EXPLORING RANKING THEORY AS AN ALTERNATIVE MODEL FOR HUMAN UNCERTAINTY REPRESENTATION

Hanbin Go, Centre for Theoretical Neuroscience, University of Waterloo; Britt Anderson, Centre for Theoretical Neuroscience, University of Waterloo

Humans' representation of environmental uncertainty is unclear. While probability theory is commonly used to represent uncertainty, it may not fully explain how humans form and represent beliefs. To investigate alternative models of belief representation, this study explored Ranking Theory to grade degrees of belief and disbelief.Three experiments (N = 168, N = 63, N = 200) examined the relationship between subjective probability and ranking functions with unknown objective probabilities. The first two experiments showed consistent negative ranking responses and variability in subjective probability responses for disbelief and belief thresholds. Experiment 3 revealed a log-odds relationship between subjective probabilities and two-sided ranks, providing a clearer picture of the relationship between belief representations and subjective probability. Experiment 4 (N = 268) examined the relationship between ranks and subjective probability in a learning paradigm, requiring participants to build a model of their opponent's behaviour.The findings suggest that people struggled to understand the law of disjunction. There was a positive relationship between minimum and maximum ranks and disjunction ranks, with predicted disjunction rank values lying in between the minimum and maximum ranks. This study contributes to our understanding of how humans represent uncertainty and provides a promising alternative model of belief representation.

CHILDREN'S BENEFITS IN DISTRACTOR LEARNING ARE ASSOCIATED WITH MORE LAPSES IN ATTENTION

Johnny Dubois, University of Toronto; Vivian Shu, University of Toronto; Alexandra Decker, McGovern Institute for Brain Research, Massachusetts Institute of Technology; Amy Finn, University of Toronto

Sustained attention is critical for successfully performing tasks across domains, yet, attention clearly fluctuates between optimal and suboptimal states. Yet, counterintuitively, adult research shows that lapses in attention can facilitate learning of distracting information. Given that children reliably demonstrate more attentional lapses than adults, it is plausible children would show larger learning benefits than adults.We therefore tested distractor learning in 156 children (ages 4-11) while tracking attention fluctuations using reaction time deviance on previous trials.As predicted, younger children (4-6 years old) exhibited more lapses, which improved with age. We also found they demonstrated the most learning, but only a trend toward learning correlating with more lapses (p=.11), while this was significant for older children (p=.001). Critically, when comparing between optimal and suboptimal states, we found that the evidence for learning was entirely driven by learning during suboptimal states, and for all children's ages.Together, our results suggest that young children may learn more about distractors than their older peers. This learning benefit may be specifically linked to times when attention lapses. These findings extend adult findings to children, while reinforcing the notion that attention lapses can be seen as opportunities to learn from other sources of information.

EXPLORING THE RELATIONSHIP BETWEEN MENTAL-STATE TALK, THEORY OF MIND, AND SOURCE MONITORING IN PARENT-CHILD REMINISCING OF EMOTIONAL EVENTS

Mallory Earnshaw, Wilfrid Laurier University; Dr. Kim Roberts, Wilfrid Laurier University

Autobiographical memories play a critical role in shaping personal identity, regulating emotions, and guiding future behaviour. Reminiscing about these memories can be particularly beneficial for coping with negative experiences. This study aims to investigate the connections between mental-state talk, theory of mind, and source monitoring in parent-child reminiscing, and how it can be influenced by remembering enjoyable versus frustrating events. This study involved children ages 3-8 (N = 50) and consisted of two sessions. In the first session, the child reminisced with their parent about an enjoyable and frustrating event and completed two source-monitoring tasks. In the second session, the child was tested on vocabulary, theory of mind, and the source-monitoring tasks. Correlational analyses were deployed. We expect higher source monitoring test scores to be correlated with increased mental-state talk and stronger theory of mind. A strong theory of mind can help children understand different perspectives, reason about mental states, and resist misleading information, resulting in better source monitoring abilities. These skills are vital for language and memory development and can have important implications for education, as they can foster a deeper understanding of material for students with varying cognitive abilities.

MOTOR-RESPONSE EXECUTION VERSUS INHIBITION ALTERS STIMULUS AFFECT: THE ROLE OF MEMORY SALIENCE VIA STIMULUS REPETITION AND CATEGORY SWITCHES

Amelia Luzy-Kocher, University of Guelph; Brooke Pardy, University of Guelph; Mark J. Fenske, University of Guelph

Withholding a behavioural response from items on No-go trials of a Go/No-go task causes them to become affectively devalued relative to novel stimuli or Go-trial items associated with motor-response execution. While leading accounts posit a key role for memory in this effect, little is known about how it varies with changes in memory salience. Here we combined Go/No-go and Affective-evaluations tasks while manipulating the relative salience of object memories by incorporating 1) a pre-exposure task involving repeated stimulus encounters and 2) switches between object-image categories (plants, animals, toys, electronics) within trial sequences. Our results (N = 165) revealed that prior No-go stimuli received more negative ratings than prior Go stimuli, with significant effects of both stimulus repetition and category switches on the magnitude of this difference. However, the direction of these effects was opposite to our predictions; the largest No-go devaluation effects occurred for object-images seen just once and among other items from the same category. We discuss the potential confounding influences of mere exposure and surprise in manipulations of memory salience, and raise the need to consider such effects in clinical interventions that use No-go trials to reduce the motivational salience of stimuli associated with disorders of self-control.

INDIVIDUAL DIFFERENCES IN GRATITUDE AND MINDFULNESS MODULATES ATTENTION TOWARDS EMOTIONS

Joline Guitard, Université de Moncton; Isabelle Bernard, Université de Moncton; Annie Roy-Charland, Université de Moncton

This study aimed to explore how individual differences in dispositional mindfulness and gratitude affected attentional processes for Ekman's 6 basic emotions (Ekman, 1999). To do so, an emotional dot probe paradigm was used (MacLeod, 1986). Additionally, dynamic eye tracking measures were added to the standard static measure of response time, as to obtain a more complete picture of the attentional processes involved in this task. Sixty individuals (68.3% women) aged between 17 and 33 years old (mean = 20.82, SD = 3.11) completed the emotional dot probe task while their eye movements were recorded. Self-reported dispositional mindfulness and gratitude were assessed with the MAAS and the GQ-6 respectively. Multiple regression analyses showed that the interaction between scores of mindfulness and gratitude was associated with different attentional measures such as response time, first fixation duration on neutral stimuli, and number of fixations per trials. However, these results varied as a function of the emotions. This suggests that the perceptual treatment of Ekman's (1999) basic emotions differs according to individual differences associated with dispositional mindfulness and gratitude. Results are discussed in light of current theories of emotions and Fredrickson's (1998) broaden-and-build theory.

THE INFLUENCE OF MATHEMATICAL GAMEPLAY ON MATH ANXIETY

Alex Snow, Memorial University of Newfoundland; Cheryll L. Fitzpatrick, Memorial University of Newfoundland; Darcy Hallett, Memorial University of Newfoundland

Increases in math anxiety (MA) can lead to poor outcomes such as lower grades in math-based courses and the avoidance of mathematics in general. This can be detrimental to an undergraduate student who may select their academic path around avoiding mathematics. The current study proposed a short-term intervention for MA using a math-based computer game in an undergraduate population. We hypothesized that engaging with a math-based computer game for 15 minutes would reduce reported rates of MA. Data was collected through Qualtrics using a repeated measures design; undergraduates students (N = 158) completed surveys on math, test, and state/trait anxiety at pre-test, followed by 15 minutes of play with Boat Coordinates (e.g., a math-based computer game), and surveys for math and test anxiety at post-test. Results demonstrated a significant reduction in MA at post-test including a surprising finding of a significant reduction of test anxiety at post-test. This study provides opportunity for further research in gameplay interventions as a way to reduce reported MA in undergraduate populations.

DO COGNITIVE STYLES PREDICT PERFORMANCE IN A VISUO-HAPTIC MATCHING TASK?
Katherine Estabrooks, Mount Allison University; Geneviève Desmarais, Mount Allison University

To perform everyday tasks, one must use touch to find what has been seen. Recent research has identified that when individuals view or touch an object, they may create a verbal memory representation; however, this research involved object naming, which may have prompted the use of verbal strategies. Research has also identified variability in memory representations for objects, which may indicate individual differences. To investigate memory representations and their associations with individual differences in cognitive styles, we measured the cognitive styles of 127 participants and had them complete a non-verbal matching task without distractors, or with verbal or visual distractors. In the task, they viewed an object and then touched an object – or vice versa – and indicated whether the objects were congruent or incongruent. On trials where different objects were presented, participants responded consistently more slowly and made more matching errors for similar objects compared to distinct objects. Importantly, higher scores on the verbalizer cognitive style were associated with faster reaction times on the matching task when no distractors were present. Overall, this indicates that cross-modal object processing in short-term memory may be facilitated by a verbal code; however, distractors may prompt participants to recruit more idiosyncratic strategies.

EXPLORING CONNECTIONS BETWEEN HEARING DIFFICULTIES, BOREDOM, AND ATTENTION THROUGH NOISY LECTURES AND INDIVIDUAL-DIFFERENCE FACTORS
Lauren McBay, University of Guelph; Carson Rumble-Tricker, University of Guelph; Carolyn M.L Crawford, University of Guelph; Yasmin N. Elliott, University of Guelph; Sibley Hutchinson, University of Guelph; Gurjit Singh, Phonak Canada, University of Toronto, Toronto Metropolitan University; Gurjit Singh, Phonak Canada, University of Toronto, Toronto Metropolitan University

Life feels harder for some people than for others. People who routinely experience boredom, for example, also have more intensely negative experiences than others when faced with perceptual challenges, such as age-related hearing loss; a correlation mediated in part by the difficulties that boredom-prone individuals have with attention and task engagement. However, prior research into the links between boredom, attention, and the subjective experience of hearing has predominantly used a clinic-based correlational approach, which makes it impossible to establish the causal nature of the interrelations. Here we adopt an experimental approach in which participants (total N = 647) listened to a recorded lecture with different levels of background noise. Increasing levels of noise resulted in higher levels of state boredom, subjective strain, effortful attention, and poorer memory for lecture material. Feelings of boredom and listening strain were higher for individuals who routinely experience boredom proneness and attentional difficulties, with boredom-prone individuals also having poorer memory performance. Overall, these results underscore the importance of considering cognitive-affective factors for understanding individual differences in hearing, while confirming that hearing difficulties can cause boredom, subjective strain, and failures of attention even in those who do not usually experience boredom or attention difficulties.

PARSING AMBIGUOUS TRIMORPHEMIC WORDS IN SENTENCE CONTEXTS: EVIDENCE FROM RSVP
Amanda Carvalho Renno de Araujo White, Concordia University; Kyan Salehi, Concordia University, Montreal; Roberto G. de Almeida, Concordia University

How are morphologically complex words recognized and interpreted during language comprehension? We investigated the role that sentence context plays in the morphological analysis of ambiguous trimorphemic words (e.g., unlockable), which can be interpreted either with a right-branching structure ([un[lockable]], meaning “not able to lock”) or a left-branching structure ([[unlock]able], meaning “able to unlock”). Using a rapid serial visual presentation (RSVP) task, native English speakers (N=19) were presented with sentences at a rate of 12 words per second, with words being presented one-by-one in the middle of the screen. We induced morphological parsing by presenting the ambiguous trimorphemic words off-centre, with the foveation (fixation) point coinciding with either the prefix-root (un+lockable) or root-suffix positions (unlock+able). Participants’ task was to judge the sentence’s semantic plausibility and to recall the sentence. We hypothesized that if context influences parsing, plausibility judgements would be more accurate and faster when the sentence context matched the induced visual split. Our preliminary analyses yielded no difference in plausibility judgments, suggesting that morphological parsing is initially insensitive to sentence context. Further analyses—including recall patterns and judgment times—will enable us to make further conjectures on the interplay between sentence context and morphological parsing.

"COPY THIS DOWN" OR "REPEAT AFTER ME" - COMPARING EFFECTIVE ENCODING TECHNIQUES FOR MEMORY OF KOREAN CHARACTERS
Brian Kim, University of Waterloo; Sophia Tran, University of Waterloo; Myra Fernandes, University of Waterloo

Language learning apps such as Duolingo provide a great resource, however these apps could make better use of memory encoding techniques such as production and drawing. Moreover, the match between the modalities engaged during encoding, and the way in which learning is later assessed, is not always considered. In two experiments, we examined the best ways to learn English-Korean word pairs in individuals naïve to Korean. We compared the production and drawing effects and examined the interaction with the type of memory test. Participants were shown English-Korean word pairs and asked to either by copy (draw) or speak (production). Later, memory for the correct word pairing was assessed in a visual and auditory two-alternative forced-choice memory test. In both experiments, we found an interaction such that memory performance was higher on the auditory test when they encoded with production. In contrast, memory was better on the visual test, when encoding involved copying. Furthermore, performance was highest overall when copying was the method of encoding. Results highlight the usefulness of drawing when learning a new character-based language. Moreover, language learning apps could tailor how information is taught to match the ways in which the information will be tested.

INDIVIDUAL DIFFERENCES IN SPELLING PERFORMANCE
Derrick Bourassa, University of Winnipeg

Literacy development requires sensitivity to graphotactic patterns (i.e., allowable letter sequences) that exist in the English language. However, there have been relatively few detailed analyses of children's sensitivity to such patterns, particularly among beginning spellers. This study examined first graders' sensitivity to contextually-based graphotactic regularities. Analyses revealed that sensitivity to these regularities captured variability on a standardized spelling test over and above well-established predictors of spelling performance.

NO, NON-BINARY WRITING IS NOT UNREADABLE.
Élias Daigle, Université de Moncton; Emalie Hendel, Université de Moncton; Alex LeBlanc, Université de Moncton; Caroline Vonlanthen, Université de Moncton; Annie Roy-Charland, Université de Moncton

Like other Latin languages, French is particularly marked by gender. This grammatical feature poses significant challenges for the inclusion of non-binary people who do not use either masculine or feminine agreements. Various forms of inclusive writing have been suggested to overcome this issue. However, the Académie Française firmly rejects the use of such writing, considering it unreadable. Is this criticism well-founded? Since no previous work has addressed this question, the present study investigates the effect of non-binary writing on the readability of French language texts by tracking eye movements. To this end, francophone participants from New Brunswick were asked to read 12 brief texts introducing 3 occupations (bricklayer, esthetician, and pharmacist). Four forms of writing were presented for each one: generic masculine (e.g., maçons), generic feminine (e.g., maçonnes), non-binary contracted doublets (e.g., maçon-ne-x) and generic non-binary (e.g., maçonx). The results showed a habituation effect to the non-binary writing forms: while words in these conditions were read more slowly on their first occurrence, this effect disappeared by the third occurrence. Additionally, generic non-binary writing was rated as equally coherent as the other generic forms. Contrary to the claims of the Académie Française, non-binary inclusive writing does not appear to complicate reading.

LET ME SAY THAT AGAIN: REPAIRING MISCOMMUNICATIONS WITH VOICE ASSISTANT INTERFACES
Emily Shiu, University of Waterloo; Katherine S. White, University of Waterloo

Voice assistant (VA) devices such as Google Assistant, Alexa, and Siri have become commonplace on mobile devices and in many households, enabling people to execute simple computer tasks using speech. The development of these interfaces must consider the socio-cognitive factors of the human users. Previous studies on VA interfaces have focused on monolingual populations or contexts, but bilingualism research has shown that language use often differs between bilinguals and monolinguals, even in single-language contexts. Therefore, studying bilinguals' responses and behaviours with VAs is crucial. We conducted an online experiment in which (early, late) bilinguals' and monolinguals' (N=146) were asked to make requests of Google Assistant (GA) on their phones. The requests were chosen to either be likely or unlikely to elicit miscommunications. Participants also completed a questionnaire about their experience with and perceptions of previous VA interactions. In ongoing analyses, we are examining the frequency of miscommunications across speakers of different language backgrounds, as well as whether they differ in the nature of their miscommunications and repair strategies. The study's findings will provide valuable insight into the socio-cognitive processes involved in using voice assistants, and have practical implications for the continued development of inclusive VA technology.

CONTEXT VARIABILITY IMPACTS THE GENERALIZATION OF NEWLY LEARNED WORDS WHEN READING ALOUD
Irys-Amelie Champagne, University of Toronto Scarborough; Mark Pitt, The Ohio State University; Blair Armstrong, University of Toronto Scarborough; Nicolas Dumay, University of Exeter

Simulation results by Miller et al. (2020) using a neural network model of English spelling-to-sound correspondences indicate that a graded "warping" mechanism enables the coding of both rules and exceptions. Words that reflect regularities (regulars, e.g., i in mint, hint, tint) require minimal representational warping and generalize broadly, words that reflect atypical pronunciations (exceptions, e.g., i in pint) require extensive warping and generalize rarely, and ambiguous words (e.g., i in drive/hive vs. give/live) fall somewhere in between. Thus, the warping mechanism predicts that the number of words with similar pronunciations, rather than pronunciation frequency, determines how likely a pronunciation is to generalize. We tested this prediction by manipulating whether participants learned one, two, or three made-up words that share the same regular, ambiguous, or exceptional rhyme body, which we refer to as a manipulation of context variability. This was accomplished in a multi-day word learning experiment, with generalization tested on the last day. We observed that all items were learned to a high degree during training, but generalization varied as predicted by the warping mechanism. Our findings indicate that context variability, more than frequency alone, drives generalization.

LOOK AT THE WABBIT! CHILDREN'S INTERPRETATIONS OF MISPRONUNCIATIONS FROM CHILD AND ADULT SPEAKERS
Dana Bernier, Capilano University; Katherine White, University of Waterloo

As adults, we have expectations about the way that people from different social groups speak; these expectations shape our speech processing. When encountering a new individual, our expectations may be activated by bottom-up cues (cues in the speech consistent with a particular group) or top-down information (knowledge that a person belongs to a particular group). We ask whether 2- and 3-year-olds have expectations about the speech of adults vs. children, relying on the fact that children commonly produce r-->w mispronunciations. Participants were trained on a new word, "roogie", by an adult and then tested on the mispronunciation, "woogie", by that same adult and a second speaker (a child in E1-3 and a new adult in E4). Although 2-year-olds did not systematically look to the trained object at test for either speaker's production of "woogie" (E1), 3-year-olds looked more at the trained object for the child's "woogie" than the adult's, whether or not they had heard the child make r-->w mispronunciations previously (E2 and E3). This suggests that 3-year-olds may expect r-->w mispronunciations from children, even in the absence of direct evidence about an individual child speaker. E4 (in progress) will confirm whether these expectations are indeed specific to child speakers.

A SYSTEMATIC REVIEW OF THE MOST COMMON LANGUAGE DIFFICULTIES IN CHILDREN & ADOLESCENTS WITH BECTS

Kirkland Johnston, Trent University; Kathie Bailey, University of Alberta; Nancie Im-Bolter, Trent University

Benign epilepsy with centrotemporal spikes (BECTS) in children is associated with language difficulties compared to typically developing peers, yet the most affected aspects are unclear. Language proficiency, including reading, is essential for learning in all subjects and overall academic success (Vetri et al., 2023; Völkl-Kernstock et al., 2009). A strong command of language skills enables children to effectively communicate, comprehend, and engage with academic content, leading to better academic performance (Völkl-Kernstock et al., 2009). Addressing these difficulties is crucial for supportive educational environments; thus, we systematically reviewed 20 studies to summarize common language difficulties in children and adolescents with BECTS. Each article measured multiple constructs, including syntax (k=10), semantics (k=9), verbal fluency (k=5), letter fluency (k=4), phonetics (k=4), morphology (k=1), phonology (k=9), and semantic fluency (k=6). The most frequent significant findings were syntax (k=6; 30.00%), semantics (k=5; 25.00%), phonology (k=4; 20.00%), verbal fluency (k=3; 15.00%), and phonetics (k=3; 15.00%). Other language problems included letter fluency (k=2; 10.00%) and semantic fluency (k=1; 5.00%). No significant findings emerged for morphology. These results indicate children and adolescents with BECTS may face heightened risk for reading and academic challenges due to struggles with syntax, semantics, phonology, verbal fluency, and semantics.

THE EFFECT OF PRODUCTIVE RHYTHMIC PROCESSING ON STATISTICAL LEARNING

Ana Miranda Guimaraes, Huron University College at the University of Western Ontario; Christine Tsang, Huron University College at the University of Western Ontario; Stephen Van Hedger, Huron University College at the University of Western Ontario

Statistical learning is a cognitive process in which an individual tracks and learns the statistical regularities and properties of a particular input. Previous research has focused on exploring statistical learning primarily in the context of language learning. The present study examines whether musical exposure can impact statistical learning. The purpose of the current study is to examine how exposure to a specific musical time signature will influence adult listeners' syllable target detection in an SL paradigm. In this study we use an online experimental paradigm where participants are trained to tap to the beat of short musical excerpts presented in 4/4, 3/4, or 12/8 and then complete 36 trials of a SL target detection task where they must identify a target nonsense syllable (see Batterink et al., 2015). We predict that exposure and practice tapping to the beat of specific musical time signatures will be an effective prime to increase reaction time and accuracy on a statistical learning target detection task.

ALTERED VISUAL FEEDBACK DOES NOT IMPACT THE SPEED OF IMPLICIT ADAPTATION

Sebastian D'Amario, York University; Jennifer Ruttle, York University; Bernard Marius Hart, York University; Denise Henriques, York University

Error feedback can profoundly impact our ability to learn motor skills, which is governed by explicit and implicit systems. We should rely on our implicit systems to perform motor tasks since it requires less effort and is automatic. Using continuous visible feedback, we have demonstrated a large emergence of implicit motor adaptation. This study stratifies rotation sizes of visual cursor feedback in an attempt to maximize implicit adaptation. Participants were exposed to perturbed locations of 15°, 30°, 45°, and 60° and reported an aiming trial to assess explicit awareness late into training. We also included a 45° condition, but with continuous explicit aiming. Our preliminary findings show a steady increase in implicit adaptation up to a 45° rotation, where it peaked at 33.9°, and showed no difference between the 60° group (35.5°). However, the continuous aiming group showed significantly less implicit adaptation at 22.0° despite training with the same rotation. Regarding speed, implicit adaptation appeared robust to visual perturbations. This suggests that frequent explicit measurement could decrease the overall amount of implicit adaptation. Moreover, error feedback can not influence the rate of implicit adaptation, but can increase the extent up to a 45° rotation, beyond which the benefit is negligible.

LEARNING TO ATTEND: EFFECTS OF PRACTICE ON SELECTIVE ATTENTION IN A TWO-TARGET TASK
Sevda Montakhaby, McMaster University; Bruce Milliken, McMaster University

Despite extensive research on the role of attention in learning and memory, there are only a handful of studies reporting evidence of attentional learning (Kelly & Yantis, 2010). Here we present evidence of attentional training that increased the efficiency of selective attention in an attentional blink (AB) task. Participants completed a two-target task in which identification of the first of two targets (T1) either did or did not require selective attention, and the report of a second target (T2) was measured. In the first session, these two trial types were presented either in separate blocks or randomly intermixed in the same block. In a second session completed two days later, we examined how selective attention efficiency was affected by the "training" that took place in Session 1. Interestingly, the training context that produced less efficient selective attention during the first session (i.e., the mixed context) produced the best transfer to the second session. These results parallel well-known findings in the motor and verbal domains (Schmidt & Bjork, 1992), and suggest that fundamental learning principles should inform the design of training procedures aimed at optimizing the learning and transfer of attentional skills.

INVESTIGATING THE ROLE OF AMPARS AND THEIR TRANSIENT EXCHANGE IN PERIRHINAL CORTEX FOR OBJECT MEMORY DESTABILIZATION
Emily Minard, University of Guelph; Kristen Jardine, University of Guelph; Madison Wilson, University of Guelph; Krista Mitchnick, York University; Ethan Huff, University of Guelph; Boyer Winters, University of Guelph

Consolidated memories can be modified through reactivation-induced memory destabilization and subsequent reconsolidation. Previous research indicates that the transient exchange of α-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid receptors (AMPARs) in the lateral amygdala is necessary for destabilizing auditory fear memories in rats; however, their involvement in other forms of memory has yet been elucidated. Here, we will investigate whether AMPAR activation and exchange from calcium-impermeable to calcium-permeable AMPARs via endocytosis is necessary in perirhinal cortex (PRh) for destabilizing object memories in rats. Using the spontaneous object recognition paradigm, we administered bilateral PRh infusions of an AMPAR antagonist, CNQX (0.7µg/µl), immediately before memory reactivation (RA; 24h after initial object exposure); the RA phase was followed by PRh infusions of the reconsolidation blocker, anisomycin. Results indicate that the pre-RA blockade of AMPARs prevents object memories from destabilizing, thereby rescuing them from the memory deficits associated with the post-RA anisomycin infusion. We are currently conducting a follow-up experiment evaluating the effects of pre-RA infusions of the AMPAR-endocytosis antagonist, GluA23Y. The results of this research will further establish the loosely understood role of AMPARs in memory destabilization and will accordingly expand our current understanding of the neurobiological bases that underlie the dynamic nature of long-term memory storage.

TWO PHENOMENA IN ONE COMPUTATIONAL FRAMEWORK: A COMPUTATIONAL ACCOUNT OF DIRECTED FORGETTING AND THE PRODUCTION EFFECT
Jackie Spear, University of Manitoba; J. Nick Reid, University of Manitoba; Dominic Guitard, Cardiff University; Randall K. Jamieson, University of Manitoba

In an item-based directed forgetting recognition task, Montagliani and Hockley (2019) recently concluded that participants elaboratively encode category-level information under instructions to remember. Conversely, Reid and Jamieson (2022) accommodated the results in an instance-based model of memory for by increasing the strength of R-cued items without assuming category-level elaborative rehearsal. We present two experiments building upon this work, exploring directed forgetting and the production effect using the same materials. We directly tested whether a retrieval-based mechanism provides a common theoretical framework (Jamieson et al., 2016; Reid & Jamieson, 2022). In Experiment 1, we replicated Montagliani and Hockley's mixed list examination and extended it to a pure-list examination to assess the role of strength regarding directed forgetting. In Experiment 2, we conducted a corresponding production-by-typing experiment in mixed- and pure-list designs. We present simulation results using an instance-based theory of human memory, MINERVA2, with assumptions that capture inter-item semantic similarity as well as what people encode when they produce an item. Our findings demonstrate that a retrieval-based account successfully explains two phenomena on the basis that a strength-based account drives the directed forgetting effect, whereas a distinctiveness-based account drives the production effect.

IN SHORT-TERM ORDERED RECALL VISUO-SPATIAL REHEARSAL BASED ON EYE MOVEMENTS MIMICS VERBAL REHEARSAL
Léonie Girard, Université de Moncton; Dominic Guitard, Cardiff University, UK; Jean Saint-Aubin, Université de Moncton

Over the last five decades a lot of work has been done to understand the contribution of verbal rehearsal to short-term ordered recall performance with verbal stimuli. However, the presence of a similar mechanism in serial memory for visual-spatial information remains sparse. Tremblay et al. (2006) showed the presence of spatial rehearsal based on eye movements. When participants made more saccades between temporally adjacent dots, recall was higher. However, they did not assessed rehearsal as a function of serial positions. Therefore, it is unknown if the distribution of visual-spatial saccades across serial positions mirror what is observed with verbal rehearsal. In two experiments, participants performed the dot task while their eye movements were monitored. Eight dots were sequentially illuminated at various locations on a screen and there was a 10-second retention interval. In Experiment 1, the 24 participants were asked to overtly rehearse by moving their eyes and no instruction was provided to the 24 participants in Experiment 2. As observed with verbal rehearsal, in both experiments, the frequency of rehearsal decreases across serial positions mimicking recall performance for the primacy portion of the serial recall curve. The theoretical implications of the findings for current models are discussed.

NAPPING AND STATISTICAL LEARNING CONSOLIDATION: A PILOT STUDY
Logan Goldring, Queen's University; Jennifer Fudge, Queen's University; Ana Alexandru, Queen's University; Jeffrey Wammes, Queen's University; Hans Dringenberg, Queen's University

Research across species demonstrates that sleep stabilizes newly formed explicit and implicit memories. One form of implicit memory is statistical learning, which involves the extraction of regularities in complex sensory environments. Whether sleep reinforces the consolidation of statistically learned information remains largely unknown. In this pilot study, we investigated whether sleep (a daytime nap) contributes to the formation of this form of implicit memory. Participants engaged in a classic visual statistical learning task involving abstract image pairs, followed by either a 1-hour nap or wake condition, monitored by means of standard polysomnography. Subsequently, participants completed a test to determine whether their memory representations for paired items had become more (i.e. integration) or less (i.e. differentiation) similar to one another. Inconsistent with our hypothesis, memory did not differ across groups. However, detailed analyses revealed interesting trends of a biphasic effect on learning-related representational change; shorter sleep duration favored integration, while longer sleep favored differentiation. These preliminary results raise the possibility that sleep supports statistical learning in a non-linear manner, with longer sleep associated with more distinct (differentiated) memory representations, reminiscent of the “pattern separation” phenomenon in memory networks of the medial temporal lobe. (Supported by NSERC grants to JW and HCD).

A SYSTEMATIC REVIEW OF THE DURATION OF ABSTINENCE NECESSARY FOR THE RECOVERY OF MEMORY PERFORMANCE IN REGULAR CANNABIS USERS
Lydia Hanna, Wilfrid Laurier University; Hannah Makar, Wilfrid Laurier University; Nina Hedayati, Wilfrid Laurier University; Jeffery A. Jones, Wilfrid Laurier University

The purpose of this systematic review was to determine the duration of abstinence (> 7 hours) necessary for the recovery of memory deficits in regular cannabis users relative to non using controls. We searched through PubMed, PsycINFO, and Web of Science databases and included studies that assessed verbal memory, long-term memory, and working memory in abstinent cannabis users and nonusing controls. Screening was performed using Covidence and PRISMA guidelines were followed. We reported the length of abstinence at the time of neuropsychological assessment for each study. Eleven studies, which included ten case-control studies and one cohort study (N=1283), met all inclusion criteria. Cannabis users abstinent for 8 days or fewer performed worse than controls in several domains of memory. Cannabis users abstinent for 3 weeks or more generally showed no significant differences in memory performance, however, two studies reported no recovery of memory deficits at 23 days and 2.5 years of abstinence. Based on our findings, memory deficits in regular cannabis users tend to recover around 3 weeks of abstinence. Overall, results were inconsistent therefore more research is needed on the long-term effects of cannabis use on memory.

POSTER SESSION II: TUESDAY, JULY 18 (3:00 - 4:45 PM)

KEEPING UP WITH THE CONTEXTS: SYSTEMIC MUSCARINIC ACETYLCHOLINE RECEPTOR ACTIVATION RESTORES OBJECT MEMORY UPDATING IN THE AGING BRAIN
Kristen Jardine, University of Guelph; Haley Edwards, University of Guelph; Karim Abouelnaga, University of Guelph; Cassidy Wideman, University of Guelph; Boyer Winters, University of Guelph

Reactivated memories can update in the presence of relevant information. Cognitive and behavioural inflexibility that is characteristic of aging may reflect a breakdown of this memory updating process. Cholinergic dysfunction underlies age-related cognitive decline, but it has not been tested how irregular cholinergic signaling may contribute to declarative memory updating deficits in aging subjects. We hypothesize that age-related cholinergic system decline underlies declarative memory updating deficits, and these deficits can be reversed by increasing muscarinic receptor activation. To test this, we designed a post-reactivation object memory modification task for mice, in which a reactivated object memory is updated with new context information. Young mice showed intact object memory updating, while aging mice were impaired. In young mice, pre-reactivation muscarinic receptor inhibition prevented updating of the reactivated object memory. In aged mice, systemic activation of muscarinic receptors restored object memory updating. Western blots of perirhinal cortex tissue from young and aging mice revealed that lack of acetylcholine release into the perirhinal cortex, rather than a lack of muscarinic receptors, underlies object memory updating deficits. Together, these findings suggest that pharmacological muscarinic receptor activation may compensate for the lack of cortical cholinergic release, ultimately improving cognitive flexibility in the aging brain.

HOOKED ON A TERPENE: WITHDRAWAL EFFECTS AFTER REPEATED SS-CARYOPHYLLENE EXPOSURE IN ZEBRAFISH (DANIO RERIO)
Matthew M. M. Harper, MacEwan University; Ethan Hagen, University of Alberta; Andréa Johnson, MacEwan University; Trevor J. Hamilton, MacEwan University

Terpenes, a class of phytochemicals produced by numerous plants, have the potential to treat psychological and physical conditions. The terpene, ß-caryophyllene (ßCP), causes a sedative effect in zebrafish at a 4% dose and has been shown to possess therapeutic promise in the treatment of many physical and psychiatric conditions, such as inflammation, cancer, and anxiety in mice models. However, there is minimal research on the effects of repeated ß-caryophyllene exposure and withdrawal effects. In this study we repeatedly administered ß-caryophyllene (4%) to zebrafish for either three days or six days, then assessed anxiety-like and locomotor variables after approximately 72 hours of withdrawal. Anxiety-like behaviour was quantified using the open field exploration and novel object approach tests and motion tracking software. In the three-day dosing condition, there were no differences in any variable between the control and ßCP groups. In the six-day dosing condition, the fish dosed with ßCP spent significantly less time in the center zone than the control fish in the novel object approach test. This study suggests that there is the potential for heightened anxiety-like behaviour following repeated exposure to ßCP during withdrawal.

DOPAMINE AT D1 RECEPTORS AND OVERCOMING BOUNDARY CONDITIONS FOR OBJECT MEMORY UPDATING
Olivia O'Neill, University of Guelph; Boyer Winters, University of Guelph

Consolidated long-term memories can be modified when destabilized by a reminder cue that returns the memory trace to a labile state before it is subsequently reconsolidated. Older (remote) memories do not destabilize unless a novel cue is presented at reactivation to signal destabilization. To determine the role of dopamine at D1-receptors in this process we tested rats using a modified spontaneous object recognition task to assess destabilization of recent and remote object memories. D1-receptors were blocked using the antagonist SCH23390. Subsequent injection of NMDA receptor antagonist MK801 was used to impair memory trace reconsolidation. We found that SCH23390 blocked the destabilization of recent, and remote object memories. Using the remote paradigm, the D1 receptor agonist SKF38393 induced memory destabilization in the absence of a salient novel cue. Furthermore, object memory modification was also impaired by SCH23390 administration. Using a post-reactivation object memory modification task, SCH23390 was administered prior to reactivation of the object memory trace. Immediately following reactivation, rats were placed into a new apparatus allowing for the integration of alternate contextual information into the existing object memory. The present results support the role of dopamine at D1 receptors in destabilizing and modifying newly encoded and boundary condition-protected object memories.

INHIBITION OF RETURN IN 3D SPACE IS DETERMINED BY THE CUE-TARGET SPATIAL RELATION ACROSS DEPTH

Noah Britt, McMaster University; Hanna Haponenko, McMaster University; Andriy Lytvyn, McMaster University; Hong-jin Sun, McMaster University

Inhibition of Return (IOR) is a visual phenomenon involving a delayed reaction time to visual stimuli presented at least ~300 milliseconds in a previously cued location. Previous studies in our lab have demonstrated that when the cue and target appear within the same placeholder object, or within the same world-centered depth plane, IOR is large in magnitude. However, when observers must orient their attention from the cue to target between two distinct depth planes, IOR is modulated depending on the direction of orienting. Specifically, IOR decreases when orienting from a far cue to a near target (i.e., orienting attention towards the observer), revealing an egocentric attention gradient. In the current study, we examined how cue-target object membership, world-centered depth, and the observed attention gradience contribute to the IOR effect. Across two experiments we compared 1) object membership/world-centered depth vs attention gradience contributions, and 2) object membership and world-centered depth. The results suggest that shared cue-target object membership/world-centered depth appear to overshadow the attention gradience contribution on IOR. Then by separating object membership and world-centered depth, IOR appeared largest when stimuli shared world-centered depth location, irrespective of object membership. These results have strong implications for the detection cost theory of IOR.

THE EFFECT OF TARGET SIMILARITY IN MULTIPLE OBJECT TRACKING AND MULTIPLE IDENTITY TRACKING

Rachel Eng, University of Guelph; Lana Trick, University of Guelph

Multiple-object tracking (MOT) and multiple-identity tracking (MIT) are two related tasks that assess the ability to keep track of several moving objects simultaneously. Currently, it is unclear whether these tasks involve the same or distinct cognitive mechanisms. A standard MOT task requires distinguishing targets from distractors (target localization), while a standard MIT task requires target localization and distinguishing targets from other targets (identity localization). To determine if target localization and identity localization require the exact same processes, we compared the effect of target feature similarity on MOT and MIT. In both tasks, the display included 16 unique items representing every combination of four colours and four shapes. There were four targets on each trial which could share a feature (i.e., colour or shape) or share no features. Furthermore, we conducted a variation on the MIT task, where there are eight targets in the display and no distractors. There were four unique items that were each repeated once. This requires distinguishing targets from one another without having to distinguish targets from distractors. The effect of target similarity should have different effects on target localization and identity localization if they involve different processes. Results supported this prediction.

ARE ATTENTION AND LEARNING DURING ONLINE VIDEO LECTURES INFLUENCED BY THE PRESENCE AND RELEVANCE OF CHAT COMMENTS?

Jackie Heitzner, University of Waterloo; Effie Pereira, University of Waterloo; Samantha Ayers-Glassey, University of Waterloo; Bruno Korst-Fagundes, University of Waterloo; Daniel Smilek, University of Waterloo

There has been a drastic increase in the use of video-conferencing platforms for online learning in recent years. However, empirical research on how different components of these platforms impact cognitive processes is lacking. For example, chat messages, wherein students can pose questions and receive answers from other students, may affect both memory and attention for lecture content. To explore this hypothesis, we had participants watch an online lecture during which pre-programmed and intermittent chat messages were either (i) not present, (ii) present and irrelevant to the lecture content, or (iii) present and relevant to the lecture content. These three conditions were randomized within participants. After the lecture, participants completed a memory test regarding the lecture material and answered questions about their subjective attention during the lecture. We found that the more time participants spent attending to all the chat comments, the lower their memory for lecture content. However, lecture-relevant comments significantly improved memory for lecture content compared to lecture-irrelevant and no comments. These findings highlight the importance of chat comments as a component of online learning and as a means of impacting students in their learning experience.

THE BILINGUAL ADVANTAGE RESULTS IN A DISADVANTAGE IN IMPLICIT MEMORY FOR UNATTENDED INFORMATION.

François Larouche, Nipissing University; Dana R. Murphy, Nipissing University; Alain Carlson, Nipissing University; Mark Wachowiak, Nipissing University

In previous research, bilingual adults have generally shown greater attentional control than monolingual adults. Could this advantage result in less implicit memory for unattended information? In this study, monolingual and bilingual participants completed a visual cognitive (Star Counting) task in silence or while ignoring auditory numbers and sentences. In an attended task, participants identified the first letter of the target word of sentences presented through headphones. To assess implicit memory for the attended and unattended sentences, participants then completed a sentence identification task in which they identified the final word of degraded sentences. These sentences (previously attended, ignored, or new) were degraded by removing all spectral information outside of a narrow 1-octave band of frequencies centred at 500 Hz. Implicit memory for the previously presented attended and ignored sentences was measured as an improvement in accuracy compared to new sentences. Both monolingual and bilingual participants demonstrated implicit memory for the attended sentences, but only the monolinguals demonstrated implicit memory for the ignored sentences. Given that the monolingual younger adults performed similarly to older adults in other studies, it would be worth exploring bilingual status as a possible explanatory factor for differences in performance normally attributed to aging.

AN EEG-INVESTIGATION OF THE CONTRIBUTION OF SHAPE AND SURFACE PROPERTIES IN FACE ENSEMBLE ENCODING

Marco A. Sama, University of Toronto Scarborough; Moaz Shoura, University of Toronto Scarborough; Adrian Nestor, University of Toronto Scarborough; Jonathan S. Cant, University of Toronto Scarborough

Extensive research has documented the neural underpinnings of single-face processing, revealing the contribution of shape and surface properties. However, comparatively less research has targeted the perception of multiple faces, referred to as a face ensemble (e.g., a crowd). For example, it is less understood how ensemble faces within versus outside the focus of attention are processed, or how shape and surface properties contribute to face ensemble processing. Here, we probe the neural representation of face ensembles using pattern analysis applied to EEG data. We designed a set of faces whose identity varies through the independent manipulation of shape or surface properties. Participants viewed ensembles consisting of seven faces, with one in the center, as a target of attention, and six in the surround. First, we show that both shape and surface played an important role in representing face ensembles, with surface playing a larger role for the ensemble surround. Next, we were able to decode the identity of the surround and target separately, with the latter occurring first. Our findings show that shape and surface play a different role in the neural encoding of ensembles relative to single faces and, further, reveal the temporal dynamics associated with their visual processing.

SENSORY SENSITIVITY IN NOISY ENVIRONMENTS INFLUENCES SPEECH MOTOR CONTROL IN AUTISTIC AND NON-AUTISTIC ADULTS

Kiera Leon, Wilfrid Laurier University; Angeline Redford, Wilfrid Laurier University; Zehra Sasal, Wilfrid Laurier University; Abel Christian, Wilfrid Laurier University; Japneet Shah, Wilfrid Laurier University; Jeffery A. Jones, Wilfrid Laurier University

Auditory feedback provides essential information to regulate our speech. When using auditory feedback, additional auditory information such as background noise may make it difficult to detect and correct for errors in one's speech. Further, the interference caused by this background noise may vary based on the speaker's degree of sensory sensitivities. One group known to have sensory sensitivities is autistic individuals. In this study, we recruited autistic and non-autistic participants to take part in a frequency altered feedback experiment. Participants vocalized a vowel sound while we introduced pitch errors into their auditory feedback. This task was performed across conditions with and without background noise playing. Adding background noise allowed us to probe how additional auditory information interfered with the speakers' abilities to regulate their speech. Participants also completed the sensory profile to provide a measure of sensory sensitivity. This allowed us to investigate whether speech motor control in the presence of background noise varied as a function of sensory sensitivities in autistic and non-autistic adults. This study will help us to better understand whether interference from background noise differentially influences people with sensory sensitivities while engaging in speech-motor control tasks and will increase our understanding of sensory-motor interactions more broadly.

GETTING A GRIP ON OBJECT REPRESENTATIONS FOR GOAL-DIRECTED ACTION

Michelle Wong, Western University; Cameron Lewis, Western University; Alice Tan, Western University; Robert Whitwell, Western University

When reaching for a goal object, the hand's in-flight aperture (grasp aperture) scales to the target's size. This scaling follows a de novo, 'just-in-time' visual analysis of the structural and spatial features of the target. The 'dual channel theory' (DCT) and the 'double pointing theory' (DPT) provide conflicting accounts of what this analysis entails: The DCT proposes a coding of target size, mapped onto grasp aperture. The DPT proposes a coding of target grasp-points, mapped onto egocentric finger-trajectories; grasp aperture is superficially correlated with target size. This study tested the DCT and DPT using a grasp adaptation paradigm in which grasp aperture tracks the 'after-effect' of a visual-haptic mismatch in object size. In this study, 38 human participants underwent grasp adaptation while their hand movements were recorded. We replicated a classic after-effect and tested its generalization to novel object positions and orientations. Crucially, visual target size was conserved, forcing the DCT to predict generalization. The DPT predicts no generalization, because novel object positions and orientations yield novel grasp-points and finger-trajectories. In line with the DPT, the after-effect did not generalize to novel orientations and positions. Our findings suggest the object representations for grasps involve target grasp-points rather than target size.

INFLUENCES ON NEGATIVE JUDGEMENTS OF AUTISTIC PEOPLE

Natalia Van Esch, Wilfrid Laurier University; Muskan Sait, Western University; Troy Boucher, Simon Fraser University; Ryan A. Stevenson, Western University; Noah Sasson, University of Texas at Dallas; Grace Iarocci, Simon Fraser University

Negative judgements of autistic people relative to non-autistic people have been consistently reported. In order to develop methods for improving people's perceptions of autistic people, it is important to understand what factors may influence these judgements. In this study, autistic adults, parents of autistic people, professionals who work with autistic people, and undergraduate students rated videos of autistic and non-autistic adults. These ratings included assessments of the autistic and non-autistic adults' traits, as well as the raters own behavioural intentions towards the adults in the videos. By comparing groups with different amounts of personal and professional contact with autistic people, we aimed to better understand how different types of autism exposure may influence judgements of autistic people. Overall, the videos of autistic people were rated more negatively than the videos of non-autistic people. Further, autistic people were rated more negatively by undergraduate students relative to autistic adults, parents of autistic adults, and professionals who work with autistic people. These findings suggest that positive experiences with autistic individuals may play a role in reducing negative judgements of autistic people.

EXPLORING THE NEUROPHYSIOLOGICAL CORRELATES OF VISUALLY-INDUCED MOTION SICKNESS (VIMS)

Polina Andrievskaia, Toronto Metropolitan University; KITE-Toronto Rehabilitation Institute; Behrang Keshavarz, Toronto Metropolitan University, KITE-Toronto Rehabilitation Institute; Stefan Berti, Johannes Gutenberg University; Julia Spaniol, Toronto Metropolitan University

Visually induced motion sickness (VIMS) is a phenomenon often induced when using visual displays including smartphones, TV, or virtual reality applications, with symptoms including nausea, fatigue, or headache. To date, little is known about the neurocognitive processes underlying VIMS. Previous studies using electroencephalography (EEG) have delivered mixed findings, with some studies reporting an increase in delta (1-3 Hz) and theta (4-7 Hz) power in the fronto-temporal regions. Yet, power changes in other frequencies have also been reported. Thus, the goal of the study was to gain further insight into EEG correlates for VIMS. Participants viewed a VIMS-inducing visual stimulus, composed of moving black-and-white vertical bars presented on an array of three adjacent monitors. VIMS ratings were recorded after each trial using subjective ratings and neurophysiological data were recorded using a 32-channel EEG. Time-frequency analyses were conducted comparing neural activity of participants reporting no VIMS (N=13) and moderate VIMS (N=12). Participants experiencing VIMS showed an increase in delta power in the left centro-parietal region (CP5), with general increase in low-frequency band synchronization in this region across trials. No other significant changes in the EEG showed. Results of this study further enhance our understanding of neurophysiological correlates of VIMS.

DIFFERENTIAL EFFECTS OF CONTINUOUS THETA BURST STIMULATION ON MOTOR THRESHOLDS AND VISUAL PHOSPHENES

Remy Cohan, Centre for Vision Research; Jennifer Steeves, Centre for Vision Research

Repetitive transcranial magnetic stimulation (rTMS) and its efficient variant, theta burst stimulation (TBS), have gained prominence in clinical and research settings. TBS studies primarily focus on the primary motor cortex (M1), with limited research on the primary visual cortex (V1). TBS has two variations: intermittent TBS (iTBS), considered excitatory, and continuous TBS (cTBS), inhibitory when applied to M1. Previously, using functional MRI and MR spectroscopy, our lab found that neither cTBS nor iTBS to V1 significantly altered functional connectivity or GABA concentration levels. In this study, we compared cTBS and iTBS on motor thresholds (MTs) and phosphene thresholds (PTs) by stimulating M1 and V1, respectively. Preliminary data indicate cTBS applied to V1 leads to higher PTs compared to sham stimulation, suggesting an inhibitory aftereffect. Understanding the differential effects of stimulation parameters across brain regions with distinct cytoarchitecture (e.g., M1 as output cortex, V1 as input cortex) is crucial for TMS applications in research and clinical settings. This knowledge will help optimise TMS approaches, ensuring they are tailored to target regions' specific requirements, and enhance TMS efficacy as a therapeutic intervention for visual disorders with neurological origins.

VOCAL MOTOR CONTROL DURING EXPOSURE TO OSCILLATING PITCH CHANGES

Rita Bishai, Wilfrid Laurier University; Jeffery Jones, Wilfrid Laurier University; Nichole Scheerer, Wilfrid Laurier University

Auditory feedback is essential for vocal motor control whereby exposing speakers to sudden shifts in their vocal pitch (F0) causes reciprocal changes in F0 production. However, it is unclear whether the vocal motor control system can track and compensate for constantly changing errors perceived in sensory feedback. To test this, participants were asked to produce the vowel “ah” for 3 seconds while they heard their F0 fed back to them through headphones. The F0 of the speaker's auditory feedback was oscillated between 0 and 16 oscillations/second and compensatory responses and mean lag time were assessed. The results indicate that the mean size of F0 compensation decreased as the frequency of the auditory feedback modulation increased. To compensate for dynamic changes in perceived auditory feedback, the nervous system must continually track and compensate for perceived vocal error. Our data suggest that in addition to compensation to sudden (on-off) perturbations to feedback, speakers activate compensatory mechanisms for modulated auditory feedback. We plan to explore the interplay between closed-loop and open-loop control mechanisms that underlie vocal control in further behavioural and brain imaging work.

LEFT CEREBELLAR LESIONS MAY BE ASSOCIATED WITH AN INCREASE IN SPATIAL NEGLECT-LIKE SYMPTOMS.

Ryan Verbitsky, MacEwan University; Britt Anderson, University of Waterloo; James Danckert, University of Waterloo; Sean Dukelow, University of Calgary; Christopher Striemer, MacEwan University

Each cerebellar hemisphere projects to the contralateral cerebral hemisphere. Previous research suggests a lateralization of cognitive functions in the cerebellum, mirroring the cerebral cortex. While adequate evidence supports the role of the right cerebellum with language functions, evidence supporting the notion that attention and visuospatial functions are left lateralized remains unclear. Spatial neglect is among the most common disorders arising from right cortical damage. We reasoned that left cerebellar damage would result in increased spatial neglect-like symptoms without necessarily leading to an official diagnosis of spatial neglect. This disconnection hypothesis was examined through a retrospective analysis of neglect screening data (line bisection, cancellation, figure copying) from 20 patients with isolated unilateral cerebellar stroke (9 left, 11 right). Left (but not right) cerebellar patients missed significantly more targets on the left side of cancellation tasks compared to a normative sample. A lesion overlap analysis indicated Crus II (78% overlap) and lobules VII and IX (66% overlap) as the most damaged regions in left cerebellar patients. Our results are consistent with the notion that the left cerebellum may be important for attention and visuospatial functions. Furthermore, assessing attention and visuospatial deficits in cerebellar patients may be important for tailoring rehabilitative efforts.

COGNITIVE ORIENTATION IMPACTS LATER DIFFERENTIATION OF CONCEPTUALLY SIMILAR MEMORIES IN ANTERIOR HIPPOCAMPUS AND PARIETAL CORTEX
Sagana Vijayarajah, University of Toronto; Margaret Schlichting, University of Toronto

Past work has shown that how the brain codes conceptual and perceptual features of experience may rely on one's current cognitive orientation. However, it remains unclear whether these orientations have a lasting impact on stimulus representation. We manipulated adults' (N=42) attention to conceptual (story) or perceptual (artist style) dimensions of illustrations during encoding. After, they completed a memory test with studied and lure illustrations. Lures were matched to conceptual or perceptual dimensions of each studied illustration. We used fMRI to examine how neural similarity between studied and lure illustrations at test varied by the previous orientation, and the behavioural consequences of this similarity. We found robust conceptual coding that also varied by previous orientation. Specifically, conceptual-based orientations supported later organization that emphasized conceptual similarity between illustrations in inferior parietal and visual cortex. By contrast, anterior hippocampus and superior parietal cortex both differentiated along conceptual dimensions—only when participants oriented to conceptual or perceptual features, respectively—in a way that benefitted memory behaviour. These findings suggest initial focus encourages different memory codes in hippocampus and neocortex for attended information. Specifically, attention emphasizes differences across experiences in hippocampus yet similarities in neocortex, with superior parietal additionally suppressing similarity along the unattended dimension.

UNDERSTANDING THE PHONOLOGICAL DEFICIT IN DYSLEXIA
Severina Ferreira-Lopes, Concordia University; Aaron Johnson, Concordia University; Zoey Stark, Concordia University

Dyslexia is a cognitive learning disability that impacts the recognition and decoding of words, leading to phonological deficits, poor spelling and reading abilities throughout their lifespan. The York-Adult Assessment Battery-Revised is designed to assess cognitive functioning in adults using tests of reading, spelling, writing and phonological measures (Warmington et al., 2013). The phonological component is measured using spoonerisms (i.e., words or phrases in which letters or syllables get swapped), and digit and object rapid automatized naming (RAN) tasks. Here we aim to investigate whether the spoonerisms and RAN tasks could act as screening tools for dyslexia. We hypothesized that a performance difference in both tasks will exist between individuals with dyslexia and non-dyslexics. We found a performance difference in both the spoonerisms and RAN digit, with dyslexics performing worse in both tasks. We also hypothesized a sex difference between and across groups for each task. We observed a sex difference for the spoonerisms task, with males performing better than females, but not for the RAN task. Therefore, spoonerisms may be an adequate tool for discerning between adults with and without dyslexia, allowing it to be used as a screener for dyslexia. However, further research is needed for the RAN task.

UNDERSTANDING SENSORIMOTOR CONTRIBUTIONS TO VERB COMPREHENSION: AN EEG INVESTIGATION
Suesan MacRae, University of Western Ontario; Heath Matheson, Memorial University

Explaining how neural patterns represent the conceptual meaning of words remains an important challenge in cognitive neuroscience. Embodied theories of cognition posit that reactivations of sensorimotor information are partially constitutive of conceptual representation. In the present study, we investigated how action concepts were represented neurally while participants (N = 35) read hand-related and foot-related verbs. On half the trials, we induced the rubber hand or rubber foot illusion in participants while they were reading. Using spatiotemporal representational similarity analysis, we show evidence of that concept information was decodable between 600-700ms after the presentation but this decoding was reduced during the illusion conditions. Using event-related potential analysis, we showed evidence of an interaction between the illusion condition and the hand or foot concept. These results suggest that sensorimotor information plays a functional role in the representation of the meaning of words.

STRUCTURAL BRAIN PREDICTORS OF TREATMENT RESPONSE IN ALCOHOL USE DISORDER PARTICIPANTS

Tegan Hargreaves, McMaster University; Carly McIntyre-Wood, Peter Boris Centre for Addictions Research, St. Joseph's Healthcare Hamilton; Emily Vandehei, Peter Boris Centre for Addictions Research, St. Joseph's Healthcare Hamilton; Danielle Love, Peter Boris Centre for Addictions Research, St. Joseph's Healthcare Hamilton; Molly Scarfe, Peter Boris Centre for Addictions Research, St. Joseph's Healthcare Hamilton; Emily Levitt, Peter Boris Centre for Addictions Research, St. Joseph's Healthcare Hamilton; Emily Levitt, Peter Boris Centre for Addictions Research, St. Joseph's Healthcare Hamilton; Michael Amlung, Cofrin Logan Center for Addiction Research and Treatment, University of Kansas; James MacKillop, Peter Boris Centre for Addictions Research, St. Joseph's Healthcare Hamilton

Addiction medicine has begun integrating neuroscience to understand biomarkers of treatment response in substance use disorders, including alcohol (AUD). MRI studies have identified neurobiological phenotypes of AUD, implicating regions and networks related to salience, reward, and executive function; however, few have identified neural correlates that predict treatment response. We investigated structural brain regions that may predict motivational interviewing treatment response. All participants were assessed for an AUD and provided estimates of alcohol consumption over the past 30 days. We included 68 AUD+ participants with 1-month follow-up data. A priori regions of interest (ROIs) were selected based on existing AUD literature and were averaged to create bilateral ROIs (n=18) as predictors. Multiple linear regressions were conducted with 1-month percent heavy drinking days (%HDD) as the outcome variable and baseline %HDD, age, sex, and intracranial volume as covariates. Clinically, we found a significant decrease in alcohol consumption ($p<0.001$) at 1-month. Greater cortical thinning significantly predicted lesser reductions in heavy episodic drinking, particularly in the inferior frontal gyrus, middle and superior temporal gyri, and anterior cingulate. Our results highlight ROIs that may be AUD-specific, as well as demonstrate implicated brain regions that may offer predictive utility in AUD treatment.

THE BENEFIT OF MOTORIC ENGAGEMENT AT ENCODING ON ROUTE MEMORY

Yadurshana Sivashankar, University of Waterloo; Myra Fernandes, University of Waterloo

Navigational devices limit the need for decision-making. We examined whether providing visual navigational guidance during initial exploration of a space hindered memory for routes travelled. In Experiment 1, participants (n = 50) explored 12 virtual reality (VR) environments created based on real-world cities, for 40s each, with the goal of finding a star. Navigation strategy was manipulated within-subjects, randomly, and required either actively self-initiating decision-making about the route of travel or following a visually-guided route, both with volitional control of movements using VR paddles, or passively viewing a pre-selected route. Following encoding, participants re-entered each map, and were asked to “re-trace” the exact route they had traveled. We found an effect of Navigation strategy on route overlap accuracy such that self-directed and visually-guided conditions similarly benefited performance significantly more than passive viewing. Results suggest motoric involvement during encoding, more so than decision-making, underlies the memory benefit. In Experiment 2 (n = 54) we implemented the same procedure using Desktop VR, with navigation via keyboard button press, rather than arm and body movement as in Immersive VR. We found no effect of Navigation strategy, suggesting again that any benefit to route memory depends on the degree of motoric engagement at encoding.

NEUROCOGNITION, BILINGUALISM AND EXECUTIVE FUNCTIONING

Jasmine Lee, University of Ottawa; Shanna Kousaie, University of Ottawa

Previous work has linked bilingualism with executive functioning, suggesting that bilingualism confers a cognitive advantage. Results have been mixed, due in part to methodologies largely comparing bilinguals and monolinguals on behavioural performance alone, while overlooking individual differences within bilinguals (e.g., language proficiency, frequency of use, or age of acquisition of a second language). The current multimodal study aims to identify specific aspect(s) of bilingualism (e.g., proficiency, fluency, age of acquisition of a second language) that may confer neurocognitive and behavioural advantages in executive functioning to start to address these issues. Data collection is currently ongoing with a goal of recruiting a total of 100 young adult English-French bilingual participants (current n=10). Executive functioning and bilingual language experience will be included as continuous predictors in regression-based analyses with measures of neural coherence across functionally relevant frequency bands (measured using resting state electroencephalography; rs-EEG) as outcomes. We hypothesize that language experience confers a neurocognitive advantage; for example, that greater bilingual language experience (e.g., proficiency, fluency, and age of acquisition of a second language) will be linked to superior executive functioning and increased neural coherence in the alpha frequency band across fronto-parietal brain regions (e.g., dorsolateral prefrontal regions, posterior parietal regions).

THE EFFECT OF CHRONIC AND ACUTE CANNABIS USE ON COGNITIVE-MOTOR TASKS

Kamila Kolpashnikova, York University; Assel Al-Bayati, York University; Holy Clayton, York University; Ryan Cortez, York University; Shital Desai, York University; Bernard Marius 't Hart, York University; Bernard Marius 't Hart, York University

To investigate the effect of cannabis on various brain functions, we created a battery of cognitively demanding, visual-spatial and visual-motor tasks (Go/No-Go, Serial Visual Search, N-Back, Trail Making, and Task Switching). Here, we discuss preliminary findings of two tasks. The first is a Go/No-Go task (80% go, 20% no-go) that measures the ability to inhibit motor impulses in frequent cannabis users (N=88), infrequent users (N=163), non-users (N=330), and users, who were high during the task performance (N=32). The second task is Visual Search (Set Sizes: 6, 12, and 18) which assesses selective visual attention. Our findings indicate that frequent users, infrequent users, and non-users performed similarly on these tasks. There were significant differences between high users and other groups in Go/No-Go tasks but not in Visual Search.These results may suggest that chronic frequent cannabis-use is not associated with working memory impairments. We also find that there is some evidence of effects on response inhibition in acute cannabis users, but not in selective visual attention. While there might be immediate effects of cannabis use, our preliminary results show little to no prolonged effects of cannabis on spatial working memory and impulsivity control.

THE COGNITIVE SCIENCE OF TASK MANAGEMENT: NAVIGATING THE TRADE-OFF BETWEEN URGENCY AND IMPORTANCE

Kristina Wu, University of Waterloo; Samuel Johnson, University of Waterloo

Life often requires us to trade-off what is urgent against what is important. Prior work (Zhu et al., 2018) suggests that we often prioritize urgent tasks in simple situations, yet this effect has been little explored. We developed a novel method to study the heuristics people use to prioritize tasks in more complex environments. We recruited 100 workers from Mechanical Turk to participate in a task management game that pitted urgency against importance. We found that participants fell into two main groups: a) those who prioritized tasks flexibly using a near-optimal balance and b) those who prioritized tasks based predominantly on importance (rather than urgency as in prior work). We consider several reasons why we found conflicting results compared to prior work, including increased psychological distance (participants planned ahead instead of actively selecting tasks) and inflated values of importance (importance was measured by large hypothetical payouts, e.g., $1000, rather than smaller real payouts, e.g., $0.04). Overall, we believe this line of research can ultimately inform productivity - enhancing nudges, stress reduction techniques, and strategies for helping us all to get the most out of life.

REASONING ABOUT SPECIFIC RELATIONS VERSUS GENERAL ASSOCIATIONS SHOWS PROTRACTED DEVELOPMENT THROUGHOUT ADOLESCENCE

Alex McArthur, University of Toronto; Katharine F. Guarino, Loyola University Chicago; Michael L. Mack, University of Toronto; Alison R. Preston, University of Texas at Austin; Margaret L. Schlichting, University of Toronto

Successful reasoning often requires the integration of multiple pieces of sometimes complex information. Past work has shown that children and even adolescents struggle with reasoning, but it remains unclear whether this is due to the demand for integration or rather the complexity of the information. Here, children (aged 6-11 years), adolescents (12-17), and adults (18-29; total N=67) were presented with relations among pairs of coloured balls and asked to judge whether one target relation was valid given four premise relations. Problems varied in the number (one vs. two) and complexity (general associations vs. specific orderings) of relevant premises. Across problem types, children performed worse than adults. In contrast, adolescents showed a larger accuracy cost particularly on decisions that required consideration of specific versus general relations, independent of relation quantity. Follow-up analyses with a drift diffusion model revealed that adolescents' greater difficulty reasoning about specific versus general relations was linked to their slower accumulation of evidence toward reasoning decisions relative to adults. These findings suggest that prior reports of an adolescent-specific "dip" in reasoning performance may stem from difficulty representing and considering more complex relations, independent of the demand for relational integration.

THE KIDS ARE ALRIGHT: SUMMER LEARNING LOSS IN NUMERACY IS MINIMAL

Jenna Rice, Carleton University; Heather Douglas, Carleton University; Shuyuan Yu, Carleton University; Rebecca Merkley, Carleton University; Jo-Anne LeFevre, Carleton University

Summer learning loss is the decline in academic skills such as reading and math that occurs during the summer months. Claims about summer learning loss are rarely evaluated with data. Additionally, little is known about how early numeracy skills are affected over the summer, despite their importance for later mathematical achievement. We analysed data from a large, provincially representative sample of students in grades 1-3 in Alberta who completed the Provincial Numeracy Screening Assessment (PNSA) up to three times, from Fall 2021 to Fall 2022 (N = 6427). The PNSA is based on research in mathematical cognition and includes subtests measuring number understanding, relations, and operations. We found summer learning loss for arithmetic fluency: Children scored significantly worse in Fall 2022, compared to Spring 2022. However, these losses were minimal in comparison to the significant growth in fluency observed over the school year. In contrast, we did not find learning loss for number line estimation. Based on these analyses, we conclude that summer learning loss in numeracy skills is a minor issue for students in this age range, however, it is also clear that numeracy skills do not improve when children are out of school.

WHAT FOUNDATIONAL NUMERACY SKILLS PREDICT ARITHMETIC PERFORMANCE ONE YEAR LATER IN GRADES 2-3: DATA FROM THE PROVINCIAL NUMERACY SCREENING ASSESSMENT

Liza Kahwaji, Carleton University; Heather Douglas, Carleton University; Jenna Rice, Carleton University; Shuyuan Yu, Carleton University; Rebecca Merkley, Carleton University; Jo-Anne LeFevre, Carleton University

Children's abilities to judge the magnitude of numerical symbols (e.g., which is larger?) and their order (e.g., what comes after 2?) are related to their arithmetic skills. Over the first years of school, children seem to gradually move from understanding symbol-quantity (i.e., that 2 represents the quantity * *) to symbol-symbol relations (i.e., that 2 comes before 3). Between kindergarten and grade 3, there is a transition in which order knowledge becomes a better predictor of arithmetic than cardinal knowledge. Here, we used a large provincially representative data set to study this transition. Students in grade 2 (N= 3588) and grade 3 (N = 2237) completed arithmetic, number comparison, and order judgment tasks up to four times, from Fall 2021 to Fall 2022, as part of the Provincial Numeracy Screening Assessment (PNSA). The PNSA is a classroom numeracy screening tool developed for the Alberta Ministry of Education. Preliminary analyses suggest that longitudinally, ordering skills were a stronger predictor of growth in arithmetic skills than were comparison skills. In this poster, further analyses of the relations among students' ordinal, cardinal, and arithmetic knowledge will be used to interpret the PNSA and evaluate models of numeracy development.

AUTISTIC TRAITS AND BASIC NUMERICAL PROCESSING

Seyed Mohammad Mahdi Moshirian Farahi,Carleton University; Craig Leth-Steensen, Carleton University

The current study examines the relations that the five trait dimensions of the Autism Spectrum Quotient (AQ) have with basic numerical processing within a large sample of N = 456 participants. Three well-known and well-studied response time (RT) effects underlying the processing of numerical stimuli are the Spatial Numerical Association of Response Codes (SNARC) effect, the Problem Size effect, and the Distance effect. Each of these effects were separately indexed in terms of slope values derived for each individual participant from their performances on a single-digit parity task, a single-digit multiplication task, and a single-digit paired comparison task, respectively. After controlling for the overall RT on each task, higher scores on the Attention to Detail subscale of the AQ were related to smaller problem size effects (i.e., less positive slopes) and higher scores on the Imagination difficulties subscale of the AQ were related to smaller distance effects (i.e., less negative slopes). No relation between any the AQ dimensions and the size of the individual SNARC effects were observed.

THE INFLUENCE OF PERSONAL TRAITS ON EMOTION PERCEPTION

Wei Fang, McMaster University; Xiaoxue Kong, McMaster University; Louis Schmidt, McMaster University; Naiqi Xiao, McMaster University

Perceiving emotions from various perceptual cues is a fundamental cognitive capacity. We can accurately identify emotional status from faces with a glance. Thus, this ability is believed to be highly robust among typical populations, and its individual difference is less known. Here, we focused on personal traits (e.g., shyness and empathy) and investigated how one's personality could associate with their ability to perceive emotions from face images. Young adult participants (N = 45, in progress) were recruited to classify emotions and rate the intensity, valence and arousal of different facial expressions across a range of intensity on screen. In addition, we collected participants' personal traits (e.g., shyness and empathy) using questionnaires. Meanwhile, we also recorded participants' eye movements using eye-tracker. Results showed that participants could reliably classify different emotions and infer expressed intensity, valence and arousal. More importantly, we found that individual traits would differently impact the processing of emotional faces. Lastly, our eye-tracking results showed that participants attended significantly more on mouth area when viewing faces regardless of different emotions and intensities. These findings might provide some empirical evidence showing that the socio-emotional difference among people could root in their perceptual bias toward different emotions in their daily

EXECUTIVE FUNCTION PREDICTS OLDER ADULTS' LURE DISCRIMINATION DIFFICULTIES ON THE MNEMONIC SIMILARITY TASK

Adelaide Jensen, University of Ottawa; Galit Karpov, Rutgers University; Charles Collin, University of Ottawa; Patrick Davidson, University of Ottawa

Older adults often have difficulty remembering the details of recently encountered objects. We (Davidson et al., 2019) previously found this with the Mnemonic Similarity Task (MST). Surprisingly, the older adults' MST lure discrimination index (LDI) was significantly correlated with visual acuity but not with episodic memory or executive function. Here we ran a replication with new, larger samples of young (N=45) and older adults (N=70), who completed the MST and a battery assessing visual acuity, episodic memory, and executive function. Consistent with previous findings, the older adults showed significantly poorer LDI but preserved item recognition. LDI was significantly correlated with both episodic memory and executive function but not with visual acuity. We then combined the original and replication older adult samples (N=108) to critically examine the relative contributions of visual acuity, episodic memory, and executive function composite scores to LDI performance using multiple regression and dominance analyses. Multiple regression results indicated that all three composites predicted LDI, but dominance analysis revealed that executive function was the most important predictor. Our findings suggest that older adults' MST LDI difficulty may be predicted by their executive function and visual acuity. These factors should be considered when interpreting older adults' MST performance.

MORPHOLOGICAL EFFECTS IN MALAY PREFIXED WORDS

M. Maziyah Mohamed, University of Western Ontario; Debra Jared, University of Western Ontario

Although research on morphological processing has been extensively studied in English and European languages (see Marelli et al., 2020), there is a growing interest in extending the research to other languages. Here we examined Malay, an Austronesian language that is morphologically rich. We investigated the effects of morphological constituents on lexical decisions for prefixed words. Specifically, we examined whether readers are sensitive to any distributional properties of the prefix and root morphemes. Variables investigated included length, family size, and family frequency for both prefixes and roots, as well as number of orthographic variants, consistency, and productivity for prefixes. Decision latencies were collected for 1,280 Malay words of various morphological structures. Data from the 640 prefixed words were analyzed in a series of GAMM models. We observed a facilitative effect of root family size on decision latencies after accounting for overall frequency and length. Furthermore, prefix length and the number of orthographic variants significantly impacted decision latencies. These findings indicate that Malay readers are sensitive to some distributional properties of individual morphemes in multimorphemic words.

HOW DOES A PERSON'S L1 WRITING SCRIPT IMPACT L2 READING IN A SAME OR DIFFERENT SCRIPT?

Naima Mansuri, McGill University; Antonio Iniesta, McGill University; Esteban Hernandez-Rivera, McGill University; Pauline Palma, McGill University; Debra Titone, McGill University

At least half the world's population speaks more than one language (Grosjean, 2010) and a large percentage can read in a second language (Lallier et al., 2021; Siegelman et al., resubmitted). Here, we investigated whether competing influences from people's first language (L1) writing system (i.e., alphabetic, logographic or alphasyllabic) impacted reading performance in an alphabetic second language (L2), specifically English. Based on previous bilingual reading models (e.g., Ziegler & Goswami, 2005), our general hypothesis was that matches between L1 and L2 writing scripts will modulate the expected relationship between L2 usage and objective L2 reading performance. We tested this hypothesis using a subsample of 1949 healthy, adult bilinguals from the English Reading Online data corpus (Siegelman et al., resubmitted). As expected, increased L2 English reading exposure predicted higher objective reading performance, and faster overall reading times. However, this expected relationship interacted with L1 script type. Specifically, higher L2 usage mitigated some of the negative effects caused by mismatches between different writing scripts. These results suggest that orthographic features of an L1 can impact L2 objective reading performance, over and above expected impacts of L2 reading exposure.

THE EFFECT OF CASE TYPE AND ATTENTIONAL STATE ON THE ORTHOGRAPHIC NEIGHBOURHOOD EFFECT

Nicolas Laham, Carleton University; Craig Leth-Steensen, Carleton University

The orthographic neighbourhood effect refers to the increased speed of lexical processing of printed words that have many orthographic neighbours (i.e., a large N). Such an effect is typically theorized to occur due to the top-down activation provided by those neighbouring words in lexical memory. In the current study, this effect was further examined by having N = 163 participants perform lexical decisions (i.e., word-nonword?) involving sets of high-N, low-N, and hermit (i.e., no N) words. Moreover, both the lower versus upper case of the words was manipulated under conditions designed to invoke either attentional or non-attentional (i.e., mind-wandering) states. As expected, hermit words were processed more slowly and less accurately than both the low-N and high-N words. Interestingly, effects of case type were present for hermit words only. Namely, such words were processed faster (but mainly in the standard attentive state conditions) and more accurately (but only in the novel non-attentive state conditions) when presented in lower case.

LINGUISTIC ABILITIES UNIQUELY PREDICT SUCCESS IN LEARNING A PROGRAMMING LANGUAGE.

Sam Egan, Carleton University; Olessia Jouravlev, Carleton University

Computer science education is becoming part of the core curriculum, with many schools requiring students to take at least one programming class. In computer science classes, students receiving the same instructions will often achieve different learning outcomes. While some students will master very complex programming ideas with relative ease, many others will find it challenging to grasp even basic notions. Why do some students succeed in learning how to program more effectively than others? Among many other factors, some propose that students' mastery of natural languages contributes to success in learning how to program (Bergin & Reilly, 2005; Erdogan et al., 2008), however, only anecdotal evidence in support of this claim has been provided so far. We examined the claim that there are links between linguistic and programming abilities. Students enrolled in introductory programming courses at Carleton University completed a battery of task measuring their linguistic abilities in English. We found a strong correlation between linguistic abilities and final grades that students obtained in the programming course, even when we controlled for other factors shown to predict programming achievement, including general intelligence and motivation to take the course.

ARE PROPOSITIONS THE PRIMITIVES OF SEMANTIC MEMORY?

Paul Stan, Concordia University; Christopher Genovesi, Concordia University; Roberto G. de Almeida, Concordia University

In attempting to explain the combinatorial nature of concepts, representational theories of mind (RTM) have traditionally assumed that meaning representation is either pictorial or propositional. While most frameworks have co-opted both mediums as possible mental primitives, proponents of propositional RTMs claim that language-like primitives must take precedence over any other formats (Fodor, 1975, 2008; Fodor & Pylyshyn, 2015; Wilson & Carston, 2019). Using a free recall paradigm (Kintsch, 1974), we explored the existence of propositional primitives in memory. Participants had to remember structurally similar sentences whose propositional content was manipulated by varying the number of truth-bearing arguments or predicators in each sentence. Thus, "the eagle circled the mouse" and "the thick snow fell" would have a similar surface structure of three content words but a different propositional complexity, with the former conveying one proposition (CIRCLE[EAGLE, MOUSE]) and the latter conveying two (FELL[SNOW] & THICK[SNOW]). We report that propositions robustly behave as units in memory for simple sentences as such, where an increase in propositional complexity yields poorer recall performances. However, we find mixed results for sentences with four content words and two or three propositions, suggesting different encoding processes that are discussed in light of communication theories.

HOW MANY LANGUAGES DO YOU KNOW? CHILDREN INFER LANGUAGE BACKGROUND FROM ACCENT

Shaneene Heupel, University of Waterloo; Ashley Avarino, University of Waterloo; Katherine S. White, University of Waterloo

Children expect language to carry information and, by 14 months, monolingual children appear to expect other individuals to communicate in a single language (Colomer & Sebastian-Galles, 2020). Children also appear to make inferences about speakers with unfamiliar accents, including that they were born far away, or are more likely to make grammatical errors (Weatherhead et al., 2018; Rett & White, 2022). But do children infer that someone with a foreign accent is likely to speak an additional language? We tested this question by presenting 4-7-year-olds (N=96) with scenarios in which they first heard two English speakers, one with a native English accent and the other with a non-native English accent (German, Italian, or Mandarin). They then heard a 3rd speaker who made a request in an unfamiliar language (German, Italian, or Mandarin, depending on the accent condition). Children were asked which of the first two speakers would understand the 3rd speaker's request. Across all age groups (and increasingly with age), children chose the speaker with the non-native English accent. This suggests that children may expect speakers with non-native accents to speak additional languages. Follow up studies are examining the specificity of this effect.

ORTHOGRAPHIC-SEMANTIC CONSISTENCY EFFECTS IN LEXICAL DECISION: WHAT TYPE OF NEIGHBORS IS RESPONSIBLE FOR THE EFFECTS?

Yasushi Hino, Waseda University; Debra Jared, University of Western Ontario; Steve Lupker, University of Western Ontario

Recent research (e.g., Marelli & Amenta, 2018; Siegelman et al., 2022) has demonstrated a significant orthographic-semantic (O-S) consistency effect on lexical decision performance. Specifically, lexical decision latencies were faster for words with consistent O-S relationships than for words with inconsistent relationships, with consistency being defined in terms of the semantics of those words' "orthographic neighbours". Interestingly, however, the words assumed to be orthographic neighbours were different in the different studies and, therefore, different factors may have been at work in the two situations. In order to more closely examine the origin of O-S consistency effects, we computed O-S consistencies based on addition and substitution neighbors separately for mono-morphemic English words and conducted a lexical decision task. While a significant O-S consistency effect emerged when the consistencies were computed based on addition neighbors (e.g., cats-CAT, pant-PAN), no consistency effect was observed when the consistencies were computed based on substitution neighbors (e.g., cot-CAT, pin-PAN). Further, when the variance due to the number of morphologically-related neighbours was statistically removed, the consistency effect disappeared. These results suggest that the O-S consistency effect in lexical decision is due to the target and its neighbours sharing morphology.

EXAMINING ADAPTATIONS IN STUDY TIME ALLOCATION AND RESTUDY SELECTION AS A FUNCTION OF EXPECTED TEST FORMAT
Skylar Laursen, University of Guelph; Dorina Sluka, University of Guelph; Chris Fiacconi, University of Guelph

Previous literature suggests learners can adjust their encoding strategies to match the demands of the expected test format. However, it is unclear whether other forms of metacognitive control are also sensitive to expected test format. In the current series of experiments we examined whether learners qualitatively adjust their allocation of study time and restudy selections when expecting a more difficult generative memory test (i.e., cued-recall) as compared to a less difficult non-generative memory test (i.e., forced-choice recognition). Counter to our predictions, we found little evidence that learners shift their study time allocation and restudy selection choices toward more difficult material when expecting a relatively easier forced-choice recognition test, even after acquiring experience with each test format. Instead, learners appeared to rely heavily on the success with which they retrieved associated studied information at the time that restudy selections were solicited. Moreover, counter to some extant models of self-regulated learning, learners tended to first choose difficult rather than easy items when making their restudy selections, regardless of expected test format. Together, these novel findings place new constraints on our current understanding of learners' metacognitive sensitivity to expected test format, and have important implications for current theoretical accounts of self-regulated learning.

THE INFLUENCE OF SELF-SERVING AND PROSOCIAL REWARD ON RECOGNITION MEMORY IN YOUNGER AND OLDER ADULTS
Shadini Dematagoda, Toronto Metropolitan University; Julia Spaniol, Toronto Metropolitan University

Lifespan theories suggest that prosocial motives become more salient across adulthood, but the impact of prosocial motivation on cognition is not well understood. The current study examined the influence of prosocial vs. self-serving reward on decision processes in recognition memory. We hypothesized that age differences in the influence of prosocial and self-serving reward would be reflected in response bias. During encoding, 64 younger adults and 64 older adults viewed a series of scenes associated with high or low reward, aware that reward was contingent on successful recognition of the scenes. During the subsequent old/new recognition test, hits resulted in high or low reward, and false alarms were penalized. Each trial was preceded by a cue that indicated whether the gain or loss resulting from the participant's decision would affect themselves or a charity. Younger adults reported being more strongly influenced by self-serving reward than older adults, confirming that the relative value placed on self-serving reward was lower in older vs. younger adults. However, reward type (prosocial vs. self-serving) did not produce differences in response bias in either age group. Overall, there was no support for the hypothesis that age differences in prosocial motivation translate to differences in motivation-cognition interactions.

META- AND META-METACOGNITIVE ACCURACY AS A FUNCTION OF MATERIAL TYPE
Julianna Salvatierra, University of Waterloo; Anna Zavadskaya, University of Waterloo; Evan Risko, University of Waterloo

Understanding how we monitor and control our cognitive processes represents a fundamental part of understanding human behaviour. Metacognitive accuracy is typically measured by comparing individuals' judgments or predictions about their own cognitive performance to their actual performance on a given task. Being accurate in this sense is crucial in, for example, learning contexts where individuals need to distinguish between information they have learned well and information they have learned poorly. In this study, we examined individuals' metacognitive accuracy when learning the same type of material presented in two educationally relevant modes—learning from a video lecture and learning from text. In addition, we extend traditional studies of metacognitive accuracy by examining individuals' judgments of their own metacognitive accuracy. That is, how well can individuals predict how accurate they are metacognitively? Overall, there were no differences in metacognitive accuracy between texts or video lectures and individuals were moderately calibrated to their own metacognitive performance.

THE CONTRIBUTIONS OF EARLY CHILDHOOD ENVIRONMENT, VISION, AND ATTENTION IN LEARNING TO READ PROCESS AND READING DIFFICULTIES
Khushi Patel, Toronto Metropolitan University; Maureen Reed, Toronto Metropolitan University

This study examined the difficulties encountered by poor readers, compared to typical readers, during the learning to read process and how this influenced academic performance and emotional well-being during childhood, adolescence, and early adulthood. Via an on-line survey and semi structured interviews participants answered questions about learning to read experiences, family environment, attentional and vision symptoms. Results demonstrated that the differences in learning to read experiences affected motivation to read due to issues related to comfort, adequacy, confidence, familial attitude towards reading, and adequacy of assistance and encouragement while learning to read. Further, participants' motivation to engage in reading activities was contingent on participants' family environment. The vision and attentional deficits symptoms experienced during childhood did not vary between poor and typical readers, and vision symptoms (e.g., poor acuity, strabismus, amblyopia) did not contribute to learning to read difficulties in childhood. Overall, the findings showed that factors contributing to the development of reading ability exist on a continuum, and a combination of these factors predict difficulties in learning to read.

ANCHORING EFFECTS ON DURATION ESTIMATES
Mohammed Aswad, Carleton University; Guy Lacroix, Carleton University

Numeric estimates can be biased by a guiding value given prior to the estimate. This is known as an anchoring effect (Tversky & Kahneman, 1974). Different models have attempted to explain the anchoring effect. However, there is little consensus on which model(s) contribute to the effect depending on the context of the task (Furnham & Boo, 2011). Moreover, Limited research has examined anchoring effects in duration judgment tasks. Thus, a series of experiments is now being conducted with the aim of understanding the underlying mechanisms of anchoring on duration estimates. The first experiment consists of a 3 (Game Durations: 2 minutes, 8 minutes, 16 minutes) X 3 (Anchoring Ratio: 0.5, 1, 2) between-subjects design. Participants will estimate a game session's duration and provide a minimum and a maximum estimate. We hypothesize that participants will overestimate the duration when presented with a large anchor (2.0), underestimate it when presented with a small anchor (0.5), and show no anchoring effects in the neutral condition (1.0). Furthermore, following the selective accessibility model (Strack & Mussweiler, 1997), we hypothesize that the anchoring effects will be more prominent as duration increases.

NEIGHBORHOOD FREQUENCY EFFECTS IN SIMPLE AND COMPLEX SPAN: DO HIGH FREQUENCY NEIGHBORS HELP OR HURT?
Molly MacMillan, Memorial University of Newfoundland; Ian Neath, Virginia Tech; Steven Roodenrys, University of Wollongong

A common, albeit implicit, assumption is that working memory is language independent. Incontrast, linguistic and long-term memory variables can have different effects on speechperception and production tasks depending on the language. In the current study, we evaluate predictions from two different accounts about the effect on working memory of a word's orthographic neighbourhood, the set of words that differ from the target word by one letter. Both accounts posit that orthographic neighbours are coactivated when the target word is encountered, and both assume that higher frequency neighbours are activated more than lower frequency neighbours. They differ in that Roodenrys (2009) predicts a beneficial effect of having higher frequency neighbours whereas Robert et al. (2015) predict a detrimental effect. Experiments 1 and 2 found a beneficial effect of having a higher frequency neighbourhood in both a simple and a complex span task. Experiments 3 and 4 did not find a detrimental effect of having one or more neighbours with higher frequency than the target in both a simple and a complex span task. Implications for theories are discussed, including the possibility that the results are language specific.

TIMING IS NOT EVERYTHING: REVISITING THE EFFECT OF CUE DURATION IN ITEM-METHOD DIRECTED FORGETTING

Pelin Tanberg, University of Waterloo; Myra A. Fernandes, University of Waterloo; Colin M. MacLeod, University of Waterloo; William E. Hockley, Wilfrid Laurier University

In the item-method directed forgetting paradigm, each presented item receives its own instructional cue during the study phase—either to-be-forgotten (F) or to-be-remembered (R)—and memory is poorer for F items than for R items during the test phase. Four experiments separately investigated the influence of cue duration using durations of 1, 5, and 10 seconds. Experiment 1 showed no effect of cue duration on the recognition of either R or F items. Switching from within-subject to between-subjects manipulation of cue duration, Experiment 2 showed that increasing cue duration improved recognition of both R and F items equivalently. Experiments 3 and 4 showed similar patterns of results for associative recognition of unrelated word pairs. Overall, we suggest the reframing of the selective rehearsal account, with the rehearsal benefit to R items depending not on ongoing cumulative rehearsal but instead on a rapid retrieval boost to increase the representation of R items in long-term memory.

IS THE MISSING-LETTER EFFECT SENSITIVE TO SEMANTIC DIVERSITY?

René-Pierre Sonier, Université de Moncton; Éric Landry, Université de Moncton; Jean Saint-Aubin, Université de Moncton

When participants are asked to search for the presence of a target letter while reading a text for comprehension, more omissions are observed when the target letter is embedded in frequent and function words than in rare and content words (Klein & Saint-Aubin, 2016). This well-replicated phenomenon, referred to as the missing-letter effect, is commonly used to investigate the cognitive processes involved in reading. While the effects of word function are ubiquitous in the literature (Roy-Charland & Saint-Aubin, 2006; Roy-Charland et al., 2007), the effects of word frequency are more spurious (Minkoff & Raney, 2000; Smith & Groat, 1979). The fluctuations in the role of word frequency suggest a confounding variable, such as semantic diversity, might explain these effects (Senaldi et al., 2022). We presented two texts comprising target words equated on word function and word frequency with varying levels of semantic diversity and asked participants to read them for comprehension while searching for target letters (the letter 'a' for one text and the letter 'e' for the second). Results showed a lack of evidence in favour or against the role of semantic diversity on the missing-letter effect. Implications for further research and the attentional disengagement model are discussed.

EMPLOYING SMARTPHONE TECHNOLOGY TO CHARACTERIZE AND MITIGATE AUTOBIOGRAPHICAL MEMORY DEFICITS IN THOSE WITH DEPRESSIVE SYMPTOMS

Sophie Kudryk, University of Waterloo; Melissa Meade, Huron University College; Morgan Barense, University of Toronto

Depressed individuals' autobiographical memories tend to be deficient in specific episodic detail and characterized by overgenerality. Whether everyday memories reflect this episodic deficit is undetermined. Personal semantic memory content in depressed individuals is also unexplored yet may explain this overgeneral memory effect. We used the Autobiographical Interview and HippoCamera app to explore everyday autobiographical memories of individuals with depressive symptoms. The HippoCamera was also used to determine if episodic deficits could be mitigated. Using the HippoCamera, young adults with varying levels of depressive symptoms recorded and replayed memory cues of events, every day for 28 days. Half the memory cues were included in replay sessions, while half were hidden from replay and used as a baseline. Participants later viewed their memory cues and recalled the events in detail during an Autobiographical Interview. The resulting memory narratives were then transcribed and scored for the number of episodic and personal semantic details. Preliminary analyses revealed a trend of episodic deficits in those with more depressive symptoms. After further analyses, we will present findings regarding the episodic and personal semantic memory content for everyday events in individuals with depressive symptoms, as well as the efficacy of the HippoCamera in mitigating episodic memory deficits.

PRAM-SCAPING: EFFICIENT SIMILARITY DATA COLLECTION THROUGH TRIAL REDUCTION
Anthony Cruz, Western University; John Paul Minda, Western University

One method for collecting similarity data is the pairwise rating method (PRaM), wherein participants judge the similarity of all possible pairs from a set of stimuli. Though PRaM is widely used to collect similarity data, it is impractical for large stimulus sets due to the large number of trials required. One solution to this issue is to reduce the number of trials presented to participants. In this study, our goal was to determine how many PRaM trials could be excluded from a pre-existing dataset without significantly impacting model fits. The data were collected from 96 participants who rated the pairwise similarities of 16 Gabor Patches on a 1-8 scale. Representational similarity analysis (RSA) was used to compare participants' similarity ratings with various physical distance models. For various n, these model fits were compared against the fits of 10,000 random subsets of n PRaM trials. The results show that for large stimulus sets, it may be feasible to substantially reduce the number of PRaM trials shown to participants without affecting RSA results. The resulting increase in efficiency makes PRaM more practical and more feasible for large stimulus sets. These findings should be expanded upon with different stimulus sets and analytic methods.

DEAF GAIN: NEURAL ENTRAINMENT IN DA' HOUSE
Sean A. Gilmore, Toronto Metropolitan University; Harley Glassman, Toronto Metropolitan University; Frank Russo, Toronto Metropolitan University

Research aiming to explain our ability to perceive and synchronize movement to a musical beat has implicated the entrainment of neural oscillations. The majority of research supporting the role of neural entrainment in beat perception has presented auditory or visual rhythms to hearing individuals. Recent research has found that vibrotactile rhythms are also capable of neural entrainment in hearing individuals, especially in the case of simple (i.e., isochronous) rhythms. The current research project aimed to compare the capacity for beat perception in deaf and hearing individuals. To do so, all participants were asked to complete a passive listening task where neural entrainment was assessed as well as an active sensorimotor synchronization (SMS) task. We hypothesize that, compared to hearing individuals, deaf individuals will show enhanced beat perception to vibrotactile rhythms as shown by heightened neural entrainment to the beat and enhanced SMS. Preliminary results indicate that overall rates of neural entrainment for vibrotactile rhythms are significantly higher in individuals who are deaf compared to those who are hearing. SMS results suggest a significant interaction, wherein there was a significant increase in SMS to complex rhythms compared to simple for deaf individuals, but no difference between rhythms for hearing individuals.

THE TIME COURSE OF CONCEPTUAL ACCESS: EVIDENCE FROM A DICHOPTIC PRESENTATION PARADIGM
Alessandro La Serra, Concordia University; Caitlyn Anta, McGill University; Roberto G. de Almeida, Concordia University

What kind of conceptual information do we attain when we first look at an object? In a recent study, Antal and de Almeida (2023) found that participants acquire superordinate and basic-level information before processing semantic features. However, their study employed simple line drawings of objects, which may hinder the perception of salient features. For instance, colour and texture provide important information about an object's typical shape and colour (e.g., that bananas are likely to be curved and yellow). The present study employed the same stimulus set as in our previous study, but with the introduction of texture and colour. We employed a masked picture-word congruency task, with a dichoptic presentation of pictures (e.g., dog) and words representing different object properties (e.g., dog, animal, bark, fur). Stimuli were presented for 30, 50, 190, and 390 milliseconds. Consistent with our previous findings, superordinate (animal) and basic-level (dog) properties were perceived faster and more accurately than high- (bark) and low-salient (fur) features. Our results suggest that we initially attain information about whole objects, while object semantic features are analyzed at a later stage of conceptual processing. These findings provide insights into the nature of conceptual information and the time course of conceptual access.

TASK-RELATED DIFFERENCES IN MENTAL ROTATION OF HANDS

Amy Flannery, University of Manitoba; Lorna Jakobson, University of Manitoba; Pauline Pearson, University of Winnipeg

Whether a mental rotation task involves objects or body parts influences the efficiency of rotation and has been accepted as evidence that body parts are rotated using egocentric, rather than the more typical object-based, frame of reference. More recently, Voyer and colleagues (2017) questioned whether frame of reference is a consequence of the type of stimuli employed or a consequence of the type of task (same/different or left/right judgment) since the latter tended to be used in studies involving body parts and the former in those involving objects. The current study assessed this conclusion by assessing both rotation efficiency and biomechanical constraints' influence. In separate blocks, 62 participants made speeded left/right or same/different judgments regarding hands. Results revealed that the efficiency of mental rotation was greater in the left/right task and that performance in this task was also more strongly affected by the awkwardness of the imagined rotation. This is consistent with the idea that same/different tasks require object imagery but left/right tasks require motor imagery.

VISUALIZING MENTAL IMAGES OF THE SELF

Arijit De, University of Toronto; Moaz Shoura, University of Toronto; Adrian Nestor, University of Toronto

Self-perception is a significant aspect of human cognition which influences self-esteem, self-concept, and everyday social interactions. While face images are used to recognize individuals, little is known about how closely mental representations of one's own face reflects their actual facial appearance. The current study addressed this challenge with the aid of behavioural-based image reconstruction methodology as applied to facial similarity data. Specifically, a group of female Caucasian adults (N=12) assessed the similarity between pairs of female face images including images of their own faces. Further, participants were asked to recall a mental image of their own face and rate its similarity with a set of visually presented face stimuli. Then, image reconstruction was applied to both sets of data to recover a visual representation of the self for each participant from perception and memory. Accuracy was estimated by comparing reconstructions with actual images of the participants. Our investigation revealed successful levels of reconstruction accuracy for both perception and memory with a clear relationship between the two. Further, we assessed and visualized systematic distortions of self-image across participants. Last, we related such distortions to visual recognition abilities and to measures of self-esteem.

DEVELOPING A SAMPLE OF PEOPLE WITH HIDDEN HEARING LOSS

Alicia Follett, Memorial University of Newfoundland; Benjamin Zendel, Memorial University of Newfoundland

Hearing difficulties are one of the most commonly reported health issues, particularly for older adults. Clinically, hearing deficits are normally identified by using pure-tone thresholds (PTT), a test of the ability to detect a near-threshold tone. Interestingly, there are some individuals who report difficulties with hearing, despite having normal PTT. This has been referred to as 'hidden hearing loss' (HHL). One common difficulty reported by this group is understanding speech when there is background noise. Understanding speech-in-noise (SpiN) is a complex cognitive task where basic auditory features, learned schemata and other perceptual inputs are used to segregate speech from background noise. Very little is known about the neurophysiology of HHL. Accordingly, the purpose of this study was to develop a sample of participants who likely have HHL, in order explore the underlying neurophysiology. PTT were compared with performance on two SPiN assessments in over 100 participants. PTT predicted performance on SpiN performance for most participants; however, some participants performed worse on the SpiN tasks than would be predicted given their PTT. It is likely that this sample has HHL, and future studies can use these participants to study its neurophysiology.

NOT ALL SMILES ARE JUDGED EQUALLY: THE IMPACT OF ETHNICITY ON SMILE JUDGEMENTS

Adèle Gallant, Université de Moncton; Angélique Caron, Université de Moncton; Marie-Pier Mazerolle, Université de Moncton; Annie Roy-Charland, Université de Moncton

Literature has demonstrated the presence of morphological cues that help differentiate authentic from fake smiles. Research has shown that participants are sensitive to such cues. Nevertheless, in social contexts, other factors might influence the judgement of authenticity. The current study explores the role of criminal context (accused of a crime or not) and ethnicities (black or white) on smile authenticity judgement. Fifty black and 50 white participants read a criminal or non-criminal background index, watched a video of a genuine or simulated smiles from white or black encoders, and rated the authenticity on 7-points Likert scales while response times were recorded. All participants judged individuals in the criminal context as less authentic. Results revealed an interaction between the ethnicity of the participants, the ethnicity of the encoders and the type of smile on judgement. All participants judged the authentic smiles and white encoders as more authentic. However, the difference between authentic and simulated smiles for white participants is larger for black encoders. There was also a difference between white and black participants in reaction times. White participants were faster for authentic than simulated smiles. However, no difference was observed for black participants. Results are discussed in terms of in/out-group theories.

EXPLORING IMPLICIT AND EXPLICIT STEREOTYPES IN GENDER EXPRESSION AND SEXUAL ORIENTATION

Alexandra Deck, Laurentian University; Emma Melanson, Université de Moncton; Annie Roy-Charland, Université de Moncton; Joël Dickinson, Mount Saint Vincent University

The aim of the study is to investigate stereotypes pertaining to individuals' views of sexual orientation and gender expression. This study investigates these stereotypes through the binary viewpoint of an Implicit Association task in conjunction with open-ended questions, which allow space for more fluid responses in accordance with Queer theory. 140 participants took part in an IAT study with pictures of couples varying in sexuality (gay or straight) and gender expression of characters (feminine or masculine). They also judged the orientation and gender in open-ended questions. Gender expression was found to play a critical role in individuals' perceptions of sexual orientation, as well as their categorization tendencies. For example, it was found that those with gender non-conforming appearances (i.e men wearing feminine clothing) tended to be categorized as homosexual, regardless of whether or not they were depicted in a homosexual or heterosexual coupling. They were also processed slower in the IAT. In addition, within homosexual couples, variations based on gender expressions were also observed (e.g. two feminine women being processed faster, while two masculine men, slower). The results suggest that gender expression, which has rarely been included in studies, should be taken into account in research.

IN EGO-DEPLETION, ALL EFFORTS ARE NOT CREATED EQUAL

Carolyn Stone, Trent University; Michael Reynolds, Trent University

Ego-depletion refers to the observation that an initial act of self-control leads to poorer self-control during a subsequent task when using the sequential-task paradigm (Baumeister et al., 1998). In the sequential task paradigm, self-control is manipulated at Time 1 (T1) using an induction task followed by an interim period, and then an outcome self-control task at Time 2 (T2). Here we examine whether the recent replication crisis surrounding ego-depletion is related to the operationalization of self-control (Cunningham & Baumeister, 2016). Operationalizations of self-control have been similar in that they are all believed to require effort, however recent research suggests that effort is not a unitary construct (Hsu et al., 2017). Two experiments are reported that use different induction tasks (emotion suppression and 'E' cancellation) but were otherwise identical. During the interim period participants rated their effort while completing the induction task on multiple dimensions. A solvable anagram task was used at T2. Analyses suggest that different types of effort are used during these induction tasks and that the type of effort that predicts ego-depletion is also task dependent. The implications for theories of self-control and ego-depletion are discussed.Keywords: effort, self-control, ego-depletion.

THE EFFECT OF PHOTO EDITING ON PERCEIVED ATTRACTIVENESS AND SOCIABILITY IN SOCIAL MEDIA
Florence Mayrand, McGill University; Sarah D. McCrackin, McGill University; Claire Wei, McGill University; Jelena Ristic, McGill University

Social media readily includes a diverse set of user-friendly digital tools for improving facial appearance. About 70% of individuals modify their photos using these tools. Here we examined if increasing facial attractiveness via these apps alters the perception of target's attractiveness and sociability. We were also interested in examining if explicit knowledge about photo editing usage affected these ratings. We digitally 'beautified' face images sourced from known databases to varying degrees (0%, 25%, 50%, 75%, 100%) using a common social media app. Half of the trials indicated that the images were digitally altered, while the other half stated they were not, with these statements randomized across images. Participants viewed each image and reported attractiveness and sociability for each face image using a sliding scale from 0 (lowest) to 100 (highest). Participants' ratings of targets' image attractiveness and sociability increased as the degree of photo editing increased. Additionally, knowledge of editing only affected perceived sociability, such that faces labeled as "edited" were perceived as less enjoyable to interact with and having lower friendship quality. Hence, photo editing appears to increase perceived attractiveness and sociability of depicted individuals, although knowledge this editing attenuates this effect on sociability.

PROBING CORRELATES OF FUTURE THINKING IN CANADIAN OLDER ADULTS
Mane Kara-Yakoubian, Toronto Metropolitan University; Shadini Dematagoda, Toronto Metropolitan University; Karl Szpunar, Toronto Metropolitan University; Michelle P. Silver, University of Toronto; David B. Flora, York University; Julia Spaniol, Toronto Metropolitan University

When people think about their personal future, they tend to exhibit a positivity bias, whereas when they think about the collective future, they show a negativity bias. Potential adaptive functions of these biases are still poorly understood. In the current study, we used data from Wave 1 of the Canadian Adulthood and Retirement Study (N=307) to identify correlates of valence biases in future thinking. In line with prior work, individuals with a greater positivity bias in personal future thinking were characterized by better mental health (r=.29). Extending prior work, these individuals were also more charitable (r=.18), exhibited a greater prosocial disposition (r=.17), were more likely to engage in collective future thinking (r=.27), and tended to view their future as being more expansive (r=.39). Positivity bias in personal future thinking was also associated with subjective wealth (r=.20), but not objective income, as well as greater life satisfaction (r=.36) and better subjective physical health (r=.27). Whereas positivity bias in personal future thinking was not significantly correlated with age, negativity bias for the national future was negatively associated with age (r=-.22). We discuss these findings with reference to Socioemotional Selectivity Theory.

POSTER SESSION III: WEDNESDAY, JULY 19 (10:30 AM - 12:15 PM)

NEURAL CORRELATES AND TIME COURSE OF TARGET-DISTRACTOR COMPETITION IN THE FRONTAL EYE FIELD
Hamidreza Ramezanpour, York University; Devin Heinze Kehoe, York University; Jeffrey Schall, York University; Mazyar Fallah, University of Guelph

When a distractor appears in the visual field shortly before saccade initiation, the resulting saccade trajectory is curved. The magnitude and direction of the curvature is influenced by various factors including distractor processing time. In order to better understand the neural correlates underlying curved saccades and its time course, we recorded from single neurons in the FEF of two rhesus monkeys shifting gaze to a target while an isoeccentric distractor appeared either left or right of the target at various delays after target presentation. Among a sample of visually responsive neurons in the frontal eye field, we found unbalanced patterns of excitatory responses before saccades curved toward or away from the distractor. This varied with distractor location and processing time. For contralateral distractors, an excitatory visual response was associated with saccades curved toward the distractor, which emerged earlier than the response before saccades curved away from the distractor. For ipsilateral distractors this pattern was reversed--shorter-latency visual response preceding saccades curved away from the distractor and later responses preceded saccades curved towards the distractor. The time of equivalent visual responsiveness was similar for contra- and ipsilateral distractor locations, consistent with a push-pull mechanism across hemispheres controlling the direction of saccade curvature.

THE EFFECT OF EARLY LIFE ENVIRONMENTAL ENRICHMENT ON COGNITION AND ANXIETY BEHAVIOR IN MALE AND FEMALE 3XTG-AD MICE
Siobhon-Elora Weber, University Of Guelph; Boyer Winters, University of Guelph

Cognitive reserve (CR) hypothesis posits that individuals with higher IQ and healthy lifestyle will be less susceptible to cognitive deficits associated with dementia. CR can be modeled with a standard Environmental enrichment (EE) protocol which places mice in a large cage with a running wheel, and objects that can be substituted daily. Unfortunately, this has a limit on quantifying the enrichment each mouse obtains from being in an enriched cage. Thus, we developed a novel EE procedure to enable better control and quantification of daily enrichment. In the present study, we used triple transgenic Alzheimer's disease mice to evaluate the potential for modeling CR. Mice were assigned to each of the four following conditions at 5 weeks of age: Enrichment Housing (EH), Enrichment Track (ET), in which mice run laps on an obstacle with novel obstacles daily; Exercise Control Track (CT), in which mice run laps, and Standard Housing (SH). Following 10 weeks in these conditions, all mice are tested on tasks assessing multisensory integration abilities, an understudied but potentially important aspect of AD cognitive impairment. Prior to cognitive testing, we monitored inactive-but-awake (IBA) behavior in all mice, to explore whether removal of enrichment influences this behavior.

SEX-SPECIFIC NEUROPATHIC PAIN INCREASES IN ASTROCYTE-NEURONAL METABOLIC COUPLING IN THE MOUSE ACC
Ana Leticia Simal, University of Guelph; Paige Reid, University of Guelph; Fariya Zaheer, University of Guelph; Giannina Descalzi, University of Guelph

One in four Canadians over the age of fifteen suffer from chronic pain. Findings from human neuroimaging studies, as well as rodent models of chronic pain, have identified that neuroplastic changes within the anterior cingulate cortex (ACC) are critical for chronic pain development. Neuroplasticity, however, imposes large metabolic demands. In the brain, neurons have the highest energy needs and interact with astrocytes, which extract glucose from blood, mobilize glycogen, and release lactate in response to neuronal activity. Specifically, in astrocytes, glucose is converted and stored as glycogen, which can be rapidly metabolized to produce lactate, and can be provided to neurons through astrocyte-neuronal lactate shuttling (ANLS). We recently showed that ANLS is necessary for pain-mediated, fear-learning induced neuroplasticity in the rat hippocampus, however whether ANLS is involved in neuroplastic changes associated with chronic pain development remains unknown. Here, using the spared nerve injury (SNI) model of neuropathic pain, we present evidence that neuropathic pain increases ANLS in the mouse ACC. Specifically, we found that long-term SNI causes increased expression levels of ANLS related proteins in male, but not female, adult mice. Our findings suggest that neuropathic pain engages ANLS in the mouse ACC in a sexually dimorphic manner.

EFFECTS OF AGE AND TIME DELAY ON THE PROCESSING OF UNATTENDED INFORMATION IN A BINOCULAR SUPPRESSION PARADIGM
Madison Peake, Nipissing University; Dana R. Murphy, Nipissing University; Alain Carlson, Nipissing University; Mark Wachowiak, Nipissing University

In the binocular suppression tasks conducted in our lab, participants are presented with a priming display in which two words are presented. Participants identify the target word and ignore the distractor. Immediately after the priming display, participants see a masking stimulus presented immediately in the left eye and a target word gradually appears in the right eye. Participants read this target word as quickly as possible. In the present study, we introduced a time delay between the presentation of the priming display and the binocular suppression task to determine if the effect of priming would be different immediately after the display compared with after a delay. Immediately after the initial presentation, younger and older adults responded fastest to previously attended words, and significantly faster to previously ignored words than new words. After a delay, while both groups responded fastest to previously attended words, there was no difference in response time between previously ignored and new words. While the influence of the unattended information did not appear to extend beyond the immediate testing period, the finding that the influence of the unattended information was similar for younger and the older adults runs contrary to the inhibitory deficit hypothesis of aging.

DIFFERENCES IN FEELING AND JUDGEMENT OF AGENCY AS A FUNCTION OF BOREDOM PRONENESS

Vanessa Dadzie, University of Waterloo; James Danckert, University of Waterloo; Allison C Drody, University of Waterloo

Boredom is a negatively valanced emotion caused by different psychological factors. Agency is considered a strong human need and has been theorized as being a cardinal component of the experience of boredom. A diminished sense of control over events in a person's environment underlies the experience of boredom, precipitating the inability to engage meaningfully. Across 2 studies, we distinguish between the two foci of agency and their respective association with boredom. We build on the established relation between boredom and self-control in our first study, in which survey data from two samples establish a negative relationship between the constructs of boredom and agency, such that the highly boredom prone experience a low sense of agency. In a second survey study, results indicate that while boredom proneness has no impact on the capacity to judge agency, state boredom and the judgement of agency are negatively correlated. State boredom ratings were negatively correlated with a measure of individual differences in anthropomorphism which assessed the tendency to ascribe intentionality to non-human elements. Our findings provide meaningful insights into the role of agency. Further work will provide deeper insights into both the state and the trait propensity to feel boredom more frequently and intensely.

A NEW FORM OF ASSOCIATIVE LEARNING BETWEEN TARGET AND DISTRACTOR LAYOUT IN A VISUAL SEARCH TASK.

Jackie Chau, McMaster University; Chao Wang, Huzhou University; Noah Britt, McMaster University; Hong-Jin Sun, McMaster University

Humans interact with their environment daily, and in doing so, they encounter and learn consistent relationships between objects in their surroundings. For example, in a classroom, if the seating arrangement remains the same, it becomes easier to find a particular student at any time. In laboratory settings, this type of learning is known as the contextual cueing effect (CCE). Specifically, when participants are presented with repeated search displays, they tend to locate targets faster than on novel search displays. Remarkably, this learning occurs implicitly, without participants being aware of it. CCE is typically shown when a repeated context is consistently associated with a single target location. However, recent findings (Wang et al 2020) suggest that when a repeated context is paired with one of multiple (2 or 4) possible targets, as long as those target locations have opportunity to pair with other repeated contexts, the learning also takes place. In this study, we investigated whether each of those target locations is learned equally well when four target locations are paired with four repeated contexts. We matched the eccentricities of target locations between repeated and novel scenes. Our results suggest that participants also learned the location probability of the target.

MIND WANDERING IS ASSOCIATED WITH IMPAIRED HIGHER-ORDER ABSTRACTION FOLLOWING STATISTICAL LEARNING

Hala Rahman, Queen's University; Jeffrey Wammes, Queen's University

Mind wandering (MW) is a ubiquitous experience where attention shifts away from a task, toward internally generated thoughts. In many tasks, associated performance costs are observed (e.g., errors, reduced comprehension and memory). However, the impact of these attention lapses is unclear in more protracted, implicit forms of learning. The current study used response time variance (RTV) and pseudo-randomly presented thought probes as markers for MW episodes, to investigate the impact on our ability to extract regularities from the environment over time (i.e., statistical learning; SL). We embedded a visual SL sequence into a validated rhythmic responding task, where high RTV is known to be associated with MW. Specifically, a stream of stimuli was presented, which, unbeknownst to the participant, included presented repetitions of base pairs (e.g., B always follows A, C follows B) and transitive pairs that could be intuited through intermediate links (e.g., A-C, through B). Later, participants completed a task where they identified the correct pair from the sequence using a two-alternative-forced-choice test. Both within and across participants, MW was negatively associated with SL of transitive, but not base pairs, suggesting that MW impacts abstraction over extended periods of time, more than it impacts immediate associative learning.

IMPACT OF VISUAL ATTENTION ON AUDIOVISUAL SPEECH PERCEPTION IN AGE-RELATED HEARING LOSS: AN EYE-TRACKING STUDY
Patricia V. Aguiar, Toronto Metropolitan University; Brandon T. Paul, Toronto Metropolitan University

Background: We tested whether hearing loss acquired during aging is associated with an attentional bias toward vision during speech communication. Past studies suggest that visual speech is more heavily weighted in audiovisual integration in age-related hearing loss, which perhaps compensates for reduced auditory perception (Rosemann and Thiel 2018, Neuroimage). It is unclear how visual attention for speech is deployed by this population, and whether visual attention is influenced by the presence of background noise during speech communication. Method: We recruited participants aged 40 to 80 with untreated hearing loss or typical hearing. During the task, participants were presented with audio-only words preceding visual-only words, or vice versa. Words were presented in either quiet or in two levels of background noise. For each trial, participants reported if the audio and visual words were the same or different. Eye-tracking measured visual attention to facial features.Results: Data collection is ongoing.Conclusions: If participants with greater hearing loss benefit more from visual speech before auditory speech, this may suggest that visual speech creates stronger perceptual priors in hearing loss that could compensate for poorer hearing, especially for individuals directing attention to a speaker's mouth and listening in background noise.

FROM VIRTUAL TO REALITY: INVESTIGATING HOW CONTEXT AND PERSONALITY TRAITS MAY INFLUENCE SOCIAL ATTENTION
Rafael Almeida, University of Alberta; Madison Fankhanel, University of Alberta; Dana Hayward, University of Alberta

While early research in social attention was by-and-large held in a laboratory setting, there has been an increase in studying social attention in naturalistic settings. In spite of this, less research has investigated whether our attention differs across contexts (e.g., videochat, face-to-face), which is of renewed importance due to the increase in online social interactions in the last few years. We investigated whether attention during conversations, operationalized as gaze behaviour, varied across contexts. We hypothesize that if context matters, then participant gaze behaviour will differ across videochat and face-to-face conversations. In contrast, if the goal of the task matters, then participant gaze behaviour should be similar across the two contexts, as participants are having a 5-minute conversation in both cases. Participants also completed a typical gaze-cueing task used to investigate social attention. Preliminary analyses of the social attention task yielded typical effects, suggesting that our sample is overall attuned to the gaze of others. In addition, gaze fixations indicate differences in time spent looking at the face across contexts. Our data shed light on how gaze may change across different contexts while exploring the potential influence of personality traits, which furthers our understanding of individual differences in social interactions.

INVESTIGATING THE EFFECTS OF BIOLOGICAL SEX AND THE BIRTH CONTROL PILL ON EPISODIC MEMORY, EXECUTIVE CONTROL, AND MENTAL ROTATION
Adelaide Jensen, University of Ottawa; Kim Thériault, University of Ottawa; Ece Yilmaz, University of Ottawa; Ethan Pon, University of Ottawa; Patrick Davidson, University of Ottawa

Oral contraceptives (OC) are one of the most common forms of hormonal birth control. A small literature suggests that OC use may affect various cognitive domains; however, studies have been criticized for their small sample sizes and use of different, single cognitive tests. In this cross-sectional study, we investigated the possible effects of biological sex and OC use on episodic memory, executive control, and mental rotation in a large sample of healthy, young adults (N=155, including OC users, naturally cycling females, and males) tested individually over videoconference. To measure cognition, we used a set of neuropsychological tasks measuring episodic memory and executive control, from which two composite scores were derived for each participant representing their relative performance in each domain. Our analysis revealed a female advantage in episodic memory (independent of OC use) and elevated gist memory in OC users. We found no significant sex- or OC-related differences on executive control or mental rotation. Our results suggest that the use of combined, monophasic OCs does not lead to many significant changes in cognition in young adults, although females may outperform males on episodic memory. Additional longitudinal and quasi-experimental studies will further clarify the effects of OC use on cognition.

MEASURING FAMILIARITY WITH MINIMAL INFLUENCE OF RECOLLECTION
Evi Myftaraj, University of Toronto and Rotman Research Institute

In amnestic mild cognitive impairment (aMCI), individuals experience memory deficits that exceed typical healthy aging, and one would expect impairments in familiarity due to perirhinal cortex atrophy. However, the evidence regarding familiarity in aMCI is mixed, arguably due to these studies failing to entirely separate familiarity from recollection. We conducted two studies accentuating familiarity while minimizing the influence of recollection. In study one, we tested 24 younger adults, 20 older adults, and 9 older adults with aMCI on a frequency judgement task, where participants viewed highly similar objects and decided how often they viewed each object. In study two, we tested 34 younger adults, 58 older adults, and 13 older adults with aMCI on a response deadline task, where participants viewed objects and decided whether they had seen the object before, with a slow deadline (5000 ms) and a fast deadline (1200 ms). Both studies revealed significant group differences; in study one, individuals with aMCI had impaired frequency judgments and in study two, individuals with aMCI had lower recognition accuracy across both deadlines, compared to younger and older adults. Therefore, both studies provide evidence that familiarity is impaired in aMCI, as expected based on perirhinal damage.

THE ERN ENHANCEMENT: FACT OR ARTEFACT?
Ze Lin Chen, University of Waterloo; Roxane J. Itier, University of Waterloo

The error-related negativity (ERN) is an Event-Related Potential (ERP) occurring within 100 ms of erroneous responses, which has a more negative amplitude than the ERP following correct responses. This amplitude enhancement correlates with trait anxiety scores, prompting some to use it as an anxiety biomarker. However, existing studies used classic analyses that focus on specific electrodes at specific time windows, a practice known to greatly inflate Type I errors. This ongoing project examines the reliability of the ERN enhancement using robust mass-univariate (MU) statistics which allow analyses of all time points at all electrodes while controlling for Type I and II errors. Response-locked ERPs in a typical flanker task (N = 36; target N = 80) were subjected to classic and MU analyses. The classic approach replicated the ERN amplification. In contrast, with MU analysis, no difference was found at any electrode around the ERN timing but differences appeared after 200 ms. These preliminary results question the reliability of the ERN enhancement reported in the literature, challenging its view as a reliable neuro-marker for anxiety. Individual-level MU analyses will investigate the possible individual variability in ERN enhancement and explore the reliability of later responses at other sites.

HOW BILINGUALISM DYNAMICALLY RESTRUCTURES THE HUMAN CORTEX
Imola MacPhee, Carleton University; John Anderson, Carleton University

Bilingualism results in known structural and functional changes in the brain. However, it is unclear how cortical neuronal microstructure underlying these differences is related to cognitive skills and the degree of bilingualism. The research objectives were to 1) use multi-shell diffusion magnetic resonance imaging (MRI) with the neurite orientation and dispersion density imaging (NODDI) model to assess cortical dendritic arborization; 2) determine bilingualism's impact on functional MRI (fMRI) activation during cognitive tasks including the picture 1-back, arrow Flanker, word fragment completion and language localizer. While data collection is ongoing, we expect that our results in English/French bilingual, young adults (ages 18-30) will help demonstrate how changes in functional networks underlying language also lead to microstructural changes in gray matter. In line with the Dynamic Restructuring Model, we expect dendritic branching in regions of the language network to follow an inverted u-shape function with increasing bilingual proficiency. We will also assess activation patterns using multi-voxel pattern analysis (MVPA) for each language to determine how well bilinguals can regulate language activation across cognitive tasks. Results are part of a planned, multi-phase longitudinal study to assess the impact of bilingualism on cognition in aging.

WORD PREDICTABILITY EFFECTS DURING FIRST-LANGUAGE AND SECOND-LANGUAGE PARAGRAPH READING IN MONOLINGUAL AND BILINGUAL ADULTS: AN EYE-TRACKING INVESTIGATION

Kate MacGregor, University of New Brunswick; Sarah MacIsaac, University of New Brunswick; Marc F. Joanisse, Brain and Mind Institute, University of Western Ontario; Veronica Whitford, University of New Brunswick

Eye-tracking research suggests that skilled readers generate predictions about upcoming linguistic input. While several studies in this area have focused on word predictability effects (i.e., the finding that high-predictable words in various contexts are easier to process than low-predictable ones; Rayner, 1998) as a means of assessing readers' expectations, the extant research has almost exclusively focused on English monolinguals. As a result, little is known about word predictability effects in bilinguals across their known languages, how these effects compare in monolinguals versus bilinguals, and how they unfold in more naturalistic contexts, such as paragraphs (see Whitford & Titone, 2017). To address these gaps in the literature, the current study employed eye movement measures to examine word predictability effects during first-language (L1) and second-language (L2) paragraph reading in English monolingual (n = 30) and English-French bilingual (n = 30) young adults (18-30 years). Results revealed similar L1 word predictability effects in monolinguals versus bilinguals, and larger L2 versus L1 word predictability effects among bilinguals, driven by the more effortful processing of lower-predictability words. Taken together, our findings suggest that contextual constraint may exert a greater influence during conditions of reduced lexical entrenchment, as is the case for bilingual L2 reading.

POSTER #15 WITHDRAWN

SCHIZOPHRENIA AND NEURAL MARKERS OF SEMANTIC PREDICTION

Matthew J. Sargent, University of Northern British Columbia; Heath Matheson, Memorial University of Newfoundland; Paul Siakaluk, University of Northern British Columbia

The brain's ability to make predictions has long been of interest to cognitive neuroscientists, who have used techniques such as electroencephalography (EEG) to study this phenomenon. A component of neurophysiological activity, termed the Semantic Predictive Potential (SPP), may be an indicator of people's readiness to predict the nature of upcoming semantic content. The SPP appears to be sensitive to semantic predictability; there is substantial discrepancy in the SPP when people read sentences which have predictable compared to unpredictable endings. Interestingly, a body of theoretical and experimental work suggests that people with schizophrenia have difficulty making predictions about meaningful information in their environment. We sought to replicate the semantic predictability-dependent SPP effect, and hypothesized that the extent to which participants experienced schizophrenia-like traits would correlate with a reduced SPP sensitivity to semantic predictability. Participants (n = 17) read sentences which differed in the predictability of their endings. Sentences were presented one word at a time while brain activity was monitored using EEG. Participants then completed a questionnaire assessing their level of schizophrenia-like traits. We replicate previous findings suggesting that the SPP is an indicator of semantic predictability, and show that schizophrenia-like traits interact with semantic predictability to influence the SPP.

EXPANSIONS OF VISUAL AND ATTENTION-RELATED REGIONS ALONG A WHOLE-BRAIN CORTICAL MANIFOLD UNDERLIE VISUAL STATISTICAL LEARNING

Keanna Rowchan, Queen's University; Daniel Gale, Queen's University; Qasem Nick, Queen's University; Jason Gallivan, Queen's University; Jeffrey Wammes, Queen's University

Statistical learning (SL) refers to our ability to extract environmental regularities over time and through repetition, make predictions – often implicitly – about the world (e.g., lightning is followed by thunder). Previous work has focused on the roles of individual brain regions in facilitating SL, but how distributed networks coordinate activity when establishing these associations is largely unknown. We measured brain activity using fMRI data while participants performed a classic visual SL task, where image pairs were covertly embedded in a sequence of images, such that image (A) always preceded its pairmate (B). By projecting patterns of cortical functional connectivity onto a low-dimensional manifold space, we found that, during learning, both visual areas and frontoparietal areas of the dorsal attention network exhibited expansions along the cortical manifold, reflecting increased segregation from other whole-brain networks. Consistent with these cortical changes being learning-dependent, we found that once the sequence was interrupted, areas in visual cortex contracted to their initial (pre-learning) positions along the manifold. By contrast, a subset of frontoparietal areas contracted beyond initial positions, indicating a longer-term change in connectivity. These results establish cortical changes that underlie SL and suggest distinguishable brain mechanisms for establishing associations in the moment versus longer-term.

END-EFFECTOR LOCALIZATION SHIFTS WITH HAND AS END EFFECTOR

Maryum Khan, York University, Canada; Shanaathanan Modchalingam, Center for Vision Research, York University; Andrew King, York University; Bernard Marius t Hart, Center for Vision Research, York University; Denise Henriques, Center for Vision Research, York University

Our brain has a remarkable capacity for learning and adapting movement. In the absence of vision, our estimates of limb position are based both on efferent ("predicted") and afferent ("proprioceptive") signals, and both get updated when visual feedback is rotated or translated. Many laboratory studies have had participants make movements in a 2D plane while their hand is represented by a cursor but, it is unknown how well this generalizes to real-world settings. Virtual Reality (VR) offers more realistic environments paired with experimental constraints. We used VR to measure shifts in end-effector localization resulting from a 30° rotation in the visual feedback during a reach training task to replicate earlier findings from our lab, showing that end-effector localization shifts are quite robust. In our pilot data, we found these findings to be consistent in VR. This will be relevant for our understanding of the brain's motor adaptation capacity and may guide how skill training or rehabilitation should be shaped.

ONGOING THOUGHT PATTERNS DURING ENCODING PREDICT SUBSEQUENT MEMORY AND DRAWING-RELATED BENEFITS

Silvia Shiwei Zhou, Queen's University; K. Rowchan, Queen's University; B. Mckeown, Queen's University; J. Smallwood, Queen's University; J.D. Wammes, Queen's University

While mnemonics employed during encoding often attempt to manipulate how one thinks, the role of changing thought patterns in subsequent memory has rarely been explicitly tested. Across two experiments, we implemented multidimensional experience sampling (MDES) to periodically probe participants' ongoing thoughts along several dimensions (e.g., about the future, self, images) during word encoding via drawing or writing. MDES probes were presented either after (E1) or throughout (E2) selected encoding trials. Word memory was later tested via free recall. We used dimensionality reduction to reveal the following prominent thought patterns: (1) mind wandering (e.g., distracting thoughts about the future and peers); 2) positive engagement (e.g., positive, deliberate, detailed); 3) verbal thinking (e.g., deliberate, word-based); and 4) detailed task-focus (e.g., absorption, problem). Model comparisons indicated that relative to writing, drawing elicited more positive engagement and less verbal thinking. Much like classic subsequent memory paradigms, we also explored the thought patterns engaged during encoding that predicted successful recall. Positive engagement and verbal thinking also led to better recall, regardless of encoding task. Findings here provide compelling evidence supporting imagery as a mechanistic basis for drawing's beneficial effects on memory, and highlight a promising approach to understanding how thoughts affect cognition in ongoing tasks.

EMPATHY AS A TRAIT CONSTRUCT: STABILITY OF THE TORONTO EMPATHY QUESTIONNAIRE OVER TIME.
Seth Winward, University of Waterloo; Roxane Itier, University of Waterloo

The Toronto Empathy Questionnaire (TEQ) has better external validity than widely used trait empathy measures like the Interpersonal Reactivity Index (IRI), yet its stability over time, its correlation with other trait scales and its possible influence by state measures are unknown. The TEQ was administered to undergraduate students online (mass testing) at the beginning of four consecutive semesters. In the same participants (n = 229), we found lower TEQ scores when administered at the end of an online empathy study than during mass testing; the two measures were not correlated, suggesting a possible influence of state empathy on this trait scale. TEQ scores were significantly and positively correlated across semesters, suggesting stability across time. TEQ scores were negatively correlated with trait sexual prejudice measured by the Modern Homonegativity Scale (MHS) (n = 2729). This correlation was larger than the replicated correlation between IRI and MHS scores (n = 2729). TEQ scores were positively correlated with both total IRI scores and IRI subscale scores (n = 2740), except the Personal Distress subscale. These results reinforce earlier findings on the TEQ, but question its relationship to trait empathy. Implications for its use and for our broader theoretical understanding of empathy are discussed.

USE OF ELECTRICAL BRAIN STIMULATION TO STUDY THE ROLE OF MOTOR AREAS IN EMOTION PERCEPTION
Carmen Dang, Toronto Metropolitan University; Michael Zara, Toronto Metropolitan University; Harley Glassman, Toronto Metropolitan University; Frank Russo, Toronto Metropolitan University

The human mirror neuron system (hMNS) is a prominent brain network encompassing sensory and motor areas that has been implicated in action perception and more recently, emotion perception. We applied transcranial random noise stimulation (tRNS) to the inferior frontal gyrus (IFG; a major node of the hMNS) to assess the neural and behavioural effects. Participants were randomly assigned to receive either sham tRNS or active tRNS and completed emotion perception tasks during an electroencephalogram (EEG) recording. EEG was used to measure hMNS activity through event-related desynchronization of the mu-rhythm (mu-ERD). For greater ecological validity, the emotion perception tasks included dynamic audio-visual portrayals of emotions in addition to images. Data collection is ongoing, but preliminary trends indicate that compared to sham tRNS, active tRNS led to greater mu-ERD, faster response times and mixed task performance, with better accuracy on some tasks and worse accuracy on others. The results will elucidate whether tRNS over the IFG leads to a mode of embodied responding to emotional stimuli. Additionally, this research will highlight the potential of brain stimulation to further our understanding of the role of motor areas in emotion perception.

EXPLORING THE CONCEPTUAL STRUCTURE OF THE CITY
Chelsea McKenzie, Western University; John Paul Minda, Western University

Our research explores the conceptual structure of built environments (e.g., cities, towns, villages) and the structure of object concepts. In one study, participants completed a feature generation task for different kinds of concepts (i.e., cities, towns, and objects) and generated up to six features for each exemplar. We examined the relationship between features and participants' prior experience. Local environment (e.g., urban or rural) had no effect on object features but did have an effect on the features generated for communities. Hierarchical clustering differed depending on prior experience with a rural or city environment. In a second study, we used these participant-generated features in a property verification task, in which participants indicated whether each statement was true or false as quickly and accurately as possible. The results showed that decision latencies were faster for object concepts when features were highly related. However, this pattern was not found for settlement concepts, where decision latencies remained similar regardless of featural relatedness. This suggests that built environment concepts are structured differently compared to other concepts, warranting further research to fully understand these differences. This study contributes to the existing literature by investigating a potentially distinct type of conceptual organization.

THE EFFECT OF INTERPOLATED TESTING WITHIN DIFFERENT EVALUATION CONTEXTS
Kate Van Kessel, University of Waterloo; Evan Risko, University of Waterloo

Interpolated testing is a popular tool used to enhance learning by reducing mind-wandering, improving metacognitive accuracy, and increasing engagement. This study examined the influence of interpolated testing on affect, effort, and metacognition reports. Judgements can be sensitive to the context that they are made (i.e., single evaluation or joint evaluation). This has potential implications for understanding how instructional design choices (e.g., adding interpolated tests) influence learning judgements. We investigated the extent to which the evaluation context influences learners' reports in the context of interpolated testing using two video lectures with or without interpolated testing and two evaluation contexts; single evaluation (lecture judged in isolation) or joint evaluation (lectures judged in conjunction). Results demonstrated that the effects of testing on learning were largely insensitive to the evaluation context; the testing effect was observed in both evaluation contexts. There was some evidence that evaluations of negative affect and goal-driven effort were influenced by the evaluation context; participants in the single evaluation context reported more negative affect and more invested effort when watching a lecture with interpolated testing, whereas participants' reports in the joint evaluation context did not differ. Overall, the study provides evidence supporting the use of interpolated testing to improve learning.

COGNITIVE FORECASTING IN EMOTION-BASED CHOICE
Dogukan Demircioglu, University of Waterloo; Samuel Johnson, University of Waterloo; Chris Dawson, University of Bath

In our research, we focused on forecasted emotions given an uncertain outcome of a decision. Mainly, we were interested in whether how people forecast their emotions about an outcome affects their risk and time preferences (Loewenstein, 1987). We divided forecasted emotions into two categories: Cognitive forecasted feelings and affective forecasted feelings. Expectation (high vs. low), attention (high vs. low), and information (the tendency to be informed vs. not) about a decision's outcome constitute cognitive forecasting (Sweeney & Shepperd, 2010; Krizan & Sweeney, 2013; Sweeney & Howell, 2017). On the other hand, positive and negative feelings, such as savor and dread, about a decision's outcome constitute affective forecasting (Loewenstein, 1987). First, we examined whether a directional relationship existed between cognitive and affective forecasting. Secondly, we investigated if cognitive forecasting predicted people's risk and time preferences (e.g., people's forecasting about their future emotions makes them more risk-seeking (vs. less risk-seeking) and patient (vs. less patient)) through affective forecasting.The result indicated that cognitive forecasting predicted affective forecasting about the decision's outcome. Secondly, it showed that affective forecasting predicted people's risk and time preferences. Lastly, when affective forecasting was added as a mediator, cognitive forecasting had a predicting effect on risk and time

CATEGORY LEARNING DIFFERS OVER DEVELOPMENT BY CATEGORY-DEFINING FEATURE AND TASK FRAMING
Merron Woodbury, University of Toronto; Anna Blumenthal, University of Toronto; Nicole Hung, University of Toronto; Marta Shahezian, University of Toronto; Jiwoo Im, University of Toronto; Dmitri Saharov, University of Toronto; Dmitri Saharov, University of Toronto; Sophia Zhao, University of Toronto; Margaret L. Schlichting, University of Toronto; Michael L. Mack, University of Toronto

Throughout our lives we organize experiences into concepts, such as "hammer" and "cat", which can be formed around different features. Previous work has distinguished intrinsic (e.g., shape) from extrinsic, or relational (e.g., an entity's common location), features. Given the later development of relational memory compared to item memory, we reasoned that conceptual organization around extrinsic features may likewise follow that of intrinsic features. Children (3-17 years old) and young adults learned to sort animal-like figures into categories using a single feature. Contrary to our predictions, we found developmental continuity such that participants of all ages more rapidly learned categories based on extrinsic features compared to intrinsic features. However, we found that this bias towards extrinsic feature learning was not present in a sample for whom the categories themselves were intrinsic to the animals (sorted into 'cell types') rather than extrinsic ('birthday parties'). Further post-hoc analyses suggested that children and adults may have different prior assumptions about which particular features will be relevant, and this may differ according to the task framing. Overall, our results suggest that category learning may be jointly influenced by the extrinsic or intrinsic nature of relevant features as well as the categorization decision itself.

PSYCHOEDUCATIONAL INTERVENTION: AN INTERDISCIPLINARY APPROACH FOR LEARNING DISABILITIES INTERVENTIONS

Swiya Murti, PUPIL Clinic; Kenneth Kwan, Psychological & Counselling Services Group

Interventions for learning disabilities requires an interdisciplinary approach as the difficulties stem in academics, cognitive abilities, and socioemotional development. We, at PUPIL (Program Using Psychoeducational Intervention for Learning) have teachers, psychometrists, psychologists and researchers working together to develop interventions for pupils with learning disabilities. Teachers provide invaluable classroom experience and expertise with the academic curriculum requirements. They have resources available to teach reading, writing, and mathematics appropriate to each grade level. Psychometrists know how the performance on different subtests across various standardized tests pinpoint to specific cognitive strengths and weaknesses, and how it is reflected in the academic performance. Psychologists develop therapeutic alliance and identify the socioemotional factors that affect academic performance and development, which allows for the interventions to develop an optimal environment. Researchers investigate both evidence-based practice, and practice-based evidence to ensure the scientific rigidity of the interventions we provide as a team at PUPIL. Having an interdisciplinary team of professionals with teachers, psychometrists, psychologists and researchers, allows us to target difficulties in academics, cognitive abilities, and socioemotional development associated with learning disabilities.

DETERMINING HOW FINANCIAL ANXIETY IS DEFINED AND MEASURED: A SCOPING REVIEW

Andie Storozuk, University of Ottawa; Mia Gerber, University of Ottawa; Emily Larkin, University of Ottawa; Christen Potvin, University of Ottawa; Nicole Wilson, University of Ottawa; Erin A. Maloney, University of Ottawa; Erin A. Maloney, University of Ottawa

Evidence suggests financial anxiety is negatively related to financial literacy. However, many researchers conceptualize financial anxiety differently across studies. This inconsistency limits empirical understanding of the construct and thwarts attempts to design interventions to improve financial literacy by lessening financial anxiety. The purpose of this review was to systematically evaluate researchers' conceptual and operational definitions of financial anxiety. We focused on articles published between 2010 and 2022 that assessed financial anxiety, financial stress, or financial worry across groups 18 and older. We retrieved articles from four interdisciplinary scientific databases. We first screened titles and abstracts to determine if articles mentioned a key term, were published in a peer-reviewed journal, and were written in English. We then screened full texts to determine if articles quantitatively measured financial anxiety (or a related term), resulting in 240 articles. While many researchers did not conceptually define financial anxiety, others defined it as "feelings of anxiousness or worry due to one's financial situation" based on Archuleta et al. (2013). Notably, researchers often used financial anxiety and financial stress interchangeably, despite these terms representing distinct constructs. This review provides clarity on the conceptualization of financial anxiety necessary to create targeted interventions to improve financial literacy.

WHY DO FATHERS, MORE THAN MOTHERS, BELIEVE STRUGGLING IN MATH IS MORE EFFECTIVE FOR THEIR CHILD'S MATH LEARNING?

Elora Wales, University of Ottawa; Fraulein Retanal, University of Ottawa; Helena Osana, Concordia University; Erin Maloney, University of Ottawa

Fathers are more likely than mothers to endorse the belief that it is beneficial for their children to struggle in mathematics. We sought to understand why this gender difference exists. Survey responses from 237 parents (n=119 women) of children ages 10-15 years old indicated that fathers believe more strongly than mothers that struggling in mathematics is beneficial for their child, replicating the findings of Vazquez et al. (2020). Using the same data set, we then tested the hypotheses that fathers more than mothers believe that struggling in mathematics is beneficial for their child's math learning because: (a) fathers believe more strongly than mothers that their child's success in math is more important than their emotional well-being, and (b) fathers believe more strongly than mothers that they are more responsible for ensuring their child's success in math than their child's emotional well-being. Results from a competing mediation model were consistent with these hypotheses: Believing success in math is more important than emotional well-being and feeling more responsible for ensuring the child's success in math than the child's emotional well-being both mediated the overall relation between parents' gender and their belief in the effectiveness of struggling in math for their child.

AN INVESTIGATION INTO THE EFFECT OF DATA VISUALIZATIONS ON MEMORY AND AFFECT FOR ONLINE DATA VIDEOS

Delica Leboe-McGowan, University of Manitoba; Jason Leboe-McGowan, University of Manitoba; Yumiko Sakamoto, University of British Columbia, Okanagan Campus; Pourang Irani, University of British Columbia, Okanagan Campus

Data videos are a popular medium for communicating educational content to online audiences. We examine three visual formats that frequently appear in online data videos: text, graphs/charts, and pictographs. After participants watched six popular data videos obtained from YouTube, we assessed their ability to recall conceptual and quantitative details from the narration content that was presented in the video set. A control group listened to the narrations without seeing any of the visual content. We additionally had a subset of participants in both the audiovisual and audio-only groups continuously record their emotional responses while they were exposed to the educational stimuli. Surprisingly, the three visualization formats did not significantly differ in terms of their effects on knowledge retention and affective experience. When compared against the audio-only group, we observed that exposure to visual content generally improved recall accuracy by about 7% for conceptual information and 10% for quantitative details. The presentation of visual content, however, did not have any significant effects on the participants' emotional response ratings. Based on these insights and additional findings, we propose a set of general guidelines for data video development.

HEAR, PEAR, BEER, NEAR: SOUND-SPELLING CONFLICT IN AUTOMATIC WORD READING

Niki Sinha, Western University; Marc Joanisse, Western University

Word recognition is an automatic process integral to fast and fluent reading. The process is strongly driven by orthography (word form), connecting the visual form of words to their meanings. However, the contribution of phonology to word recognition may further reveal how word information is evaluated in fluent reading. The present study investigated how adults (n=45) with varying reading skill evaluate conflict in orthography and phonology when making rhyme judgements. Word pairs were visually presented in four conditions, congruent trials which shared both orthography and phonology (mood/food) or shared neither (yarn/truck), and incongruent trials with conflicting orthography and phonology (tide/fried or snow/cow). Participants instructed to indicate whether word-pairs rhymed or not were less accurate in their judgement of incongruent trials and were the least accurate and slowest when judging incongruent non-rhyming pairs (snow/cow) over all other word-pair types. Performance on incongruent trials showed individual differences when associated with reading skill. Participants with stronger nonword reading and reading comprehension measures performed more accurately on trials with incongruent word-pairs, suggesting automatic word recognition may benefit from use of a phonological or semantic processing strategy. In our next steps, this study will evaluate processing pathways of congruent and incongruent word-pairs via EEG analysis.

WHAT IS ACTUALLY TAUGHT WHEN CHILDREN LEARN TO READ VIA PHONICS INSTRUCTION? A COMPARISON OF THREE CURRICULA

Hannah Rognan, University of Toronto Mississauga; Yiannie Lin, University of Toronto St. George; Emma Abrams, University of Toronto St. George; Alyssa Labre, University of Toronto Scarborough; Irys-Amélie Champagne, University of Toronto Scarborough; Kathleen Rastle, Royal Holloway, University of London

Presently, there is a large gap between how basic reading science has conceptualized reading and how reading is actually taught in the classroom. Moving to narrow this gap, we codified and analyzed several important features of three major phonics curricula in use in England (Jolly Phonics, Read Write Inc., and Letters & Sounds), which has mandated Phonics instruction in schools. These features included what spelling-sound rules are taught (e.g., <i> is associated with the /ɪ/ phoneme), and in which order; how many rules are taught, and the overall complexity of those rules; how many example words are taught to illustrate rule usage, how often these examples are repeated, and how orthographically similar these example words are to one another; and how many "tricky" (exception) words are taught. One or more of the curricula differed significantly from each of the others on all of these metrics, sometimes by as much as a factor of 4. This clearly indicates that "phonics instruction" is not a monolithic construct, and points to targeted directions for leveraging insights from basic reading research for optimizing each of these (and other) dimensions of phonics curricula.

SHOULD I STAY OR SHOULD I SHIFT? CONTEXT EFFECTS ON PERCEPTUAL ADAPTATION FOR SPEECH

Katherine White, University of Waterloo; Ashley Avarino, University of Waterloo; Taylor Columbus, University of Waterloo

Listeners contend with substantial variation in the pronunciation of speech sounds. Some of this variation is due to factors that differ across speakers, such as idiosyncratic speaker characteristics or accent differences (e.g., "pig" pronounced as "peeg"). In some circumstances, listeners cope with these types of cross-talker differences by adjusting their perceptual representations. We asked whether these adjustments are determined by the amount of evidence that the speaker reliably uses a particular pronunciation. We exposed adults (N=399) to words in which 's' sounds were shifted in the direction of 'sh', producing ambiguous sounds (e.g., 'hos*pital'). Across two experiments, we found that the degree of adjustment was related to the number of contexts in which the ambiguous sounds appeared: there was little adjustment when the s* always appeared in the same phonological context (after 'p'), but more when they occurred in a greater variety of consonant and vowel contexts. However, a 3rd experiment demonstrated that it is not the number of contexts alone that matters. When only a single ambiguous s* token was used, the degree of adaptation was constant, regardless of the number of contexts. Overall, these findings demonstrate that listeners weigh both acoustic and contextual information during perceptual adaptation.

THE PRODUCTION EFFECT AND SECOND LANGUAGE LEARNING: THE ROLE OF PROFICIENCY.

Sébastien Gionet, Université de Moncton; Sophia Tran, University of Waterloo; Myra Fernandes, University of Waterloo

Producing words at encoding (reading them aloud or writing them down) has proven to be beneficial in enhancing memory. However, production's ability to benefit learning of new words is up for debate, with some studies suggesting production could actually disrupt learning. Importantly, since encoding strategies are often used to facilitate vocabulary acquisition in classrooms, evaluating their efficacy as tools for second language learning is critical. Here, 120 English monolinguals, who self-reported knowing little to no French, were visually presented with 60 English-French word pairs and asked to read them silently, write them down, or read them aloud in a repeated-measures design. We then assessed learning of the bilingual word pairs with paper & pencil 'matching tests', separately for pairs learned with each encoding strategy; participants had to select the French translation for each word from a set of 20 familiar alternatives. Participants also completed subjective and objective measures of their English and French proficiency. Overall, there was no production benefit on performance. Importantly, however, we found that the magnitude of the production benefit increased as French proficiency decreased. This result suggests that prior knowledge of a second language influences the efficiency of the production benefit for second language learning.

CONVERGENCE INSUFFICIENCY SYMPTOMS IN TYPICAL VERSUS POOR READERS: THE CONTRIBUTIONS OF CONVERGENCE INSUFFICIENCY IN LEARNING TO READ PROCESS AND READING DIFFICULTIES

Khushi Patel, Toronto Metropolitan University; Maureen Reed, Toronto Metropolitan University

During reading both eyes converge. When the convergence mechanism fails, the eyes misalign. Convergence insufficiency (CI) symptoms (e.g., blurry/double vision, eyestrain) can lead to reading difficulties (e.g., losing place, slow reading speed). About 85% of children with learning disabilities, referred to optometric evaluations suffer from CI, yet the contributions of CI in the learning in the read process have been largely ignored. Here, a large sample of university undergraduate students were surveyed and interviewed about their learning to read experiences and CI symptoms were measured. We then conducted a meta-analysis examining the prevalence of convergence insufficiency in poor versus typical readers. Our survey and interviews identified that compared to typical readers, those reporting learning to read difficulties experienced CI symptoms more frequently during childhood, adolescence and currently. Our meta-analysis supported these findings. Further, as the frequency of CI symptoms increased, the age at which participants could read without assistance increased and the level of comfort experienced during reading decreased. Results indicate that CI symptoms affects the learning to read process and discomfort caused by CI symptoms may cause decreased reading practice in poor readers, thereby contributing to reading difficulties.

PLAYING OR VIEWING A GAME WHILE WATCHING A VIDEO LECTURE: EXPLORING THE IMPACT OF ACTIVE VS PASSIVE MULTITASKING ON LEARNING.
Jeremy Marty-Dugas, McMaster University; Brandon Ralph, University of Waterloo; Joe Kim, McMaster University; Daniel Smilek, University of Waterloo

This study examined volitional Media multitasking (MMT) during an asynchronous online lecture by giving participants the opportunity to engage with a secondary, non-required media stream (i.e. the game of snake). 252 participants were randomly assigned to either an active condition, in which they could play the snake game using the arrow keys; or a passive condition, in which they could watch the snake game, but not play it. In both conditions, participants could voluntarily toggle the snake game on and off, using a keypress. We tracked MMT behaviourally using the percentage of time participants had the secondary stream toggled on (i.e. snake time), and the number of seconds where the experimental window was not the active window on the participant's computer (i.e. blur events). Following the lecture, participants completed a multiple-choice quiz and self-reported their level of MMT. Both behavioural measures indicated participants spent significantly more time MMT in the active condition. However, there were no significant differences in self-reported MMT or quiz performance. Further, correlations between MMT and performance was either non-significant or inconsistent, depending on the measure of MMT. Thus, the present study found no performance decrement as a result of, or in association with, increased volitional MMT.

CHILDREN'S NATIVE-SPEAKER BIASES INTERACT WITH LANGUAGE KNOWLEDGE
Ashley Avarino, University of Waterloo; Jacky Chen, University of Waterloo; Katherine S. White, University of Waterloo

Children typically endorse information presented by native speakers over information from non-native speakers. Although this may be due to social preferences for native-speaking individuals, endorsements may also be rooted in an evaluation of the information provided (e.g., an assumption that the native speaker's information is more accurate). We asked how children's native-speaker bias is affected by another phonological property of the words, their stress pattern. English-speaking 7-9-year-olds (N=45) heard pairs of novel labels for novel objects produced by native and non-native speakers. Labels differed either in accent, stress pattern (strong-weak or weak-strong), or both accent and stress pattern. Children demonstrated an overall preference for the native-accented speaker and labels that followed the dominant English stress pattern (strong-weak). However, when these factors were manipulated together, children endorsed the label with a strong-weak stress pattern – overriding their native speaker bias. That is, when the non-native speaker used the dominant English stress pattern while the native speaker used the non-dominant pattern, children endorsed the former. Thus, children do not uniformly endorse native-accented speakers, but consider the quality of the information along other dimensions (e.g., other phonological properties). Ongoing analyses are examining whether individual differences in language knowledge (vocabulary size) affect children's judgments.

DOES MUSICAL SENSORIMOTOR SYNCHRONIZATION ABILITY PREDICT SPONTANEOUS SYNCHRONIZATION IN A SPEECH TASK?
Meyha Chhatwal, University of Toronto Mississauga; Christina Vanden Bosch der Nederlanden, University of Toronto Mississauga

Humans spontaneously synchronize their movements to an external stimulus in many settings, including dancing and walking. In previous work, a subset of participants spontaneously synchronized their speech productions to an ongoing speech stream—especially when those participants were musically trained. It is possible that musical skills related to playing in an ensemble predict spontaneous synchronization or that specific skills that are related to music training underlie this relationship. Here, we examine whether participants who spontaneously synchronize their speech to an ongoing speech stream also have better sensorimotor synchronization skills when tapping to the beat of popular music. We predict our results will mirror previous findings, with Canadian participants falling into a bimodal distribution of spontaneous synchronizers and non-synchronizers. We also predict that the degree of spontaneous synchronization will be correlated with beat tapping ability and will examine whether this relationship is due to specific types of music training or is present regardless of musical background. This work is important for furthering our understanding the cognitive and perceptual processes responsible for beat or rhythm perception across multiple domains and may suggest a shared neural driver of spontaneous synchronization, musical beat perception, and language processing.

EFFECTS OF MOTION ON RECOGNITION OF UNFAMILIAR FACES

Vanessa Cunha, University of Ottawa; Patrick Davidson, University of Ottawa

The world is visually dynamic, yet researchers still rely heavily on standardized sets of non-moving stimuli to investigate memory for faces. It remains unclear whether there is a motion advantage for recognition of unfamiliar faces, with some studies showing an advantage but others not. Here, we investigated whether 1) motion improves recognition memory for unfamiliar faces, and 2) the amount of motion presented in an unfamiliar face affects recognition memory. To better understand the influence of motion on memory, participants learned a series of unfamiliar faces either as videos or as images, and at test indicated whether they recognized each face using "yes" or "no." A paired samples t-test showed no significant difference in recognition memory for faces that were viewed and tested as videos compared to faces that were viewed and tested as images. As some previous research has suggested that the amount of motion shown by a face may affect recognition memory, an objective measure of the amount of motion (i.e., frame-to-frame Pearson Correlations) of each face video was calculated. Spearman correlations showed no significant relationship between the amount of motion shown by each face and the likelihood of it being recognized.

FLUENCY OF LEARNED MOTOR SEQUENCES IS ENHANCED BY ENACTMENT

Victoria A. Bernardo, University of Waterloo; Myra A. Fernandes, University of Waterloo

Enactment is an encoding strategy in which physically performing an action represented by a word or phrase benefits memory relative to reading or viewing them. Studies to date have focused on enactment's beneficial effects in retaining verbal information. However, there is little research on its influence on memory for action sequences, needed for retaining dance steps, choreography, or movements to execute sport skills. Here we presented 46 undergraduates with 12 different motor sequences (e.g. step forward, jump right, turn left, touch knees) in videos shown one at a time. Participants were then asked to either re-watch the video or enact the movements with encoding type blocked, in counterbalanced order, within-subjects. Memory for the individual movements, and their sequence order, was unaffected by encoding type. Movement fluency measured by time to recall and perform the sequence, however, was significantly faster for sequences enacted during encoding. Such a finding has implications for teaching new motor skills where fluency and timing are critical (dance choreography, executing plays/actions in sports, changing lanes while driving). While current teaching methods focus primarily on learning through observation or verbal instruction, our work shows that enactment is best when motor sequence fluency is relevant.

EXPLORING THE RELATIONSHIP BETWEEN METACOGNITION AND EVENT MEMORY USING TRADITIONAL METHODS AND MIXED-EFFECT MODELS

Astrid Coleman, University of Windsor; Dr. Kristoffer Y. Romero, University of Windsor

Metacognition is the ability to monitor, reflect on, and control cognitive processes. The relationship between metacognition and memory is not well understood. Previous research has focused on controlled experimental tasks which may not capture the richness of mental representations constructed when remembering past events. The goal of the current research is to gain insight into the ambiguous relationship between memory and metacognition using a more ecologically valid event memory paradigm. The sample consisted of 47 cognitively healthy adults aged 18-32 years. Participants performed an event memory task, which entailed watching a series of short video clips and subsequently orally recalling each clip. Metacognitive ratings (vividness and confidence judgements) were made after each clip was encoded and recalled. All recalled clips were audio recorded, transcribed, and analysed to determine the number accurately recalled event memory details. The ability of vividness and confidence judgements to predict accurate event memory recall is performed using traditional metacognitive methods, including absolute accuracy (mean comparisons) and relative accuracy (trial-by-trial comparisons). Additionally, we explored these relationships using linear mixed-effects models. This project employs an ecologically valid memory paradigm as well as advanced statistical techniques to improve our understanding of the complex relationship between memory and metacognition.

DO SEQUENTIAL DEPENDENCIES DEPEND ON ATTENTION? INVESTIGATING SEQUENTIAL DEPENDENCIES IN RECOGNITION MEMORY DECISIONS
Michelle A. Dollois, University of Guelph; Chris M. Fiacconi, University of Guelph

In recognition memory, it is well established that recognition judgments are influenced by irrelevant information. One example of this is the judgment made on previous trial at test. Previous research has demonstrated sequential dependencies during test, such that the response given on the previous trial often predicts the response made to the current trial. Our lab has replicated this, confirming that responses tend to repeat, and expanded it to show that trial content also carries across trials to influence responding. Specifically, we have found that similar items occurring consecutively at test increase the probability of responding "old". We demonstrate this content carryover effect with two forms of similarity, orthographic and semantic, which are presumed to increase the experience of perceptual and conceptual fluency, respectively. With an increase in processing fluency, the close occurrence of similar items at test may create illusions of familiarity, thus leading to more liberal responding. Here we present these findings, as well as test a model of response carryover which posits that they are the result of lapses in attention (Annis & Malmberg, 2013). We find partial support for this model, and consider whether the two sequential effects (response and content) may result from different mechanisms.

EFFECT OF REAL-WORLD EXPERIENCE ON LAB-BASED SCENE MEMORY
Maria Orlando, York University

Boundary extension (BE) is as an error in scene memory, such that participants recall details beyond the given boundaries of a previously viewed scene image. In the BE literature, there is variability in what types of stimuli are used, how BE is tested, and the proposed mechanism underlying the phenomenon. Overall, the literature supports the idea that most individuals are prone to BE, and thus memory error. BE is viewed as a memory bias in incorporating additional context in the internal representation formed during perception. Consistently, the perception of a continuous background and contextual information elicit BE. Therefore, prior knowledge and experience of a scene will likely have an important influence on the way one processes an image. This study will compare lab-based encoding of images of pre-experimentally familiar (real-world) places with images of unfamiliar places to investigate the influence of familiarity on BE. Based on the literature, familiarity could either increase or decrease BE. A difference in the effect of BE between familiar and unfamiliar stimuli will provide insight as to how the brain processes images and scenes. This may bridge current BE theories and potentially account for discrepancies.

THE IMPACT OF CONTEXTUAL SELF-RELEVANCE, VALENCE, AND SOCIAL ANXIETY ON FACE RECOGNITION AND SOURCE MEMORY
Amie Durston, University of Waterloo; Myra Fernandes, University of Waterloo; Roxane Itier, University of Waterloo

Whether contextual self-relevance and valence impact face recognition or source memory for contextual information is unclear. Additionally, social anxiety's influence on these memories is unknown. Here, 120 participants saw 48 faces one at a time, each preceded by that individual's positive or negative opinion (contextual sentences) of the participant (self-relevant) or someone else (other-relevant). Participants rated how each face made them feel. Faces preceded by self-relevant sentences were rated as more arousing than those preceded by other-relevant sentences. Individuals with medium and high social anxiety traits rated faces as more arousing when they were preceded by negative compared to positive opinions. Accuracy on a surprise face recognition test was not affected by the opinion context. However, performance on a surprise source memory test for the opinions' relevance was higher when the opinion was other-relevant than self-relevant. Interestingly, those with high social anxiety showed enhanced source memory for negative compared to positive opinions, regardless of relevance. Thus, in contrast to other types of information, memory for faces and their context source is not enhanced by self-relevance. Results also suggest that the previously reported memory benefit for negative information may depend on individuals' social anxiety status.

EXAMINING THE IMPACT OF MULTIPLE TESTS ON METAMEMORY FOR EMOTIONAL IMAGES
Danial Gonsalves, Memorial University of Newfoundland; Kathleen Hourihan, Memorial University of Newfoundand

When individuals perceive, control, and monitor their memories, they engage in metamemory. Metamemorial research often focuses on the accuracy of subjects' prediction of future memory performance, commonly referred to as judgments of learning (JOLs), to examine the monitoring aspect of metamemory. Subjects often exhibit higher JOLs for emotional content than for neutral content, but recognition accuracy depicts the contrary. As JOLs may be the result of a misunderstanding of test conditions, subjects may require experience with test conditions to calibrate themselves better and adjust their JOLs to match their recognition accuracy. In the present study, participants studied a list of positive, negative, and neutral images while providing JOLs for each trial, and then completed an old/new recognition test. Then, they completed a second block of the same task, but with new images. In the first block, JOLs were highest for negative emotional images, but recognition accuracy was highest for neutral images. JOLs were similarly inaccurate on the second block, again showing the highest JOLs but the lowest recognition accuracy for negative images; experience did not improve the accuracy of JOLs. Theoretical implications regarding the impact of emotion on memory for images and future directions of research are discussed.

DIRECTION OF VISUAL SHIFT AND HAND COMPATIBILITY INFLUENCE POINTING ERROR REDUCTION DURING VISUOMOTOR ADAPTATION
Claire Kryska, MacEwan University; Christopher Striemer, MacEwan University

The aftereffects observed during prism adaptation (PA) are typically seen in the directionopposite the prism shift. Recent work in our lab has demonstrated a “congruency effect” inwhich larger aftereffects are observed when the hand used matches the direction of visual shift(e.g., right hand, rightward prism shift). In this experiment, we were interested in determining ifthe congruency effect was influenced by the size of the error signal produced during PA. Toinvestigate this, we manipulated the hand used (left vs. right), direction of prism shift (left vs.right), and the size of the reach error induced during adaptation by using two differentmagnitudes of prism shift (8.5° vs. 17°). Although we did not find any evidence of a congruencyeffect when measuring prism aftereffects, we did observe a significant congruency effect forpointing error reduction during PA such that participants in the 17° group (but not the 8.5°group) were better at reducing their pointing errors during PA when the hand used matched thedirection of visual shift. This suggests that the congruency effect may be driven by the increaseddifficulty associated with adjusting for larger reach errors (i.e., 17°), compared to smaller reacherrors (i.e., 8.5°).

AN INVESTIGATION OF ATHLETES & THE COLAVITA EFFECT
Keira Dyck, Mount Allison University; Jonathan Wilbiks, University of New Brunswick; Genevieve Desmarais, Mount Allison University

When individuals are presented with an auditory and visual stimulus simultaneously, they tend to report this bimodal stimulus as ‘visual-only’ more frequently than ‘auditory-only’. This phenomenon is known as the Colavita effect and seems resistant to a variety of manipulations to the stimulus and environment. The effect is typically stronger when concrete stimuli (e.g. picture/sound of a cat) are presented compared to abstract stimuli (lights and tones) and even seems to persist when the visual and auditory stimuli do not correspond to the same concept (picture of lamppost with the sound of a cat). Our aim was to extend this effect to spoken and printed words as stimuli. Participants were presented with an auditory, visual, or bimodal stimulus and were asked to report the modality of the stimulus as quickly as possible. Importantly, we used three versions of the task. Participants were presented with pictures/sounds, pictures/spoken words, and printed/spoken words. Participants generally responded slower to verbal stimuli, and we observed a Colavita effect across all tasks: participants reported that bimodal stimuli were ‘visual-only’ more often than ‘auditory-only,’ and this effect was not modulated by the type of stimuli used.

EXPLORING THE RELATIONSHIP BETWEEN VECTION, ANXIOUS TEMPERAMENT, AND VISUALLY INDUCED MOTION SICKNESS

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Visually induced motion sickness (VIMS) is a common sensation when using Virtual Reality applications or other visual devices, characterized by feelings similar to traditional motion sickness (e.g., nausea, disorientation, headache). Several factors have been discussed to affect VIMS. For instance, the illusion of self-motion in the absence of real physical movement (vection) has been linked to VIMS, but the exact relationship between the two remains vague. Our aim was to test whether an individual's tendency to experience vection is linked to their VIMS susceptibility. Additionally, all participants completed the State-Trait Anxiety Inventory as only little is known about how an individual's level of anxiety may contribute to VIMS. Participants were exposed to two different visual stimuli: The first stimulus consisted of alternating black-and-white vertical bars moving horizontally to induce circular vection. Vection onset time, intensity, and duration were recorded to estimate an individual's tendency to experience vection. The second stimulus consisted of a rotating 360° photograph tilted by 18° to induce VIMS, recorded via the FMS and the SSQ. Preliminary results of 30 participants will be presented. We believe that our results will help to better understand individual factors associated with VIMS.

THE ROLE OF SENSORY REWEIGHTING IN CYBERSICKNESS SUSCEPTIBILITY IN VIRTUAL REALITY

Siyavash Izadi Sokhtabandani, University of Waterloo; Michael Barnett-Cowan, University of Waterloo

As virtual reality (VR) technology gains popularity, understanding factors contributing to cybersickness is crucial for enhancing user experiences. Cybersickness, a motion sickness induced by immersive VR and augmented reality applications, varies in severity among individuals. Our recent study (Chung & Barnett-Cowan, 2023: https://doi.org/10.1007/s10055-023-00786-z) investigated sensory reweighting and cybersickness susceptibility using the subjective visual vertical (SVV). Results showed significant SVV shifts after high-intensity VR gameplay, with less sick participants exhibiting larger changes. The current study assesses sensory reweighting of bodily, gravitational, and visual information using SVV and the Oriented CHAracter Recognition Task (OCHART), which measures the perceptual upright (PU). Preliminary results reveal both SVV and PU are affected by orientation information, with PU results better capturing visual information's influence. There is a tendency for those experiencing less cybersickness to change their reliance on visual information. These findings suggest a potential relationship between cybersickness susceptibility and sensory reweighting. We plan to collect more data and fit a vector sum model to evaluate the impact of orientation cues on these measures. Insights into these factors' interactions will help identify individual differences in cybersickness development, informing personalized mitigation strategies and promoting more comfortable VR experiences.

I SEE WHAT YOU'RE SAYING: DIRECT EYE GAZE BOOSTS AROUSAL AND SELF-REFERENCE MEMORY

Quinn Ree-Fedun, University of Alberta; Michelle Jarick, MacEwan University

Previous work showed that direct eye gaze increases physiological arousal and has also been shown to elicit self-referential processing by increasing self-awareness. Experiment 1 examined whether physiological arousal and memory for words would vary based on the experimenter's gaze direction (direct, averted, no- gaze). Participants were read a series of words by the experimenter while their skin conductance was recorded and completed a subsequent recognition task. Under direct gaze, participants experienced greater skin conductance responses during direct eye gaze compared to averted and no-gaze conditions, along with better recognition accuracy for words. In Experiment 2, we asked whether the increase in self-awareness from direct eye gaze would enhance self-reference memory. Using a self-referential memory strategy showed significant enhancement of arousal and accuracy during direct gaze, compared to using a semantic strategy. Altogether our findings indicate that direct gaze during a live social interaction causes an increase in physiological arousal, improved recognition memory for words and more effective use of a self-referential memory strategy.

AN UPDATED LOOK AT NSERC FUNDING WITHIN CANADIAN COGNITIVE SCIENCE

Michelle Yang, McGill; Women in Cognitive Science Canada; Penny Pexman, University of Calgary, Women in Science Canada; Debra Titone, McGill; Women in Cognitive Science Canada

Research has demonstrated persistent gender disparities within academia over the professional life span, despite an increasing number of women receiving academic positions (Casad et al., 2021; Llorens et al., 2021; West et al., 2013; Knobloch-Westerwick et al., 2013). To investigate this in the Canadian context for cognitive science, Titone, Tiv, and Pexman (2018) analyzed gender distributions in publicly available federal funding data from the Natural Sciences and Engineering Research Council (NSERC) of Canada, across undergraduate, graduate, postdoctoral, and professor awards. Here, we update these analyses to include data from the last six years, during which time NSERC initiated several relevant policies, and WiCS-Canada was introduced to the cognitive science community in 2016. The updated data show that gender disparities may be reducing in terms of the number of funds awarded, and in average grant size, particularly at the postdoctoral and early career professor levels. This suggests that federal funding policies relevant to equity, diversity, and inclusion from NSERC, as well as grass-roots efforts to raise awareness, may be having a positive impact in shoring up the leaky pipeline for our discipline.

THE GAZE ADVANTAGE: TEMPORAL ORDER JUDGEMENTS ARE MORE ACCURATE FOR GAZED-AT TARGETS

Sarah McCrackin, McGill University; Phoebe Zhao, McGill University; Florence Mayrand, McGill University; Jelena Ristic, McGill University

It is well documented that gaze following improves detection and perception of gazed-at targets. It remains virtually unexplored however how this social attention shift impacts other aspects of perception, such as the perception of time. To address this question, we used a modified gaze cuing task, in which participants viewed central faces that averted their gaze before reacting with a fearful, happy, or neutral expression. Two peripheral targets appeared on both sides of the face with varying stimulus-onset asynchronies and participants were asked to make temporal order judgments about which target appeared first. Judgment accuracy was higher when the first target appeared at the gazed-at relative to the not gazed-at location. Further, participants were also more likely to indicate that the targets presented on the left side appeared first when the target was gaze congruent and when the face displayed a fearful emotional expression. Together, these findings suggest that social attention can improve temporal precision of attended targets and that both emotional and gaze driven effects on time perception may be lateralized.

PROSODY PERCEPTION AND TASK-DEPENDENT PERFORMANCE IN AUTISTIC PERSONS

Zehra Sasal, Wilfrid Laurier University; Jeffery Jones, Wilfrid Laurier University

While it is widely accepted that individuals with autism often experience atypical sensory processing, a growing body of literature suggests that autistic persons may excel in perceiving details commonly missed by non-autistic individuals. This heightened detail perception is attributed to local to global processing theory which suggests that autistic persons are inclined to process information from small to large. Effective communication relies on global and local processing, with prosody playing a crucial role in detecting local pitch to accurately perceive emotions while understanding the broader emotional context. To confirm this theory, we tested 56 neurotypical and 19 autistic individuals in tasks that required attention to auditory detail and tasks that focused on understanding the emotion of the speaker. Participants were asked to detect the direction of sweep tones, the direction of spoken sentences' vocal pitch, and the emotions expressed in sentences. We found that autistic individuals identified the pitch direction of sweep tones better than non-autistic individuals but performed similarly to neurotypical individuals in emotion identification. These findings conflict with some previous work. We hypothesize that high-functioning autistic adults in our sample may have developed adaptations that allowed them to cope with the social demands.