COGNITIVE AGING LAB NEWSLETTER

Understanding the aging brain | Dr. Lixia Yang

A Message From the CAL Team

Another wonderful academic year has come and gone! With rapidly changing protocols regarding the COVID-19 pandemic, the *Cognitive Aging Lab* and the broader university community have worked over the past year to strengthen strategies to promote research excellence amidst all of this change. The *Cognitive Aging Lab* would like to extend a most sincere thank you to everyone who has participated in our research and been a part of our work over the past year – our research truly could not be done without you! We invite you to explore this newsletter for updates on our research endeavours, including findings from recently completed projects, awards and funding, and current research participation opportunities.

Health Pamphlet Appraisal

Dr. Lixia Yang, Dr. Maureen Reed, Dana Greenbaum, Justice Cupid

In a study recently accepted for publication in *Aging, Neuropsychology and Cognition*, Dr. Lixia Yang (the director of the *Cognitive Aging Laboratory*), her students (Dana Greenbaum, Justice Cupid), and colleague (Dr. Maureen Reed) examined whether combining goal (i.e., emotion- vs. future-oriented information) and valence framing (i.e., positively vs. negatively framed information) could optimize older adults' memory and general evaluation (behaviour intention, informativeness, likeability, persuasion) of health pamphlets.

Toronto Metropolitan University

Results showed that younger adults demonstrated a more favourable appraisal for pamphlets with future- rather than emotion-oriented goals in younger adults. Additionally, older adults showed a more favourable appraisal and a slight memory advantage for the emotion-oriented positively framed pamphlet, relative to their younger counterparts. Both age groups remembered more information from the pamphlets that focused on emotion- rather than future-oriented. This suggests that combining goal and valence framing strategies could optimize the effectiveness of health communication for older adults. This publication was originally based on the honour's thesis of Dana Greenbaum.

The Effect of Oral Contraceptive Use on Cortisol Reactivity to the Trier Social Stress Test: A Meta-analysis

Julia Gervasio, Sally Zheng, Cassandra Skrotzki, Alexander Pachete

Toronto Metropolitan University graduate students Julia Gervasio *(Psychophysiology Lab)*, Sally Zheng *(Cognition and Psychopathology Lab)*, Cassandra Skrotzki *(Cognitive Aging Lab)* and Alexander Pachete *(Science of Music, Auditory Research, and Technology Lab)*, successfully published a manuscript in *Psychoneuroendocrinology* titled "The Effect of Oral Contraceptive Use on Cortisol Reactivity to the Trier Social Stress Test: A Meta-analysis." (link). This paper examined changes in salivary cortisol in females taking oral contraceptive pills (OCPs) and naturally cycling (NC) females after exposure to a popular stress test. Synthesizing findings across 14 published research papers, the results showed that OCPs blunt cortisol reactivity relative to NC females. However, there were no statistically significant differences in stress-induced salivary cortisol reactivity observed between OCP users and NC females in the follicular phase of the menstrual cycle. These findings have important implications for stress research, namely that females taking OCPs do not exhibit a distinct stress response from *all* NC participants and should not be excluded from studies measuring cortisol responsivity to the Trier Social Stress Test.

Award Spotlight

Sonja Givetash

Sonja Givetash (Master's Student) has been awarded the *Canada Graduate Scholarships-Master's Program, The Natural Sciences and Engineering Research Council of Canada* (CGS-M NSERC). The purpose of CGS-M program is to develop research skills, train students and financially support high-calibre scholars who are enrolled in an eligible graduate program at a Canadian institution. NSERC supports research related to increasing knowledge of fundamental processes in humans such as age-related changes in cognitive processes and underlying mechanisms in memory. Sonja received this award for her Master's thesis project which will compare the effect of learning strategies (i.e. item pre-learning) on younger and older adults' memory for names. She will investigate if learning items separately (i.e. a name, and a face) will increase the accuracy of remembering a person's face and their name together.

Age Disparities in COVID-19 Mental Health: Resilience & Coping

Dr. Lixia Yang, Dr. L. Na

In a manuscript recently accepted for publication in *Social Science & Medicine*, Dr. Na (University of Toledo), Dr. Yang (Toronto Metropolitan University) and colleagues analyzed data from the Understanding America Study's (UAS) longitudinal online survey related to the COVID-19 pandemic. They found pronounced age disparities in mental distress, perceived adversities, resilience and coping, as well as highlighted how resilience and coping could adaptively mitigate mental distress during this unprecedented pandemic. The youngest age group (aged 18-34) appeared to be most vulnerable during the pandemic. Mental health interventions may provide vulnerable individuals with resilience training to combat everyday adversities and empower them to achieve personal growth that challenges age boundaries.

Research Participation Opportunity

Lab director Dr. Lixia Yang, graduate student Mariah Lecompte, and undergraduate student Angela Xiang are currently conducting a novel study examining interactive presentation and associative memory in young and older adults. Throughout the pandemic, many have resorted to using online video conferencing platforms as a method of communication and learning. With this in mind, we hope to examine how associative memory performance might be affected by online learning conditions. In small groups over Zoom, participants will be shown a video of people presenting self-introductions, and will then be asked to remember this information to complete a subsequent memory test. The findings from this study will help inform researchers of the online conditions that best support memory performance in young and older adults.

We are currently aiming to recruit 96 participants (48 younger, 48 older) who meet the following inclusion criteria:

1. Are aged 18 to 29, or 65+
2. Do not have any previous neurological conditions (i.e., *not* had a stroke, prolonged unconsciousness, or suffered a head injury)
3. Have normal or corrected-to-normal eyesight and hearing
4. Are proficient in English
5. Are comfortable with using, and have reliable access to Zoom via a computer or laptop ONLY (must not be through other devices, e.g., cellphone, tablet, etc.) with audio and webcam access
6. Did not participate in the IPAM Phase 1 (pre-recording) study

If you are interested in participating and meet the above criteria, please send us an email at cal@ryerson.ca with "IPAM" in the subject line for more information!

Toronto
Metropolitan
University

Mood & Cognitive Control
Dr. Lixia Yang, Linda Truong, Kesaan Kandasamy

In a recent publication (Truong et al., 2022), Dr. Yang and her students (Linda Truong and Kesaan Kandasamy) examined the effects of induced positive or negative mood on cognitive control mode in older and younger adults using a standard letter-cue and a modified face-cue AX-CPT. The results showed little effect of mood induction (positive or negative) on cognitive control across the two versions of the the tasks, but the modified dichotomous face cues (female or male) reversed older adults' reactive control bias in the standard letter-cue task towards a proactive control bias in response time performance.

Award Spotlight
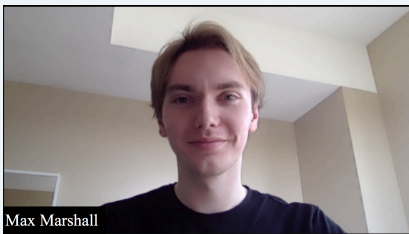
Max Marshall

Max Marshall, co-lab manager and research assistant, was awarded a Natural Sciences and Engineering Research Council of Canada (NSERC) Undergraduate Student Research Award (USRA). USRAs are awarded to undergraduate students who have demonstrated academic excellence and research potential. In the *Cognitive Aging Lab*, Max has led a research project examining psychological effects of the COVID-19 pandemic on undergraduate student populations across Canada. He is currently preparing a manuscript for this study.

Mental Health of International Students
Dr. Peizhong Wang, Dr. Lixia Yang, Linke Yu

Led by Dr. Peizhong Wang from the Memorial University of Newfoundland, a group of researchers investigated the mental health conditions of Chinese international students aged 16 or above who were primarily from Canada. An online study was launched during the second wave of the pandemic (February 7th - May 31st, 2021). The findings of the study showed that 15.3%, 20.4%, and 10.5% of Chinese international students reported severe to extremely severe levels of depression, anxiety, and stress, respectively. In addition, the findings showed that amongst all the demographic factors, financial status and education level were associated with mental health conditions.

Specifically, Chinese international students with lower financial status and higher education level reported higher levels of depression, anxiety, stress, and lower general mental health status. These findings urge both the government and community to provide sufficient financial and mental health support to international students during the pandemic.

Award Spotlight

Kathryn Bolton
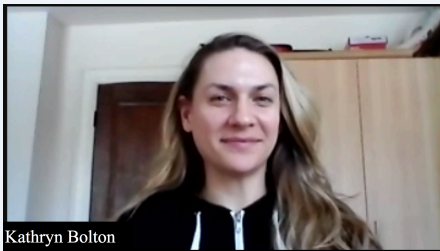
The *Canada Graduate Scholarships-Master's Program, The Social Sciences and Humanities Research Council* (CGS-M SSHRC) is an award granted to a student based on the merit of their academic excellence, the research potential of their proposed study, and their personal characteristics and interpersonal skills. It is meant to provide financial support to students so they may develop their research skills and training in their chosen field. Kathryn Bolton received the CGS-M SSHRC funding for her master's thesis project that aimed to identify sociodemographic risk predictors for psychosocial functions of North American older adults during the COVID-19 pandemic, and understand how decreased psychosocial functioning predicts performance on cognitive tasks.

Conference Presentations

Event Segmentation & Cognitive Control
Cassandra Skrotzki

Cassandra Skrotzki presented a poster titled "Investigating the Effect of Event Segmentation on Cognitive Control Use in Young and Older Adults" in collaboration with Charles Stone, Kesaan Kandasamy, and Dr. Lixia Yang at the *Cognitive Aging Conference* April 7th-10th in Atlanta, Georgia. The Biennial Cognitive Aging Conference is the premier conference for presentation of research about aging and cognition. Individuals using proactive cognitive control strategies prepare responses to events ahead of time, while those using reactive control respond to events in the moment.

Prior research shows that cognitive control use shifts from a predominantly proactive strategy in younger age to a reactive control strategy in older age. Event segmentation refers to the way that we segment a continuous stream of information into meaningful "chunks," like a scene change in a movie or a new paragraph in a book. This project aimed to test whether event segmentation can effectively enhance individuals' existing cognitive control biases using a modified version of the AX-Continuous Performance Test. The results showed that event segmentation can affect the ways that young and older adults "chunk" information and enhance reliance on their existing cognitive control strategies. Cassandra will be taking a lead role collecting more data this Summer to test whether these findings are replicable.

Social Importance, Recognition Confidence, & Memory
Mariah Lecompte

Mariah Lecompte presented a poster titled "Do self-perceived social importance and recognition confidence ratings relate to face-related associative memory in young and older adults?" in collaboration with Dr. Lixia Yang at the *Cognitive Aging Conference* April 7th-10th in Atlanta, Georgia. During a memory task, specifying that particular stimuli are more important to remember than the others can increase memory accuracy for the highly important stimuli. Additionally, when testing memory accuracy, higher recognition confidence ratings signal the use of recollection-based, as opposed to the familiarity-based process. Recollection-based retrieval is resource-demanding and tends to decline with aging, whereas familiarity-based retrieval occurs automatically and tends to be intact in older adults. This project attempted to answer if participants' self-perceived social importance of face stimuli, or self-reported confidence ratings in memory, were related to participants' recognition accuracy. If so, this study also strived to answer if these correlation patterns would differ depending on participants' age, or the stimulus' schematic support and emotional valence. The results found that there are no significant correlations between social…

importance ratings and memory accuracy, however there was a positive correlation between confidence ratings and memory accuracy for younger adults among the easily remembered face-occupation pairs. These results suggest that young adults, but not older ones, are able to engage recollection-based process for high-schematic face-occupation pairs, and subsequently boost their memory performance.

How to Get Involved: Ryerson Senior Participant Pool

The Ryerson Senior Participant Pool (RSPP) is a protected database that our laboratories use to recruit participants for our research projects. To be included in the RSPP, you will be asked to undergo a brief intake where personal information (e.g., contact details, age, gender, health status, etc.) will be collected. This information helps us determine your eligibility for future studies. Once include in the RSPP, you will be personally contacted by a member of our team if there is an opportunity for you to participate.

Please contact *cal@ryerson.ca* to sign up!

Psychosocial Function and Cognitive Outcomes of Older Adults
Kathryn Bolton

Kathryn Bolton presented a poster titled, "The Psychosocial Functions and the Related Cognitive Outcomes among Older Adults During the COVID-19 Pandemic" in collaboration with Dr. Lixia Yang at the *Cognitive Aging Conference* April 7th-10th in Atlanta, Georgia. The COVID-19 pandemic has been shown to increase psychological distress, which has been associated with decreased cognitive functioning during the COVID-19 pandemic. Research has shown that different age groups are differentially affected by…

pandemic related stressors. However, few studies have focused on older adults in North America to understand their experience of the COVID-19 pandemic as it relates to psychological distress and cognitive functioning. The current study aimed to identify risk predictors for psychological distress of older adults during the COVID-19 pandemic, and see how increased psychological distress related to performance on cognitive tasks. Data was collected from January to July 2021 using an online survey to record sociodemographic information, and to assess psychological distress and performance on executive functioning tasks. Regression analysis was conducted, and we found that older adults' psychological distress was predicted by being married, having an average income, being in poor health, and being with COVID-19 contact, with COVID-19 symptoms, and that psychological distress predicted worse interference resolution among older adults.

Grants and Funding

Dr. Yang and members of the Cognitive Aging Lab have recently been awarded funding for the following projects:

Grant award: Mitacs Accelerate
Proposal: "The effects of AI empathic music therapy on psychosocial and cognitive functions of older adults: a pilot and validation study"
Recipients: Dr. Lixia Yang, Faculty Supervisor, with Kathryn Bolton and Sonja Givetash as interns
Amount: $45,000
Received: May 15, 2022

Grant award: 2022 SSHRC Explore
Proposal: "Mitigating the Psychological Impact of the COVID-19 Pandemic on Older Chinese Immigrants: A Research-Community Mutual Support Project"
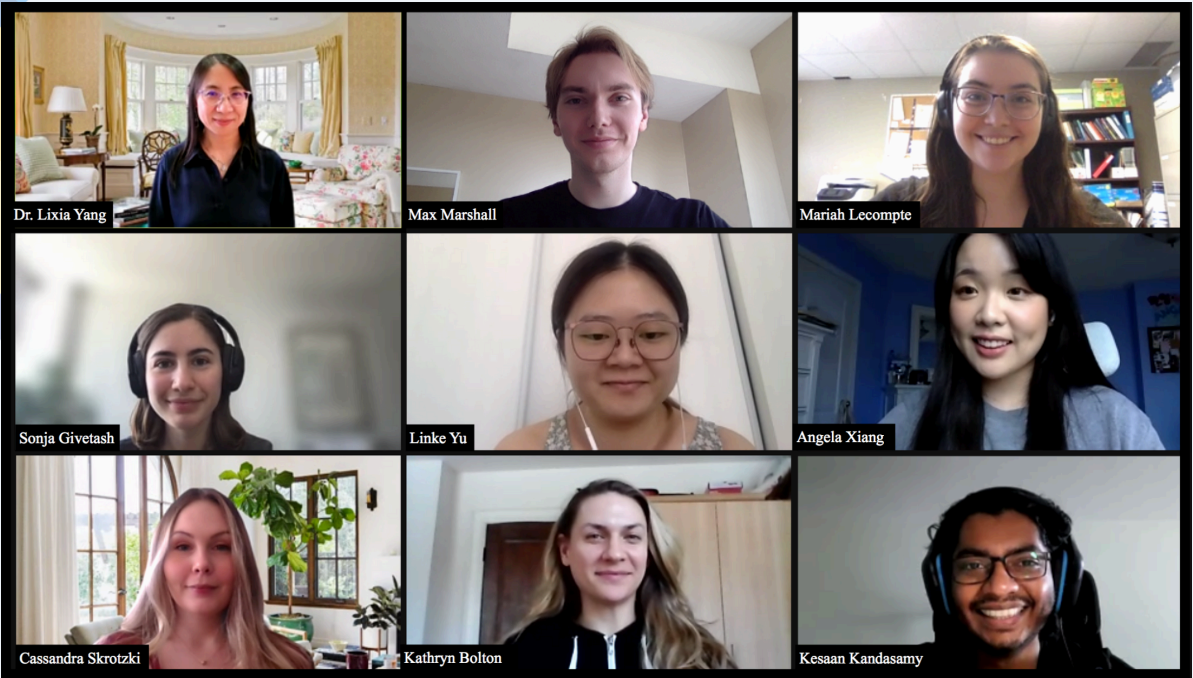**Recipient:** Dr. Lixia Yang
Amount: $7,000
Received: March 31, 2022

Meet Our Lab

Lab Director: Dr. Lixia Yang
Graduate Students: Kathryn Bolton, Sonja Givetash, Kesaan Kandasamy, Mariah Lecompte, Cassandra Skrotzki
Lab Management Team/Research Assistants: Max Marshall, Angela Xiang, Linke Yu

Where to Find Us

Email us at cal@ryerson.ca if you have any questions or comments on this issue.

Check out our Twitter @CogAgeLab to get our latest research updates.

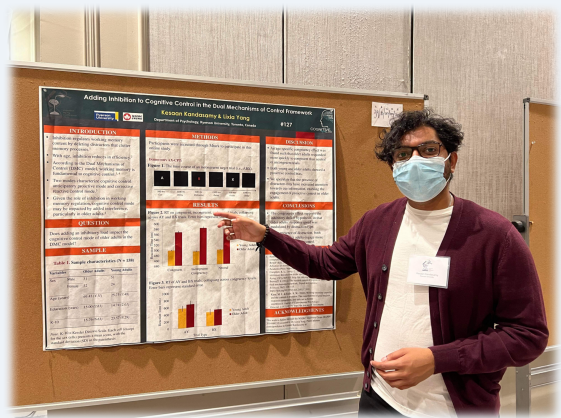*Visit our website to learn more about our research lab at https://psychlabs.ryerson.ca/cal/ .*

Check out our Facebook page to get our latest research updates.

If you need mental health support, please visit https://toronto.cmha.ca/help-for-seniors/, or call the Ontario Community Helpline, (Tel: 211).
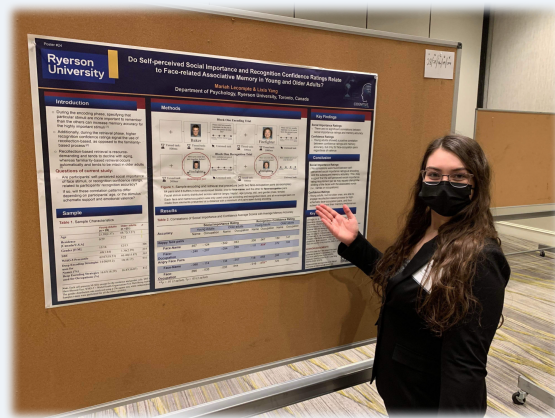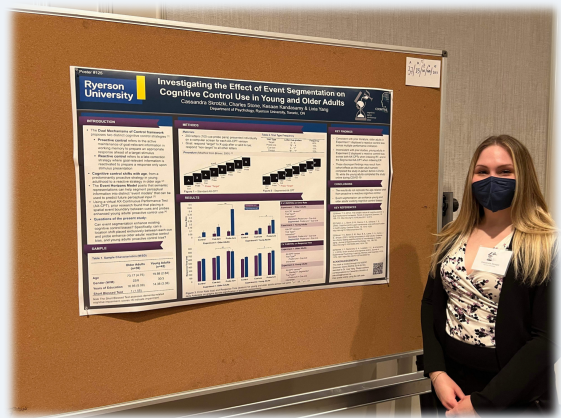
Image Gallery

Kathryn Bolton

Kesaan Kandasamy

Mariah Lecompte

Cassandra Skrotzki

Images of some of our graduate students at the *Cognitive Aging Conference* in Atlanta, Georgia. April, 2022.

Some of our wonderful graduate students!

Pictured from left:
Kesaan Kandasamy
Mariah Lecompte
Kathryn Bolton
Cassandra Skrotzki

Image Gallery

Electroencephalogram (EEG) training! An EEG is a type of test that measures electrical activity in the brain. Two of our graduate students (Sonja Givetash, pictured left in the top photo, and Kathryn Bolton, pictured right) practicing how to administer the test.

One of our wonderful research assistants, Shirley Su (pictured wearing the red cap), assists in being a practice participant for Kathryn and Sonja. This training is in preparation for a new research project in the *Cognitive Aging Lab* that will use EEG tests as part of the study measures.

Thank you for reading our 2021/2022 *Cognitive Aging Lab* Newsletter, and thank you for being part of our research community. If you have any questions about the work of our lab or how to get involved, please do not hesitate to contact us at cal@ryerson.ca

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