



CHOW LAB

We are a **psychology lab** at **St. Thomas University** focusing on **multisensory perception and cognition**. Under the direction of Dr. Doris Chow, undergraduate students in our lab conduct experimental research to understand **how human participants respond to, interpret, and remember information from the different senses**. Such an understanding has the potential to improve health and education-related outcomes. Furthermore, students in the lab develop important skills for research-oriented careers and beyond. We are proud of how far we have come and appreciate the support we got, including our participants for helping us learn more about the human mind!



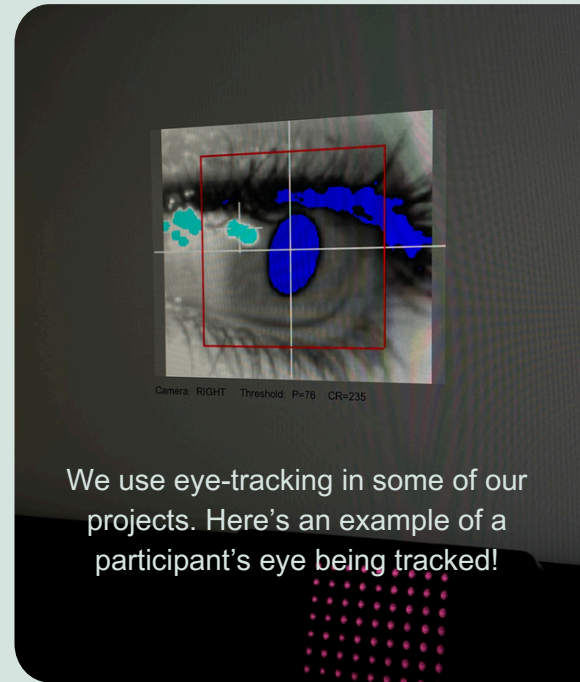
Dr. Doris Chow: Principle Investigator

Doris joined STU Psychology as a faculty member in 2022 with a PhD in developmental and brain sciences. Born and raised in Hong Kong, she travelled and lived in many places before calling Fredericton home. When not at work, she can be found reading, riding her bike, or experimenting with new recipes with her partner in their kitchen.

Lab updates and achievements!

Since 2022, members of the Chow Lab have accomplished the following:

- 2 Honours thesis students completed their study and presented their work at Science Atlantic Psychology, an undergraduate Psychology conference:
 - Serena Bunin (2023-24): “Exploring associations between perceptual load and memory: How does perceptual load impact information retention?”
 - Danyelle Fields (2022-23): “The impact of beat hand gestures on the attention and learning of adult listeners”
- 2 students (Serena Bunin & Gavin Woodward) received the prestigious NSERC Undergraduate Summer Research Award for full-time summer research in the lab.
- 1 student (Gavin Woodward) was accepted into York University’s [CVR – VISTA Vision Science Summer School](#) in Toronto.
- 1 student (Danyelle Fields) was accepted into the MSc program in Applied Forensic Psychology at Saint Mary’s University in Halifax.
- 3 students (Flavia Orellana, Kyla Carter, and Alexander D’Alessandro) completed their positions as research assistants in the lab.
- 5 articles were published in the [Journal of Vision](#), [Vision Research](#), [Journal of Experimental Child Psychology](#), and [Multisensory Research](#) [[1](#), [2](#)].
- 3 new research projects were co-created with students based on their diverse interests.
 - Read on to learn more about these projects!



We use eye-tracking in some of our projects. Here’s an example of a participant’s eye being tracked!

Project update: Learning amidst distraction

Conducted and written by Serena Bunin

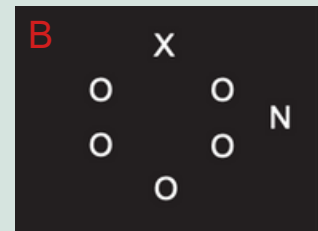
Researcher



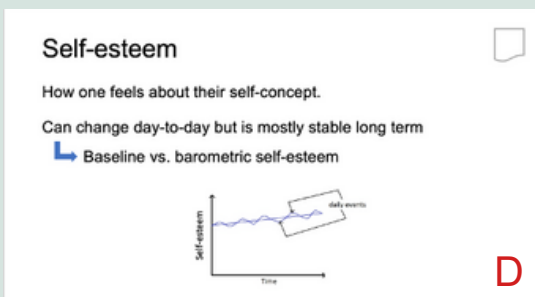
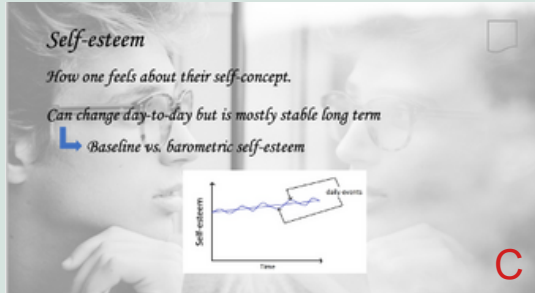
Serena is a recent graduate at St. Thomas University who completed an Honours in Psychology with a double-minor in Anthropology and Sociology. She is from Fredericton and took an interest in Psychology after enrolling in an introductory course at École Sainte-Anne, where she graduated from high school in 2020. In her free time, Serena enjoys being with her friends and family, watching movies, and hiking the trails of NB.

Study rationale

Selective attention is necessary in our day-to-day lives because it helps direct our limited attentional resources to important features of our environment (e.g., a professor's lecture) and ignore distractors (e.g., students chatting in the hallway). One factor that impacts selective attention is perceptual load: higher perceptual load increases the selectivity of our attention and reduces distractor interference. As summarized in a review article, a display that imposes a higher perceptual load minimizes distraction by requiring more focus to discriminate between the target and non-target letters. In such a condition (**Fig. A**), a distractor letter was less detrimental to participants' response times than in a low-load condition (**Fig. B**).



Study design



Given the protective qualities of high load against distractor interference, Serena set out to test the educational implications of load theory on learning. In her study, half of the participants watched a recorded lecture video where contrast and font style were manipulated to reflect a high-load condition (**Fig. C**) in an attempt to engage deeper processing. The other half of the participants watched a low-load video (**Fig. D**), where a simpler design was used to engage only shallow processing. Importantly, all participants were exposed to the same distractions in both conditions, and their memory of these distractors was measured alongside that of the lecture material via surprise recall questions.

Finding

Serena predicted that participants who watched the high-load video would have higher scores on the lecture material-related questions than those who watched the low-load video. She also hypothesized that the surprise recall of distractors would be lower amongst these participants, because of the buffering effect of high load against distractor processing. Contrary to her hypothesis, no significant effects of perceptual load were found for the memory of distractors or for course content. In light of the non-significant findings, Serena hopes to further explore why perceptual load did not have the expected effects in her summer research in the Chow Lab.

Project update: What makes us more susceptible to crossmodal illusions? Conducted and written by Gavin Woodward

Researcher



Gavin is going into his fourth year, Honours in Psychology and minoring in Philosophy. He is from Fredericton and fell in love with perceptual psychology after taking a second year course on sensation. He hopes to pursue graduate studies in cognitive neuroscience or psychology and beyond the lab, can be found reading, biking, and spending time with friends.

Study rationale

Did you know that hearing beeps can make you see non-existent flashes? Discovered by Shams et al. in 2000, the sound-induced flash illusion refers to the tendency for human observers to see two flashes when a single flash is presented alongside two beeps. The contrary can happen too, when observers see just a single flash when two flashes are presented with a single beep. This illusion happens because of multisensory integration—the binding of sound and visual information—and can be used to study differences in multisensory integration, such as those between younger and older adults. What we don't know is whether crossmodal correspondence (similarity) between the flashes and beeps affects how often we experience the illusion. Therefore, we sought to answer the question of whether we can change the frequency of the illusion (and in turn learn about multisensory integration) by manipulating the similarity of the flashes and beeps.

Study design

To manipulate similarity, Gavin made use of the pitch-height correspondence, an observation by many observers that auditory pitch and visual physical height tend to go together. So, high-pitched beeps and flashes higher on a screen are often considered to be more similar than a high-pitched beep and a flash lower on a screen. In the experiment, in addition to varying the number of beeps and flashes, participants were presented with low- or high-pitched beeps and flashes in high or low positions on the screen. When low-pitched beeps and low flashes or high-pitched beeps and high flashes were presented together, the stimuli were said to be congruent (more similar). When low-pitched beeps were presented with high flashes or high-pitched beeps were presented with low flashes, they were considered incongruent (less similar). Participants were tasked with reporting the number of flashes they saw. We hypothesized that participants would be more likely to experience the illusion when the beeps and flashes were congruent than when they were incongruent.

Finding

Based on preliminary data collected from ten participants, congruence did not affect the likelihood of participants experiencing the illusion. We aren't ready to give up yet, though! Other audio-visual similarities affect the illusion and Gavin will continue exploring this topic during his summer research and thesis work.

Project update: Do hand gestures aid learning?

Conducted and written by Danyelle Fields and Flavia Orellana

Researchers



Danyelle is currently in the second year of her MSc in Applied Forensic Psychology at Saint Mary's University in Halifax, Nova Scotia, where she grew up before moving to New Brunswick. She graduated from St. Thomas University in the spring of 2023 with Honours in Psychology and English Literature and Language, with a minor in Criminology and Criminal Justice. Danyelle spends any of her time not studying with a good book and a cup of coffee.



Flavia is going into her fourth year, double majoring in psychology and history, with a double minor in Italian and digital media. She is from Guayaquil, Ecuador and found her love for psychology in her high school and found her love for history at St. Thomas University. During her free time, she enjoys reading, writing, watching movies and series, and spending time with her friends.

Study rationale

Adults and children alike communicate with their hands a lot. One form of hand gesture is called beat gestures, which are baton-like movements that occur during speech. Despite potentially drawing attention to a significant point in speech, beat hand gestures do not carry meanings. Therefore, beat gestures were investigated less than other types of gestures. Considering the potential benefit of beat gestures in guiding learners' attention in classrooms, Danyelle sought to explore if adult learners recalled more information when presented with beat hand gestures from a speaker.

Initial finding

In Danyelle's study, participants watched a video of someone telling a story with beat hand gestures vs. without using their hands. Afterward, participants answered questions about the story. Participants also wore a pair of eye-tracking glasses while watching the video to record their eye positions during the experiment as a substitute for visual attention. In support of her hypotheses, participants in the gesture-video condition scored higher in the questionnaire than in the no-gesture-video condition. Despite the significant difference, the effect might have been explained by factors other than hand gestures, such as the speaker speaking with more force when using hand gestures or visual motion in the periphery.

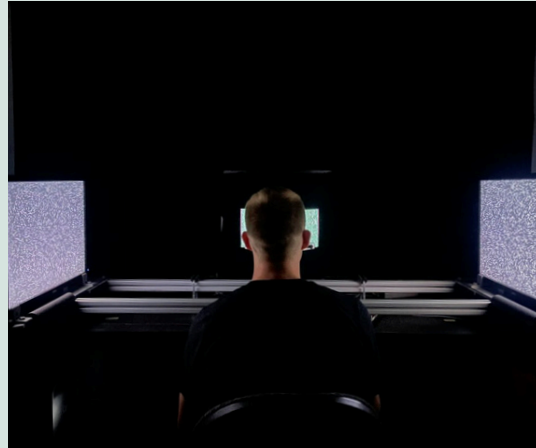
Follow-up

This was when Flavia came in to conduct additional experiments. In this follow-up, participants watched one of the three videos: one involved beat gestures (same as before), another with a white box occluding the speakers' hands (gesture occluded), and the last one with a small dot moving in place of the hands (gesture occluded with visual motion). Based on a small dataset of 21 participants, participants were no more or less likely to recall the story better in any of these conditions, suggesting that beat gestures did not affect information recall. More data are needed to reveal any true effects; therefore, we look forward to continuing this project in 2024-25.

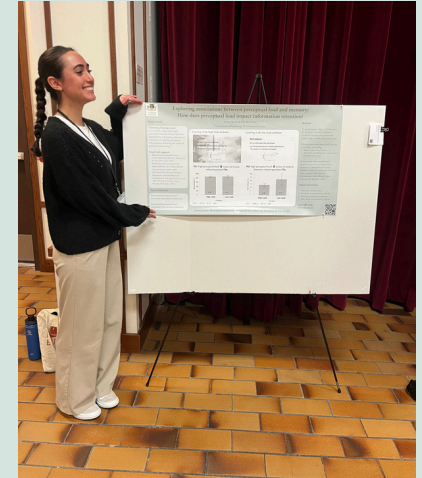
Summer Fun!



Kyla, Serena, & Danyelle
at 2023 summer lab party



Gavin at the York University Center
for Vision Research Summer School



Serena with her poster
presentation at Science Atlantic

Advice to Prospective Honours Students

Don't be afraid to put yourself out there! Reach out to your professors and/or the Psychology department chair for questions about the Honours program (Dr. Sandra Thomson until 2025, can be reached at sthompson@stu.ca).

Requirements for majoring and Honours can be found in the psychology section of the academic calendar. If you intend to pursue Honours, remember to register for PSYC 2013 (Intro. to Statistics) and 2023 (Intro. to Research Methods), as well as third-year statistics and research methods (PSYC 3933 and PSYC 3943, respectively)!

If you are unsure about research, the best way to find out is to try it! Becoming a research assistant or participating in research studies early on are great ways to explore your interests before committing to doing a thesis. You can find out more via:

- [Learning in Action](#) (for job postings)
- [Psychology Research Information System](#) (for research studies)
- Campus flyers (for research studies)
- Psychology Society Instagram page @stu_psychsociety

Acknowledgement

We are grateful for the funding support of our work, including the Harrison McCain Student Research Internships, Harrison McCain Research Grant, Tohoku University RIEC Nation-wide Cooperative Research Project, and NSERC USRA.

The land we work, play, and live on is the traditional territory of the Wolastoqiyik, Wəlastəkewiyik / Maliseet, whose ancestors, along with the Mi'Kmaq / Mi'kmaw and Passamaquoddy / Peskotomuhkati Tribes / Nations signed Peace and Friendship Treaties with the British Crown in the 1700s.