Growing up in a multilingual household, I have always been curious about the individual differences in people's language processing. This interest is what led me to investigate how visual and verbal information influences how people perceive and internally represent information. I have collaborated with Psychology Professor Chantel Prat and Psychology PhD student Malayka Mottarella on my project, *Exploring the Effect of Attentional Biases on Decision Making Under Conflict*, for over a year. I have also been an active member of the Cognition and Cortical Dynamics Laboratory (CCDL) for the past two years. First, I was a research assistant on multiple projects, and have since created and executed my own research project. I spent last year learning the processes of data analysis, literature searching, developing and evaluating research questions and hypotheses, scientific communication skills, and the planning that constitutes a successful research project. I was invited to give a talk at the weekly lab meeting during the early stages of my project to present a research proposal and will present again soon to share Post-Hoc analyses and get feedback on next steps. I presented my project findings and research process at last year's Mary Gates Undergraduate Research Symposium poster session. While there, I was able to talk to experienced individuals in psychology, many of whom brought up questions and ideas for further investigation of my topic. Working on this project raised interesting areas for future exploration that I will continue to investigate at the CCDL.

People are constantly receiving and encoding information from different sources. Sometimes, this information conflicts; for example, when using GPS, it may show both a picture map and written directions. People vary in whether they pay more attention to the visual map or

verbal instructions. When forced, people show different biases toward visual and verbal information, however, these differences are not all or nothing (Alfred, 2020). Individuals vary not only in the direction of attentional bias, but also its strength. My research investigated whether individuals with greater visual or verbal attentional biases, relative to more neutral attenders, show different levels of sensitivity to conflict between visual and verbal information during a categorization task. Some people very strongly attend to either the visual or verbal information, while others do not have a strong preference. The Card Sorting Task measures people's bias strength: participants are asked to sort cards based on the suit that is shown. Each trial contains visual (shape) and verbal (word) representations of the suit. In most trials, word and shape representations match, however, some trials have inconsistent information. The analysis compared response times on trials with consistent vs. inconsistent information in high- and low-biased individuals, to measure conflict. We found that more biased attenders have faster response times and are more automatic in their responses, not being as perceptive to conflict. Conversely, neutral attenders are slower and take their time to look at both stimuli before selecting an answer, recognizing the conflict more (Fig. 1). The individual differences in the degree of attentional biases people have impact how much and what kind of information they attend to.

To succeed in this part of my project, I worked closely with my mentors. I met with Malayka once a week, where we discussed progress and next steps. I met with Chantel periodically to discuss findings and implement feedback on my work. Chantel has agreed to mentor me as an honors student in the Psychology Department Honors Program, and as the next

stage of my research begins, we will have weekly meetings to discuss progress and feedback. Chantel and I have discussed how to integrate research gaps in the next phase of this project, and have come up with exciting future directions.

Biased and neutral attenders have different decision making strategies under conflict, however, the root of these differences is unknown. It is unclear whether longer response times for neutral attenders result from taking time to accumulate evidence before deciding, or if it is a random strategy. A study asked participants to select trials in a task that aligned with their information processing style (visual or verbal) and then select ones that misaligned, finding that participants used a conversion strategy to complete both trials equally well, converting the misaligned stimulus to their own processing style (Kraemer, 2009). Kraemer analyzed this in terms of accuracy, but did not investigate internal conflict. We will use the Card Sorting Task to assess people's information processing style, and then force them to choose one of the two types of stimuli first, followed by the other, in separate blocks. Using drift diffusion modeling, we will be able to quantitatively see if internal conflict exists and how long people take to gather information before deciding. We hypothesize that neutral people will have longer response times than biased people, especially during misaligned stimulus trials. Conversely, similarly to the conversion hypothesis, there may not be a great difference between response times in aligned and misaligned stimulus trials. In this case, we still expect neutral attenders to have longer response times as they take longer to gather evidence and information before decision making.

Doing this research and participating in the Psychology Honors program will help me get experience with the whole research cycle. I have collected data, but not for my own project, and

have done data analysis for my project, but not for others that I participated in as a research assistant. This project will allow me to collect data for my project, design my research questions, and analyze data that I had control of collecting from the very beginning. It will also help me continue to improve my programming, data visualization, scientific communication, and project leadership skills. These are important skills to have, as I hope to go to graduate school. Being able to create a research project now will prepare me for doing the same thing in a PhD program, but on a larger scale. Being creative and taking charge in my own research is something I am prepared for and want to put into action. I hope to integrate psychology, research, and computer science in my future career. In order to improve human interaction with technology, I must know how people best learn and the internal conflict experienced when processing information. Researching this topic will help me to learn what is helpful to people, and present information in a way that maximizes people's learning ability. As I plan to apply to the 2025 Psychonomics conference in Denver, Colorado, receiving this scholarship would help me to go and disseminate my research, as well as learn from other psychologists. I also plan to submit my research to a journal as a two-part paper- the first part being the completed part of the study and the second part being the planned study. Receiving this award would help me to publish my findings. Finally, I am interested in diversifying my participant sample, as we are interested in language background differences as a determinant of information processing style. Being able to pay participants online would make it possible to get more diverse age ranges and demographics, which the funding would greatly help with. With the help of this scholarship, I will be able to investigate the individual differences in people's information processing more deeply, expanding the body of knowledge of this topic and gaining valuable research experiences.

Figures and References

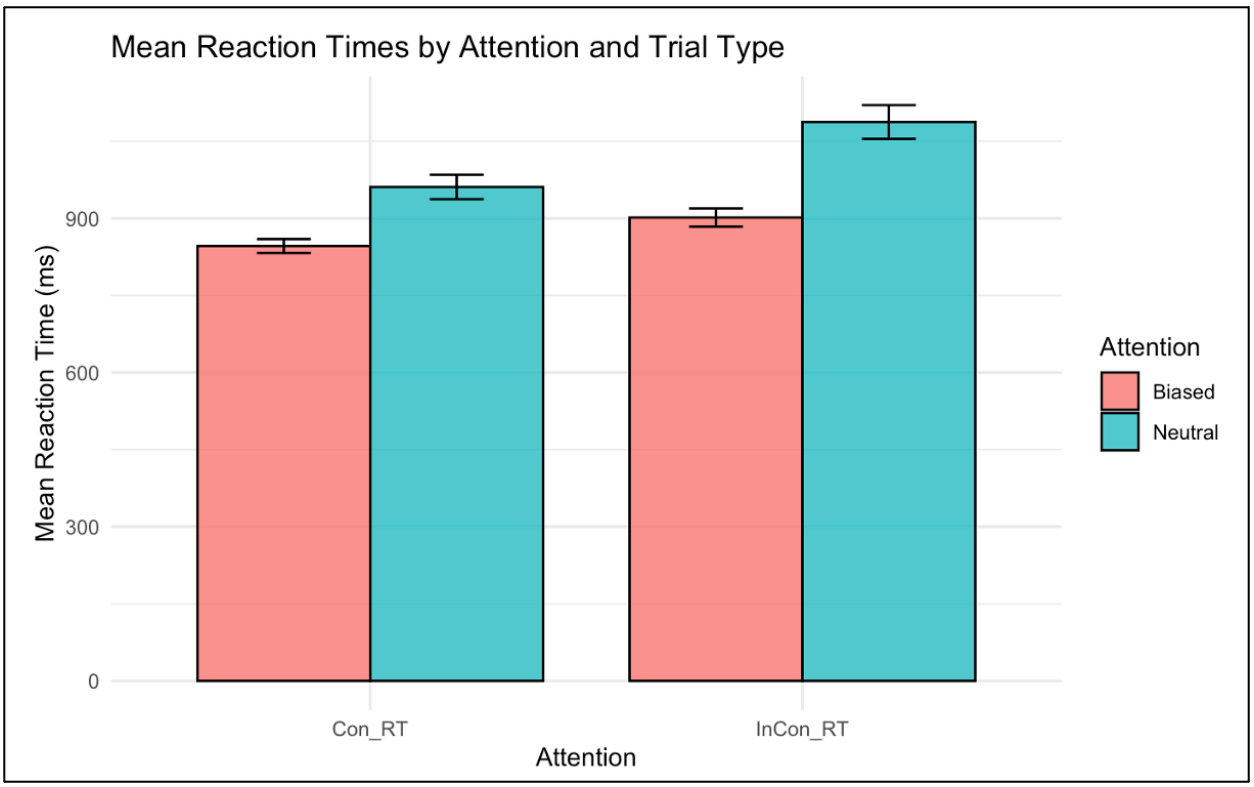

Fig. 1 Bar graph showing the differences between response times for biased and neutral attention groups, separated by trial type.

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