

Title: Change Blindness & Attention to Sexual Orientation

Faculty Member: Sarah Johnson, Associate Professor, Psychology

Students: Crystal Yautz, Mary Sampson

Description of Project

This project reflects a collaboration between Mary and Crystal, under Dr. Johnson's guidance, to design and conduct a psychological experiment combining their interests to create a unique and relevant study about sexual orientation and attention in crime-related scenarios.

In past decades, only a small percentage of individuals outwardly identified as non-heterosexual. Now after the gay rights movement and legalization of same-sex marriage, these numbers have been steadily increasing.¹ Despite this increase, there are lasting stereotypes about this population that prevent them from feeling equal and accepted.² For example, stigma about categories of people can be detrimental in a legal setting. In a trial, these stereotypes can influence a juror's decision regarding whether a defendant is guilty. Our research project will explore stigma about sexual orientation in terms of its impact on basic cognitive processes that are relevant to people's interpretations of eyewitness situations.

We will use change blindness, a well-accepted research paradigm for testing attention, to further understand these stereotypes. Change blindness involves participants viewing a picture of a busy scene, witnessing a distractor, and then viewing the same scene again with a detail changed. The participants are asked to press a button indicating they have spotted the change. As seen in other studies,³ it can be determined where a participant's attention is held by the changes that they miss. In addition, research with change blindness has implicated an impact of social categories (e.g., age, occupation) on our attention to people.⁴ We will be measuring whether the stereotypes in the scene enhance the change-blindness effect. We will also draw ties between participants' general attitudes about sexual orientation, obtained via survey, to their attention in the change blindness task.

Our main hypothesis is that participants' attention will be more strongly focused on same-sex couples as compared to opposite-sex couples in the scenes. I.e., participants will notice more central changes (e.g., changes to the people in the pictures) and fewer peripheral changes (e.g., changes to objects around them) for scenes with same-sex couples than those with opposite-sex couples. We also hypothesize that with increasing age, participants' attention will be even more affected by these stereotypes. Participants will be recruited from the local community to provide a wider age range, which will allow us to see how the stereotypes affect people from different generations, including those who were alive when homosexuality was seen as a mental disorder.⁵

Overall, the primary goals that we hope to accomplish with this research are:

- 1) Use change blindness to explore the extent to which sexual orientation as displayed through public behaviors attracts attention potentially pulling it away from other details.
- 2) Manipulate pictures in a way that expresses a crime scene to gain better ecological validity in our study when interpreting and applying the results to a legal setting.

¹ <https://news.gallup.com/poll/201731/lgbt-identification-rises.aspx>

² We are considering including race as a key variable, either to be studied or to increase generalizability. Sexual orientation and race may create a greater negative stereotype together than either stigma alone. We will base our decision on background readings on the subject of racial stigma and attention.

³ Pickel, K. L. (2009). The weapon focus effect on memory for female versus male perpetrators. *Memory*, 17(6), 664–678. <https://doi-org.moravian.idm.oclc.org/10.1080/09658210903029412>

⁴ Simons, D. J., & Levin, D. T. (1998). Failure to detect changes to people during a real-world interaction. *Psychonomic Bulletin & Review*, 5, 644–649. doi: 10.3758/BF03208840

⁵ Drescher J. (2015). Out of DSM: Depathologizing Homosexuality. *Behavioral sciences (Basel, Switzerland)*, 5(4), 565-75. doi:10.3390/bs5040565

- 3) Learn advanced statistical methods to analyze our results in order to better explore the gradual impact of participant age.
- 4) Make ties between a participant's attitude ratings about sexual orientation and their accuracy during the change blindness task.
- 5) Share quality research on an applied problem with community members to bring awareness of the problem and help reduce the impact of stereotypes.

Roles and Responsibilities of Students

Mary and Crystal will be directing all steps of the research, including developing the research questions, creating a research design, creating stimuli, gaining ethical approval, recruiting participants, collecting and analyzing data, and sharing the findings with others in a discipline-appropriate way. They have worked together to integrate their interests into a single study, but they will focus independently on different themes within the project, bringing in background readings from separate areas, in addition to shared readings. Mary, with an interest in basic perception, will explore background literature on the cognitive processes involved (perception and attention), with an emphasis on increasing the validity of the study via making the best selections for the stimuli. For example, she will explore visual characteristics important to the viewer's understanding of gender and sexual orientation. She will also focus on the change blindness paradigm itself and the interaction between perception and attention. Crystal, whose interests lie in the psychology of law, will focus more on applying the research to a larger setting. She will explore background research on attention in crime scenarios, and will help ensure the stimuli accurately represent a crime scene in order to increase ecological validity. The group will share readings on change blindness overall and on attention in relation to stereotyped categories, the latter being a topic within Dr. Johnson's primary research focus.

Both students are familiar with designing simple psychological experiments, carrying out cognitive research studies designed by Dr. Johnson, recruiting participants from within the psychology participation pool, conducting experiment sessions, and carrying out basic data analyses. This project will expand their research abilities as they: 1) design a multi-variable research project, far surpassing the complexity of the research that have created in Psychology courses to this point; 2) generate their own stimuli, controlling for many factors while also meeting criteria that they lay out for best portraying the social categories of interest; 3) create a recruitment plan to bring in participants of a wide range of ages and backgrounds; 4) learn a new approach to data analysis in order to include age as a continuous variable. Their specific responsibilities are laid out further in the timeline below.

Justification for two students

Having two students will be necessary for the completion of the study in terms of data collection. One-on-one sessions are required because of the computerized nature of the task and the need for individualized pacing. A large number of participants (70+ according to power analyses) is required for a valid analysis of age in combination with the other independent variables. Both collecting data and community outreach for recruitment will require extensive time and labor. Also, we have planned separate student themes within the larger project topic, as described above, so that each student will be contributing to the richness of the project content via unique background research perspectives, in addition to the larger shared themes of change blindness, attention, and stereotypes. The students will create a presentation together, but with separate written introductions. They can benefit from writing separately about the same project and sharing their work to provide feedback for each other while also seeing some of the strengths and areas for improvement in their own writing.

Anticipated timeline

Week 1-2

- Materials Prep/IRB approval: Mary and Crystal will refine and finalize the design and prepare the stimuli and task instructions. We will simultaneously develop the HSIRB proposals, which must be approved in advance of data collection.
- Background research: Mary will conduct background readings on the key perceptual characteristics of the stimuli. Crystal will focus on adapting the change blindness paradigm to the theme of crime settings. We will meet regularly to discuss readings.

Weeks 3-4

- Materials Prep/Recruitment: We will finalize the picture stimuli (a subset of which will be given to the IRB earlier, but which will require substantial time and photo editing to finish). We will develop the recruitment plan and, pending IRB approval, begin recruitment efforts both within and outside of Moravian.
- Background research/writing: Weekly meetings to discuss background research will continue. The students will write the methods section for their presentation.

Weeks 5-8

- Data collection/coding: We will begin data sessions, implementing the recruitment plan. Data collection will continue throughout the rest of the summer, as needed. We will begin coding the data. Both students will learn how the computer program for the project was developed (by Dr. Johnson) and how to process the data from that program. We will prepare for data analysis via readings as well as consultation by the students with other faculty with relevant statistical expertise (as available).
- Background research/writing: Readings will explore the statistical approach for our results. The students will begin working on separate introduction papers reflecting their individual themes.

Weeks 9-10

- Data collection/coding/analysis: We will continue collecting data until we meet our goal of 70-80 participants or until week 9, at which point we will finalize data analysis.
- Writing/Scholarly presentation: Mary and Crystal will finish their combined presentation (results and discussion) and individual introductions and share their writing for feedback.

Disseminating our work to the discipline and beyond

Beyond Scholar's Day in 2020, we will submit our work for conferences like the LVAIC Undergraduate Psychology Research Conference, the Eastern Psychological Association (a professional disciplinary conference to which results from our lab have been accepted before), and the National Conference for Undergraduate Research. As a relevant topic in our society, it is important to share our findings not only with other researchers, but also with our community to help advocate for individuals who are victimized by these stereotypes. We plan to do a presentation and bagged lunch talk, inviting affected groups on campus, e.g., the Diversity, Equity, and Inclusion office, Spectrum, and AAUW, along with other interested students.

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Expense Proposal

We request \$300 as an incentive to aid in recruitment of participants. We will use the funds to offer gift cards on an individual basis to every participant, although we will attempt to recruit from some summer classes via extra credit (as arranged ahead with the instructors). Each gift card will be \$5 from either Amazon or Starbucks. We need a minimum of ~60-80 participants to run a powerful study, so we are planning gift cards for ~60 participants; therefore, the overall cost would be \$300. Without compensation, our recruitment ability will be greatly limited, esp. over the summer when fewer classes are offered. Without an additional incentive, we are unlikely to get enough participants to create sufficient power to find significant results.

Title: Change blindness & Attention to Sexual Orientation

Name: Crystal Yautz

Major: Psychology

Expected Graduation: May 2020

Faculty Mentor: Dr. Johnson

Coming to Moravian as a freshman, I knew exactly what I wanted my academic path to look like. I wanted to major in psychology, get as much research experience as possible, and go to law school to become a family lawyer. In the beginning, I felt that clinical psychology was for me considering I wanted to help people. However, after taking Psyc 211/212 and completing a research project on false memories, my plan was altered. My focus shifted from people's feelings to why people felt this way, which led me to conduct multiple research projects in the field of cognitive psychology. I've studied false memories in my 211/212 project, priming stereotypes of race, gender, and sexual orientation in Dr. Johnson's lab, and the weapon focus effect using a change blindness paradigm in a seminar course.

The legal field revolves around eyewitness testimonies to convict criminals. However, as I have learned in my cognitive seminar and through my 211/212 project, eyewitness testimonies are not very reliable. Since people's memories are malleable, they change with personal beliefs and conflicting incoming information from other eyewitnesses, the media, or investigators. Unfortunately, not many legal professionals are aware of this. This SOAR project will allow me to share knowledge with other legal professionals, when I get into the field in the future, to help further understand the cognitive processes that can unconsciously affect an eyewitness's understanding of and decisions about a crime scene. Research like this, is used by cognitive psychologists to better understand how people think and process the world, but can also be used by legal professionals to help them better do their job, therefore improving the legal system.

Research has been a huge part of my academic career because I find it interesting to ask critical thinking questions and analyze possible outcomes. After my last research project in Dr. Johnson's lab focusing on the perception of sexual orientation in a sexual assault scenario, I have gained an interest in stereotypes. This topic is so relevant considering that a few decades ago, the population of people who identify as something other than heterosexual was even smaller than it is today. However, within the past couple decades, the number of homosexual people has increased dramatically in such a small amount of time. I learned in my sociology class, that in the legal system, new concepts take long periods of time to catch up putting the legal system behind on research showing cognitive processes that could negatively affect testimonies. Through conducting research on these stereotypes, we will in time help the legal system adapt and change.

This project combines two concepts that I have researched separately: change blindness and sexual orientation. By pulling together two separate areas of interest, it creates a new perspective on a common stereotype creating a unique study involving many different areas of psychology including: cognitive, social, and developmental. This study will show how a person's attention is impacted by their perception of sexual orientation when trying to identify changes in a scenario. The unconscious stereotype that a person may have could result in missing important changes. These changes could be critical to what is happening in the scenario, making a person's memory less accurate.

One of the major limitations of conducting research in a class or in Dr. Johnson's lab is time. Often, research designs and data cannot be fully analyzed because the semester is short and requires my time to be divided among other classes, as well. Through the SOAR program, I would have the opportunity to dedicate numerous hours to one project creating a stronger study and therefore learning more from it. Dedicating more time to each step of the research process will allow me to acquire skills that I would not have gained in a class or independent study. In my most recent research on sexual orientation, I did not have enough time to think about what types of questions I was asking beforehand and how they could be combined to run appropriate analyses. This resulted in many of the questions being dropped, lowering the impact of the research and potentially missing results that could have been found. Having more time will allow me to dive into different parts of the research process, creating higher quality stimuli and planning appropriately for results. I will expand on the skills I have learned through previous research that include: using research designs, carefully planning materials, calculating and analyzing data while learning new skills like recruiting outside of Moravian College and learning how to interact with a different population of older non-psychology participants that is not typical of an in-class research project.

However, it doesn't stop when the research is completed. As usual for all research, it needs to be shared throughout the scientific community. I will gain communication skills by presenting my results to both individuals with a psychology background through conferences, such as Scholar's Day, LVAIC, EPA, and NCUR, but also individuals without a psychology background through the SOAR weekly presentations and bagged lunch sessions in the fall. The ability to explain research using language that is appropriate for people with different levels of understanding is a skill needed in the field of law. By explaining my research, I will also be advocating for LGBT individuals hopefully breaking down the stereotypes and negative stigma that comes with same-sex relationships.

I would be a good candidate to participate in this program because I have already conducted numerous research projects, my future career would allow me to share this knowledge with a group of people who are uneducated on this topic, and it will help me better prepare for my honors project I plan to do in the fall of 2019. I have a growing passion for work in this discipline that ties directly into my career path, and I genuinely want to raise awareness on sensitive topics that could be difficult for some individuals to discuss.

My expected outcome for this project is to learn about stereotypes of sexual orientation, how they affect a person's attention, how they can be applied to the legal system, and how the negative stigma could be diminished through advocating by communicating my results. I also expect to end this project with a better understanding of how to conduct extensive high-quality research with in-depth thinking while asking appropriate critical thinking questions that provide quality results. I expect that this project will help me to conduct better research in the future taking what I have learned from this project and applying it. I can apply what I have learned from this project to myself personally as well. It will help me grow as a person, making myself aware of stereotypes and reducing any that I may have. The skills learned through this project will help me further my academic career helping me both in law school and beyond.

Soar Research Proposal, Summer 2019

Title: Change Blindness & Attention to Sexual Orientation

Name: Mary Sampson

Major: Psychology

Expected Graduation Date: May 2020

Mentor: Dr. Johnson

Cognition is a field of psychology that has fascinated me and continues to intrigue me. By working on this project, I can learn more about the field in the depth of detail that goes beyond what is reached in a classroom environment. This project focuses on change blindness, a paradigm that I have yet to explore outside the classroom. In using and studying the change blindness paradigm, I can learn more about basic cognitive functions that interest me. This project in particular will help me understand how individuals see the world, which is why I want to study cognition, particularly perception. I have worked with Dr. Johnson and her lab team where we address questions about stereotypes; however, our studies have focused on memory rather than perception. By studying stereotypes through the lens of change blindness, I will be probing the perception of stereotypes while adding a notable contribution to the field as stereotypes are not typically studied in this manner. This will allow us to deepen our understanding of stereotypes and perception. This project will be beneficial to me because I will be working with Dr. Johnson, who is a professional with topics on cognitive psychology and stereotypes. Since I have collaborated with Dr. Johnson and Crystal Yautz in Dr. Johnson's previously on the topic of stereotypes, we have had time to thoughtfully plan this project in detail. Conclusively, I would love to explore if the stereotypes seen in the photos affect if participants exhibit change blindness.

After my time at Moravian, I look forward to going to graduate school where I plan to conduct research in the field of cognitive psychology. Ultimately, this project will help me explore potential research questions and give me experience with the details of research design. I look forward to learning new methods for research design through this paradigm and a new data analysis technique that will broaden my research experience and diversify my skills. While I have some experience in effective survey design and survey analysis because of my Experimental Methods and Data Analysis I/II study, this experience will allow me to expand these skills because I will apply and adapt what I've learned in these classes to a new change blindness paradigm. Furthermore, this project will allow me to significantly apply what I've learned in the field so far, while simultaneously learning in a more realistic manner because it is modeling the way real researchers direct a study.

Furthermore, this project will help me learn to communicate about psychological research across an array of social communities, especially a wide range of age demographics and individuals from the LGBTQ+ community. This is important to my future as a researcher

because I may need to describe studies and methods to groups of people who may not have any background in psychology or research methods. By participating in a SOAR presentation with a multidisciplinary audience, I can share my passion with others in a positive environment while reinforcing skills in communicating scientific findings. We will also be holding bagged lunch sessions with a variety of social groups such as Spectrum and the Diversity, Equity, and Inclusion Office where we will share our findings with relevant communities to open an insightful discussion.