

My research program focuses on attention and memory failures in eyewitness memory and in searching for missing and wanted people. My research is guided by a metacognitive perspective.

### **Locating Missing and Wanted Persons**

Hundreds of thousands of people go missing in the U.S. annually. Missing and wanted person alerts enable the public to search for them. I investigate the cognitive mechanisms underlying how people search for and identify a target person (for review see **Moore et al., 2021**). Research on *prospective person memory*, remembering to look for a target person while going on about one's daily life, began recently (Lampinen et al., 2008). In field studies, where people search for a target in the real world, only 5-15% of people make a sighting despite all of them encountering the target (**Moore et al., 2021**). I aim to understand why people fail at this task and identify interventions to improve performance. I have theorized and found that people's beliefs about the task and their attention to the task are major causes of failure (**Lampinen & Moore, 2016; Moore & Lampinen, 2019**). Another complication is the difficulty of recognizing an unfamiliar person's face (Bruce, 1982; **Moore et al., 2024a**).

**Meta-cognition.** I theorized and found that low expectations of encountering the target reduce attention to searching and sightings. Top-down expectations, such as expectations about the prevalence of encountering a target, affect sightings (**Lampinen & Moore, 2016; Moore et al., 2016, 2018c**). Similarly, bottom-up experience with target prevalence impacts prospective person memory. Prior experience failing to encounter targets reduces attention to searching and sightings (**Lampinen & Moore, 2016; Moore et al., 2022a**). Absolute manipulations of expectations influenced participants in the field paradigm but not in the lab-based paradigm, which is much easier, suggesting that people's expectations influence their consideration of external cues (**Moore et al., 2024a**). Visual search research suggests it may be easier to work around people's expectations rather than try to change them (Lau & Huang, 2010). We found that inducing empathy toward the missing person increased reported willingness to search but not attention to searching (**Saraqini et al., 2022**). In the future, we will investigate the impact of a similarity search strategy (Taylor et al., 2022) and feedback on performance.

**Attention.** I theorized and found that expectations of encounter impact attention and memory mechanisms. In **Moore et al. (2016)**, the relationship between the expectation manipulation and sightings was mediated by searchers' expectations of encounter, intent to search, and search efforts, which demonstrates the role of attention in sightings. Attention capture (via a spoken interaction with the target!) only increased sightings from 5% to 11% (**Moore & Lampinen, 2019**). Why? I hypothesized that people may need to maintain the goal of searching and be searching, or strategically monitoring, to make a sighting. Attending to the target person while searching for her (i.e., strategically monitoring) increased sightings to 60%. Most participants (~70%) recognized the target from a post-task lineup. These findings suggest *inattentive blindness*, or looking without conscious awareness, for the target is a major contributor to failing to make a sighting. Eye tracking is needed to determine the extent to which participants look at the target but fail to make a sighting. Our methods have a control-realism tradeoff; cognitive failures that occur in realistic field studies cannot be measured. To eliminate this trade-off, I developed a search paradigm using live action 360° video with eye tracking. This will enable me to draw theoretical conclusions about the cognitive processes underlying search efforts, giving us a more robust understanding of the role of attention and memory in prospective person memory. This research will allow us to formulate policy recommendations regarding missing and wanted person search campaigns.

**Face Recognition.** Typically, I find that around a third of participants cannot recognize the target's face 24 hours after studying it. Unfortunately, adults exhibit an *own-age bias*, performing worse at sighting children who are more vulnerable while missing due to their age (**Moore et al., 2023**). A critical question is which photograph is most likely to lead searchers to recognize the person. The similarity between study and test appearance as well as exposure to *within-person variability* enhanced sightings in an in-lab paradigm but not in a field-based paradigm, possibly owing to attentional failures to notice the target person (**Moore et al., 2024a**). I am conducting a set of studies with Adam Sandford investigating whether photographs that represent a person's current appearance or general likeness leads to more sightings. Future directions in this domain include examining the impact of access to the person's likeness during the search and identifying best practices for which photograph to feature in an alert.

**Beyond the PPM Paradigm.** Searching for a person often takes the form of a prospective person memory task. However, this is not always the case; citizens and professionals, such as police officers, may engage in search tasks exclusively, as a *vigilance task*. To address the need to understand performance on these searches, I created new paradigms. I have examined search performance in *vigilance* versus *prospective memory* conditions (**Moore et al., revise and resubmit, a**). Task importance instructions impacted attention to searching and sightings, but the presence of the intention to search in working memory had no impact on searching. In a study funded by an American Psychology-Law Society Early Career Grant (PI: Moore), police devoted more attention to searching than laypersons but did not make more accurate sightings regardless of search conditions. In a *visual search* paradigm, participants with higher expectations made more false alarms and responded more quickly than participants with low expectations (**Yu et al., accepted**). Feedback eliminated this effect.

Overall, I aim to understand the cognitive mechanisms underlying the process of searching for a missing or wanted person. I am developing theory on realistic and important visual searches that lie at the intersection of prospective memory, visual search, vigilance, and face recognition. My work will enhance well-being by increasing the apprehension of fugitives and the recovery of missing people.

#### **(Eyewitness) Memory Accuracy**

Understanding the mechanisms underlying memory fallibility can help prevent memory errors. I study meta-cognitive processes that impact children's and adults' memory accuracy.

**False Memories.** Adults use *meta-cognitive strategies* to reject false information, such as *recollection rejection* which relies on logical exclusivity (if X happened then Y could not) and *diagnostic monitoring* which relies on expectations (I would remember A if it occurred; Gallo & Lampinen, 2016). Metacognition develops through childhood, so we examined the development of metacognitive strategy use to prevent false memories. By 5 years old, children use *recollection rejection* and *diagnostic monitoring* to reject *spontaneous*, or internally generated, *false memories*, and 8–9-year-olds perform similarly to adults (**Moore et al., 2018b, 2020, 2022b**). I extended this to *suggested false memories*. I harnessed multiple measures to obtain converging evidence that adults use *recollection rejection* to reject suggested information (**Moore & Lampinen, 2016**). Further, people are more likely to reject contradictory than additive misinformation, because they can use *recollection rejection* to reject contradictory misinformation (replicated in **Moore et al., 2018a, 2024c**). Adults and children as young as 6 years old use *recollection rejection* to prevent suggested false memories, but 6–7-year-olds did not use the strategy as well as older children or adults (**Moore et al., 2018a**). Additionally, the extent to which suggested information prompts metacognitive processes, via the presentation format of misinformation or its relationship to the original event, influences the acceptance of false information (**Moore et al., 2024c**). My PhD student, Dara Zwemer, is conducting their master's thesis on the metacognitive strategies underlying this effect. Additionally, they received a Graduate Research Fellowship from the National Science Foundation to study the role of metacognitive strategy use on the impact of the explanatory value of misinformation on false memories, or how well misinformation explains an ambiguous event.

**Eyewitness Identification.** Recently, I began researching the role of metacognition in eyewitness identification. Legal stakeholders do not know whether an eyewitness has identified the culprit, but they may be able to rely upon confidence as an indicator of accuracy. I co-lead a project examining whether pre-event instructions bias people's meta-cognition and impact their identification accuracy and confidence (**Baldassari<sup>1st</sup> & Moore<sup>1st</sup> et al., 2023**). This project was inspired by the observation that there is variability in what researchers disclose to participants about the study before they witness a mock crime. Participants were told to watch the video or that the video would depict a crime and that they would be given a lineup task. We predicted that participants in the eyewitness condition would have better discriminability and would be more overconfident than participants in the no information condition. In the past 10 years, new analytic techniques have revolutionized the field, but they require large Ns (100s to 1000s of participants). To pull off this large N (N = 1,000) design, Mario Baldassari and I pitched our idea to the Consortium for High-Powered Eyewitness Research, and it was selected. Therefore, we collected data at many sites around the world. Our hypotheses were not supported but eyewitness instructions

impacted decision criterion indicating that vague instructions should be used to ensure findings are generalizable to actual eyewitnesses.

In 2022, I was awarded an NSF grant (Co-PI: Moore) to test the influential pristine conditions hypothesis, which claims that when lineups follow evidence-based procedures, high confidence identifications will be highly accurate, even if estimator variables, or conditions about the crime or witness that police cannot control, are poor (Wixted & Wells, 2017). This claim is based on the reanalysis of 20 existing studies. It has been presented in court (People of the State of New York v Boone, 2019) and news articles (e.g., Wixted & Riley, 2020). It assumes that people's metacognition about the influence of estimator variables is accurate, which is often not the case (Benton et al., 2006). My lab developed and conducted two experiments to examine the impact of estimator variables on accuracy at high confidence. In Experiment 1, I used real 360-degree video embedded in virtual reality headsets to promote realism. I examined the impact of two estimator variables, age (5 – 8 years, 9-13 years, 18-35 years) and exposure duration, to examine the accuracy of highly confident eyewitnesses. To collect the Ns for these studies (N = 1,055 and N = 366), I established relationships with three museums (i.e., Discovery Lab in Tulsa, Discovery Gateway in Salt Lake City, and the Leonardo in Salt Lake City) where we hosted and staffed exhibits to collect data. In Experiment 1, identification accuracy was low (12 - 53%) even when witnesses were highly confident (up to 70%; **Moore et al., revise and resubmit, b**). Similarly, response time was not associated with identification accuracy (**Zwemer et al., in submission**). In Experiment 2, we examined lighting at encoding and age using a basic paradigm, where participants studied a photograph and completed a lineup. We completed data collection in May of 2025. Preliminary observations of the descriptive statistics suggest that people infrequently endorse high confidence, even though the task was relatively easy. This undermines the usefulness of high confidence in court and the ability to address if high confidence is associated with high accuracy. We have also found that high confidence identifications were infrequent and not associated with remarkable accuracy (51-56%) in adults regardless of weapon focus condition (**Pennekamp et al, in preparation**). Using simulation data, we found that high confidence identifications are rare and not associated with high accuracy when memory is poor (**Pennekamp et al., in submission**).

In an upcoming NSF grant submission, I propose examining the impact of lineup fairness on child eyewitness' accuracy and confidence. Using a fair lineup is an evidenced-based practice shown to reduce the misidentification of innocent suspects, but no one has tested the assumption that lineups that are fair for adults are also fair for children. Fitzgerald et al. (2023) showcased that accounting for lineup fairness impacts the measurement of high confidence-accuracy.

In an invited paper in *Policy Implications for the Behavioral and Brain Sciences* (downloaded over 600 times in less than a year), we examined the assumptions of the pristine conditions hypothesis and reviewed the literature since its publication and conclude that it is premature to use high confidence as a proxy for accuracy in criminal cases (Moore et al., 2024b). Overall, we have shown that the claim that high confidence is associated with high accuracy is not universally true.

Most eyewitness identification studies rely on a single trial, which is ecologically valid, but requires aggregating data. This limits the ability to address the court's question of whether a given eyewitness is accurate based on their confidence. My PhD student, Chenxin Yu, led a synthesization of the eyewitness literature and metacognition literature and identified a novel use of analytic techniques to answer the court's question, which will be the basis for his dissertation (**Yu & Moore, in preparation**).

**Conclusion.** My research program seeks to advance our theoretical understanding of attention and memory errors and to use this understanding to improve memory in the real world.

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