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Misinformation About Eyewitness Confidence Can Influence Jurors' Memories and Decision Making

DISSERTATION

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DOCTOR OF PHILOSOPHY

in Psychological Science

by

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Dedication

There are many people without whom this dissertation, nor this journey in graduate school, would be possible.

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Abstract of the Dissertation

Misinformation About Eyewitness Confidence Can Influence Jurors' Memories and Decision Making

By

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Doctor of Philosophy in Psychological Science

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Distinguished Professor Elizabeth F. Loftus, Chair

Eyewitness testimony is often enormously influential to jurors in a trial. One aspect of that testimony, eyewitness confidence, is especially dominant in determining whether the testimony is judged as credible or not. Therefore, there has been an immense focus on proper collection and protection of eyewitness evidence. However, appropriate use of this evidence requires the jurors to accurately remember the eyewitness testimony as they are deliberating and arriving at their verdict. The current research examines the effect of misinformation about an eyewitness after they have testified, introduced during jury deliberation or closing arguments. In Study 1, misinformation about the eyewitness confidence is divulged by a juror during jury deliberation – either mistakenly stating that the eyewitness was more or less confident than was stated in trial. In Study 2, the high confidence misinformation item is disclosed either by a juror during deliberation or by the prosecutor during closing arguments. In a third condition, the prosecutor states the misinformation item, and later, during jury deliberation, a juror challenges the misinformation. In Study 3, the use of a case vignette manipulating the eyewitness confidence statement allows exploration of how jurors perceive commonly used verbal

confidence statements, and how these statements influence jury decision-making. The current studies explore potential drawbacks to the use of verbal confidence statements in the criminal justice system, and seek to provide understanding toward how these confidence statements may be perceived.

In Study 1, participants exposed to high confidence misinformation remembered the witness as being significantly more confident comparted to participants who were exposed to low confidence misinformation. This misinformation exposure seemed to not influence other perceptions and decision making, though. In Study 2, there was no effect of misinformation on remembered witness confidence – those who were exposed to high confidence misinformation via either a juror or prosecutor did not differ in remembered witness confidence compared to the control group. However, when a juror challenged the prosecutor for introducing misinformation, participants showed a decrease in remembered witness confidence as well as a decrease in the proportion of guilty verdicts, in comparison to participants who were exposed to misinformation from the prosecutor without it being challenged. Finally, Study 3 explored how jurors perceive commonly used verbal confidence statements. These results revealed that the eyewitness confidence statement affects how jurors perceive the witness's accuracy, credibility, and quality of view, as well as jurors' decision making in the case. Implications for potential consequences associated with the use of verbal statements of eyewitness confidence are discussed.

Introduction

Eyewitness testimony is highly influential in legal matters, persuasive to police, judges, and juries (Garrett, 2011). It can be persuasive, even when it is mistaken. In fact, the Innocence Project estimates that over 60% of wrongful convictions involved, at least in part, eyewitness misidentification (www.innocenceproject.org). As our understanding of the power of eyewitness evidence has grown, the concern for protecting the purity of eyewitness testimony has become of key concern in the legal field. Throughout the years, many recommendations have been proposed to protect against the consequences of faulty eyewitness evidence. To this point, the American Psychology-Law Society appointed various committees to review the science of eyewitness memory and provide guidelines for the collection and protection of eyewitness evidence, first in 1998 and then again in 2020 (Wells et al., 1998; Wells et al., 2020).

The importance of maintaining pristine and unbiased eyewitness evidence is clear, and there has been particular focus on the protection of the eyewitness confidence statement. When a witness provides a report of the crime or makes an identification, they are typically asked a question like, "How confident are you?" The answer to this confidence question is often relied upon as an indicator of eyewitness accuracy, and therefore has serious implications for the outcome of the case. In fact, research has shown that eyewitness confidence is a predominant factor in jurors' perceptions of the eyewitness and decision-making, and may even override other indicators of credibility, such as testimonial inconsistencies (Cutler, Penrod, & Dexter, 1990; Cutler, Penrod, & Stuve, 1988).

There has been much discussion about best practices for protecting eyewitness evidence, with some discussion centered on the step of collecting eyewitness evidence, such as using double blind lineups and collecting eyewitness confidence reports immediately after the

identification (Wells et al., 2020), and other conversations focused on the step of communicating the evidence to the jury (Berkowitz & Loftus, 2018). However, proper use of the evidence requires jurors to accurately remember the information. Research shows that jurors' memories for trial information may be inaccurate, and so even if the processes leading up to deliberation involve fair procedures and "pristine" circumstances (Wixted & Wells, 2017), memory errors may introduce bias into jury decision-making. For example, jurors who tend to remember more incriminating evidence are more likely to render a guilty verdict, while jurors who remember more non-incriminating evidence are more likely to render a not guilty verdict (Lorek, Centifanti, Lyons, & Thorley, 2019). Because jury deliberation is typically a confidential process, it is immune to the oversight of judges and attorneys. Therefore, these types of biasing memory errors can go unnoticed and may be unintentionally exerting influence over the outcome of trials.

To frame the current studies here, imagine a situation in which an eyewitness testifies at trial that they were *pretty confident* that they identified the actual perpetrator from a photo lineup. Then, later during jury deliberation, another juror recalls that the witness said *very confident*. How might this memory mistake influence what other jurors remember about the original eyewitness testimony? How might it affect the ultimate verdict?

In this dissertation, I examine the effects of misinformation in jury deliberation on jury decision-making. Study 1 explores a situation in which one juror introduces misinformation about the eyewitness's confidence – either incorrectly stating that the confidence was higher or lower than was stated in trial. Study 2 examines whether the source of the misinformation impacts juror susceptibility to the misinformation, and explores a possible remedy for the problem. This study manipulates whether jurors are exposed to the misinformation from another

juror in jury deliberation, or from an attorney during closing arguments. Another condition explores what happens when the attorney is challenged for distorting the eyewitness's confidence. Study 3 delves into jurors' perceptions of commonly used confidence phrases. Across the three studies, I test whether misinformation exposure impacts perceptions of the eyewitness and jurors' decision-making in the case.

Literature Review

The background literature relevant to the present research comes from a variety of areas. Some literature has to do with the power of eyewitness evidence in the courtroom, some has to do with the role of eyewitness confidence in jury decision-making, and some has to do with the misinformation effect in memory. The following literature review will delve into each of these areas in order to provide important background that frames the discussion of the current research.

Eyewitness Evidence in the Courtroom

Eyewitness testimony is a powerful piece of evidence in the courtroom (Garrett, 2011). However, it is well known that eyewitness testimony is fallible, and therefore jurors must discern through the testimony and subsequent cross-examination whether to trust the eyewitness testimony. One way in which jurors attend to the accuracy of eyewitness testimony is through attending to inconsistencies in the eyewitness's account of the event. Specifically, research has shown that jurors are less likely to render a guilty verdict when the prosecutorial witness has inconsistencies in their testimony (Berman & Cutler, 1996). However, while testimonial consistency plays a role in jurors' perception of the eyewitness, it seems that eyewitness confidence holds immense weight in determining jurors' perception of eyewitness accuracy (Brewer & Burke, 2002).

In fact, a recent meta-analysis investigated the impact of eyewitness confidence on jurors' verdicts (guilty or not guilty) and judgements of guilt (on a scale). Across 35 studies, Slane and Dodson (2022) found that an eyewitness who was highly confident (as compared to a witness with low confidence) led mock jurors to judge the defendant as more likely to be guilty. This judgment translated into decision-making in these studies – high confidence witnesses led to higher rates of guilty verdicts when compared to low confidence witnesses. For example, in

one study, mock jurors were exposed to a trial in which the eyewitness to a robbery reported differing levels of confidence – some participants saw an eyewitness who said he was 80% confident, while others saw an eyewitness who said he was 100% confident. When the witness said he was 80% confident, the rate of guilty verdicts was 39%, while when the witness said he was 100% confident, the rate of guilty verdicts was 54% (Cutler, Penrod, & Stuve, 1988).

It is known that jurors often use eyewitness confidence as an indicator for accuracy – in fact, this meta-analysis upheld this notion in its finding that witnesses who were highly confident were judged as being more accurate in their identification compared to witnesses with low confidence. Moreover, Fox and Walters (1986) illustrated that jurors continue to rely on eyewitness confidence as an indicator of eyewitness accuracy, even when warned against doing so by an expert witness. However, it seems that the impact of eyewitness confidence leaks into other perceptions as well. Bradfield and Wells (2000) demonstrated that high confidence had spillover effects into other judgements of the eyewitness. For example, a witness with high confidence was also judged as having had a better view than a witness with low confidence.

Verbal confidence recommendation. While eyewitness confidence continues to be a powerful determinant in judging eyewitness accuracy, there has been much discussion around the collection of eyewitness confidence statements. Such conversations have led to the recommendation of collecting verbal confidence statements, asking witnesses to describe their confidence in their own words (Technical Working Group on Eyewitness Evidence, 1999; Wells et al., 2020). This recommendation aims to collect a statement of confidence that is most accurately reflective of the witness's certainty, removed from any outside influence that may influence the witness's statement. However, the use of verbal confidence also presents the issue that any person who interprets the witness's verbal confidence statement understands the

intended meaning behind it. Because verbal statements tend to be "vaguer" and "more variably interpretable" than numeric statements (Renooij & Witteman, 1999), two individuals may assign two different meanings to the same confidence statement. For example, a witness who reports being "fairly confident" may have an underlying confidence level of 85%, while a juror may interpret the statement to mean that the witness was only 60% confident.

This type of misinterpretation has been demonstrated in studies exploring how justifications that accompany confidence statements impact how others interpret those statements. In one study, Dodson and Dobolyi (2015) showed participants a photo lineup and verbal confidence statement from mock-witnesses and asked participants to translate the verbal confidence statement into a number. Across three experiments, the researchers demonstrated that participants had an increased level of misunderstanding others' intended confidence level when the confidence statement was accompanied by a featural justification (e.g., "I remember his chin").

The inherent variability in interpreting verbal statements of confidence suggests that malleability in memory for verbal statements may be more likely than for numeric statements. A juror who hears, for example, that a witness is "somewhat confident" may be more easily swayed in their memory than a participant who hears that a witness is "60% confident", simply due to the fact that the verbal confidence statement is vaguer and may be more widely interpreted compared to the numeric statement. Additionally, it may be more likely for verbal confidence to be unintentionally miscommunicated. Since people may interpret verbal phrases differently, an individual may paraphrase the confidence and unintentionally exaggerate the confidence level. In this case, the individual does not believe they are being misleading, but the end result is a distorted confidence level.

Confidence Inflation

Because the eyewitness' level of confidence is highly influential to jurors' perceptions and decision-making, of particular concern is when the eyewitness confidence is distorted. Confidence malleability refers to a situation in when the eyewitness confidence is altered, without any change in accuracy (Luus & Wells, 1991). Confidence malleability is problematic because it erodes the relation between confidence and accuracy. While some research has shown only a modest relation between confidence and accuracy (Brewer & Wells, 2006; Sporer, Penrod, Read, & Cutler, 1995), more recent discussion of eyewitness confidence has determined that, under "pristine conditions", there can be a strong relation between confidence and accuracy (Wixted & Wells, 2017). In other words, under pristine conditions, which include a fair lineup without administrator influence and immediate collection of confidence, high confidence predicts high accuracy. Stepping away from these pristine conditions, however, the confidence-accuracy relationship may not be as informative.

One area of concern, however, is when the eyewitness's confidence changes between the initial statement (e.g., the one collected under the pristine conditions) and the confidence of the witness on the stand during trial. This scenario, called confidence inflation, threatens the diagnostic potential of eyewitness confidence because jurors are exposed to a confidence statement that is detached from the initial identification experience. Confidence inflation may occur for a variety of reasons, such as exposure to post-identification feedback or talking with co-witnesses (Luus & Wells, 1991; Steblay, Wells, & Douglass, 2014; Wells & Bradfield, 1998). An interesting new finding suggests that confidence inflation may even happen simply with the passage of time and repetition of asking the witness to report their confidence, even in the

absence of any external influence (referred to as "natural confidence inflation", Greenspan & Loftus, 2020).

Jurors' Perception of Eyewitness Testimony

Confidence inflation is dangerous because a highly confident witness on the stand in court is likely to be influential to juries (Cutler et al., 1990). Let's think about a situation in which a witness's initial confidence statement, taken immediately after the witness made an identification, conveys low confidence. However, due to some reason, such as external influence or natural confidence inflation, the witness appears on the stand in court and expresses high confidence in their identification. According to the literature on the confidence-accuracy relationship, the witness is likely to be inaccurate, because low immediate confidence is associated with low accuracy. However, jurors are seeing a highly confident witness, which they will correlate with a high probability of accuracy, and therefore are more likely to trust (Brewer & Burke, 2002).

Two recommendations have been proposed in order to mitigate the scenario described above: double blind lineups and immediate collection of confidence (Wells et al., 2020). A double blind lineup is where both the lineup administrator and the witness do not know which person is the suspect. This recommendation aims to prevent external influence from the lineup administrator, such as cueing while the identification is being made or inadvertently supplying a post-identification feedback, which may artificially inflate the witness's confidence. Immediate collection of confidence following the identification procedure aims to document the purest form of eyewitness confidence, before any outside influence is able to distort the confidence. The other purpose of immediate confidence collection is that the initial confidence statement can be

revealed at trial, so should a witness have inflated confidence at the time of trial, jurors are privy to the fact that the initial confidence was lower.

Given this second recommendation, how do jurors actually respond to information that the witness's confidence has inflated since initial collection? Research suggests that it depends. In an early study, Bradfield and McQuiston (2004) used a mock-jury paradigm to explore how jurors evaluate information about confidence inflation by a witness. Participants read a trial transcript and were randomly assigned to one of three confidence inflation conditions. In the control condition, the eyewitness reported being "positive" in their identification at both the time of the identification and at trial. In the mere inflation condition, the eyewitness reported being "not sure" at the time of the identification, but was "positive" at the time of the trial. In the inflation + challenge condition, the eyewitness' confidence pattern was identical to the mere inflation condition, but the eyewitness was rigorously cross-examined by the defense attorney during the trial. Results showed that both confidence inflation conditions showed opinions that favored the defense, such as higher ratings of the strength of the defense's case. Only the inflation + challenge condition showed significant changes to the evaluations of the defendant's guilt and of the eyewitness' accuracy – when the eyewitness was rigorously cross examined about the confidence inflation, participants were less likely to believe the defendant was guilty and were less likely to believe the witness was accurate. However, the researchers attempted to replicate the results here (obtained with White participants) with Hispanic participants and did not replicate the findings here.

To expand on this line of research, Jones, Williams, and Brewer (2008) conducted three experiments to investigate the impact of the type of attribution that accompanied the witness' confidence inflation on mock-juror perceptions. The first study revealed that participants

perceived confidence inflation as an inconsistency in the eyewitness testimony, and generally reduced their perception of eyewitness accuracy and defendant guilt as a result. The authors found that participants made a variety of attributions to explain the confidence inflation, and they explored three different attributions in the next two experiments. In these experiments, authors manipulated the explanation the witness gave for the confidence inflation. In the strategic inflation condition, the witness explains that she inflated her confidence to be more believable, in the memory contamination condition, the witness explains that she has become more confident as she has been rehearsing her testimony with the lawyers, and in the confidence epiphany condition, the witness explains that since the identification, she has recalled more information that has made her more confident. Results showed that participants' perceptions were more favorable to the defense in the strategic inflation and memory contamination conditions, but not the confidence epiphany condition. In other words, the confidence epiphany condition seemed to restore jurors' trust in the eyewitness. The pattern of results showed that whether jurors discredit the witness based on confidence inflation may depend on the explanation that accompanies it.

Paiva, Berman, Cutler, Platania, and Weipert (2011) attempted to replicate the pattern of findings of Jones et al. (2008) with a study design that removed the strategic inflation condition and added two additional control conditions to the design used by Jones and colleagues. Contradictory to the findings of Jones et al. (2008), Paiva and colleagues found that jurors did not perceive the witness in the confidence epiphany condition to be more accurate than the witness in the memory contamination condition. The authors explain that the divergence in the pattern of results may be due to the different settings -- Jones et al. (2008) had the confidence inflation revealed in a court setting while Paiva et al. (2011) used a police interview setting.

These findings further reveal the complexities surrounding the influence of confidence inflation and witness explanations on juror perceptions of the witness.

Jurors' Memories for Trial Information

During trial, jurors are exposed to an immense amount of information about the case before they are asked to deliberate and render a verdict. While some information about jurors' decision making has been ascertained through post-trial interviews (e.g., Bridgeman & Marlowe, 1979), of great concern is jurors' capacity to accurately remember critical information from the trial, which is crucial for jurors' abilities to render an appropriate verdict. Forgetting crucial evidence from the case may negatively impact the jurors' decision making.

Extant literature shows that jurors may have incomplete or inaccurate recall of trial information (Thorley et al., 2020). Further, research suggests that the type of critical evidence that jurors recall predicts their verdict -- jurors who recall more incriminating evidence are more likely to render a guilty verdict, while jurors who recall more non-incriminating evidence are more likely to render a not guilty verdict (Lorek, Centifanti, Lyons, & Thorley, 2019). This highlights the importance of juror recall of critical trial information, as the information recalled could have serious consequences on the outcome of the trial.

One line of research which examines jurors' memories for trial information explores the effect of note taking on recall accuracy. Thorley, Baxter, and Lorek (2016) used a mock-juror paradigm to explore this issue. In this study, participants were randomly assigned to not take notes, to take freestyle notes, or to take notes using a trial-ordered-notebook. Then, half of the participants in each notetaking condition (freestyle and trial-ordered) were allowed access to the notes during the memory test, while the other half in each condition were not. The results showed that both notetaking conditions improved recall of trial information when they did not

have access to their notes, compared to the no notetaking control. Interestingly, participants who took trial-ordered notes and were allowed access to their notes showed the highest rate of recall, compared to both freestyle with access to notes, both notetaking conditions without access to notes, and the no notetaking control. This suggests that the trial-ordered-notebook offered additional retrieval enhancement compared to simply freestyle notetaking. Notably, the results showed that notetaking condition did not predict the verdict rendered and did not influence the mock-jurors' confidence in their verdict.

While the recall of the type of true trial information has been shown to influence the subsequent verdict, a recent study explored what happens when misinformation about the trial is introduced during jury deliberation. In this study, Thorley et al. (2020) had participants act as mock jurors when they watched a murder trial. Participants then read a partial transcript of a jury deliberation for the trial, and half of the participants were given a transcript that included critical pieces of pro-prosecution misinformation, while the other half were given a transcript that did not include misinformation. Additionally, half of the participants were allowed to take notes, while the other half were not. Finally, participants rendered a verdict and completed a source-monitoring test. The authors found that jurors who read the transcript containing pro-prosecution misinformation later reported believing that 31% of the misinformation was encountered during the trial. Further, the more pro-prosecution misinformation jurors endorsed, the more likely they were to render a guilty verdict. Note taking did not affect misinformation endorsement or verdict. The results here indicate that we do not only need to be concerned about jurors recalling enough true critical information about the trial, but also about the possibility of misinformation introduced during jury deliberation that may impact jurors' verdicts.

Similar warnings come from the pre-trial publicity literature, which has demonstrated that jurors may make source-monitoring errors by remembering information from pre-trial publicity as having appeared during the trial (Ruva, 2018; Ruva, McEvoy, & Bryant, 2007). Of substantial concern is that the pre-trial publicity may influence the verdict – exposure to pre-trial publicity that is negative for the defendant has been shown to result in more guilty verdicts, while pre-trial publicity that is positive for the defendant results in fewer guilty verdicts (Ruva & McEvoy, 2008). Further, juries with mixed levels of pre-trial publicity exposure do not seem to show consistent correction for bias of pre-trial publicity during jury deliberation, but instead seem to spread the pre-trial publicity bias amongst the other jurors. That is, jurors exposed to negative pre-trial publicity about the defendant, who deliberated on a jury with mixed levels of pre-trial publicity exposure, had guilt ratings at the same level as juries who had all been exposed to negative pre-trial publicity about the defendant, suggesting that the bias of the publicity-exposed jurors spread to the unbiased jurors. This effect was not mirrored for pre-trial publicity of the victim, however, as there was evidence for bias correction on juries with mixed exposure when the pre-trial publicity was negative toward the victim (Ruva & Guenther, 2017). The problem here is that a juror may enter the deliberation with biased or inaccurate information, and may therefore spread this bias during jury deliberation. Therefore, the verdict would be contaminated, since it would not be based purely on the facts presented during trial.

More support for this line of concern comes from the eyewitness memory literature, where Wright, Self, and Justice (2000) found that, when pairs of eyewitnesses saw conflicting things, one half of the pair tended to conform to the account of whichever person had higher confidence. In this study, participants were split into pairs and viewed an event via storybook pictures. The event was identical for all participants, except half saw an event in which there was

no accomplice, while the other half saw that there was an accomplice. Participants discussed the events in their pairs, and then were separately tested on their memory for the event. They found that half of the participants conformed to agree there was no accomplice, while the other half of pairs conformed to saying there was an accomplice. While there is some complexity to the results, the authors found that overall, if one of the participants confidently said there was an accomplice, the other half of the pair tended to conform. The findings here suggest that this same pattern may occur with jurors – it's possible that a confident juror who misstates an element of the eyewitness testimony may convince other jurors to conform to this misinformation, therefore altering the jurors' memories of the eyewitness testimony.

The Misinformation Effect

The misinformation effect refers to a situation in which one's memory is altered following exposure to inaccurate or misleading information. The misinformation effect is a robust effect that has been demonstrated in a variety of circumstances, from misremembering a yield sign as a stop sign to fabricating entire rich false memories of an event (Loftus, 2005). The typical misinformation paradigm has participants view an event and then later exposes the participant to post-event misinformation. Finally, participants are tested on their memory for the original event.

One explanation for the misinformation effect is through the discrepancy detection principle (Tousignant et al. 1986), which posits that people may be more susceptible to misinformation when they do not detect a discrepancy between the original memory and the misinformation. For example, in one study, Loftus (1979) found that, when exposed to blatantly false information, participants uniformly reject the misinformation, and, interestingly, show resistance to any subsequent subtle misinformation. Participants who were not exposed to the

blatant misinformation, in contrast, showed suggestibility to the subtle misinformation. This suggests that the detection of discrepancy between the blatant misinformation and the original memory heightened the participants' attention to subsequent misinformation and allowed them to discriminate between accurate and inaccurate information.

The Source Monitoring Framework is another way in which to understand the misinformation effect (Johnson, Hashtroudi, & Lindsay, 1993). According to this framework, people may misattribute the source of the information to the original memory, rather than to the source of the post-event misinformation. This misattribution may be due to characteristics of the memory, such as the level of perceptual detail, or due to the decision criteria of the individual, such as familiarity and coherence with the original memory. This kind of source attribution error may be particularly prevalent with recognition memory tests, since seeing the misinformation item as one of the possible answers on a recognition test may trigger a sense of familiarity (since the individual had previously seen the item during the misinformation exposure phase) and therefore the individual may misattribute that sense of familiarity to the original memory.

Another explanation for the misinformation effect comes from the fuzzy trace theory (Reyna & Breynard, 1995). Fuzzy trace theory posits that experiences create two independent types of memory: verbatim and gist. Because verbatim memory tends to fade more quickly than gist memory, people tend to rely on gist memory rather than verbatim memory as the original event becomes further away. Research has shown that the misinformation effect is stronger when the misinformation is placed further away from the original event because the longer retention interval allows the original memory (and the verbatim memory associated with it) to fade. This weaker memory results in the reliance on gist memory rather than verbatim memory, leaving the memory more open to distortion.

Attitudinal congruence. While the misinformation effect is certainly a robust effect, the likelihood of incorporating false information into one's memory may very well depend on their attitudes toward that information. This idea stems from the false memory literature which shows support for the attitudinal-congruence model of false memory formation (Frenda, Knowles, Saletan, & Loftus, 2013). The attitudinal model suggests that prior opinions and beliefs may influence what people remember -- and so they are more likely to remember (or falsely remember) something if it is consistent with their prior attitudes. Frenda and colleagues (2013) tested this model in a large false memory study examining how political orientation impacted false memory formation. In this study, participants were shown a mix of true and false events and were asked if they remembered the event, and, if so, how they felt about it at the time and at the present moment. The false events included images that focused on either Republicans or Democrats, for example Bush entertaining a famous baseball player during Hurricane Katrina, and Obama shaking hands with the Iranian president. The findings showed that, for the two example events listed, participant political orientation predicted the false memory rate. Specifically, liberals were more likely than conservatives to report remembering the Bush vacation event. Similarly, conservatives were more likely than liberals to believe the Obama handshake event. Based on these findings, the researchers conclude that the likelihood of forming a false memory depends on the fit between the event and then individual's prior attitudes. For example, liberals may already disapprove of Bush, and therefore find it easy to incorporate negative information about him into their memories. This is the same case for conservatives incorporating negative information about Obama into their memories.

Murphy, Loftus, Grady, & Levine (2019) expanded the study of political orientation on false memory formation through the investigation of false memories during a real political

campaign. This study took place during the 2018 abortion referendum in Ireland, which was held to repeal an amendment that guaranteed an unborn child an equal right to life as the pregnant mother. The researchers used fabricated events that were negative for either the "yes" campaign or the "no" campaign. Importantly, they used identical events for both sides so the severity and complexity of the events were balanced. Each participant saw one fabricated story about the "yes" campaign and one about the "no" campaign. The results showed that participants who were "yes" voters were more likely to believe the false story about the "no" campaign, and likewise, "no" voters were more likely to believe the false story about the "yes" campaign. Further, the researchers found through qualitative responses that participants even created rich false memories surrounding the events. This study further supports the notion that people are more likely to believe and remember false information that fits into their prior beliefs and opinions.

Together, the findings from these studies offer support for the attitudinal-congruence model of false memory formation. Moreover, the attitudinal-congruence model suggests that misinformation endorsement may also depend on the fit between the misinformation and prior opinions. Hence, in the proposed studies, the likelihood of incorporating misinformation about the eyewitness confidence may depend on whether the misinformation fits with the jurors' preconceived impressions of the trial. A juror who is leaning toward a guilty verdict may be more likely to incorporate misinformation that the eyewitness was more confident, as this would lead to more incriminating evidence toward the defendant. Therefore, the misinformation is congruent with the attitude of the juror and is integrated into the juror's memory.

Coherence based reasoning. Further support for the hypothesis that people accept misinformation when it is congruent with their pre-existing attitudes comes from the literature on

coherence based reasoning (Holyoak & Simon, 1999; Simon, 2004; Simon, Pham, Le, & Holyoak, 2001). According to coherence based reasoning, decisions are made most comfortably and efficiently when all of the factors leading into the conclusion are coherent (Simon & Scurich, 2011). In order to achieve cognitive coherence, we unconsciously strengthen the evidence that supports the conclusion and weaken any contradicting evidence. This line of reasoning suggests that jurors may place more weight on pieces of evidence that support their conclusion and discount evidence that contradicts their conclusion. Therefore, a juror is more likely to accept misinformation that is coherent with their case opinion, and less likely to accept misinformation that contradicts their opinion.

Warnings. A subset of research on the misinformation effect has explored whether this effect can be attenuated by warning the person that they will be or have been exposed to misinformation. Research on the former – warnings that one will be exposed to misinformation (known as pre-warnings) – has illustrated that warning a person *before* the misinformation exposure is relatively effective in reducing suggestibility to misinformation, though not fully eliminating the misinformation effect (Greene, Flynn, & Loftus, 1982). The reasoning behind this finding is thought to be increased scrutiny toward the post-event information following the warning. While the reduction of suggestibility to misinformation following a pre-warning is theoretically interesting, the practical application is limited. There are very few scenarios in the real world in which warning someone of future misinformation is possible. In a real-world eyewitness scenario, warnings about potential misinformation may only be possible after the exposure has happened. This has led to a breadth of research exploring the efficacy of post-warnings.

Greene and colleagues (1982) were the first to examine both pre- and post-warnings, finding that post-warnings had no effect on participants' susceptibility to misinformation – participants warned after being exposed to misinformation performed equally to participants who were not warned at all. This pattern has been found in a wide array of studies examining post-warnings in the misinformation effect literature (e.g., Murphy, Loftus, Hofstein Grady, Levine, & Green, 2019). In contrast, other studies have subsequently found that, while post-warnings do not eliminate the misinformation effect entirely, they can moderately reduce the effect (Blank & Launay, 2014; Chambers & Zaragoza, 2001; Christiaansen & Ochalek, 1983). This mitigating effect of post-warnings is found to be more effective for specific warnings than for general warnings (Ecker, Lewandowsky, & Tank, 2010). For example, Wright (1993) warned participants by identifying the exact piece of misinformation and disclosing the correct information, illustrating that post-warnings that are explicit and specific are effective in reducing misinformation suggestibility. Taken together, it seems that warnings can be effective, depending largely on the temporal placement of the warning and the specificity of the information given in the warning.

The Current Research

The current dissertation research implements a novel study of misinformation in the role of a jury trial. While much research on the misinformation effect focuses on the contamination of what the witness remembers, these studies offer a novel contribution to studying the contamination of what the jury remembers. This line of research is relevant to several areas of research within psychology and law. The combined research advances the misinformation effect literature through studying the effect in a novel scenario. The studies extend research on jury decision-making and jurors' memories for trial information. Further, the dissertation research

explores a possible consequence of using verbal confidence statements in the courtroom. The scenarios presented thus far are likely to happen, as misinterpretations of verbal confidence statements have been found previously (Dodson & Dobolyi, 2015, Dodson & Dobolyi, 2017; Cash & Lane, 2017). When a juror or attorney interprets a confidence statement differently than the witness intends, it opens the door for inadvertent distortion of the witness's confidence. Natural paraphrasing of the confidence statement may then lead to a misleading situation for jurors. Because eyewitness confidence is so powerful to jurors, this situation may therefore have very dangerous consequences.

Across two studies, I explore whether jurors are likely to incorporate misinformation about eyewitness confidence, and if that misinformation has consequences for jurors' perception of the eyewitness testimony and their final verdict. In Study 1, I investigate whether jurors may incorporate either misinformation suggesting either higher or lower eyewitness confidence. In Study 2, I examine whether memory suggestibility is impacted by whether the misinformation is spoken by the prosecution attorney or another juror. Additionally, in Study 2, the application of research on post-warnings allows exploration of a potential solution to this problem, through investigating whether challenging the attorney on distorting the confidence mitigates the subsequent misinformation effect. In Study 3, I take a closer look at jurors' perceptions of verbal confidence statements, aiming to enhance our understanding of commonly used confidence phrases.

In Studies 1 and 2, participants read a trial transcript that is accompanied by images of a real trial. They then enter a "simulated" jury deliberation, in which they read a transcript of a jury deliberation that they are told took place following the trial. Finally, participants render a guilty or not guilty verdict and answer questions pertaining to their perception of the eyewitness,

attorneys, and jurors. In Study 3, participants read a brief case summary of the same crime from Studies 1 and 2. They then render a verdict and answer questions about their perception of the eyewitness.

Study One

Method

Overview and Purpose

It is known that jurors highly weigh eyewitness confidence in their judgments and decision making in the courtroom. Extant literature shows that jurors tend to be strongly influenced by a confident witness, even when the witness shows apparent signs of inaccuracy, such as inconsistencies in their testimony (Brewer & Burke, 2002). As noted earlier, this line of research has led to various suggestions for the preservation of the eyewitness confidence statement, such as immediate collection of eyewitness confidence and double blind lineups (Wells et al., 2020). However, what happens when, even if the eyewitness confidence statement is collected in the most "pristine" circumstances, the eyewitness confidence statement is distorted in the trial setting? Literature on the misinformation effect suggests that jurors who are exposed to misinformation about the eyewitness' confidence may incorporate this misinformation into their memory of the trial, which may, in turn, influence the jurors' decision-making.

With many organizations currently recommending that law enforcement personnel collect eyewitness confidence statements in the witness's "own words" (e.g., U.S. Department of Justice, 2017; Wells et al., 2020), this leaves room for external distortion of the confidence statement. For instance, if a witness were to express that she is *fairly confident* in her identification, the perceived confidence level may differ depending on the perceiver – one person may interpret this as a moderate level of confidence, while another may interpret this as a highly confident witness.

Further, this presents the opportunity for misrepresentation and miscommunication of this powerful piece of evidence. Consider two possible and plausible scenarios. Perhaps a juror hears that the witness is *pretty confident* in her identification; to this juror, the witness is expressing a high level of confidence. When talking with other jurors in jury deliberation, the juror may want to discuss the highly confident witness. The juror may paraphrase the witness's words in language comfortable to him, substituting *pretty confident* with *very confident*. In this scenario, this juror believes that he is conveying the appropriate confidence level of the witness, not realizing that he has misrepresented the original confidence statement.

In another scenario, a juror hears that the witness is *pretty confident,* but, to her, this conveys a completely different level of confidence. To this juror*, pretty confident* is expressing some level of doubt in the identification since there is a gap between this confidence level and complete confidence in the identification. To this juror, the eyewitness has a low level of confidence. In jury deliberation, this juror seeks to point out that the witness was not very confident in her identification, again paraphrasing and miscommunicating the original confidence statement to the other jurors.

In each of these scenarios, the jurors perceiving the eyewitness's confidence are not intentionally distorting the witness's confidence. Each juror is doing what they are instructed to do – to listen to the evidence and consider its weight. Because language is variably interpreted, this opens the door for misinterpretations and misrepresentations of the evidence. With a piece of evidence known to be heavily weighted in jury decision-making, such as eyewitness confidence, this presents the possibility that a misrepresentation may alter the perceptions and decisions in the case as a whole.

The current study explores both of these presented scenarios, examining misinformation regarding the eyewitness confidence statement in a simulated jury deliberation setting. In this study, participants act as mock-jurors on a criminal trial and read a transcript of a trial. The transcript contains still images from a real murder trial, with text from a fictional trial transcript underneath the images. Then, participants read a partial transcript of a jury deliberation, in which one piece of misinformation regarding the eyewitness confidence is present. Participants were randomly assigned to one of three misinformation conditions: misinformation that the witness was more confident, misinformation that the witness was less confident, or no misinformation. Participants then answered questions about the case and rendered a final verdict.

Participants

Jury-eligible participants were recruited via Cloud Research and were directed to participate in the study via Qualtrics. A priori power analyses were conducted based on the range of effect sizes seen in the empirical literature (f = 0.17-0.20). These analyses indicated a range of total participants from 246 to 339 was sufficient to detect effects even on the smaller end of the range with conventional power (80%) and alpha level (p = 0.05). Three hundred and fifty-three participants completed the study; 8 participants were removed from analyses for choosing to withhold their data and 43 participants were removed for failing the attention check questions, leaving a final sample of 302 participants.

The sample was mostly female (59.6%) and White/Caucasian (73.8%) with an average age of 26 years (SD = 13.9). Almost all participants were U.S. Citizens (97.7%). For political affiliation, participants mostly identified as Democrat (46%), followed by Independent (27.8%) and Republican (21.9%). Most participants had never served on a jury before (81.8%), never

been a witness to a crime (74.2%), never been a victim of a crime (54.6%), and never been convicted of a crime (93.7%).

Materials

Trial transcript with images. The trial transcript combined images of the 1992 trial, *New Jersey v. Bias* (Ruva & McEvoy, 2008), with edited text from the trial transcript from Fessinger, Stepinski, and Kovera (2020; accessed via Open Science Framework, https://osf.io/ap8t9/). In this trial transcript, the defendant (Samuel Williams) is on trial for the robbery of a young man (Henry Potter) while working at the front desk of a hotel. The trial transcript was edited from its original format in two ways: (1) to change the victim to be a male rather than female, and (2) to include a witness confidence statement. Editing the transcript in this way allows for added content that can be controlled and altered for the exact scenario of interest in this study. Specifically, the transcript was edited so that the confidence statement is precisely chosen for this research scenario. While on the stand, the witness states that he is "pretty confident" in his identification of the defendant. This statement was chosen for two reasons. First, the decision to use a verbal confidence statement was informed by the National Research Council (2014), who recommend collecting eyewitness confidence statements in the witness's "own words". Second, this specific confidence statement provides a middle-ground, with room for participants' memory of the eyewitness confidence to increase or decrease without ceiling or floor effects.

The trial events began with the judge's instructions, followed by the prosecution and defense presenting their opening statements, respectively. The trial then went through and direct and cross examination of the eyewitness, arresting officer, lineup administrator, and a stress

expert. At the close, the prosecution and defense both presented their closing arguments, respectively. Finally, the judge gave closing instructions for the jury.

Jury deliberation transcript. The jury deliberation transcript was modeled after Thorley et al. (2020), where six anonymous jurors discuss the details of the trial they just watched. Each juror was referred to by a number (e.g., "Juror 1"). Juror statements were balanced for perceptions of the case, so that if a juror presented a prosecution-favoring statement, another juror would present a defense-favoring statement. Each juror speaks 2-4 times during the deliberation.

Three versions of the transcript were created, and participants were randomly assigned to either the high confidence, low confidence, or control transcript. In the high confidence transcript, a juror in the transcript says, "Henry did say that he was *very* confident that [Samuel Williams] was the man that robbed him". In the low confidence transcript, the juror states, "Henry did say that he was *not very* confident that [Samuel Williams] was the man that robbed him". In the control transcript, the eyewitness confidence is not mentioned.

Procedure

Upon signing up for the study, participants completed an informed consent form, which partially disclosed the tasks of the study while masking the true purpose of the study. The true purpose was not disclosed in order to capture an unbiased measure of memory -- disclosing that the participants will be exposed to misinformation and tested on their memory would likely prime participants to increase attention to details of the trial in a way that may be inconsistent with real jurors who would not be tested on their memories. Instead, participants were told that the study was examining participants' perception of trial proceedings.

After obtaining informed consent, participants were informed that they would read about the proceedings of a criminal trial and were instructed to act as jurors on the case. Participants then clicked through the trial transcript at their own pace to accommodate different reading speeds.

At the conclusion of the trial, participants were instructed that they would read a partial transcript of the jury deliberation that took place following the trial. At this point participants were randomly assigned to one of three conditions: high confidence misinformation, low confidence misinformation, or control. Assignment to condition determined which jury deliberation transcript participants read (e.g., a participant in the high confidence misinformation condition received the transcript with misinformation suggesting that the eyewitness was more confident than originally stated). Participants clicked through the jury deliberation transcript at their own pace, again to accommodate for different reading speeds.

Following the jury deliberation phase of the study, participants were then asked to disclose their opinions on the case. Participants rendered a verdict on the case, deciding whether the defendant should be found guilty or not guilty, followed by reporting their confidence in their verdict decision.

Next, participants answered questions about perceptions of the eyewitness testimony. This included questions about the eyewitness's confidence level ("How confident was the witness, Henry Potter in his identification?"), credibility ("How credible was Henry Potter?") and accuracy ("How accurate was Henry Potter's testimony?"), each assessed on a 0-100 sliding scale with verbal anchors (i.e., 0 represented "not at all" and 100 represented "completely"). Participants were also asked two open-ended questions in order to capture specific target phrasing. Participants were asked "How convincing was Henry Potter's testimony?" and "How

certain was Henry Potter that the photo he selected from the lineup was the man who robbed him?", each accompanied by an open text box. The second question served the purpose of obtaining reports of the remembered witness confidence in the same format as the original event. The witness reports his confidence in a verbal statement (i.e., *pretty confident*). While the numeric assessment of remembered witness certainty serves as an objective measure of misinformation endorsement, the free response question allows examination of whether participants remember the phrasing used in the trial or in jury deliberation.

Next, participants answered questions about their perception of the attorneys and jurors in the case. First, participants were asked, "In your view, did the prosecution or defense present a stronger argument?" with options to choose that the prosecution had a stronger argument, the defense had a stronger argument, or they had equally strong arguments. Next, participants answered questions about their perception of jury members, reporting how smart they are, how good of a memory they have, and how easily they give into pressure. Each of these questions were assessed on a 0-100 sliding scale. Finally, participants were asked, "At the start of jury deliberation, do you think most jurors thought the defendant was guilty or not guilty?", with options to choose that most jurors thought he was guilty, most jurors thought he was not guilty, or it was about equally split in the beginning.

Following these questions, participants answered attention check questions. These questions focused on details of the case that would be obvious to anyone who paid attention while reading the case (e.g., "What was the name of the defendant?"). These questions were used to exclude participants who did not pay attention to the case.

Finally, participants entered a funneled debriefing procedure (Greenspan & Loftus, 2020) which assesses whether participants detected the misinformation in the jury deliberation

transcript. The debrief began with vague questions about the study ("What do you think this study was about?") and got increasingly more specific about the jury deliberation transcript ("Did you find anything strange about the jury deliberation transcript?"). At the end of this funneled debriefing procedure, participants were fully debriefed on the true purpose and procedure of the study and were provided with the option to withdraw their data.

Measures

Remembered witness certainty. Participants' memories for the witness's confidence statement was assessed in two ways. For the numeric assessment, participants were asked, "How confident was the witness, Henry Potter, in his identification?" and were provided with a 0-100 sliding scale. The purpose of this assessment was to obtain an objective measurement of the participants' perception of the witness's confidence. This question served as a measure of misinformation endorsement for the critical misinformation item of eyewitness confidence.

For the free response assessment, participants were later asked, "How certain was Henry Potter that the photo he selected from the lineup was the man who robbed him?" with an open text box for participants' responses. The purpose of this assessment was to capture participants' memories for the confidence statement – either the true confidence statement from the trial, or the misinformation introduced during jury deliberation. These free response reports were assessed by two independent research assistants. Coders, blind to condition, coded the free response reports into a 1-5 scale, with the lower end of the scale indicating low confidence and the higher end of the scale indicating high confidence. Coding disagreements were resolved through discussion between the two coders.

Verdict. Following the jury deliberation transcript, participants were asked to render a final verdict for the defendant, choosing to find the defendant either guilty or not guilty.

Following their verdict, participants were asked, “How confident are you in your verdict decision?” and were provided with a 0-100 sliding scale.

Retrospective detection. Retrospective detection was assessed using the responses to the funneled debriefing. Responses were coded by independent coders who were blind to condition. Participants were coded as detectors at two levels: participants were coded as detectors if they reported noticing the misinformation in response to the first question of the funneled debriefing (“What do you think this study was about?”), if, after being informed of the study’s manipulation, they reported correctly that they were in the misinformation condition.

Hypotheses

Misinformation effect. The main purpose of the first study was to see if misinformation introduced during jury deliberation would distort jurors’ memories for the eyewitness’ confidence level. Given research on the misinformation effect (Loftus, 2005), it was hypothesized that, compared to participants who did not discuss the eyewitness’ confidence (control), participants in the high confidence misinformation group will rate the eyewitness as more confident and participants in the low confidence misinformation group will rate the eyewitness as less confident. It was predicted that this pattern of results would occur for both the numeric reports of remembered witness confidence, as well as for the coded qualitative responses.

Verdict. The second aim of this study was to examine if exposure to misinformation about the eyewitness’ confidence would affect the juror’s verdict in the case. Prior research shows that jurors who have higher rates of remembering pro-prosecution or incriminating misinformation are more likely to render a guilty verdict (Neil, Higham, & Fox, 2021; Thorley et al., 2020). If the results here follow the same pattern, it is predicted that, compared to the control

group, participants in the high confidence misinformation group will have a higher rate of guilty verdicts; similarly, compared to the control group, participants in the low confidence misinformation group will have a lower rate of guilty verdicts.

Perceptions of eyewitness. Consistent with research showing that misinformation about a specific critical item can affect memories for surrounding details (e.g., Loftus & Palmer, 1974), the current study also sought to explore whether exposure to misinformation about the eyewitness' confidence affect perceptions of the eyewitness? It was predicted that, compared to the control group, participants in the high confidence misinformation group will perceive the eyewitness as more credible and more accurate; similarly, compared to the control group, participants in the low confidence misinformation group will perceive the eyewitness as less credible and less accurate.

Results

Memory Distortion

Numeric assessment. The means for the remembered witness confidence for each condition are illustrated in Figure 1.1. To test whether participants' memories for the eyewitness' confidence changes following misinformation exposure, a one-way ANOVA was conducted with condition (high confidence, low confidence, control) as the independent variable and the numeric report of remembered witness confidence as the dependent variable. Results from the ANOVA showed a significant main effect of condition (F (2, 299) = 4.23, p = 0.016, η^2 = 0.028, 95%CI [0.00092, 0.069]), suggesting that remembered witness confidence differed by misinformation condition. Post hoc Bonferroni comparisons revealed a significant difference between the high confidence condition (M = 74.92) and low confidence condition (M = 66.01), t (196) = 2.90, p = 0.012. There was no significant difference between the control condition (M = 71.00) and the

high confidence condition (t (203) = 1.30, p = 0.58) or low confidence condition (t (199) = -1.64, p = 0.31).

The next analysis explored whether participants' verdict in the case was associated with their reports of remembered witness confidence. An independent means t-test revealed that participants who rendered a guilty verdict reported remembering the witness as more confident (M = 83.59) than participants who rendered a not guilty verdict (M = 64.23), t (299) = -8.06, p < 0.001, d = -0.98, 95%CI [-1.23, -0.73]. This result could be interpreted in two ways: either the participants who perceive the witness as more confident are more persuaded by the testimony and therefore render a guilty verdict, or participants who feel that the defendant is guilty perceive the witness as more confident because it aligns with their opinion (e.g., confirmation bias, Oswald & Grosjean, 2004).

Free response assessment. For analysis, participants' written reports of the remembered witness confidence were transformed into a quantitative variable via coding. Two trained, independent coders who were blind to condition read each written response and assigned a corresponding code on a 1-5 scale, with 1 indicating low confidence and 5 indicating high confidence. This 1-5 scale was selected based on the inherent variability of verbal confidence reports, as well as previous research having assessed verbal confidence statements on a 1-5 scale (Kenchel, Greenspan, Reisberg, & Dodson, 2021). The two coders were moderately consistent (70%, Cronbach's α = 0.87). Additionally, a comparison of the coding scheme to the numeric reports of remembered witness confidence illustrated that the codes were moderately, positively, and significantly correlated with participants' numeric assessments of remembered witness confidence, r (282) = 0.49, p < 0.001. Table 1.1 displays the average numeric confidence rating participants assigned within each level of the coding scheme for the written confidence. A small

number of responses (N = 14) were off topic and did not offer enough information to assign a code, and were therefore left out of analyses.

Unexpectedly, some participants used the exact confidence descriptor used in trial or in the misinformation when writing the free response remembered witness confidence. The use of the descriptor was sometimes offered on its own (e.g., "pretty certain") and sometimes embedded within a more detailed response (e.g., "Henry Potter was very certain considering he remembers Mr. Williams' face"). Of participants in the control group, 31.73% wrote that the witness was *pretty* confident within their free response. Meanwhile, 14.85% of the high confidence condition offered the descriptor, *very* confident, and 2.06% of the low confidence condition offered the descriptor, *not very* confident.

A one-way ANOVA using free response remembered witness confidence as the dependent variable and misinformation condition as the independent variable revealed a significant effect of condition on free response reports, (F (2, 281) = 4.34, p = 0.014, η^2 = 0.030, 95%CI [0.0012, 0.075]). A follow-up Bonferroni test illustrated that the high confidence condition reported the witness as being significantly more confident (M = 4.16) compared to the low confidence condition (M = 3.76, t (196) = 2.77, p = 0.018). The comparison between the control condition (M = 3.84) and either high confidence or low confidence conditions did not reach statistical significance (t (203) = 2.28, p = 0.069; t (199) = -0.53, p = 1.00, respectively).

Verdict

Overall, a higher proportion of participants rendered a not guilty verdict (66.56%) than a guilty verdict (33.44%), which is consistent with previous research using this trial transcript (Fessinger et al., 2020). Participants' verdicts separated by misinformation condition are illustrated in Figure 1.2. A 3 (condition: high confidence, low confidence, control) x 2 (verdict:

guilty, not guilty) chi-square showed that verdict did not differ significantly by condition, χ^2 (2, N = 303) = 2.93, p = .23. The effect size for this finding, Cramer's V, was conventionally small at 0.10 (Cohen, 1988).

Verdict Confidence

Participants were overall moderately confident in their verdict, reporting 72.97% confidence on average. Participants who rendered a guilty verdict were significantly more confident in their verdict (79.42%) than participants who rendered a not guilty verdict (69.73%), t (300) = 4.19, p < .001, d = 0.51, 95%CI [0.27, 0.75] (see Figure 1.3). This pattern of results is consistent with findings from Thorley et al. (2020).

To test whether exposure to misinformation influenced jurors' confidence in their verdicts, a one-way ANOVA was conducted with condition (high confidence, low confidence, control) serving as the independent variable and verdict confidence serving as the dependent variable. The ANOVA showed that misinformation condition did not significantly affect verdict confidence, F (2, 299) = 0.66, p = 0.52, η_p^2 = 0.0044.

To explore how participants' perceptions of the attorneys' arguments influenced their verdict confidence, a one-way ANOVA was conducted with participants ratings of the strength of the attorneys' arguments as the independent variable (defense had a stronger argument, prosecution had a stronger argument, they had equally strong arguments) and verdict confidence serving as the dependent variable. The ANOVA showed that participants' confidence in their verdicts differed significantly depending on how they perceived which side had a stronger argument in the trial, F (2, 299) = 11.09, p < 0.001, η^2 = 0.069, 95%CI [0.021, 0.13]. A post-hoc Tukey test revealed that participants who felt that the prosecution had a stronger argument were significantly more confident in their verdict (M = 78.22) than participants who thought both

sides presented equally strong arguments (M = 65.64), t (177) = -4.46, $p < 0.001$. Similarly, participants who felt the defense presented a stronger argument were also more confident in their verdict (M = 74.93) than participants who thought both sides presented equally strong arguments, t (215) = -3.60, $p = 0.001$. There was no significant difference between participants who thought either the prosecution or defense presented a stronger argument, t (206) = 1.24, $p = 0.43$. It seems that perceiving one side as presenting a stronger argument bolsters participants' confidence in their decision-making, presumably because participants rendered a decision aligned with the side they felt was strongest. In contrast, feeling that both sides presented equally strong arguments left participants feeling less confident in their final verdict.

To explore whether there was an interaction between participants' verdicts and which side they thought presented a stronger argument, a 2 (verdict: guilty, not guilty) x 3 (argument opinion: defense was stronger, prosecution was stronger, equally strong arguments) ANOVA was conducted on verdict confidence. While, unsurprisingly, the main effect of verdict on verdict confidence, as well as the main effect of argument opinion on verdict confidence, were significant (as outlined in separate analyses above), the interaction between these two variables was non-significant, F (2, 296) = 2.27, $p = 0.10$, $\eta_p^2 = 0.015$.

The next analyses examined how participants' perceptions of the other jurors influenced their verdict confidence, a one-way ANOVA was conducted with participants ratings of how they felt the other jurors were leaning in jury deliberation as the independent variable (most jurors thought he was guilty, most jurors thought he was not guilty, it was about equally split) and verdict confidence serving as the dependent variable. The ANOVA showed that participants' confidence in their verdicts did not significantly differ depending on how they perceived the jurors leaning during jury deliberation, F (2, 299) = 2.61, $p = 0.075$, $\eta^2 = 0.017$. While the

findings here did not reach statistical significance, the results show an interesting pattern, with participants who felt that most jurors thought the defendant was guilty having the highest confidence in their verdict (M = 77.11), followed by participants who felt that jurors' opinions were equally split (M = 72.13), and finally followed by participants who felt that most jurors thought the defendant was not guilty (M = 69.81).

Perceptions of the Eyewitness

Does exposure to misinformation about eyewitness confidence spill into other elements in the jurors' perception of the eyewitness? Previous research has shown that eyewitness confidence can affect other judgements of the witness – witnesses who are highly confident are judged as having paid more attention and having had a better view of the crime as compared to witnesses with low confidence (Bradfield & Wells, 2000). Two measures of perception were assessed: eyewitness credibility and eyewitness accuracy. The mean ratings for each of these measures are shown in Figure 1.4, broken down by misinformation condition. Two separate one-way ANOVAs were conducted to determine the effect of misinformation condition on these measures. Both ANOVAs, examining the effect of condition on perceptions of witness accuracy (F (2, 299) = 0.28, p = 0.75, η^2 = 0.0019) and examining the effect of condition on perceptions of witness credibility (F (2, 299) = 0.21, p = 0.81, η^2 = 0.0014), were non-significant.

Perceptions of the Trial

Participants were asked to report, in their view, whether the prosecution or defense presented a stronger argument. Participants were provided with three choices: the prosecution had a stronger argument, the defense had a stronger argument, or they had equally strong arguments. Overall, most participants felt that the defense had a stronger argument (40.73%),

followed by feeling both sides had equally strong arguments (31.13%), and finally followed by feeling that the prosecution had a stronger argument (28.25%).

To explore whether jurors' perception of the strength of the attorneys' arguments in the case differed by misinformation condition, a 3 (condition: high confidence, low confidence, control) x 3 (perception: pro-prosecution, pro-defense, equal) chi-square was conducted. The results showed that perceptions of the attorney's arguments did not differ significantly by condition, χ^2 (4, N = 303) = 7.97, p = .093. The effect size for this finding, Cramer's V, was conventionally small at 0.11 (Cohen, 1988).

Perceptions of the Jurors

To examine the participants' perceptions of the jurors in the jury deliberation transcript, four measures were assessed. The first three, how smart the other jurors are, how good of a memory the other jurors have, and how easily the other jurors give into pressure, were assessed on a 0-100 continuous scale. The last measure asked participants which way they felt jurors were leaning at the beginning of jury deliberation, with three choices: most jurors felt the defendant was guilty, most jurors felt the defendant was not guilty, or it was equally split.

To investigate whether misinformation condition impacted participants' perceptions of the jurors, three one-way ANOVAs were conducted on the three continuous measures of perceptions of the jurors, each using misinformation condition (high confidence, low confidence, control) as the independent variable. All three tests – examining how smart the other jurors are (F (2, 299) = 3.0, p = 0.051), how good of a memory the jurors have (F (2, 299) = 2.15, p = 0.12), and how easily jurors give into pressure (F (2, 299) = 0.47, p = 0.62) – were all non-significant. In order to explore whether misinformation condition affected which way participants felt jurors were leaning in deliberation, a 3 (condition: high confidence, low

confidence, control) x 3 (perception of juror: pro-prosecution, pro-defense, equally split) chi-square test was performed. Results showed that condition did not influence how participants perceived jurors leaning in the beginning of jury deliberation, χ^2 (4, N = 302) = 3.72, p = .45. The effect size for this finding, Cramer's V, was conventionally small at 0.08 (Cohen, 1988).

The next analyses explored whether these perceptions of the other jurors differed by participants' verdicts in the case. Three t-tests were conducted on the three continuous measures of perceptions of the jurors with verdict (guilty, not guilty) as the independent variable. All three tests – examining how smart the other jurors are (t (300) = -1.02, p = 0.31), how good of a memory the jurors have (t (300) = 1.38, p = 0.17), and how easily jurors give into pressure (t (300) = -1.15, p = 0.25) – were all non-significant. Participants' verdicts alongside their opinions on how the jurors were leaning in deliberation are displayed in Table 1.2 To examine whether verdict was associated with which way participants felt jurors were leaning in deliberation, a 2 (verdict: guilty, not guilty) x 3 (perception of juror: pro-prosecution, pro-defense, equally split) chi-square test was performed. Results showed that how participants perceived jurors leaning in the beginning of jury deliberation significantly differed by verdict, χ^2 (2, N = 302) = 7.60, p = .022. The effect size for this finding, Cramer's V, was conventionally moderate at 0.16 (Cohen, 1988). Of the jurors who rendered a not guilty verdict, 59.70% felt the jurors were equally split in deliberation, 20.40% felt most jurors thought the defendant was guilty, and 19.90% felt most jurors thought the defendant was not guilty. Of the jurors who rendered a guilty verdict, 51.49% felt it was about equally split, 34.65% felt most jurors thought the defendant was guilty, and 13.86% felt most jurors thought the defendant was not guilty. When excluding the participants who felt that the jurors were equally split in deliberation, those who rendered a not guilty verdict were balanced between feeling like the jurors were leaning towards the prosecution or defense,

while those who rendered a guilty verdict seemed to lean toward feeling that most jurors thought the defendant was guilty.

Retrospective Detection

Retrospective detection was assessed at multiple levels, from the qualitative responses to the general question, "Did you find anything strange about this study?" to the quantitative responses to specific questions asking participants to guess whether they were in the misinformation or control conditions.

Of the participants who were in either misinformation condition (either the high confidence or low confidence conditions) 20.71% correctly reported that they received the transcript with false information about the eyewitness confidence – 30.93% in the low confidence condition and 10.89% in the high confidence condition. Of participants in the control condition, 64.42% correctly reported that received the transcript with only true information. Participants who responded saying that they received the transcript with false information were prodded further, being asked whether the misinformation stated that the witness was more confident or less confident than the witness stated in trial. Of the participants in the low confidence condition who reported receiving false information, 80.00% (24 of 30 participants) correctly reported that they received the misinformation that stated that the witness was less confident. Of the participants in the high confidence condition who reported receiving false information, 45.45% (5 of 11 participants) correctly reported that they received the misinformation stating that the witness was more confident.

Discussion

Study 1 explored the effect of misinformation about eyewitness confidence on jurors' perception of the eyewitness as well as decision-making in the trial setting. The study examined

whether jurors incorporate misinformation about the eyewitness confidence into their memories, finding that participants' memories for the eyewitness's confidence level were significantly distorted following misinformation exposure. As predicted, participants in the high confidence misinformation condition reported that the witness was significantly more confident than participants in the low confidence misinformation condition. This result shows that even a small comment regarding the eyewitness confidence amid a larger discussion during jury deliberation impacted participants' memories for the trial. However, the subsequent findings departed from the hypothesized results, as the effects of this misinformation did not spill into distorting other perceptions of the eyewitness. Moreover, the study also sought to examine whether this misinformation exposure influences judgments within the trial, including the final verdict. Findings from the current study reveal that, while misinformation exposure influenced participants' memories for the eyewitness confidence, the misinformation did not impact participants' verdicts in the case.

While these findings do not support the proposed hypotheses, it is possible that the misinformation presented was not strong enough to alter participants' judgments in the trial. While the high confidence and low confidence conditions differed from each other significantly in remembered witness confidence, they did not significantly differ from the control group. Perhaps the misinformation was just strong enough to push participants' memories for the witness confidence away from the original statement, but not strong enough to differ on any other measure. It is possible that a more extreme piece of misinformation would push judgements further from the control group, and therefore a difference in trial perceptions and judgments might be seen.

Previous studies have shown that mock jurors perceive an eyewitness as less accurate when the witness discloses that they made an identification after some time rather than making an identification immediately (Slane & Dodson, 2022). In the present study, the witness is said to have looked at the pictures "for a while" before making an identification. This may have influenced participants' perception of the eyewitness's accuracy and credibility. In fact, in the free responses, some participants mentioned that the witness "took a while" or "hesitated" before making an identification, which led them to believe that the identification was less trustworthy.

The current study was the first of its kind to explore misinformation regarding eyewitness confidence in this context, so the aim of the first study was to explore whether the misinformation effect in this context was possible. The first study took a conservative approach: the original eyewitness confidence statement was selected to be high enough to be believable in the courtroom, while still remaining moderate enough to enable movement above and below the original point. The misinformation phrase was selected within a careful balance of being different enough from the original statement to elicit a misinformation effect, while not being so different that participants would reject the misinformation entirely. Previous research has shown that exposure to blatant misinformation causes participants to reject the misinformation entirely, while also being more resistant to other misinformation (Loftus, 1979). The specific phrase was also chosen to allow a mirroring effect for the high confidence and low confidence conditions (e.g., *very confident* and *not very confident*). While the misinformation was carefully chosen to allow exploration of the misinformation effect in this context, it is clear that it may have been too conservative in its approach. Study 2 attempts to remedy this, with a more extreme choice of misinformation wording.

While the findings did not support the hypothesis that misinformation would influence participants' verdicts, an interesting finding emerged regarding participants' confidence in their verdicts. Further exploration of verdict confidence revealed that, while a larger proportion of participants found the defendant not guilty, participants who rendered a guilty verdict were significantly more confident in their verdict. This suggests that, perhaps in order to find the defendant guilty, participants had to feel more confident in his guilt. This might also explain why more participants leaned towards a not guilty verdict. The trial contained detailed jury instructions that informed the jury on the prosecution's burden of proof, and explained what "proof beyond a reasonable doubt" means. There may have been participants who thought that the defendant could be guilty, but perhaps did not feel confident rendering such a verdict "beyond a reasonable doubt". While further research would need to parse apart this pattern of results, these findings suggest that participants were taking their roles as jurors seriously and were only willing to render a guilty verdict if they felt confident enough to do so.

Another consideration involves participants' perceptions of how the jurors were leaning in deliberation. Those who rendered a not guilty verdict seemed equally split between feeling that jurors were leaning toward the prosecution or defense. However, of those who rendered a guilty verdict, the proportion of participants who felt that jurors leaned toward the prosecution was over twice the size of those who felt that jurors leaned toward the defense. This could be interpreted in two ways – perceiving the jurors' opinions as prosecution-leaning may have convinced participants in the same direction, or perhaps participants who felt that the defendant was guilty were more likely to interpret jurors' opinions as in line with theirs, which would be consistent with the phenomenon of confirmation bias (Oswald & Grosjean, 2004).

This first study demonstrates the ease with which misinformation exposure can happen in a jury deliberation setting. The use of verbal expressions of eyewitness confidence present an opportunity for legal players such as jurors, attorneys, and law enforcement to paraphrase the wording used by an eyewitness. By switching one word, a juror can accidentally distort the eyewitness confidence level, exposing the other jurors to misinformation. In a jury deliberation setting, there is no "fact-checking" entity which ensures that the jurors are staying true to the facts of the case – instead, the jurors themselves are considered fact finders. Therefore, a flippant comment about the eyewitness's confidence may not be caught and corrected – this would require the jurors themselves to do so. The next study, in part, aimed to explore this idea of a juror correcting the misinformation – this time, while varying the source of the misinformation.

Study Two

Method

Overview and Purpose

The first study focused on whether jurors incorporate misinformation about eyewitness confidence into their memories for trial information. Study 2 sought to understand whether the source of the misinformation matters, so in this study, the source of the misinformation was manipulated. Jurors were either exposed to misinformation through comments of the prosecutor during closing arguments or through comments of another juror during jury deliberations. Additionally, this study explored a possible remedy for the problem through adding a prosecution + challenge condition, in which a juror, during jury deliberation, challenged the prosecution for misrepresenting the eyewitness confidence level.

Study 2 used a similar procedure as Study 1, with a few key changes. The first study included misinformation conditions that distorted the confidence level to be either higher or lower than the original confidence statement. While the findings showed that jurors' memories for eyewitness confidence can be distorted in both directions – and, apparently equally so – the realistic concern surrounding distorted eyewitness confidence comes from a witness presented as being more confident than they truly are. For this reason, the low confidence misinformation condition was eliminated in Study 2, so each misinformation condition presented the high confidence misinformation.

Additionally, the specific wording of the high confidence misinformation was altered in Study 2. In Study 1, the critical high confidence misinformation reported that the witness was *very confident,* with the intention that this would convey a high level of confidence. Upon further reflection and discussion, it was determined that *very confident* might not convey the highest

level of confidence. In order to increase the sensitivity of the misinformation manipulation, the critical misinformation was changed to state that the witness was *highly confident.*

The next methodological changes concern the research questions for Study 2. This study sought to explore whether the source of the misinformation impacts participants' susceptibility to the misinformation effect. The first study presented a scenario where jurors misinterpret the eyewitness confidence level and communicate that misperception to other jurors. However, another likely scenario is the misrepresentation of the witness's confidence level by the attorneys themselves. In the current study, participants were randomly assigned to receive misinformation from either a juror (as in Study 1) or the prosecution attorney during closing arguments. In each of these conditions, the participant is exposed to misinformation stating that the witness was highly confident. In a third experimental condition, the prosecution stated the high confidence misinformation, and then, in jury deliberation, a juror pointed out that the prosecution misstated the eyewitness's confidence level.

The two new experimental conditions were chosen to reflect a scenario that would be plausible in the real world. Due to the interchangeable nature of language, it is common to paraphrase people's words; in the criminal justice system, attorneys may often use words that magnify the gravity of the events in question. It is therefore possible that an attorney may exaggerate the eyewitness's words without intentionally distorting the original confidence level. This is the scenario presented in the prosecution misinformation condition. The study also explored what happens when the misinformation is challenged – when a juror notices the distorted confidence and points it out to the other jurors. In the prosecution misinformation + challenge condition, this is exactly what happens: the prosecutor conveyed that the witness was

highly confident, then during jury deliberation, a juror mentioned that the prosecutor was mistaken in stating that the witness was highly confident.

Participants

Jury-eligible participants were recruited via Cloud Research and were directed to participate in the study via Qualtrics. A priori power analyses were conducted based on the range of effect sizes seen in the empirical literature (f = 0.16-0.20). These analyses indicated a range of total participants from 280 to 432 was sufficient to detect effects even on the smaller end of the range with conventional power (80%) and alpha level (p = 0.05). Due to anticipating some participants failing the attention check questions as in Study 1, an additional 30% of the high end of the participant range was collected. Six hundred and ninety-eight participants completed the study; 6 participants were removed for withholding their data following debriefing and 49 participants were removed for failing the attention check questions, leaving a final sample of 643.

The sample was mostly female (64%) and White/Caucasian (75.9%) with an average age of 43 years (SD = 13.9). Almost all participants were U.S. Citizens (99.4%). For political affiliation, participants mostly identified as Democrat (42%), followed by Independent (25.9%) and Republican (25.2%). Most participants had never served on a jury before (77%), never been a witness to a crime (66.8%), never been a victim of a crime (58.9%), and never been convicted of a crime (92.3%).

Materials

Trial transcript with images. Two separate trial transcripts were created for Study 2, still using the combined images of the 1992 trial, *New Jersey v. Bias* (Ruva & McEvoy, 2008), with edited text from the trial transcript from Fessinger, Stepinski, and Kovera (2020; accessed

via Open Science Framework, https://osf.io/ap8t9/). The first one (control transcript) is identical to the trial transcript from Study 1 and does not contain misinformation. A second transcript (prosecution misinformation transcript) was created with only one change – in the prosecution's closing arguments, the prosecutor states, "[Henry] was highly confident that Mr. Williams was the man who robbed him" when referring to the witness' identification.

Jury deliberation transcript. Three separate jury deliberation transcripts were created for Study 2. The first transcript (misinformation transcript) was nearly identical to the high confidence misinformation transcript from Study 1, where a juror mistakenly states that the witness was highly confident. The second transcript (control transcript) was identical to the control transcript from Study 1 and did not contain the critical misinformation statement. A third transcript (challenge transcript) was created; in this transcript, a juror challenges the misinformation presented by the prosecution. Specifically, a juror states, "Yeah we should note that the prosecutor claimed that Henry was highly confident but that's not what Henry said in his testimony".

Procedure

The procedure for Study 2 is illustrated in Figure 2.1. All participants experienced a parallel procedure in which they read the trial transcript, accompanied with images, and then enter a simulated jury deliberation in which they read a jury deliberation transcript. Participants were randomly assigned to one of four conditions: jury misinformation, prosecution misinformation, prosecution misinformation + challenge, or control. The jury misinformation condition is identical to the high confidence misinformation condition from Study 1: participants read the trial transcript that does not contain misinformation and the jury deliberation transcript that introduces misinformation from a fellow juror. In the prosecution misinformation condition,

participants read the transcript that introduces misinformation through the prosecution's closing arguments and the control jury deliberation transcript that does not contain misinformation. In the prosecution misinformation + challenge condition, participants read the transcript that introduces misinformation through the prosecution's closing arguments and the jury deliberation transcript in which a fellow juror challenges the misinformation item. In the control condition, participants read the control trial transcript and the control jury deliberation transcript, in which no misinformation is introduced.

Following the jury deliberation transcript, participants rendered judgements about the trial. They were asked to decide if the defendant is guilty or not guilty, and then are asked to report how confident they are in their verdict. In Study 2, an additional question was added, asking participants their perception of the defendant's guilt, accompanied by a sliding 0-100 scale with verbal anchors of "it is unlikely he is guilty" at the 0 and "it is likely that he is guilty" at the 100. The verdict and the perception of guilt questions were counterbalanced for order effects.

The remainder of the procedure follows exactly as that of Study 1, where participants answer questions about their perception of the eyewitness testimony, the trial, and the other jurors. Finally, participants proceed through the funneled debriefing procedure outlined in Study 1.

Hypotheses

Misinformation source. To reiterate, the main purpose of Study 2 was to examine if the source of the misinformation affects participants' susceptibility to the critical misinformation item. On this question, there are two competing hypotheses that are likely. First, given that Study 1 showed few participants who detected the presence of misinformation, it is possible that

misinformation on such a specific item will go unnoticed regardless of the condition, resulting in a misinformation effect for the juror misinformation condition and prosecution misinformation condition. Specifically, participants in both of these conditions will report remembering the eyewitness confidence level as higher than in the control condition.

On the other hand, it is possible that participants will view the misinformation presented by the prosecution as motivated exaggeration in order to win the case. Because the legal system is an adversarial system, both the prosecution and defense put forth their best effort to convince the jury of their truth. Participants may know this and may therefore be skeptical of the misinformation presented by the prosecution, while not applying the same skepticism to the misinformation presented by a fellow juror. In this scenario, participants will show the largest misinformation effect in the juror misinformation condition, followed by a smaller misinformation effect in the prosecution misinformation condition, as compared to control. That is, participants who receive misinformation from a fellow juror will report the witness as having been more confident compared to participants who received misinformation from the prosecutor. It is also possible that participants may be paying more attention to the trial itself than the jury deliberation, since making a decision lies more heavily on knowing the facts of the case than the opinions of the other jurors. Therefore, it is possible that participants may detect the misinformation introduced by the prosecution at a higher level than the juror misinformation. This, again, may lead to a decrease in misinformation endorsement in the prosecution misinformation condition.

In each of these competing hypotheses, I predicted that the misinformation effect will be mitigated in the prosecution misinformation + challenge condition, so that the prosecution misinformation + challenge condition will resemble the control condition. While research on

post-warnings – when individuals are warned of exposure to misinformation after the exposure has already happened – is mixed, studies examining a particular form called social post-warnings have shown to be effective in mitigating the misinformation effect. Echterhoff, Hirst, and Hussy (2005) explain that, when the source of misinformation is revealed to be "exerting a biasing influence" (p. 771), individuals may be more likely to resist the misinformation. In their study, Echterhoff and colleagues found that the misinformation effect was reduced when the source of the misinformation was revealed to be untrustworthy or incompetent (Study 1). Importantly, a second study included a "social validation" condition, in which the source of the misinformation was characterized as being highly credible (i.e., a trained police officer). These results showed that, while the misinformation effect was reduced for participants who were told the source was untrustworthy, participants in the social validation condition showed a misinformation effect that was equal to that of participants who received no warning at all. These results indicate that participants in the post-warning conditions were induced to more carefully monitor the source of the information – either validating the source as credible, or determining to resist the influence of a biased or untrustworthy source. These findings suggest that, for participants in the prosecution + challenge condition of the current study, the juror challenging the prosecutor's misinformation may induce participants to carefully consider the source of the misinformation. It is predicted that this source monitoring may prompt participants to characterize the prosecutor as a biased source, since the adversarial nature of the legal system tasks attorneys with arguing for their side to the best of their abilities.

Verdict. The second aim of the current study was to again explore whether exposure to misinformation about the eyewitness' confidence will affect the juror's verdict in the case. I predicted that participants in the juror misinformation condition and prosecution misinformation

condition will have a higher rate of guilty verdicts, compared to the prosecution + challenge condition and control condition. Because the misinformation in this study suggests that the witness was more confident, and the witness is a prosecution witness, I predicted that this information will increase guilty verdicts. Additionally, I predicted that the effect of the post-warning in the prosecution + challenge condition will similarly mitigate the effect of misinformation on verdict – that is, the rate of guilty verdicts in this condition will likely look similar to the rate of guilty verdicts in the control condition.

Results

Misinformation Effect

Numeric assessment. Participants' reports of remembered witness confidence within each condition are illustrated in Figure 2.2. To test whether the source of misinformation exposure impacts participants' susceptibility to misinformation, a one-way ANOVA was conducted using misinformation condition (jury misinformation, prosecution misinformation, prosecution + challenge, control) as the independent variable and remembered witness confidence as the dependent variable. The ANOVA revealed a significant effect of misinformation condition on remembered witness confidence, F (3, 623) = 2.90, p = 0.034, η^2 = 0.014. Post-hoc Bonferroni comparisons revealed that participants in the prosecution + challenge condition had significantly lower remembered witness confidence (M = 70.73) compared to those in the prosecution misinformation condition (M = 77.32). No other contrasts were significant. While the effect of misinformation provided by a jury member seen in Study 1 did not replicate in the current study, it seems that the new prosecution + challenge condition was effective. It appears that the effect of a jury member challenging the prosecutor for misstating the witness' confidence level results in participants lowering their rating of the witness' confidence

compared to participants who are exposed to the prosecutor's misinformation without any challenge.

The next analysis explored whether participants' verdict in the case was associated with their reporting of the witness's confidence level. An independent means t-test using verdict as the explanatory variable and remembered witness confidence as the outcome variable revealed a significant difference, $t(625) = -11.08$, $p < 0.001$. Specifically, participants who rendered a guilty verdict reported the witness as significantly more confident ($M = 83.26$) than did participants who rendered a not guilty verdict ($M = 66.80$).

Free response assessment. As in Study 1, participants' written reports of the remembered witness confidence were transformed into a quantitative variable via coding by two trained, independent coders who were blind to condition. The two coders read each written response and assigned a corresponding code on a 1-5 scale, with 1 indicating low confidence and 5 indicating high confidence. Disagreements were resolved through discussion between the coders. Overall, the two coders were highly consistent (90%, Cronbach's $\alpha = 0.93$).

Additionally, a comparison of the coding scheme to the numeric reports of remembered witness confidence illustrated that the codes were moderately, positively, and significantly correlated with participants' numeric assessments of remembered witness confidence, $r(651) = 0.44$, $p < 0.001$. Table 2.1 displays the average numeric confidence rating participants assigned within each level of the coding scheme for the written confidence. A few responses ($N = 39$) were off topic and did not offer enough information to assign a code, and were therefore left out of analyses.

While the omnibus one-way ANOVA test using free response remembered witness confidence as the dependent variable and condition as the independent variable revealed a

significant effect, F (3, 649) = 2.64, p = 0.049, η^2 = 0.012, a follow-up Tukey test showed that the difference between the prosecution misinformation condition (M = 4.30) and prosecution + challenge condition (M = 4.08) was only marginally significant (t (650) = -2.54, p = 0.054), while the remaining comparisons were non-significant.

Verdict

To test whether the verdict differs by misinformation condition, a chi-square test was conducted on misinformation condition (jury misinformation, prosecution misinformation, prosecution + challenge, control) and verdict (guilty, not guilty). While results only reached marginal significance, χ^2 (3, N = 627) = 7.41, p = 0.06, Cramer's V = 0.11, the pattern of results shows that participants who received misinformation – in the jury misinformation condition or the prosecution misinformation condition – had higher rate of guilty verdicts compared to the control condition or prosecution + challenge condition (see Figure 2.3). In fact, when combining these two misinformation conditions, the results show a significant effect of misinformation on participants' verdicts χ^2 (2, N = 627) = 7.19, p = 0.027, Cramer's V = 0.11. Specifically, while roughly 41% of participants in the control group rendered a guilty verdict, this number increases to 48% in the jury misinformation condition and 50% in the prosecution misinformation condition. Interestingly, the effect of a juror challenging the prosecutor's misinformation seemed to have a boomerang effect – guilty ratings in the prosecution + challenge condition decreased to 36%, a rate lower than that of the control group.

Verdict Confidence

Participants were overall moderately confident in their verdict (M = 73.15). A one-way ANOVA using misinformation condition (jury misinformation, prosecution misinformation, prosecution + challenge, control) as the independent variable and verdict confidence as the

dependent variable revealed that condition did not impact participants' confidence in their verdicts, F (3, 623) = 1.38, p = 0.25, η^2 = 0.0066. As in Study 1, participants who rendered a guilty verdict were more confident in their verdict decision (M = 80.17) than participants who rendered a not guilty verdict (M = 67.63), t (625) = 7.85, p < 0.001, d = 0.63, 95%CI [0.47, 0.79]. This is a moderate-to-large effect size according to conventional benchmarks (Cohen, 1988).

To explore how participants' perceptions of the attorneys' arguments influenced their verdict confidence, a one-way ANOVA was conducted with participants ratings of the strength of the attorneys' arguments as the independent variable (defense had a stronger argument, prosecution had a stronger argument, they had equally strong arguments) and verdict confidence serving as the dependent variable. As in Study 1, results showed that participants' perceptions of which side had a stronger argument in the trial significantly impacted their confidence in their verdicts, F (2, 624) = 30.34, p < 0.001, η^2 = 0.089, 95%CI [0.049, 0.13]. A post-hoc Tukey test revealed that all three groups differed significantly from each other, ps < 0.001. Specifically, participants who felt the prosecution had a stronger argument had the highest level of confidence in their verdict (M = 80.02), followed by participants who felt that the defense had a stronger argument (M = 72.27), with participants who felt that both sides had equally strong arguments having the lowest level of confidence in their verdicts (M = 64.58). These results are similar to those of Study 1, in that participants who felt that both the prosecution and defense presented equally strong arguments had lower confidence compared to participants who felt either the prosecution or defense had a stronger argument. However, departing from the pattern seen in Study 1, participants who felt that the prosecution had a stronger argument were significantly more confident compared to those who felt that the defense had a stronger argument.

This led to the next analysis, which explores whether there was an interaction between participants' verdicts and their perception of the strength of the attorney's arguments on participants' verdict confidence. A 2 (verdict: guilty, not guilty) x 3 (argument: defense was stronger, prosecution was stronger, they were equally strong) ANOVA with verdict confidence as the dependent variable revealed a significant interaction effect, F (2, 621) = 8.84, $p < 0.001$, $\eta_p^2 = 0.028$, 95%CI [0.0067, 0.056]. Notably, a follow-up Tukey test showed that, while verdict confidence did not differ between guilty and not guilty verdicts for those who felt that the defense had a stronger argument, nor for those that felt that the arguments were equally strong, there was difference for those that felt that the prosecution had a stronger argument. Specifically, for those who thought that the prosecution had a stronger argument, those who rendered a guilty verdict were significantly more confident in their verdict (M = 83.15) than those who rendered a not guilty verdict (M = 58.13), t (624) = 6.68, p < 0.001.

To examine how participants' perceptions of the other jurors influenced their verdict confidence, a one-way ANOVA was conducted with participants' ratings of how they felt the other jurors were leaning in jury deliberation as the independent variable (most jurors thought he was guilty, most jurors thought he was not guilty, it was about equally split) and verdict confidence serving as the dependent variable. As in Study 1, the results showed that participants' confidence in their verdicts did not significantly differ depending on how they perceived the jurors leaning during jury deliberation, F (2, 624) = 0.12, $p = 0.89$, $\eta^2 = 0.00038$.

Perceptions of the Eyewitness

Overall, participants perceived the witness as moderately credible (M = 75.94) and moderately accurate (M = 75.04). To test whether the misinformation condition impacted how the participants perceived the witness, a one-way ANOVA was conducted using misinformation

condition (jury misinformation, prosecution misinformation, prosecution + challenge, control) as the independent variable and witness credibility as the dependent variable. Results showed that misinformation condition did not significantly affect participants' ratings of witness credibility, F (3, 623) = 1.68, p = 0.17, η^2 = 0.008. A second one-way ANOVA was conducted on perceived witness accuracy, using misinformation condition as the independent variable, again finding that there was not a significant effect of misinformation condition on participants' perception of the witness' accuracy, F (3, 623) = 1.50, p = 0.21, η^2 = 0.007.

Perceptions of the Trial

Participants were asked to report, in their view, whether the prosecution presented a stronger argument, the defense presented a stronger argument, or whether they presented equally strong arguments. Overall, most participants felt that the prosecution had a stronger argument (38%), followed by the defense (35%), and finally followed by both sides having equally strong arguments (27%).

To explore whether jurors' perception of the strength of the attorneys' arguments in the case differed by misinformation condition, a 4 (condition: jury misinformation, prosecution misinformation, prosecution + challenge, control) x 3 (perception: pro-prosecution, pro-defense, equal) chi-square was conducted. The results showed that perceptions of the attorney's arguments did not differ significantly by condition, χ^2 (6, N = 627) = 5.38, p = .50. The effect size for this finding, Cramer's V, was conventionally very small at 0.066 (Cohen, 1988).

Perceptions of the Jurors

Participants were asked a series of questions about the jurors in the jury deliberation transcript. Overall, most participants felt that jurors were equally split in their beliefs about the defendant's guilt (49%), while some felt that most jurors thought the defendant was guilty

(39%), and few felt that most jurors thought the defendant was not guilty (12%). Participants overall perceived the other jurors in jury deliberation as being moderately smart (M = 73.10), having a decent memory (M = 74.95), and rated jurors at about average when asked how easily they give into the pressure of others (M = 54.79). Note the large standard deviations accompanying these measures, indicating quite a lot of variability in responses.

In order to explore whether source of misinformation exposure influenced participants' perceptions of the jurors, three separate one-way ANOVAs were conducted, using participants' perception of how smart the jurors are, how good of memory the jurors have, and how easily jurors give into pressure as the dependent variables and misinformation condition as the independent variable. All three ANOVAs were nonsignificant (F (3, 623) = 0.45, p = 0.72; F (3, 623) = 0.60, p = 0.61; F (3, 623) = 0.43, p = 0.73, respectively).

In order to examine whether misinformation condition influenced participants' perception of how the jurors in jury deliberation were leaning in the case. A 4 (condition: jury misinformation, prosecution misinformation, prosecution + challenge, control) x 3 (perception: pro-prosecution, pro-defense, equal) chi-square was conducted. The results showed that perceptions of how the jurors were leaning in the case did not differ significantly by condition, χ^2 (6, N = 627) = 6.40, p = .38. The effect size for this finding, Cramer's V, was conventionally very small at 0.071 (Cohen, 1988).

The next set of analyses explored the association between participants' verdicts and their perception of the other jurors in jury deliberation. Three separate t-tests were conducted using verdict as the grouping variable and the measures of perception of the jurors as the outcome variables (how smart the jurors are, how good of a memory they have, and how easily they give into pressure). Participants' ratings of how good of a memory the jurors have differed

significantly depending on the verdict decision given, t (625) = -2.57, p = 0.01. Specifically, participants who rendered a guilty verdict rated the jurors as having a better memory (M = 77.02) than participants who gave a not guilty verdict (M = 73.31). The other two measures of perceptions of the jurors were not significant (for how smart: t (625) = -1.78, p = 0.076; for giving into pressure: t (625) = -1.12, p = 0.26).

Next, to examine whether participants' verdict was associated with participants' perception of how the jurors in jury deliberation were leaning in the case, a 2 (verdict: guilty, not guilty) x 3 (perception: pro-prosecution, pro-defense, equal) chi-square was conducted. The results showed that participants' perceptions of how the jurors were leaning in the case differed depending on participants' verdict decision, χ^2 (2, N = 627) = 31.37, $p < 0.001$. As seen in Table 2.2, while the percent of participants who felt that jurors were equally split in opinions is similar for those who gave a guilty and not guilty verdict (51.45% and 51.28%, respectively), participants' perceptions differ for the other opinions. In particular, for participants who rendered a not guilty verdict, after accounting for those who thought the jurors were equally split, more participants felt that most jurors were leaning pro-prosecution (33.91%) then that most were leaning pro-defense (16.81%). For participants who rendered a guilty verdict, the pattern is the same but the magnitude changes. Again, for this group, after accounting for those who felt that the jurors were equally split, most participants felt that most jurors were leaning toward the prosecution (44.93%). Only 3.62% of participants who rendered a guilty verdict felt that most jurors were leaning toward the defense.

Retrospective Detection

When participants were fully debriefed and thus were told the true nature of the study, they were asked whether they believe they received misinformation. Of participants in the

control condition, 66.89% correctly reported only receiving correct information. Of participants who were in one of the misinformation conditions, 11.97% correctly reported that they received misinformation – 13.73% in the jury misinformation condition, 11.32% in the prosecution misinformation condition, and 10.98% in the prosecution + challenge condition. Interestingly, even though misinformation was pointed out to the participants in the prosecution + challenge condition, this did not increase the number of detectors in this group. Participants were also asked whether they believed they received misinformation that stated the witness was more or less confident (note that in this study all misinformation conditions used the high confidence misinformation). Of the participants in one of the misinformation conditions who reported receiving misinformation,, 57.14% (32 of 57 participants) correctly reported that they received misinformation that misstated the witness's confidence as higher than the witness stated in trial – 76.19% (16 of 21 participants) in the jury misinformation condition, 50.00% (9 of 18 participants) in the prosecution misinformation condition, and 38.89% (7 of 18 participants) in the prosecution + challenge condition.

Discussion

Study 2 investigates whether jurors are more likely to incorporate misinformation based on the source. It was hypothesized that, because the judicial system is adversarial by nature, jurors may be less likely to believe misinformation when it comes from an attorney in the case, such as the prosecution or defense, as compared to coming from another juror in the case. This hypothesis was not supported. The results illustrated no significant difference between the jury misinformation condition and the prosecution misinformation condition. In fact, the high confidence misinformation evidently did not impact participants' ratings of the eyewitness' confidence in Study 2. This result was surprising in its conflict with Study 1 results, which found

that participants exposed to high confidence misinformation from a juror rated the witness as more confident compared to participants who were exposed to low confidence misinformation. Study 2 did not replicate this finding when comparing the jury misinformation condition to the control condition, which showed no difference in ratings of remembered witness confidence. The lack of replication of this finding could be due to the change in the wording of the misinformation item. In Study 1, the high confidence misinformation stated that the witness was *very confident*, while, in Study 2, the misinformation stated that the witness was *highly confident*. The change in the misinformation phrase was intended to increase the misinformation effect – *highly confident* was selected with the idea that it was a higher level of confidence than *very confident.* The findings in Study 2 suggest that this is not the case.

The difficult process of selecting the verbal confidence statements to be used in these studies highlighted the subjective nature of verbal confidence. A statement of confidence to one person, such as *highly confident* may be perceived differently by another. It is possible that the change in confidence statement from Study 1 to Study 2 actually decreased the perceived confidence level. Another possibility is that the statement *very confident* is a more specific description of confidence – most people would agree that *very confident* would fall on the high end of the confidence spectrum. In contrast, *highly confident* may capture a wider range of confidence – someone may be highly confident at 70% but also at 100%. This range may overlap more with the original confidence statement – someone who is *pretty confident* may be perceived as highly confident by some. Therefore, this piece of misinformation may not actually be misinformation to some participants.

However, while misinformation condition did not influence reports of remembered witness confidence, the results show that the misinformation condition may be influencing the

verdict. As seen in Figure 2.3, participants in the jury misinformation and prosecution misinformation conditions arrive at more guilty verdicts compared to the control group. This is consistent with the pattern seen in Study 1. Interestingly, in the prosecution + challenge condition, percent of guilty verdicts decreased to a level below that of the control group. This finding shows that participants were receptive to the misinformation in their decision-making. Further, participants who saw the prosecutor being called out for stating misinformation not only rejected the misinformation in their decision-making, but seemed to display further distrust or distaste toward the prosecution's case.

Study 2 did find that participants' own verdicts were significantly associated with how confident they perceived the witness to be – participants who decided on a guilty verdict reported the witness being more confident than participants who decided on a not guilty verdict. This finding replicates that of Study 1. It is possible that this finding is the result of confirmation bias – participants who already believe that the defendant is guilty may be perceiving the witness to be more confident since this aligns with their opinion in the case. On the other hand, perhaps participants who perceive the witness to be more confident are more persuaded by the witness testimony, and this sways them to render a guilty verdict in the case.

The results of the current study are consistent with findings in the literature on misinformation and the role of post-misinformation warnings. Research examining the effect of post-warnings when the warning is specific in identifying the misinformation item have been shown to be effective in mitigating the misinformation effect (Wright, 1993). In the current study, the prosecution + challenge does essentially that: the juror points out that the prosecutor distorted the eyewitness's confidence level to be higher than the witness reported in the trial. This specific post-warning resulted in participants resisting that piece of misinformation, an

effect that is illustrated by the diminished guilty verdicts in the prosecution + challenge condition.

Interestingly, the data on retrospective detection in Study 2 show that participants in the prosecution + challenge condition did not report receiving misinformation at a higher rate than other participants, even though the misinformation was pointed out to them. While this was somewhat surprising, it is likely that participants did not categorize the misinformation as exactly that; rather, participants may have believed that the misinformation was simply an exaggeration tactic used by the prosecution. Moreover, the overall data on retrospective detection show that participants in Study 2 detect the misinformation at half the rate as in Study 1 (11.9% in Study 2 compared to 20.7% in Study 1). This supports the notion that the phrase *highly confident* may not truly be misinformation for some participants, as compared to the phrase *very confident*.

The discrepancy in findings from Study 1 to Study 2 based on a difference in one word in the confidence statement raises a question about perception of verbal confidence. Discussions about the selection of the confidence statements used in the trial as well as in the misinformation, alongside discussions regarding coding participants' free response remembered witness confidence, indicated a need for investigating how common confidence statements are perceived in a criminal case setting. Study 3 aims to explore this issue.

Study Three

Method

Overview and Purpose

While changing the misinformation phrase from *very confident* in Study 1 to *highly confident* in Study 2 was intended to increase the misinformation effect, it seemed to have the opposite effect – a finding that highlighted the variable nature of verbal confidence. This surprising finding emphasized a need for understanding how individuals interpret commonly used confidence phrases. Prior studies have established that humans may be more inclined toward expressing confidence using words rather than numbers, citing that verbal expressions come more naturally than numeric ones (Smalarz et al., 2021; Windschitl & Wells, 1996). However, verbal expressions of confidence have also been found to be more ambiguous and widely interpreted than numeric expressions (Renooij & Witteman, 1999). This notion seemed to come to light both in the selection of confidence phrases for Study 1 and 2, as well as in developing the coding scheme for the free response remembered witness confidence in both studies.

The purpose of Study 3 was twofold: First, the study intended to decipher whether the different pattern of results from Study 1 to Study 2 was due to the change in the misinformation phrase *very confident* to *highly confident*. Holding case details constant and varying the confidence phrase would allow a direct comparison between the two confidence phrases. In Study 3, involving a rather different experimental design, the two phrases can be directly compared in terms of their influence on verdicts and perceptions of an eyewitness.

A second aim of Study 3 was to explore jurors' perception of commonly used eyewitness confidence expressions. Previous research examining verbal expressions of eyewitness

confidence have found much interpersonal variation in interpretations of verbal confidence statements. These studies have found that mock jurors' interpretations are influenced by how eyewitnesses justify their identification decision (e.g., "I remember his nose") as well as by contextual knowledge about the identification (e.g., whether the witness chose the suspect or a filler; Dodson & Dobolyi, 2015; Grabman & Dodson, 2018). Research outside of the eyewitness domain shows that individuals are widely inconsistent in their perceptions and interpretations of certainty judgments (e.g., Budescu & Wallsten, 1985) Moreover, consistency in interpretations does not seem to improve even when individuals have familiarity with the area of judgment (Beyth-Marom, 1982; Nakao & Axelrod, 1983). Accurately interpreting eyewitness confidence is imperative within the criminal justice system, as many decisions regarding legal proceedings are strongly influenced by this one piece of evidence. For example, if a witness expresses low confidence in their identification, this may affect how law enforcement personnel proceed in the investigation, how attorneys structure their arguments, and how plea recommendation may be made. Ambiguous verbal expressions of confidence may affect the decision-making, depending on how the evaluator (e.g., police officers, jurors, attorneys) interprets the confidence level.

Verbal expressions of confidence have become a practically significant topic, especially since the latest guidelines on collection and preservation of eyewitness evidence put forth by a special committee of the American Psychology-Law Society recommended using either a numeric scale (0-100) or a graded verbal scale for collecting eyewitness confidence evidence – for example, a scale containing words such as, "positive", "probably", "maybe" is suggested in the guidelines (Wells et al., 2020). It should be noted that there is no current empirical evidence supporting graded verbal scales as a superior mode of confidence collection, nor is there a specific agreed upon graded verbal scale in the field. The results of Study 3 could provide an

overall picture of how some commonly used phrases are interpreted, independent of the intended confidence level. This can provide further understanding of how free response confidence statements (e.g., "In your own words, how confident are you?") are interpreted as well as provide insight towards how a graded verbal scale may be constructed. Additionally, through varying the confidence phrase used in the case summary, Study 3 allows exploration of how perceptions of verbal confidence expressions may influence subsequent judgements in the case, such as the likelihood of the defendant's guilt, verdict in the case, and perceptions of the eyewitness's accuracy, credibility, and view during the crime.

Participants

Jury-eligible participants were recruited via Cloud Research and were directed to participate in the study via Qualtrics. Nine hundred and five participants completed the study; six participants were removed for withholding their data following debriefing and two participants were removed for failing the attention check, leaving a final sample of 897.

The sample was mostly female (66.8%) and White/Caucasian (76%) with an average age of 42 years (SD = 13.7). Almost all participants reported being U.S. Citizens (98.4%). For political affiliation, participants mostly identified as Democrat (40.5%), followed by Independent (25.8%) and Republican (25%). Most participants had never served on a jury before (80.7%), never been a witness to a crime (65.6%), never been convicted of a crime (92.3%), and about half of participants reported having been a victim of a crime (49.6%).

Materials

Case summary. The event used in Studies 1 and 2 was condensed into a brief summary of the crime and identification (see Appendix E). The case summary explained that Henry Potter was robbed while working at the front desk of a hotel, and that Henry was brought into the police

station to view a six-person photo lineup to see if the perpetrator was present in the photos. In the summary, Henry identifies one of the photos and the officer asks, “How confident are you?”. Nine versions of the case summary were created, each of which differed in the confidence statement that Henry gives, while all other details were held constant. The confidence statements included are seen in Table 3.1.

Procedure

After providing informed consent, participants were informed that they would be reading a case summary of a crime and would be asked to render a verdict on the case. Participants were randomly assigned to one of the nine confidence conditions, which determined which case summary they would read. Following the case summary, participants entered a retention interval in which they were asked innocuous questions, including attention check questions. The purpose of this was to provide a retention interval similar to the period of time separating the trial from the verdict and eyewitness perception questions in Studies 1 and 2. Next, participants reported the likelihood that the defendant was guilty on a 0-100 sliding scale, along with rendering a guilty or not guilty verdict and reporting how confident they are in their verdict decision. Following the verdict, participants were asked questions about the eyewitness. These questions included asking participants to report, on a 0-100 sliding scale, how confident the witness was in his identification. They were also asked which specific phrase the witness used to express his confidence level, with the nine confidence statements available as answers. Participants also answered questions about, in their view, how accurate the witness’ identification was, how good of a view the witness got of the perpetrator, and how credible the witness was, each on a 0-100 sliding scale. Finally, participants were asked demographic questions and were fully debriefed.

Hypotheses

Study 3 aims to differentiate between perceptions of the confidence statements used in Study 1 and 2. It is predicted that *very confident* will be rated higher on the numeric scale compared to *highly confident*. Further, *highly confident* will likely not significantly differ from *pretty confident*, supporting the notion from Study 2 that the perception of *highly confident* overlaps with that of the original confidence statement from the trial, *pretty confident*.

While the purpose of Study 3 is partially exploratory, it is hypothesized that participants who read the case summaries with commonly "high confidence" statements (e.g., *very confident, highly confident, quite confident*) would rate the eyewitness as being more confident compared to those who read the case summaries with commonly "low confidence" statements (e.g., *not confident, not very confident*). This pattern will remain for participants' ratings of the eyewitness's accuracy, credibility, and how good of a view the witness got of the perpetrator. Similarly, it is predicted that the commonly high confidence statements will result in a higher rate of guilty verdicts and a higher rating of the likelihood of the defendant's guilt compared to the commonly low confidence statements. Based on the findings of Studies 1 and 2, it is also predicted that participants who render a guilty verdict will be more confident in their verdict decision compared to participants who render a not guilty verdict.

Results

Eyewitness Confidence

The average confidence ratings for each of the eyewitness confidence phrases can be seen in Figure 3.1. It is clear that the participants were attentive to the eyewitness confidence statement, with high confidence phrases such as *confident* and *very confident* hovering just below 90% confidence, and low confidence phrases such as *not very confident* and *not confident*

hovering around 25% confidence, with moderate phrases such as *somewhat confident* falling at 60% confidence.

Although I predicted that *very confident* would be rated higher than *highly confident,* and that *pretty confident* would not differ from *highly confident*, this result did not occur. A one-way ANOVA using condition (very, highly, pretty) as the independent variable and witness confidence as the dependent variable revealed a significant effect of condition on reported witness confidence, F (2, 303) = 17.20, $p < 0.001$, $\eta^2 = 0.10$. A follow up Tukey test showed that participants who saw *pretty confident* rated the witness as significantly less confident (M = 76.58) compared to those who saw *very confident* (M = 89.36; t (204) = -5.47, $p < 0.001$) and compared to those who saw *highly confident* (M = 87.17; t (203) = -4.52, $p < 0.001$). Notably, the reported witness confidence did not significantly differ between participants who saw *very confident* and *highly confident*, t (199) = 0.92, $p = 0.63$.

Participants were also asked to select the exact phrase that the witness used to describe his confidence, with the nine confidence phrases as answer options. Participants' accuracy in selecting the confidence phrase from the condition they were assigned to is displayed in Table 3.1. Notably, participants' accuracy in remembering the exact confidence phrase used ranged from 49% to 81%. These results indicate that, while participants were attentive to the general level of confidence conveyed by the eyewitness – illustrated by the pattern of average confidence ratings seen in Figure 3.1 – the participants were not retaining the exact confidence phrase used by the witness.

Perceptions of the Eyewitness

The next hypotheses posited that, not only would participants in conditions with commonly known high confidence phrases would rate the witness as more confident than

participants in conditions with commonly low confidence phrases, but also that this pattern would remain for ratings of the witness' goodness of view, accuracy, and credibility. The pattern of means is shown in Figure 3.2, broken down by each variable within the composite variable. The data indicated that these three outcome variables – goodness of view, accuracy, and credibility – were significantly correlated (see Table 3.2). Therefore, these three variables were combined to create a composite variable that represented the participants' perception of the eyewitness. A one-way ANOVA was conducted using confidence condition as the independent variable and the eyewitness perception composite variable as the dependent variable. The results showed that confidence condition significantly impacted the participants' perception of the eyewitness F (8, 896) = 28.66, $p < 0.001$. A post-hoc Tukey test was used to probe the significant omnibus test. Those who saw the phrase *very confident* (M = 69.65) did not significantly differ from those who saw the phrase *highly confident* (M = 67.64) in their perceptions of the witness, t (199) = 0.68, p =0.99. Unexpectedly, participants who saw *pretty confident* (M = 63.82) did not significantly differ from those who saw *very confident* (t (204) = -1.99, p = 0.55) or those who saw *highly confident* (t (203) = -1.30, p = 0.93). Of note, the two low confidence phrases (*not confident* and *not very confident*) differed significantly on the composite variable from each of the other seven confidence phrases (see Table 3.3). This indicates that eyewitness confidence informed participants' perceptions of the eyewitness' accuracy, credibility, and goodness of view of the perpetrator.

Verdict and Perception of Guilt

Participants' judgments and decision-making in the case were assessed by a continuous measure of the likelihood of the defendant's guilt (on a 0-100 scale) as well as by a dichotomous verdict (guilty or not guilty). Overall, the verdict decision was almost exactly split, with 49.05%

of participants rendering a not guilty verdict and 50.95% rendering a guilty verdict. As in Studies 1 and 2, an independent means t-test revealed that participants who rendered a guilty verdict were significantly more confident in their verdict (M = 68.19) than were participants who gave a not guilty verdict (M = 56.08), t (895) = -8.03, $p < 0.001$. Meanwhile, participants' confidence in their verdict decision was not impacted by the confidence phrase condition, F (8,888) = 1.33, p = 0.22, $\eta^2 = 0.012$.

Next, a one-way ANOVA using confidence condition as the independent variable and likelihood of guilt as the dependent variable revealed that participants' ratings of the defendant's guilt differed significantly by confidence condition, F (8, 888) = 20.18, $p < 0.001$, $\eta^2 = 0.15$. A post-hoc Tukey test demonstrated that participants who saw the phrase *very confident* did not significantly differ in ratings of the likelihood of the defendant's guilt from participants who saw the phrase *highly confident*, t (199) = 0.28, p = 1.0. Further, those who saw *pretty confident* did not differ from those who saw *very confident* (t (204) = -1.98, p = 0.56) or *highly confident* (t (203) = -1.69, p = 0.75). The follow-up test also indicated that the two low confidence phrases (not confident and not very confident) differed significantly from each of the other phrases (see Table 3.4).

Additionally, participants' verdict decisions are broken down by condition in Figure 3.4. To assess the dichotomous verdict variable, a 2 (verdict) x 9 (confidence condition) chi-square was conducted. The results showed that the confidence phrase that participants were exposed to significantly impacted the verdict rendered, χ^2 (8, N = 897) = 92.48, $p < 0.001$. The effect size for this finding, Cramer's V, was conventionally very large at 0.32 (Cohen, 1988). Notably, while 48.57% of participants who saw the phrase *pretty confident* rendered a guilty verdict,

62.38% of participants who saw *very confident* and 73.00% of those who saw *highly confident* delivered a guilty verdict.

Discussion

The main purpose of Study 3 was to further explore verbal expressions of confidence. In particular, Study 3 sought to understand how commonly used confidence phrases are understood by laymen, and, as a result, gauge whether the confidence phrases used in Studies 1 and 2 achieved what they intended to. It is clear that participants were attentive to the confidence level. In Study 3, the only difference between conditions was the confidence phrase spoken by the witness. This difference between conditions affected participants' perception of the eyewitness' accuracy in his identification, credibility as a witness, and goodness of view of the perpetrator during the crime. Moreover, the difference in confidence phrase affected participants' perceptions of the likelihood that the defendant was guilty, as well as verdict in the case. This finding provides one example of how changing one element of the eyewitness' testimony can influence jurors' perceptions and decision-making.

Further, the results from Study 3 help to understand the results of Studies 1 and 2. Specifically, while the intention of the misinformation ("highly confident") in Study 2 was to increase the magnitude of the misinformation effect, the confidence phrase selected was unsuccessful in doing so. Results of Study 3 demonstrate that *highly confident* does not reflect a higher level of confidence than *very confident*. These two confidence phrases did not differ statistically in the perceptions of confidence, perceptions of the witness, or in perceptions of the likelihood that the defendant is guilty. Interestingly, it seems that *highly confident* may even be a more memorably phrase than *very confident*, with more participants accurately identifying that as the confidence phrase used by the witness compared to *very confident*.

Study 3 also offers a broader purpose in understanding how common confidence phrases are understood. In the recent guidelines for collecting and preserving eyewitness evidence, Wells et al. (2020) recommended graded verbal scales for the collection of eyewitness confidence. While the intention of this is unclear, results from the current study signal that creating a graded verbal scale with a universal underlying spectrum of confidence may prove difficult. The data discussed here confirm that verbal confidence phrases are widely interpreted, with each of the phrases exhibiting a standard deviation between 14 and 25. Even when only looking at participants who accurately identified the confidence phrased used, the standard deviations remain between 11 and 19. However, this study does offer a step towards developing a general rank-ordering of these commonly used confidence phrases. When looking at the means and medians of the reported confidence level by confidence phrase conditions, there is a consistent ordering of the confidence phrases, as depicted in Table 3.1. This provides some suggestion that an agreed upon scale is possible – however, it should be noted that perception of what those scale points mean will likely differ between individuals.

General Discussion

The aim of the current research was to explore a scenario in which mock jurors receive misinformation in the form of erroneously reported statements about the confidence of an eyewitness. In Study 1, after the witness stated in court that he was *pretty confident* in his identification, a juror in jury deliberation either mistakenly stated that the witness was *very confident* (high confidence misinformation) or *not very confident* (low confidence misinformation). Participants who were exposed to the high confidence misinformation reported remembering the witness as significantly more confidence than did participants who were exposed to the low confidence misinformation. This finding suggests that jurors' memories for verbal confidence statements can be distorted.

Study 2 sought to expand this finding, exploring whether the source of misinformation impacts participants' susceptibility to the misinformation. In this study, the misinformation was either spoken by a juror or by the prosecutor. A third condition involved the prosecutor stating the misinformation, and a juror discrediting that misinformation during jury deliberation. While the second study did not replicate the results of the first study – Study 2 showed no misinformation effect for the remembered witness confidence – the results demonstrated that the misinformation did affect participants' verdicts. Specifically, while participants in the jury misinformation and prosecution misinformation showed an increase in guilty verdicts compared to the control: participants in the misinformation + challenge condition showed a rate of guilty verdicts below that of control. This indicates that the juror pointing out the misinformation spoken by the prosecution signaled a lack of agreement or trust for the prosecution.

The disparate findings in remembered witness confidence between Study 1 and Study 2 may be attributed to the different misinformation phrase used. While the high confidence phrase

in Study 1 was *very confident*, the phrase in Study 2 was *highly confident*. This change in misinformation phrase was intended to increase the magnitude of the misinformation effect – *highly confident* was thought to be a higher level of confidence than *very confident*. This was evidently not the case. One possible explanation is that *highly confident* contains a wider range on the confidence scale, while *very confident* sits more narrowly on the top end of the scale. Therefore, *highly confident* could conceivably overlap with the correct level of confidence, *pretty confident*, making this statement not truly misinformation. Study 3 indicated that, in fact, *highly confident* was not rated as a higher level of confidence than *very confident*. Further, the distribution of confidence ratings indicates that both phrases occupy similar territory on the confidence scale – *very confident* was rated at an average of 89% with a standard deviation of 16, while *highly confident* was rated at an average of 87% with a standard deviation of 15.

Another possible explanation hinges on the obtrusiveness of the confidence phrase. Previous research has illustrated that people are more likely to resist misinformation when that misinformation is blatant (Loftus, 1979). According to the discrepancy detection principle (Tousignant et al., 1986), resistance to misinformation relies on an individual's ability to detect a discrepancy between the original memory and the misinformation. This is more likely to occur if the misinformation is more obvious. It is possible that the misinformation in Study 2 was more obvious to the participants, and therefore more participants were able to reject the misinformation. The data in Study 3 lean toward this hypothesis, with more participants accurately identifying *highly confident* as the phrase used in trial (76%) than participants able to accurately identify *very confident* as the phrase used in trial (59%). This distinction points to *highly confident* being a more memorable phrase to use. However, retrospective detection data indicate that fewer participants detected the presence of misinformation with the use of *highly*

confident in Study 2 (11%) compared to those who detected misinformation with the use of *very confident* in Study 1 (20%). This explanation is therefore not likely the driving effect behind the contrasting results in Studies 1 and 2.

The findings presented here indicate that jurors' memories for eyewitness confidence can be distorted by misinformation. The use of verbal eyewitness confidence presents the opportunity for various legal players to paraphrase the witness' words, and unintentionally distort the level of confidence. In the current studies, only three paraphrased scenarios were presented – *pretty confident* being distorted into *not very confident*, *very confident*, or *highly confident*. However, the phrasing options are boundless. The first study took a conservative approach to the misinformation, aiming for misinformation that 1) was not so blatantly obvious that it was rejected and 2) could be mirrored with a high confidence and low confidence phrase. The second study attempted to increase the magnitude of misinformation, but likely unintentionally decreased its strength. It is possible for more dramatic distinctions between the original confidence level and the paraphrased confidence level to be established. For instance, the two independent coders who coded the free response remembered witness confidence showed a 70% agreement rate in Study 1 and a 90% agreement rate in Study 2. This means that, in Study 1, 30% of the time the two coders were interpreting the same phrase to mean two different levels of confidence. For a layperson, who has not been thinking about expressions of verbal confidence extensively (as had the independent coders by the end of coding), one may not even consider that their interpretation of the confidence statement may differ from the eyewitness' intended level, or a fellow jurors' interpreted level. This creates the opportunity for more substantial rifts between the original confidence level and the paraphrased confidence.

These studies also brought to light the possibility that a small change in wording can impact the outcome of the trial – when changing *pretty confident* to *highly confident*, the proportion of guilty ratings increased by 6-8%. While this may seem inconsequential, consider the fact that changing one word can alter the decision-making of even one juror. In a criminal trial, jurors' verdicts must be unanimous in order to convict in both state and federal courts (*Ramos v. Louisiana*; Rule 31(a) Federal Rules of Criminal Procedure). Imagine a scenario in which this distorted confidence level in the form of changing one word is the factor that pushes a juror either toward or away from a guilty verdict. That juror has the potential to sway the outcome of the case.

There are some limitations to the current studies. First, all three studies were conducted online using MTurk participants via Cloud Research. This presents the possibility that the sample may be less attentive in the online setting compared to an in-person sample. However, research has shown that data collected from MTurk participants is highly similar to the results collected from in person, convenience samples (Irvine, Hoffman, & Wilkenson-Ryan., 2018). Further, this research has indicated that MTurk samples tend to be highly attentive. In fact, this is bolstered by the use of attention check questions in the current research – only 12% of participants in Study 1, 7% in Study 2, and 0.2% in Study 3 were removed for failing the attention check questions. Moreover, the qualitative data collected indicated that participants were engaging deeply with the content of the study.

The online format of these studies does deviate from applicable real-world scenario, however, in that participants in the current studies are reading through the trial and jury deliberation rather than listening to the words spoken. This differentiation is especially important considering the focus on verbal confidence, which may be impacted largely by tone of voice.

The tone used when speaking one's confidence level may be critical in understanding the intended meaning, and without the context of tone, the verbal confidence statements may lose some of the nuance and richness of the intended confidence (Erickson, Lind, Johnson, & O'Barr, 1978). However, the application of written verbal confidence statements is still relevant in legal proceedings. The movement to protect eyewitness evidence includes diligent documentation of each step, including documenting the eyewitness confidence level immediately (Wells et al., 2020). The guidelines for documenting the confidence recommend that the lineup administrator immediately record the witness's confidence in their "own words" (Technical Working Group on Eyewitness Evidence, 1999; U.S. Department of Justice, 2017). This documented confidence is then scrutinized by law enforcement personnel, attorneys, judges, and jurors through the investigation and trial process. The recorded confidence statement is also often brought forth in trial. Therefore, while the original statement of verbal confidence may have included context in the tone of voice used, that richness is lost as the confidence statement is passed through the trial process. Hence, the written confidence statement used here is not totally divergent from a real-world trial scenario.

Conclusion

The criminal justice system, and as a result, the field of legal psychology, has shown increased attention toward verbal expressions of eyewitness confidence. While the movement in support of using verbal confidence is focused on the abilities of an eyewitness to express their inner confidence, as well as in documenting that confidence, the use of these expressions leaves room for distortion when verbal confidence is perceived by various legal players. While it is less likely to happen with numeric confidence, verbal confidence presents the opportunity for legal players to paraphrase the confidence level and therefore unintentionally skew the intended

confidence. Moreover, the data presented here illustrate that, even without paraphrasing or misinformation, the perceived level of confidence for the same verbal expression may vary widely between individuals. Future research should be dedicated to understanding the way in which we communicate and perceive verbal expressions of eyewitness confidence in the criminal justice system. The present studies indicate that misinformation about the eyewitness' confidence level may impact jurors' memories for the eyewitness' confidence and may ultimately affect jurors' decision-making in the case. In a system that relies on unanimous verdict decisions in order to convict, changing the decision-making of one juror may have crucial consequences.

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Appendix A

Verdict Questions

You are now asked to decide a verdict for the defendant, Samuel Williams. You should base your decision solely on the evidence presented in the trial.

How do you find the defendant?

Guilty
Not guilty

How confident are you in your verdict decision?

0 – 100 sliding scale with 10-point increments

Appendix B

Eyewitness Perception Questions

How confident was the witness, Henry Potter, in his identification?

0 – 100 sliding scale with 10-point increments

How credible was Henry Potter?

0 (not at all credible) – 100 (completely credible) sliding scale with 10-point increments

How accurate was Henry Potter's testimony?

0 (not at all accurate) – 100 (completely accurate) sliding scale with 10-point increments

How convincing was Henry Potter's testimony?

Free response text box

How certain was Henry Potter that the photo he selected from the lineup was the man who robbed him?

Free response text box

Appendix C

Trial Perception Questions

In your view, did the prosecution or defense present a stronger argument?

Prosecution had a stronger argument
Defense had a stronger argument
They had equally strong arguments

Now, think about the other jurors in the jury deliberation transcript you read.

How smart do you feel they are?

0 – 100 sliding scale with 10-point increments

How good of a memory do you think they have?

0 – 100 sliding scale with 10-point increments

How easily do you think they give into the pressure of others?

0 – 100 sliding scale with 10-point increments

At the start of deliberation, do you think most jurors thought the defendant was guilty or not guilty?

Most jurors thought he was guilty
Most jurors thought he was not guilty
It was about equally split in the beginning

Appendix D

Funneled Debriefing – Studies 1 and 2

What did you think the study was about?
Text box

Did you notice anything strange about the study?
Yes

What did you find strange about the study?
Text box

No

Think back to the jury deliberation transcript. Did you notice anything strange about it?
Yes

What did you find strange about the study?
Text box

No

At this point, we would like to tell you more about the true purpose of the study. We were interested in how misinformation during a trial may influence juror perceptions and decision-making. In the jury deliberation phase, some participants received a transcript that only went over correct information, while some participants received a transcript that contained false information where one of the jurors misstated the eyewitness's confidence level. Which condition do you think you were in?
I received the transcript with false information

You said that you think you received the transcript with false information about the eyewitness's confidence level. Do you think the transcript suggested that the witness was more confident or less confident than the witness stated in trial?

The transcript said the witness was more confident
The transcript said the witness was less confident
I am not sure

I received the transcript with correct information
I am not sure

Appendix E

Case Summary – Study 3

Overview: *The sentences in italics reflect the confidence statements that were varied between conditions. Participants were shown one of the nine phrases listed in italics.*

Henry Potter works at the front desk of the Embassy Suites in New York City. On Friday, May 31st at 9:00 PM, a man entered the lobby while Henry was on the phone with a customer. Henry glanced at the man before turning back to the computer to complete the booking.

When he hung up the phone, Henry felt a gun pointed at the back of his head. A man said, "Give me all the money". Henry then emptied the drawer of cash and handed it over to the man.

He noticed the man was wearing a baseball hat, jeans, and a black jacket. Henry tried to pay attention to the man's face as he handed him the money and the man turned to leave the lobby of the hotel. The man fumbled with the door for a moment before running out of the hotel.

When police arrived at the hotel, Henry reported that the man was a white male in his 20's with an average build.

The next day, the police contacted Henry and asked him to come to the police station. The police officer showed Henry six photos and asked Henry if the man who robbed him was present in the photos. After viewing the six photos, Henry told the officer that he thought the one on the top right was the same man who robbed him at the hotel.

The officer asked Henry, "How confident are you?"

Henry responded, "I am pretty confident that he is the man who robbed me."
Henry responded, "I am fairly confident that he is the man who robbed me."
Henry responded, "I am very confident that he is the man who robbed me."
Henry responded, "I am highly confident that he is the man who robbed me."
Henry responded, "I am quite confident that he is the man who robbed me."
Henry responded, "I am confident that he is the man who robbed me."
Henry responded, "I am not very confident that he is the man who robbed me."
Henry responded, "I am not confident that he is the man who robbed me."
Henry responded, "I am somewhat confident that he is the man who robbed me."

The man from the photo that Henry selected, Samuel Williams, is now on trial for the robbery at the hotel.

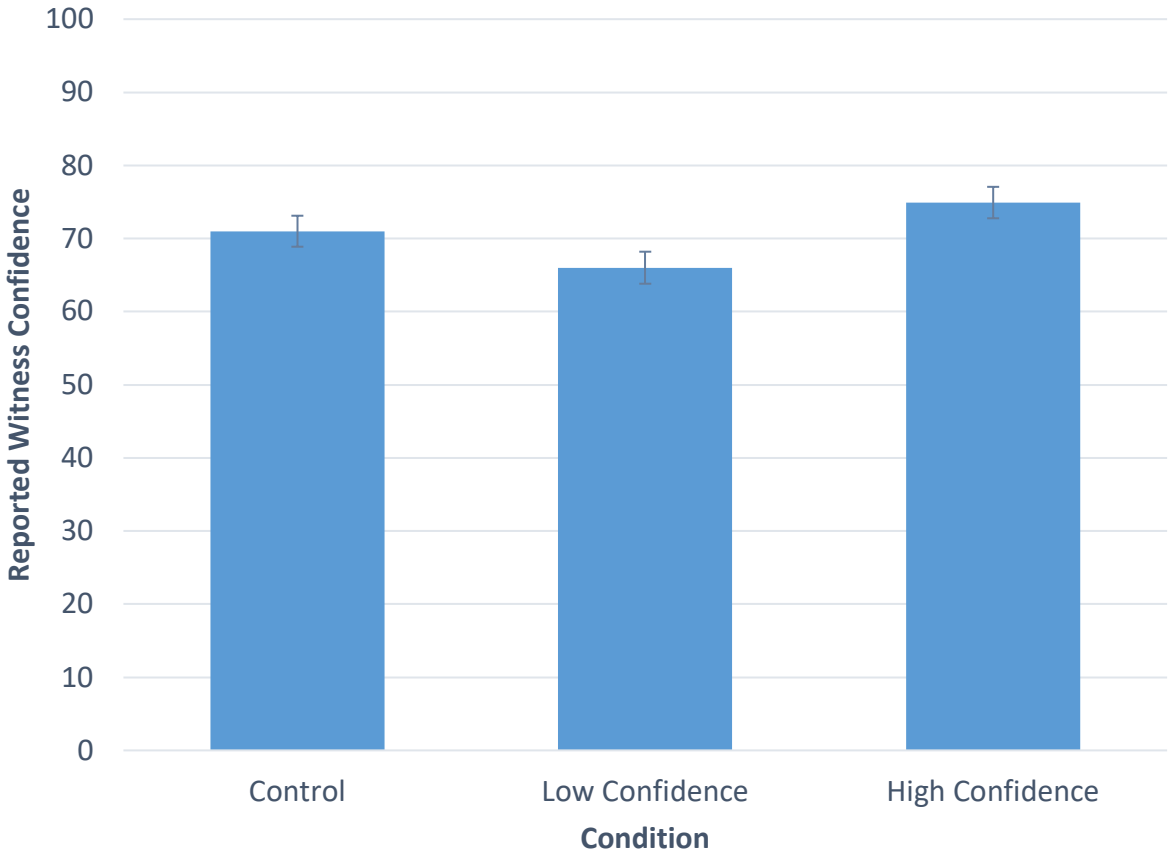


Figure 1.1. Remembered witness confidence by misinformation condition in Study 1. Error bars represent standard errors.

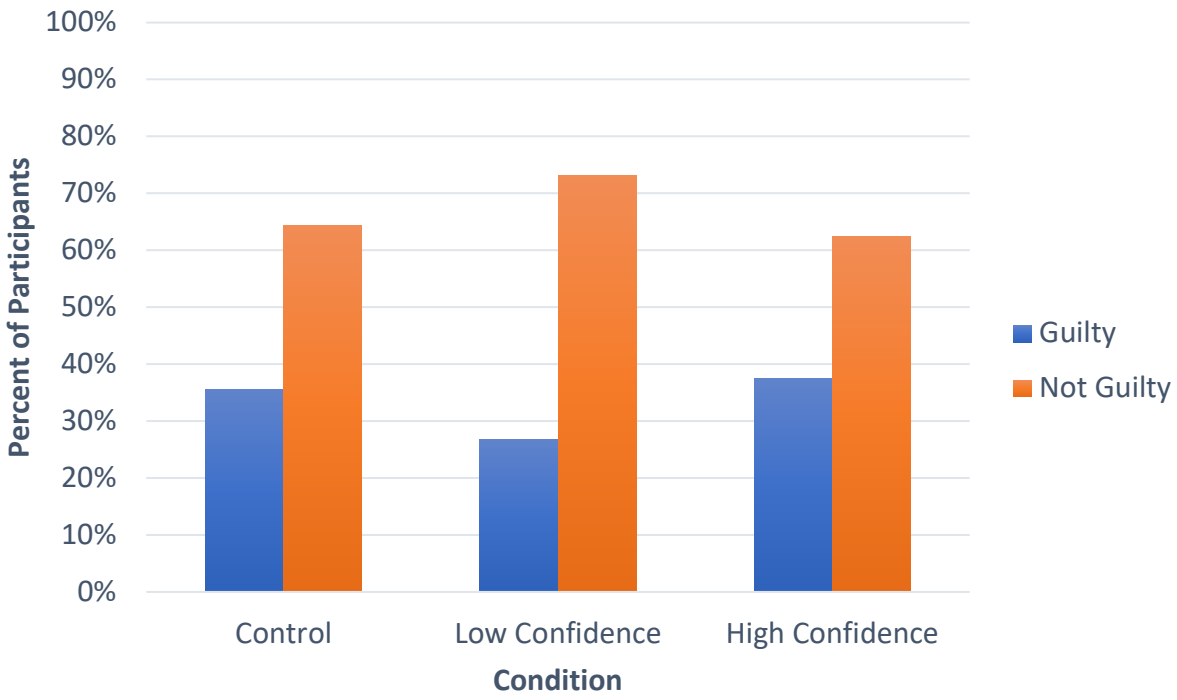


Figure 1.2. Percent of participants rendering guilty and not guilty verdicts in the case by misinformation condition.

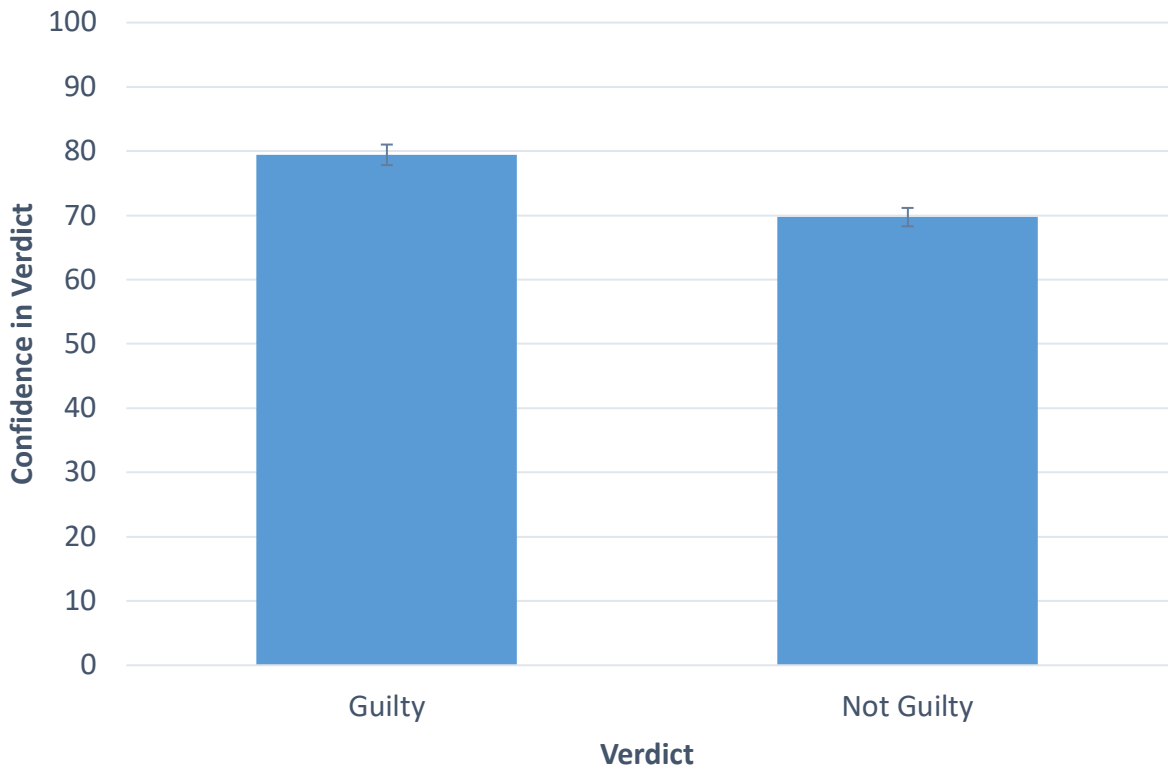


Figure 1.3. Participants' confidence in their verdict decision by participants' verdicts in the case. Error bars represent standard error.

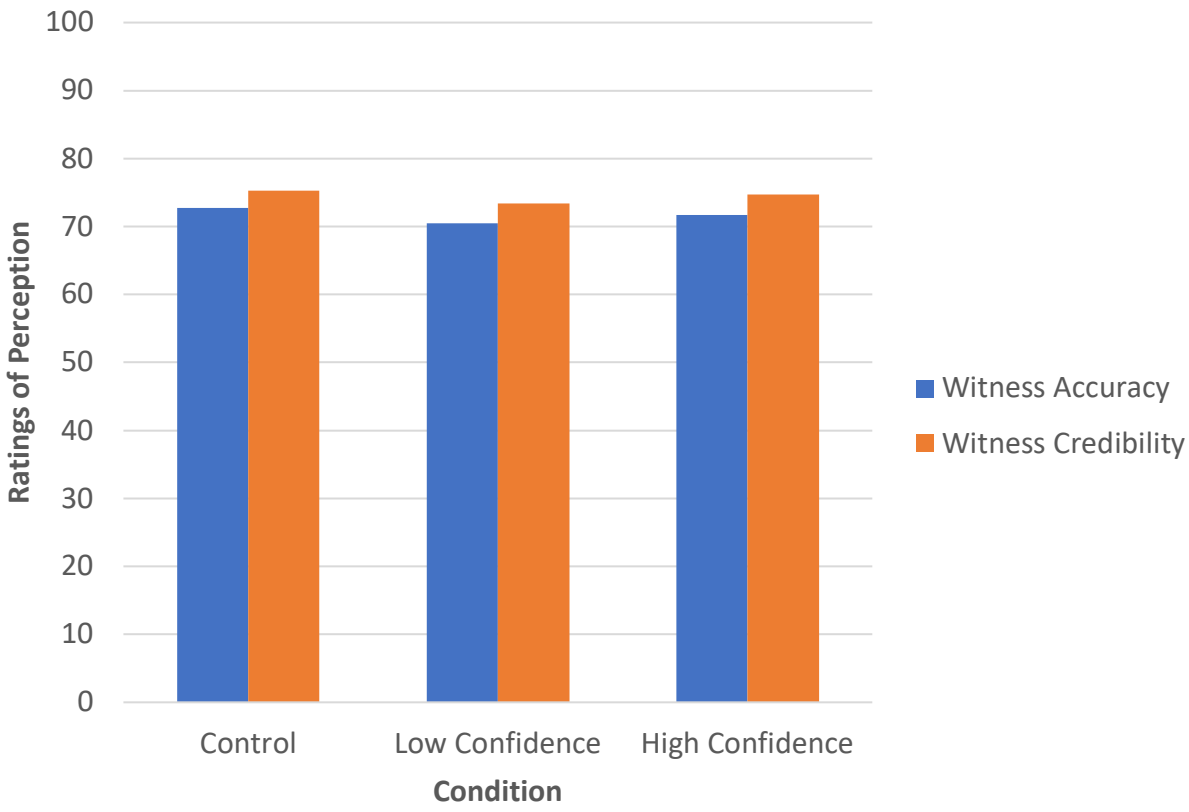
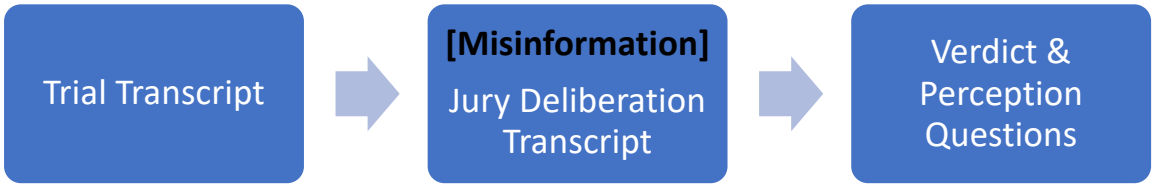


Figure 1.4. Participants' perception of the eyewitness in terms of witness accuracy and credibility, separated by misinformation condition. Error bars represent standard error.

Control Condition

Jury Misinformation Condition



Prosecution Misinformation Condition

Prosecution + Challenge Condition

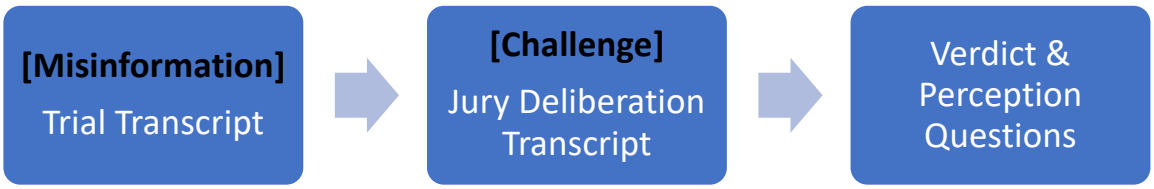


Figure 2.1. Procedure of Study 2.

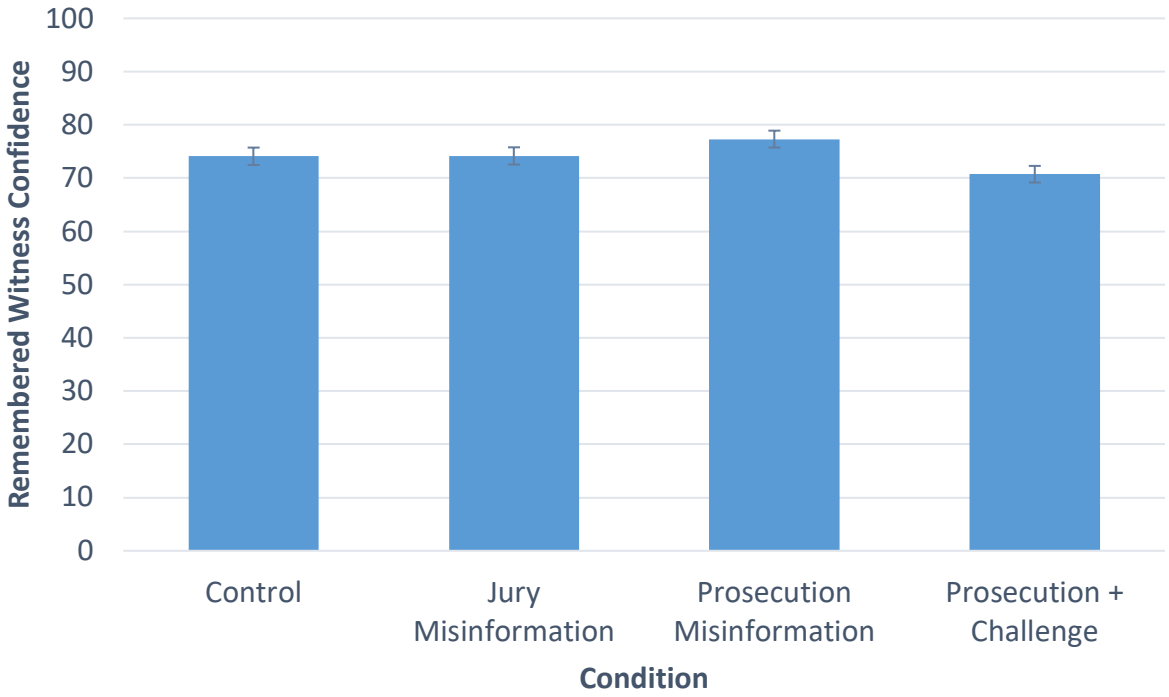


Figure 2.2. Remembered witness confidence by misinformation condition in Study 2. Error bars represent standard errors.

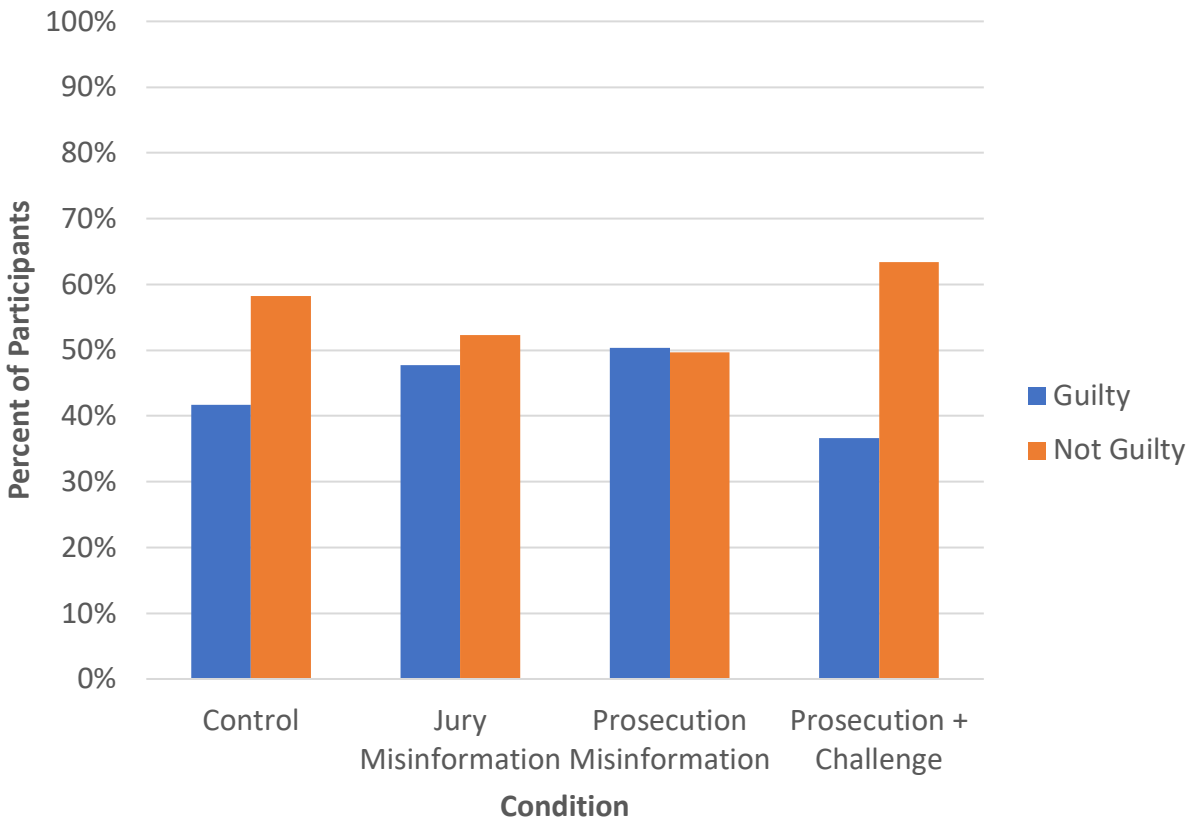


Figure 2.3. Percent of participants rendering guilty and not guilty verdicts by misinformation condition in Study 2.

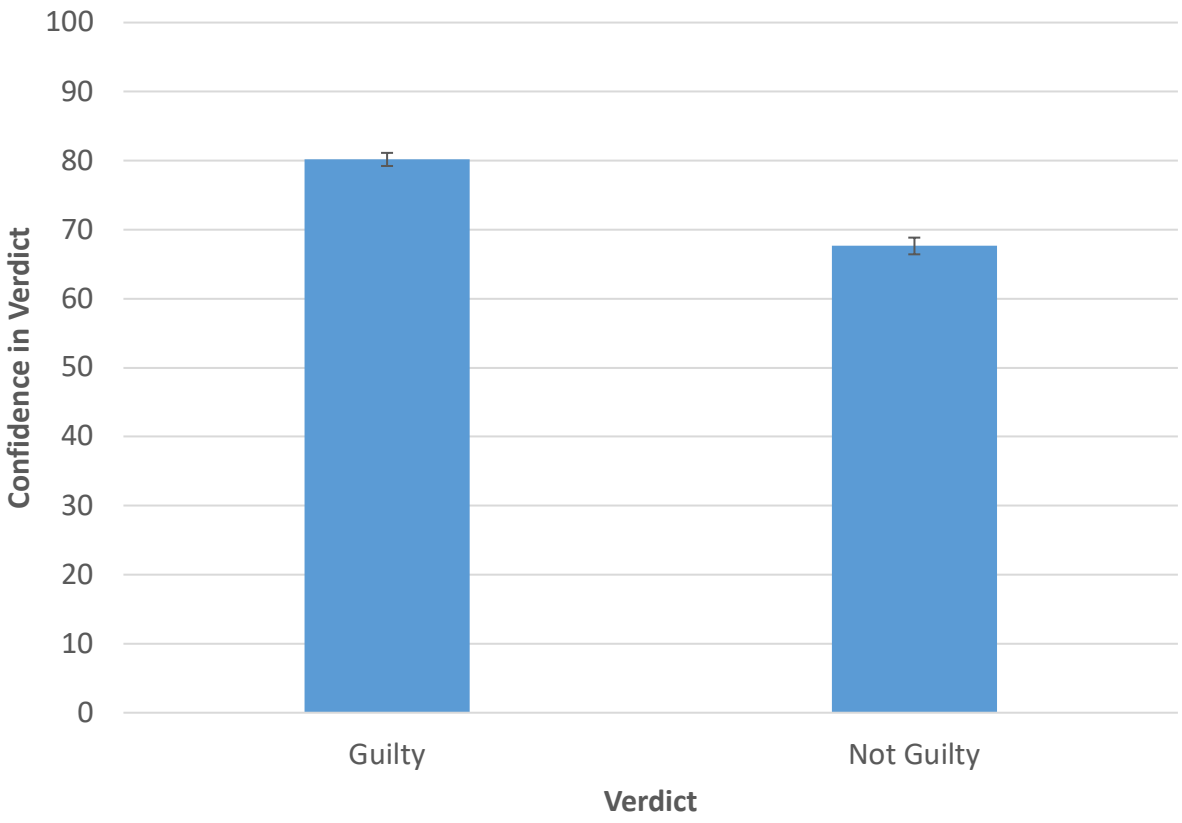


Figure 2.4. Participants' confidence in their verdict decision by participants' verdict in Study 2. Error bars represent standard error.

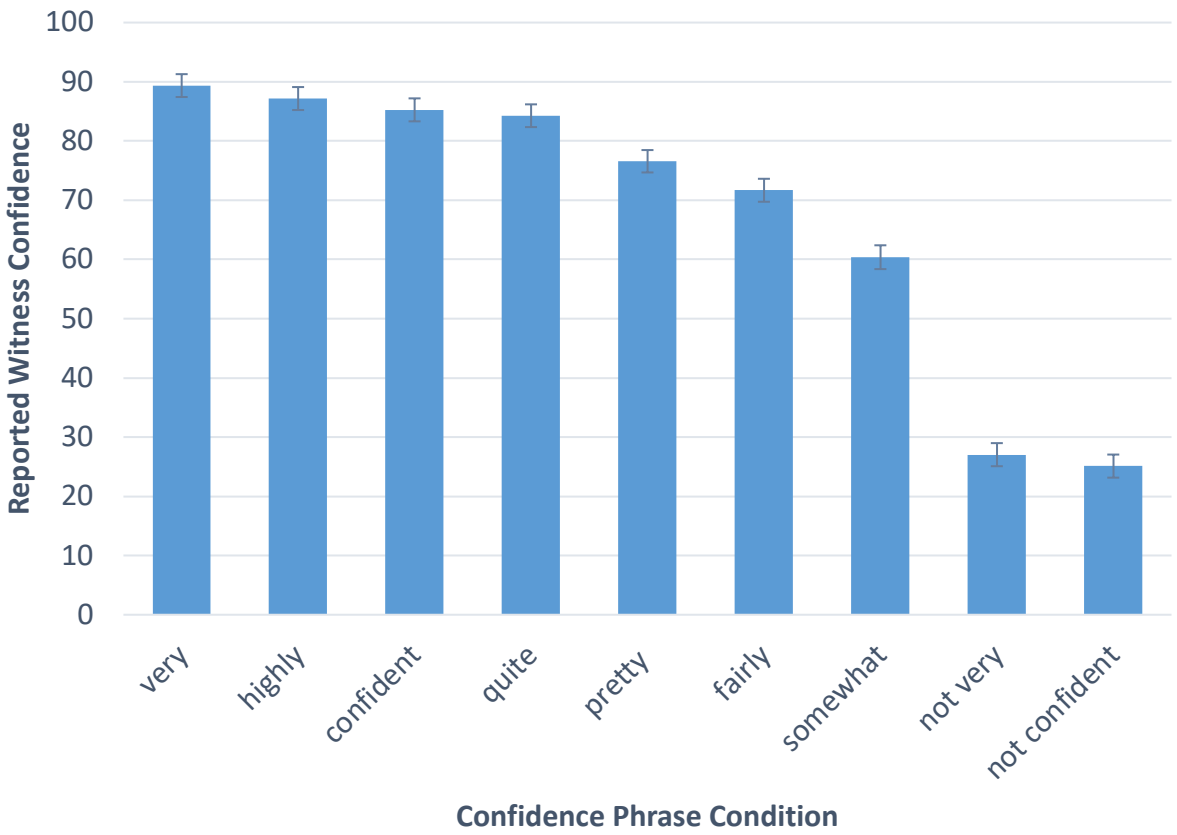


Figure 3.1. Participants' reports of the witness' confidence level by confidence phrase condition in Study 3. Error bars represent standard error.

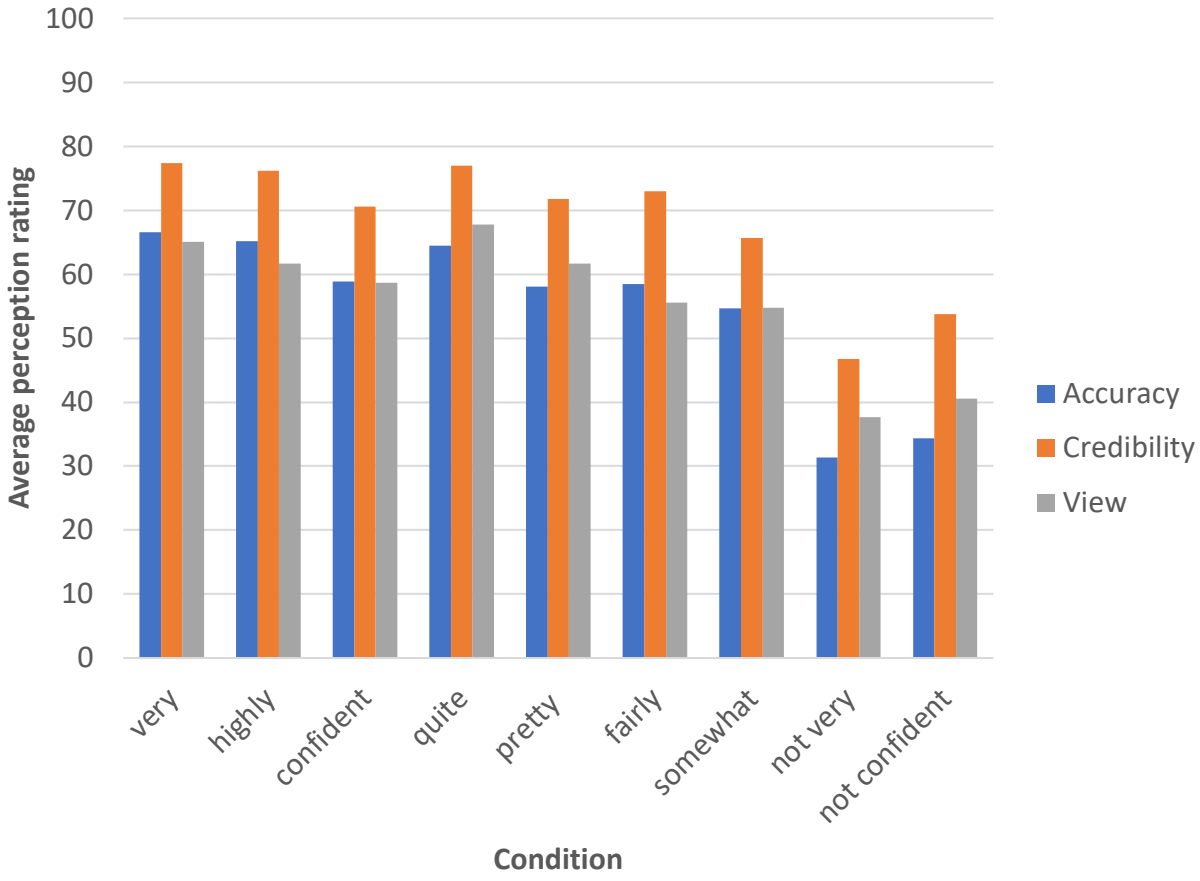


Figure 3.2. Perceptions of the eyewitness by confidence phrase condition in Study 3. Error bars represent standard error.

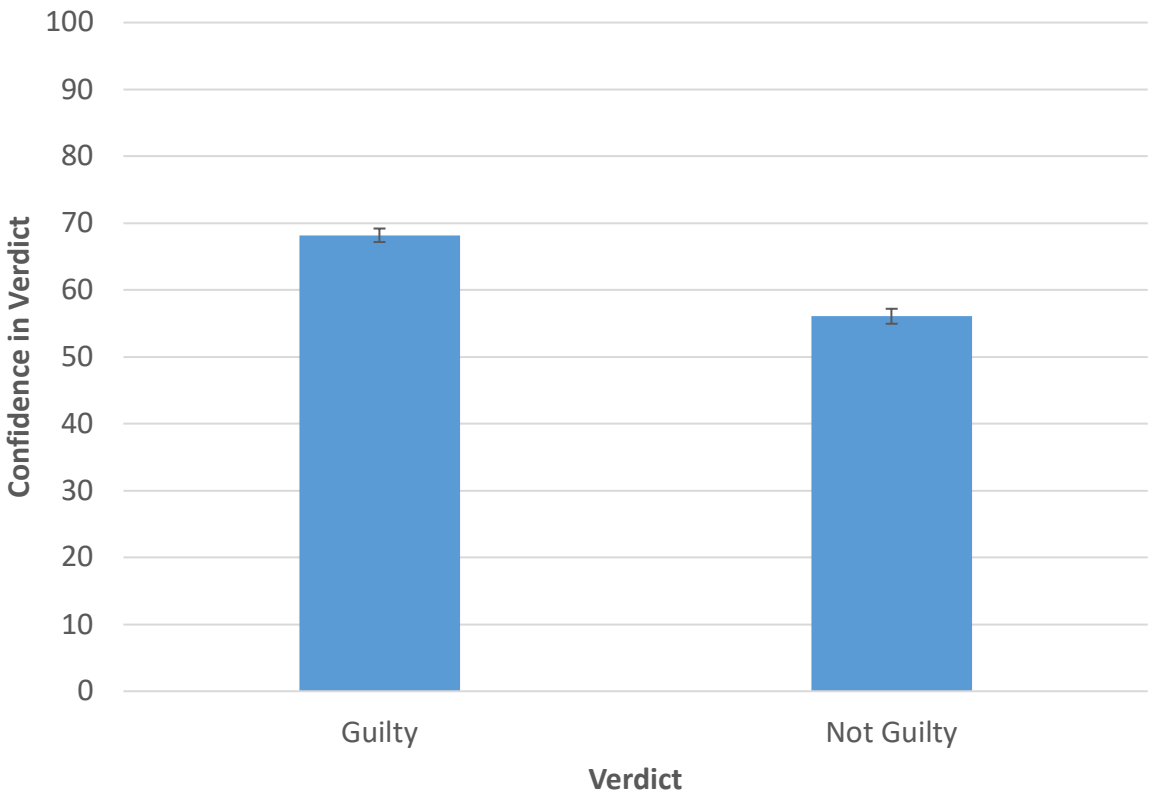


Figure 3.3. Participants' confidence in their verdict decision by participants' verdicts in Study 3. Error bars represent standard error.

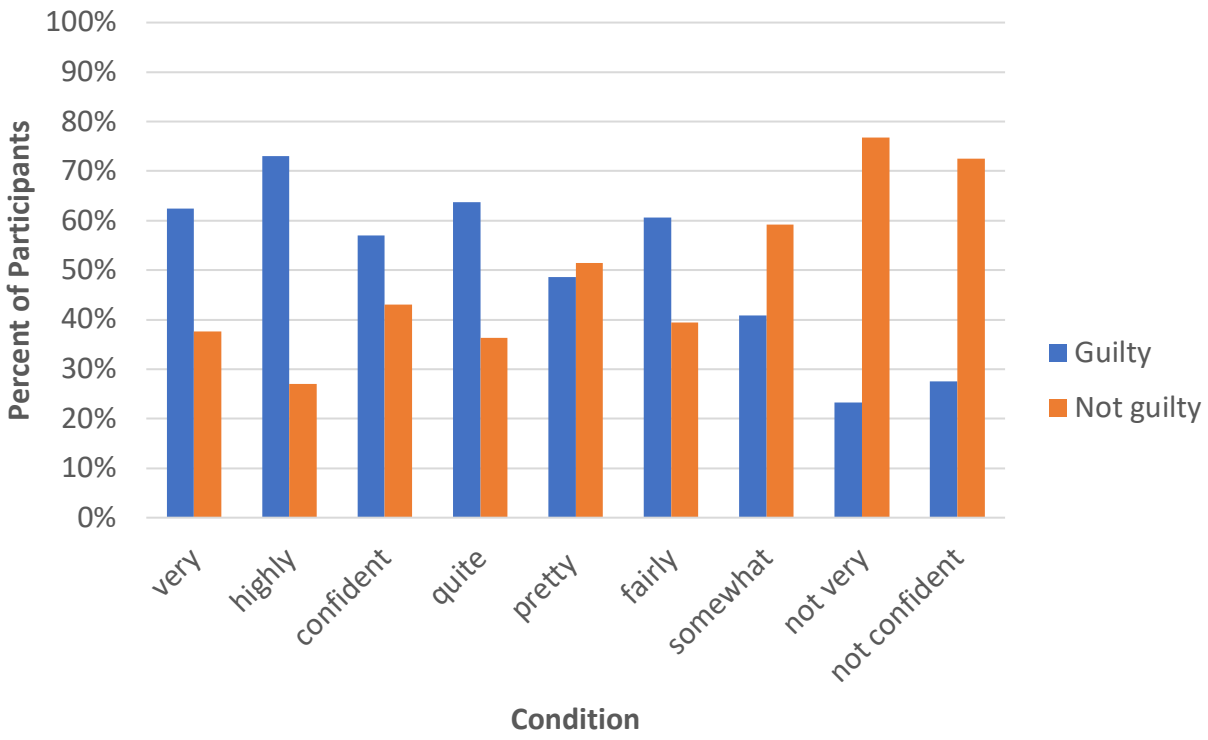


Figure 3.4. Participants' verdict decisions by confidence phrase condition in Study 3.

Table 1.1

Free Response Codes with Corresponding Average Reported Numeric Confidence for Remembered Witness Confidence in Study 1

Coded written response	**Average numeric confidence** ***M (SD)***	**N**
1	49.91 (16.14)	12
2	42.69 (25.91)	16
3	60.66 (17.29)	32
4	72.82 (18.45)	147
5	82.47 (16.52)	77

Table 1.2

Participants' Verdicts and Perceptions of the Jurors' Opinions in Study 1

	Most thought the defendant was guilty *% (N)*	**Most thought the defendant was not guilty** *% (N)*	**It was equally split** *% (N)*
Guilty	34.65% (35)	13.86% (14)	51.49% (52)
Not Guilty	20.40% (41)	19.90% (40)	59.70% (120)

Table 2.1

Free Response Codes with Corresponding Average Reported Numeric Confidence for Remembered Witness Confidence in Study 2

Coded written response	**Average numeric confidence** ***M (SD)***	**N**
1	37.00 (27.82)	10
2	45.77 (22.14)	22
3	57.86 (20.24)	36
4	73.91 (17.37)	365
5	81.56 (17.74)	220

Table 2.2

Participants' Verdicts and Perceptions of the Jurors' Opinions in Study 2

	Most thought the defendant was guilty *% (N)*	**Most thought the defendant was not guilty** *% (N)*	**It was equally split** *% (N)*
Guilty	44.93% (124)	3.62% (10)	51.45% (142)
Not Guilty	33.91% (112)	16.81% (59)	51.28% (180)

Table 3.1

Reported Confidence Levels and Accuracy for Confidence Phrases in Study 3

**add mean, median, sd, & when only looking at accurate

Confidence Phrase	***M (SD)***	***Median***	***M (SD)* for Accurate**	**Percent Accuracy**
very confident	89.35 (16.22)	95	91.41 (14.24)	59.4
highly confident	87.17 (15.14)	91	90.71 (11.25)	76.0
confident	85.26 (21.23)	95.5	85.73 (19.42)	49.0
quite confident	84.27 (14.95)	90	83.71 (13.64)	56.9
pretty confident	76.58 (18.63)	80	73.50 (16.78)	49.5
fairly confident	71.69 (16.94)	71	70.73 (13.88)	74.8
somewhat confident	60.38 (18.84)	60	55.79 (16.79)	73.1
not very confident	27.03 (24.00)	20	19.91 (13.40)	80.8
not confident	25.10 (25.49)	20	16.15 (14.48)	54.1

Note: Percent accuracy refers to the percent of participants in the condition who accurately identified the confidence phrase used. *M (SD) for Accurate* refers to the mean and standard deviation of reported witness confidence only for participants who accurately identified the confidence phrase seen.

Table 3.2

Correlations for Eyewitness Perception Measures

	Accuracy	Credibility	Goodness of view
Accuracy	54.7 (25.6)		
Credibility	0.74*	68.1 (26.5)	
Goodness of view	0.75*	0.64*	56.1 (26.7)

Note: Correlations are on the bottom left of the matrix. The diagonal contains the mean (SD) for each variable. Correlations marked with * are significant at $p < 0.001$.

Table 3.3

Follow-up Test Results for Confidence Phrase Condition on Composite Eyewitness Perception

Comparison	***t***	***p***	***n***
not confident			
confident	-8.06	< 0.001	198
highly	-8.26	< 0.001	198
very	-8.95	< 0.001	199
quite	-8.99	< 0.001	200
pretty	-7.07	< 0.001	203
fairly	-6.48	< 0.001	197
somewhat	-5.08	< 0.001	191
not very confident			
confident	-6.60	< 0.001	199
highly	-9.72	< 0.001	199
very	-10.42	< 0.001	200
quite	-10.46	< 0.001	201
pretty	-8.55	< 0.001	204
fairly	-7.94	< 0.001	198
somewhat	-6.51	< 0.001	192

Table 3.4

Follow-up Test Results for Likelihood of Guilt by Confidence Phrase Condition

Comparison	***t***	***p***	***n***
not confident			
confident	-6.20	< 0.001	198
highly	-7.31	< 0.001	198
very	-7.61	< 0.001	199
quite	-6.72	< 0.001	200
pretty	-5.72	< 0.001	203
fairly	-4.95	< 0.001	197
somewhat	-3.84	0.004	191
not very confident			
confident	-7.48	< 0.001	199
highly	-8.60	< 0.001	199
very	-8.90	< 0.001	200
quite	-8.01	< 0.001	201
pretty	-7.02	< 0.001	204
fairly	-6.23	< 0.001	198
somewhat	-5.09	< 0.001	192