

# DO MEMORY-FOCUSED JURY INSTRUCTIONS MODERATE THE INFLUENCE OF EYEWITNESS WORD CHOICE?

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Some ways of describing an eyewitness event are likely to be more effective than others. We investigated how one such factor - linguistic concreteness - influenced juror decision making. Jurors who received testimony with more concrete language (e.g., *he was twitching nervously* versus *a nervous, twitchy guy*) were more likely to vote guilty and rate the eyewitness as credible (Study 1). This effect was mitigated when jurors received additional information prior to rendering a verdict; specifically, memory-focused jury instructions made jurors less likely to vote guilty or find the eyewitness credible (Study 2). Overall, these results suggest concrete language is more persuasive to jurors, but can be overcome by the presentation of additional information, particularly that which increases skepticism of eyewitness evidence.

*Keywords:* eyewitness, testimony, linguistic concreteness, juror decision making, jury instructions

## ***Eyewitness Word Choice and Memory-Focused Jury Instructions on Juror Decision Making***

Eyewitness identification and subsequent testimony are an integral part of many criminal cases. When accompanied with other corroborating evidence, eyewitness testimony can be an effective means of persuading a jury of a defendant's guilt. However, nearly half a century of research has shown that memory is not infallible, and that eyewitness memory can often be flawed. Yet many potential jurors continue to have poor knowledge of the factors that can impact memory quality (see Simons & Chabris, 2011; Simons & Chabris, 2012). If jurors are generally misinformed about how memory works, it stands to reason that their judgments about eyewitness credibility and accuracy must instead be

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based primarily on other, probably tangential factors. One such factor shaping how jurors evaluate the eyewitness is likely the eyewitness's own language choices, given the heavy emphasis on argument and testimony in the courtroom. Because recipients are more sensitive to the effects of how a message is delivered than speakers (Semin & De Poot, 1997), understanding how an eyewitness's seemingly inconsequential language choices can influence jurors has critical consequences for legal professionals and their clients.

The current research investigated how one such linguistic factor – linguistic concreteness – affects perceptions of the eyewitness's credibility and influences jurors' subsequent decision making. Linguistic concreteness, or the extent to which something can be experienced with the physical senses (Brysbaert, Warriner, & Kuperman, 2014), has been found to convey information about implicit in-group and out-group stereotypes, as well as shape perceptions of power, distance, control, and notably even truthfulness (Hansen & Wänke, 2010; Maass, Salvi, Arcuri, & Semin, 1989; Reitsma-Van Rooijen, Semin, & van Leeuwen, 2007; Snefjella & Kuperman, 2015; Wakslak, Smith, & Han, 2014). There has been some investigation on how linguistic concreteness operates in the courtroom (see Schmid & Fiedler, 1998); however, the manner in which an eyewitness's use of concrete language might influence jurors remains unclear. Further, we also explored how use of jury instructions, a type of procedural safeguard, can reduce this effect. Memory-focused jury instructions for evaluating eyewitness evidence provide courts a cost-effective and systematic means to educate jurors on factors that influence the reliability of memory. Unlike previous instructions (e.g., the *Telfaire* instructions; *U.S. v. Telfaire*, 1972), more modern jury instructions provide jurors a research-based overview of not only the factors that may be relevant in the case, but also how memory works in general (Cutler & Penrod, 1995; *State v. Henderson*, 2011). Although the efficacy of even modern memory-focused jury instructions is mixed (see Jones, Bergold, Dillon, & Penrod, 2017), such instructions may render jurors more critical of the evidence, limiting the influence of unrelated cues like an eyewitness's style of language.

### ***Eyewitness Style of Language***

Without explicit knowledge or familiarity of the factors that can lead to reliable eyewitness memory, jurors must instead rely on verbal and non-verbal cues when giving weight to an eyewitness's testimony. Unsurprisingly, previous research has shown that eyewitness language choices can influence jurors' impressions about that eyewitness's reliability and accuracy, which can in turn influence juror decision making. For instance, speakers who avoid using linguistic hedges and hesitations (also known as powerless speech) appear more confident and are generally perceived as being more trustworthy (O'Barr, 1983). Accordingly, jurors are more likely to believe the prosecution's case against the defendant and recommend harsher sentences when the eyewitness uses a more powerful speech style (Jules & McQuiston, 2013). Other language factors, such as accent and intonation, can also affect juror perceptions of an eyewitness's reliability by eliciting stereotypes about speakers' backgrounds or gendered expectations (Crystal, 2004; Smalls, 2004). Despite having no bearing on the content, the style of language eyewitnesses employ when presenting their

testimony can inform juror decision making, even without the juror being explicitly aware of their bias.

According to Semin and Fiedler's Linguistic Category Model (LCM; 1988), words can be divided into four linguistic categories on a continuum from concreteness to abstractness. These categories range from the more concrete descriptive action verbs (DAVs) and interpretive action verbs (IAVs) to the more abstract state verbs (SVs) and adjectives (ADJs; Semin & Fiedler, 1988). The more concrete categories (DAVs and IAVs) describe specific actions that are dependent upon context and can be confirmed, whereas the more abstract categories (SVs and ADJs) "imply enduring states" (Fiedler, 2008, p. 183). Importantly, each of the four linguistic categories elicits distinct inferences about control, stability, and verifiability, as seen in Table 1. Thus, a speaker's choice to be more concrete or more abstract can potentially change how the listener perceives a given situation.

Table 1: *Overview of the Four Categories of the Linguistic Category Model*

Linguistic category	Characteristics	Semantic implications	Example
Descriptive action verbs (DAVs)	Highly context-dependent Single behavioral event, usually without emotional valence "Physically invariant" behaviors	Low information about the subject Low stability of trait High internal control Can be verified	He <i>hit</i> him.
Interpretive action verbs (IAVs)	Less context-dependent Single behavioral event with positive or negative valence Class of behaviors	More information about subject Low stability of trait High internal control Can be verified	He <i>hurt</i> him.
State verbs (SVs)	No context dependence Mental or emotional state with no clear beginning or end	More information about subject More stability of trait Low internal control Hard to verify	He <i>despises</i> him.
Adjectives (ADJs)	No context dependence Abstract description of a person, event, or object Unrelated to a specific event or behavior	Most information about subject Most stable Low internal control Hard to verify	He's <i>aggressive</i> .

*Note.* Based on Coenen, Hedeboom, & Semin, 2006, and Schmid & Fiedler, 1998.

The semantic implications of the linguistic categories as described in Semin and Fiedler's (1988) LCM suggest that strategic use of these categories could shape juror perceptions. Although in most cases people are unknowingly employing concrete language in their conversations, it is not improbable that a speaker could selectively use concrete or

abstract language to persuade others of a certain view, particularly in a courtroom setting. However, only a limited amount of research has investigated the role linguistic concreteness may play in court. In perhaps the only investigation on the LCM in the courtroom, Schmid and Fiedler (1998) found that the change from high internal control to low internal control implied by the transition from IAVs to SVs can influence later judgments about an individual's level of responsibility for their actions. The researchers found that prosecution closing statements written by laypersons were more likely to contain IAVs when negatively describing the defendant, suggesting high internal control for those actions and therefore higher defendant culpability. Conversely, defense closing statements were more likely to contain SVs for negative defendant descriptions, implying low defendant internal control for negative actions. Additionally, mock jurors who later watched these closing statements were more likely to find the defendant culpable when intentionality, as implied by linguistic category, was higher. Schmid and Fielder's findings suggest that variations in internal and external causality do in fact extend to the courtroom and can influence the level of blame jurors assign to defendants.

### ***Memory-Focused Jury Instructions***

Because prospective jurors are generally misinformed about how memory works, many courts permit some sort of memory rebuttal information when cases involve eyewitness identification (see Federal Evidence Review, 2016). One way jurors may receive information is through memory-focused jury instructions. These instructions are intended to address and correct layperson beliefs and misconceptions about memory and often describe how factors both inside (e.g., lineup procedures) and outside the control of the legal system (e.g., lighting conditions) can influence the reliability of a given memory (see *State v. Henderson*, 2011). Unfortunately, jury instructions on eyewitness memory tend to have limited and inconsistent effects on juror comprehension and decision making. Research has found that even more modern jury instructions can fail to render jurors more discriminating to factors that influence memory, often making jurors more skeptical rather than more sensitive to witnessing conditions (Dillon, Jones, Bergold, Hui, & Penrod, 2017; Jones, Bergold, Dillon, & Penrod, 2017; Papailiou, Yokum, & Robertson, 2015).

Despite these shortcomings, the major benefits of instructions over expert witnesses, such as reduced cost and trial time (Sheehan, 2011), will likely encourage more courts to adopt similar instructions. Although jury instructions may not increase sensitivity, instructions in and of themselves may prime jurors to be more critical of evidence overall. For the current investigation, the increased skepticism caused by jury instructions is of particular interest, as inducing suspicion of an account has been found to reduce believability ratings when the level of detail – and thus concreteness – is increased (Johnson, Bush, & Mitchell, 1998). If jury instructions induce skepticism, as found previously, jurors should be able to overcome the influence of eyewitness word choice.

### ***The Current Research***

As noted above, little research has been done to investigate the use of these categories in a courtroom setting, and to our knowledge none to date has investigated the role of linguistic concreteness in eyewitness testimony. Thus, our investigation into eyewitness

use of concrete language extends the current research on linguistic concreteness in shaping perceptions, as well as the role language plays in juror decision making. In the present experiments, we used an online juror decision making paradigm to investigate if linguistic concreteness impacts mock jurors' perceptions of eyewitness credibility and juror decision making under simplified conditions (Study 1) and if jury instructions moderate any effect of concrete language (Study 2). We hypothesized that jurors would find the eyewitness who used more concrete language to be more credible and would therefore be more likely to convict the defendant in these cases, but those who received jury instructions would be less affected by the concrete testimony.

## STUDY 1

### *Participants*

Study participants ( $N = 167$ ) were drawn from those enrolled in introductory undergraduate psychology and neuroscience courses at a large southwestern university. The study was approved by the authors' university Institutional Review Board (IRB) and was determined to have met the standards for minimal risk to participants. Participants received one hour of course credit for their participation. As only U.S. citizens 18 years of age or older are permitted to participate in a jury, only participants who were at least 18 were permitted to participate in the study. Eleven participants failed to complete the study, and two participants failed over 33% of the case questions; thus, a total of fifteen participants were withdrawn from analyses, resulting in a final sample size of 154 (30.1% male,  $M_{\text{age}} = 19.32$ , age range: 18-26).

### *Materials*

**Case summary.** We created a summary of a case describing the armed robbery of a local convenience store that included prosecution and defense statements. The case was intended to be ambiguous, and the prosecution's evidence was primarily circumstantial in nature.

**Eyewitness testimony.** The case information also included either a concrete or abstract transcript of the testimony of a prosecution eyewitness. The testimony contained several factors known to decrease the accuracy of eyewitness memory: the presence of a weapon, perpetrator use of disguise, and high stress (for a review see Wells, Memon, & Penrod, 2006). The eyewitness also claimed he was confident in his identification of the defendant, even though confidence statements at testimony are unlikely to be reliable (Wixted & Wells, 2017). We worked to ensure that the concrete and abstract versions did not differ radically in semantic content. For example, we replaced phrases with more concrete verbs, such as *He walked to the register*, to phrases with more abstract ones, e.g., *He came to the register*; alternatively, we modified verb phrases, such as *I'll never forget his face*, to make adjective phrases, e.g., *His face will be unforgettable to me*. Each part of the testimony that introduced new information was matched between versions, and these versions did not differ in word length ( $p > .10$ ). Four independent raters evaluated each section of the testimony on the level of linguistic concreteness with high reliability,  $\kappa = .67$  and  $.68$

for the two versions. The raters confirmed the concrete version of the testimony was more concrete than the abstract version ( $p = .01$ ).

**Dependent variables.** Participants indicated their verdict dichotomously (“Not Guilty” or “Guilty”). Degree of confidence in their verdict decision was indicated on a scale from 0-100%, with 0% = No confidence and 100% = Complete confidence. Eyewitness credibility was rated on a similar scale, with 0% = Not at all credible and 100% = Completely credible.

### ***Procedure***

Participants were randomly assigned to one of the two treatment conditions (Concrete or Abstract). Using online survey software, all participants read the case summary and a version of the eyewitness’s testimony. At the end of the study, participants were asked several questions to assess their awareness of details in the case summary. Participants were then asked to indicate their verdict, as well as to indicate the degree of confidence in their verdict, before rating the eyewitness’s perceived level of credibility. After completing the study, participants were thanked and debriefed.

## **RESULTS**

Analyses for dichotomous verdict were conducted using binomial logistic regression; analyses of variance (ANOVA) were conducted for confidence and eyewitness credibility. Testimony version (Concrete or Abstract) was entered into all analyses as an independent variable. Correlations, means, and standard deviations among dependent variables are reported in Table A1.

Although overall verdicts were fairly evenly split (51.9% Not Guilty), jurors who received the abstract version of the eyewitness testimony were more than twice as likely to find the defendant not guilty, Wald  $\chi^2 = 7.36$ ,  $p = .007$ , OR = 2.45. However, the concrete and abstract groups had similar levels of confidence in their verdicts,  $F(1, 152) = 1.25$ ,  $p = .266$  ( $M_{\text{Concrete}} = 67.95$ ,  $SEM = 2.04$ ;  $M_{\text{Abstract}} = 64.74$ ,  $SEM = 2.02$ ). Separately, there was a marginally significant but small effect of linguistic concreteness on eyewitness credibility,  $F(1, 152) = 3.88$ ,  $p = .051$ , partial  $\eta^2 = .03$ . The concrete group found the eyewitness marginally more credible than the abstract group ( $M_{\text{Concrete}} = 62.07$ ,  $SEM = 2.63$ ;  $M_{\text{Abstract}} = 54.79$ ,  $SEM = 2.59$ ).

## **DISCUSSION**

The findings from this initial study offer support for our hypotheses that eyewitness use of concrete language serves as a signal for credibility and influences juror perceptions and decision making. Jurors who read concrete testimony from a prosecution eyewitness were more likely to find the defendant guilty in the context of an ambiguous criminal trial. Additionally, those who read the concrete testimony rated the eyewitness as more credible. Taken together, these two findings suggest jurors were more willing to believe the

eyewitness's version of events when presented concretely, and this in turn influenced their verdict decisions.

The difference in linguistic concreteness may have served as a cue for verifiability of the information, therefore appearing more reliable to the jurors when making their decisions. Participants may have also used level of concreteness as a cue for the strength of the eyewitness's memory for the event, as concrete language is strongly correlated with imageability (see Dellantonio, Mulatti, Pastore, & Job, 2014). Despite research indicating that memory for specific details is unlikely to correspond to a better memory for the event overall (Wells & Leippe, 1981), level of detail in an eyewitness's testimony has been shown to influence jurors' perceptions of the quality and accuracy of an eyewitness's memory (Bell & Loftus, 1985; Bell & Loftus, 1989). Jurors may have assumed that the more concrete and perhaps seemingly more detailed testimony was indicative of better memory for the event and rendered their judgments accordingly. Interestingly, although juror verdict differed by linguistic concreteness, confidence in those decisions did not. Therefore, it is unlikely that participants were aware of the effect of concrete language on their decisions, as the similarity in confidence ratings implies they were not considering this factor explicitly.

Our findings suggest that jurors are influenced by manipulations of linguistic concreteness in eyewitness testimony. However, jurors in some courts are likely to receive memory-focused jury instructions, which may make them more critical of the eyewitness and thereby moderate any effect of concrete language. We explored this possibility in Study 2. In addition to adding a jury instruction manipulation, Study 2 also utilized participants from both university and online samples to explore any differences in responses between the two populations. Although prospective jurors are generally under-informed about memory, university students enrolled in psychology and neuroscience courses likely have a more evidence-based understanding of memory than members of the general public. Thus, along with our previously stated hypotheses, we also expected that university students would be slightly more critical of the eyewitness than members of the general public.

## STUDY 2

### *Participants*

One hundred ninety participants were drawn from introductory undergraduate psychology and neuroscience courses at a large southwestern university ( $n = 99$ ) and online using Amazon's Mechanical Turk (MTurk;  $n = 91$ ). Undergraduate students received one hour of course credit for their participation, and MTurk participants were offered a rate of \$1.50 per half hour in exchange for their completion of the online survey. Twenty-four participants (University = 18, MTurk = 6) failed to complete the study and six participants failed 40% or more of the case questions (University = 1, MTurk = 5). Thus, the final sample size consisted of 160 participants (42.5% male,  $M_{\text{age}} = 27.7$ , age range = 18-69), with both the undergraduate (26.3% male,  $M_{\text{age}} = 19.2$ , age range = 18-39) and the MTurk sample (58.8% male,  $M_{\text{age}} = 36.2$ , age range = 22-69) consisting of 80 participants.

### **Materials**

**Case materials.** We reused the same case summary from Study 1. The eyewitness testimony was modified slightly to increase differences between the concreteness and abstractness of the two versions. Two independent raters evaluated the testimonies' linguistic concreteness with moderate reliability,  $\kappa = .58$  and  $.65$  for the two versions. The raters again confirmed the concrete version of the testimony was more concrete than the abstract version ( $p = .017$ ).

**Jury instructions.** Participants read either set of modified provisional jury instructions (*Commonwealth v. Gomes*, 2015) or a document of equal length on an unrelated topic to account for the passage of time and cognitive load. The jury instructions provided an overview of the three stages of memory as well as descriptions of several factors that can undermine the reliability of eyewitness memory, including those present in the eyewitness's testimony.

**Questionnaire.** We used an adapted version of the questionnaire employed by Jules and McQuiston (2013) to better assess how our independent variables affected juror evaluation of the eyewitness and case in general. As in Study 1, participants were asked to render their verdict and level of confidence. Participants were then asked to answer several questions regarding defendant culpability, eyewitness accuracy, and eyewitness credibility; questions were averaged by topic to create aggregate scores for each of these dependent variables. The questionnaire also asked participants facts about the case to ensure participants were paying attention to the materials. Verdict and confidence were measured the same as in Study 1; all other dependent variables were measured on a scale from 0% to 100%.

### **Procedure**

Study 2 followed similar procedures to those in Study 1. University and MTurk participants were randomly assigned to one of four treatment combinations. All participants read, at their own pace, the case summary and a version of the eyewitness's testimony (Concrete or Abstract). After reading testimony, participants read either jury instructions or an unrelated document of equal length. Participants then rendered their verdict and answered questions about the eyewitness, defendant, and the case in general. All participants were debriefed about the study's aims at the end of the study.

## **RESULTS**

Once again, verdict was analyzed using binomial logistic regression. Due to the high correlations among our other dependent variables, we conducted a series of ANOVA for confidence, defendant culpability, eyewitness credibility, and eyewitness accuracy. All analyses were conducted with a 2 (Testimony: Concrete or Abstract)  $\times$  2 (Document: Jury Instructions or Unrelated Document)  $\times$  2 (Sample: University or MTurk) factorial design. Correlations, means, and standard deviations among dependent variables are reported in Table A2.



### Primary Analyses

Once again, participants were relatively split in verdict (56.3% Not Guilty), but unlike in Study 1 concrete language did not significantly affect verdict, Wald  $\chi^2 = 1.85$ ,  $p = .174$ . However, a main effect of document on verdict was observed, Wald  $\chi^2 = 12.45$ ,  $p < .001$ , OR = 2.27, such that participants who read the control document were more than twice as likely to render guilty verdicts compared to those who received the jury instructions. There were no significant or trending effects for sample on verdict, Wald  $\chi^2 = 0.02$ ,  $p = .882$ . A separate analysis on confidence ratings revealed only a trending effect of sample,  $F(1, 152) = 3.25$ ,  $p = .074$ , partial  $\eta^2 = .02$ . Online participants were marginally more confident in their verdict decisions than those in the undergraduate sample ( $M_{\text{Online}} = 72.73$ ,  $SEM = 2.14$ ;  $M_{\text{University}} = 67.28$ ,  $SEM = 2.14$ ).

Linguistic concreteness had no significant main effect on ratings of defendant culpability, eyewitness credibility, or eyewitness accuracy, but there was a small interaction between sample and testimony concreteness on perceptions of eyewitness accuracy,  $F(1, 152) = 4.62$ ,  $p = .033$ , partial  $\eta^2 = .03$ . Post-hoc analyses indicated undergraduate participants who received the concrete testimony were less likely to rate the eyewitness as accurate ( $M_{\text{University}} = 48.18$ ,  $SEM = 3.85$ ) than online participants who also received the concrete testimony ( $M_{\text{Online}} = 64.88$ ,  $SEM = 3.85$ ),  $F(1, 152) = 9.38$ ,  $p = .003$ , partial  $\eta^2 = .06$ . Document condition, however, had a significant main effect on defendant culpability,  $F(1, 152) = 7.09$ ,  $p = .009$ , partial  $\eta^2 = .05$ ; eyewitness credibility,  $F(1, 152) = 7.40$ ,  $p = .007$ , partial  $\eta^2 = .05$ ; and eyewitness accuracy,  $F(1, 152) = 8.38$ ,  $p = .004$ , partial  $\eta^2 = .05$ . Participants who received the jury instructions were less likely to find the defendant culpable ( $M_{\text{Jury Instructions}} = 48.69$ ,  $SEM = 2.84$ ;  $M_{\text{Control}} = 59.39$ ,  $SEM = 2.84$ ), less likely to find the eyewitness credible ( $M_{\text{Jury Instructions}} = 55.11$ ,  $SEM = 2.69$ ;  $M_{\text{Control}} = 63.26$ ,  $SEM = 2.69$ ), and less likely to find the eyewitness accurate ( $M_{\text{Jury Instructions}} = 51.00$ ,  $SEM = 2.73$ ;  $M_{\text{Control}} = 62.16$ ,  $SEM = 2.73$ ). Finally, there was a main effect of sample on eyewitness credibility,  $F(1, 152) = 7.40$ ,  $p = .007$ , partial  $\eta^2 = .05$ , and eyewitness accuracy ratings,  $F(1, 152) = 4.76$ ,  $p = .031$ , partial  $\eta^2 = .03$ . Online participants rated the eyewitness as more credible ( $M_{\text{Online}} = 64.34$ ,  $SEM = 2.69$ ;  $M_{\text{University}} = 54.03$ ,  $SEM = 2.69$ ) and more accurate than undergraduate participants ( $M_{\text{Online}} = 60.78$ ,  $SEM = 2.73$ ;  $M_{\text{University}} = 52.38$ ,  $SEM = 2.73$ ).

### Secondary Analyses

To better understand our findings in Study 2, we conducted secondary analyses for the verdict decision variables and a single eyewitness credibility rating with a 2 (Testimony: Concrete or Abstract) x 3 (Document: None, Jury Instructions, or Control Document) factorial design. We compared those who received some kind of document (Study 2) to those who did not (Study 1), controlling for sample. A binomial logistic regression revealed a significant main effect of document, Wald  $\chi^2 = 12.33$ ,  $p = .002$ . Those who received jury instructions were over four times more likely to render not guilty verdicts than those who received no document, Wald  $\chi^2 = 10.04$ ,  $p = .002$ , OR = 4.35. There was no main effect of concrete language on verdict, Wald  $\chi^2 < 1$ ,  $p = .993$ . However, these results were qualified by a significant concreteness by document interaction, Wald  $\chi^2 = 8.12$ ,  $p = .017$ . Follow-up analyses found that although those who did not receive a document were more likely to

render guilty verdicts when reading the concrete testimony, Wald  $\chi^2 = 7.36$ ,  $p = .007$ , OR = 2.45, those who received either the jury instructions or control document did not differ based on testimony condition, Wald  $\chi^2 = 0.95$ ,  $p = .331$ , and Wald  $\chi^2 = 0.82$ ,  $p = .367$ , respectively. Sample was not a significant covariate, Wald  $\chi^2 < 1$ ,  $p = 1.00$ .

Separate ANOVAs found no significant effects on confidence ratings; however, document type had a small but significant main effect on eyewitness credibility ratings,  $F(1, 307) = 3.77$ ,  $p = .024$ , partial  $\eta^2 = .02$ . Those who received jury instructions were less likely to find the eyewitness credible ( $M_{\text{Jury Instructions}} = 52.02$ ,  $SEM = 2.85$ ) compared to those who received either the control document ( $M_{\text{Control}} = 61.15$ ,  $SEM = 2.85$ ) or no document ( $M_{\text{No Document}} = 61.03$ ,  $SEM = 2.17$ ). Sample accounted for significant variance in eyewitness credibility ratings,  $F(1, 307) = 7.18$ ,  $p = .008$ , partial  $\eta^2 = .02$ .

## DISCUSSION

Contrary to the findings in Study 1, eyewitness use of concrete language did not directly influence verdicts decisions, perceptions of defendant culpability, eyewitness credibility, or eyewitness accuracy, and there was no evidence to support our hypothesis regarding an interaction between testimony concreteness and increased skepticism. However, we did observe an interaction between sample and linguistic concreteness on eyewitness accuracy ratings: undergraduate participants who received the concrete testimony found the eyewitness less accurate than the online participants who received the concrete testimony. The reasons for this change in direction for undergraduates in the concrete testimony condition from Study 1 is unclear; however, undergraduates were overall less receptive to the prosecution's case according to our dependent measures.

The lack of expected findings for our testimony manipulation may have been due in part to the fact that all participants in Study 2 were required to read either jury instructions or an unrelated document between reading the testimony and rendering their verdicts. Our secondary analyses on the effect of document revealed that those who received jury instructions were less likely to find the defendant guilty and less likely to find the eyewitness as credible. Further, linguistic concreteness interacted with document type for verdict decision, such that only those who received no additional information were more likely to render guilty verdicts in the concrete testimony condition. Together, these findings suggest that the small effect of concrete language on juror decision making is suppressed by the addition of further information to review, regardless of the type of load document or the population from which the participants are drawn. Whether this attenuation is due to the increased effort to process the information or the increased time between the testimony and rendering verdict decisions requires further study, but the findings regarding jury instructions highlight the importance of clarifying information versus additional information in shaping juror perceptions.

In a similar vein, our use of jury instructions was effective for all of the dependent variables save confidence ratings. Compared to those who received the control document, participants who received the jury instructions were more likely to render not guilty

verdicts, were less likely to rate the defendant as culpable, and were less likely to rate the eyewitness as credible or accurate. Receiving information about the fallibility of eyewitness memory likely made them more critical of the eyewitness evidence, which in turn influenced their judgments about the case overall. These results add to a growing body of research showing that jury instructions increase juror skepticism of eyewitness identification. Whether this increased skepticism was accompanied with a lack of sensitivity to factors known to impact the quality of eyewitness testimony (e.g., Papailiou et al., 2015) was not investigated in this study. However, our jurors in Study 2 had similarly high confidence ratings in their decisions regardless of document condition. Despite reading information on the shortcomings of memory, jurors did not reassess their own confidence in their decisions, which may reflect an insensitivity to the overall strength of evidence.

Finally, the undergraduate and online sample differed in their responses to the case, as anticipated. Although the two samples gave similar ratings on our guilt measures, the online sample overall was more likely to rate the eyewitness as credible and accurate than the undergraduate sample. These findings support previous research on the general public's misconceptions about the reliability of eyewitness memory (Simons & Chabris, 2011; Simons & Chabris, 2012). In conjunction with our findings regarding the use of jury instructions, these results imply that any knowledge about how memory works, be it from classroom instruction or jury instructions, may be enough to induce skepticism about the eyewitness's version of events.

## GENERAL DISCUSSION

Jurors rely on the information presented to them throughout a trial to make their decisions. Although the hope is that jurors come to these decisions after careful deliberation of the sum of evidence, research suggests otherwise. According to Pennington and Hastie (1992), jurors often spontaneously create a story over the course of a trial in order to better organize and understand incoming information. These stories are influenced not only by the weight of the information presented, but also by perceptions of the motives, confidence, and credibility of those presenting it (Pennington & Hastie, 1992). Under this story model of decision making, juror judgments are more likely to be made in accordance to these narratives. Given the argument-heavy nature of the adversarial criminal trial, the linguistic choices made by a lawyer or witness can influence juror decision making in a similar manner as the content of their argument or testimony. For instance, jurors may misinterpret a witness's motive or confidence based on their style of delivery, shaping their narrative for the trial and potentially their final judgments. By examining the effects of word choices on juror decision making, one can better understand the various ways explicit and implicit language choices play a role in juror perceptions of guilt or reliability.

Our research focused on an eyewitness's use of linguistic concreteness, a linguistic cue that has been only somewhat investigated in the context of the criminal justice system. We explored how changes in linguistic category from concrete to abstract influenced jurors' verdict decisions as well as their perceptions of the eyewitness. Mock jurors in Study 1 who received the concrete version of the eyewitness testimony were more likely to find

the defendant guilty and were more likely to rate the eyewitness as credible than those who received the abstract version. These were small but expected effects, as more concrete language is perceived as more verifiable and lends some appearance of truthfulness (Hansen & Wänke, 2010).

In contrast to our findings in Study 1, jurors in Study 2 did not differ in their verdict or ratings due to the level of linguistic concreteness in the eyewitness's testimony. However, our secondary analyses comparing Study 1 and Study 2 may offer some insight into these unexpected results. The increased cognitive load or time required to review another document appeared to attenuate the effect of concrete language. Importantly, jury instructions in particular not only rendered jurors less likely to vote guilty, but also less likely to find the eyewitness credible compared to those who received a control document or those participants in Study 1 who received no document. Participants who received jury instructions in Study 2 were overall more critical of the prosecution's case. Similarly, university students drawn from primarily introductory psychology and neuroscience courses were more skeptical of the eyewitness than online participants. Together, these findings suggest that even limited knowledge about how memory works, be it from jury instructions or a course, can influence juror decision making. Even if memory information only renders jurors more skeptical of eyewitness evidence, jurors' reduced willingness to render guilty verdicts or believe the eyewitness could decrease the number of false convictions due to eyewitness misidentification.

Linguistic concreteness likely plays a larger role when the testimony importance or relevance is high, or when the pattern of concrete language is consistent over time. Our manipulations were modest, and used written rather than spoken presentation. Future researchers investigating eyewitness language choices on juror decision may wish to use more powerful manipulations of linguistic concreteness.

Jurors are undoubtedly influenced by the language an eyewitness utilizes when delivering their testimony or answering questions. As seen in our two studies, an eyewitness's use of concrete language influenced jurors in cases where they receive minimal information. However, these effects were attenuated when jurors were given additional information before making their decisions, particularly when the information focused on memory. As jurors weight their impressions of an eyewitness heavily when rendering verdicts, it is important to continue to investigate the ways language can shape juror perceptions of witnesses. Understanding how eyewitness word choices influence courtroom decisions and ways to moderate the effects may provide lawyers with new guidance for not only witness preparation, but also for framing their own arguments in the courtroom.

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## APPENDIX

## Correlation Matrices for Analyses Performed in Study 1 and 2

Table A1: *Summary of Correlations, Means, and Standard Deviations for Dependent Variables in Study 1*

Dependent Variable	1	2	3	<i>M</i>	<i>SD</i>
1. Verdict	–			1.52	0.50
2. Confidence	-.33*	–		66.32	17.82
3. Eyewitness Credibility	-.57*	.50*	–	58.38	23.13

*Note.* Correlations are representative of the sample as a whole. \*  $p < .01$

Table A2: *Summary of Correlations, Means, and Standard Deviations for Dependent Variables in Study 2*

Dependent Variable	1	2	3	4	5	<i>M</i>	<i>SD</i>
1. Verdict	–					0.12	1.00
2. Confidence	-.28*	–				70.00	19.10
3. Defendant Guilt	-.78*	.21*	–			54.04	25.76
4. Eyewitness Credibility	-.70*	.23*	.77*	–		59.18	24.61
5. Eyewitness Accuracy	-.77*	.22*	.80*	.87*	–	56.58	25.39

*Note.* Correlations are representative of the sample as a whole. \*  $p < .01$

Table A3: *Summary of Correlations, Means, and Standard Deviations for the Dependent Variables in the Secondary Analyses in Study 2*

Dependent Variable	1	2	3	<i>M</i>	<i>SD</i>
1. Verdict	–			0.46	0.50
2. Confidence	.30*	–		68.20	18.54
3. Eyewitness Credibility	.63*	.34*	–	58.74	24.48

*Note.* Correlations are representative of the sample as a whole. \*  $p < .01$