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The Influence of Jailhouse Informant Testimony on Jury Deliberation

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This study investigated the impact of jailhouse informant testimony on mock juries. In addition to allowing for jury deliberations, individual judgments (as measured in most prior research) were examined. Two hundred ninety-one undergraduates, in five- to six-member mock juries, heard a fictional murder trial summary in one of three conditions: jailhouse informant testified after receiving an incentive, jailhouse informant testified after receiving no incentive, or no jailhouse informant testimony. Participants made predeliberation judgments, deliberated on a verdict, and made postdeliberation judgments. The primary results showed that there were more guilty verdicts for juries that heard jailhouse-informant testimony than for those that did not hear such testimony. This relationship was fully mediated by perceptions of the defendant (e.g., sympathy for and credibility of). In addition, jury deliberations often produced a change in verdict; those who gave an initial guilty verdict were more likely to switch to not guilty after deliberation. Finally, cognitive network analyses showed that jailhouse informant testimony was the focus of jury deliberations for both guilty (viewed the testimony as reliable) and not guilty (viewed the testimony as unreliable) verdicts. Results are discussed in terms of the importance of how jailhouse informant testimony can influence jury deliberations in both a positive and negative way.

Keywords: cognitive networks, deliberations, jailhouse informant, jury, law

During a criminal trial, a prosecutor's case is often bolstered by the testimony of a jailhouse informant. This witness claims to have obtained evidence (through a direct conversation or overhearing a conversation), while in custody, about a crime committed by a fellow inmate who is currently on trial (see Natapoff, 2009; Neuschatz & Golding, in press). The jailhouse informant's testimony is typically offered in exchange for an incentive (e.g., reduced sentence or dropped charges; Roth, 2016), and these witnesses usually testify in the most serious cases (e.g., murder, rape) when there is a lack of other evidence (see Neuschatz et al., 2020). Jailhouse informant testimony is very influential at trial, even though jurors recognize informants have an incentive to lie (DeLoach et al., 2020; Jenkins et al., 2021; Neuschatz, 2008). However, prior research has focused on the perceptions of individual jurors and has not addressed the role that informant testimony plays during jury deliberations. The purpose of the present

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study is to investigate the impact of jailhouse informant testimony on jury deliberations.

How many jailhouse informants exist? There are no data on this question, as states generally do not keep statistics on it (see Neuschatz & Golding, in press). However, it can be argued that every inmate in jail is a potential jailhouse informant. The problem in this regard (as noted by Natapoff, 2009) is that inmates are surrounded by many vulnerable targets who can easily be taken advantage of by the authorities. Moreover, inmates have incentives readily available, and inmates in jail learn the ins and outs of obtaining information about crimes from various sources (Los Angeles County Grand Jury, 1990). Regarding the former, jailhouse informants may receive reduced charges or jail time, money, or jail privileges (see Neuschatz & Golding, in press). Regarding the latter, inmates learn that, although they are in jail, they can obtain information about a case from any number of public outlets. This can include media outlets as well as police reports and other legal information (Rohrlich, 1988a, 1988b, 1989).

The impact of jailhouse informants on the prosecution of cases is significant, as jailhouse informant testimony is a leading cause of wrongful convictions (Natapoff, 2009; Neuschatz & Golding, in press; Wetmore et al., 2020). For example, jailhouse informants have contributed to more than 119 known wrongful convictions (including 102 murder cases) according to the National Registry of Exonerations (Gross & Jackson, 2015; see also Garrett, 2011;

Innocence Project, 2019; Warden, 2004). Heath (2012) reported that since 2005, in the federal prison system at least 48,895 convicts—one of eight—had their prison sentences reduced after helping government investigators. According to Heath, these figures are an underestimate of the amount of cooperation that exists because they only consider cases in which the information regarding the cooperation was preserved in the court record and the prosecution found the information beneficial.

The use of jailhouse informants by the justice system, and the concern about these witnesses providing unreliable testimony (likely due to receiving incentives), has led to a recent surge in psychology and law research investigating the impact of jailhouse informants on legal decision-making (see Neuschatz & Golding, in press). The research has investigated both the impact of jailhouse informants (Neuschatz et al., 2007) and the underlying factors that might influence mock jurors who hear this testimony (DeLoach et al., 2020; Golding et al., 2020; Wetmore et al., 2020). This research has only investigated legal decision-making at the individual mock juror level, using primarily murder cases (but see Golding et al., 2020; Le Grand et al., 2021; Wetmore et al., 2014; for other types of cases). These studies have led to several significant findings. First, there has been a robust effect of jailhouse informant testimony compared with when such testimony is not presented—that is, mock jurors give more guilty verdicts when a jailhouse informant testified compared with when there was no jailhouse informant testimony (Jenkins et al., 2021; Maeder & Pica, 2014; Maeder & Yamamoto, 2017; Neuschatz et al., 2008; Neuschatz et al., 2012; Wetmore et al., 2014). Moreover, Jenkins et al. and Wetmore et al. found that jailhouse informant testimony led to as many guilty verdicts as when defendants themselves had confessed to the police about a crime.

Second, the impact of a jailhouse informant's testimony depends on how participants judge the jailhouse informant's credibility (i.e., mediation). For example, Golding et al. (2022) compared participants who heard only the testimony of a jailhouse informant to those who heard a jailhouse informant testify and a defendant counter the jailhouse informant's testimony. The former rated the jailhouse informant higher in credibility and rendered more guilty verdicts than the latter. Third, recent studies have examined the impact of a jailhouse informant on mock jurors' cognitive representation of the case using Pathfinder analyses (e.g., Le Grand et al., 2021; Wetmore et al., 2020); Those studies found that mock jurors who read jailhouse informant testimony conceptualized a case primarily in terms of this testimony. Thus, jailhouse informants' testimony affected their perceived credibility and observers' related case judgments; those judgments then have a direct effect on mock jurors' verdicts.

Finally, researchers have largely been unable to attenuate the impact of jailhouse informant testimony (but see Golding et al., 2022, for the only study that has reduced the effect of jailhouse informants on guilty verdicts). This includes research that made participants aware of (a) the incentive a jailhouse informant received for testifying (DeLoach et al., 2020; Neuschatz et al., 2008); (b) the jailhouse informant having testified for the prosecution in exchange for an incentive many times in the past (Neuschatz et al., 2012; Experiment 1); and (c) the possibility (presented by an expert) that a jailhouse informant might fabricate information about a defendant (Maeder & Pica, 2014; Neuschatz et al., 2012; Experiment 2). In addition, research by Wetmore et

al. (2020) presented mock jurors with explicit cautionary judicial instructions (including those used in actual courts) to assess the jailhouse informant testimony, but these instructions were ineffective at sensitizing them to the potential unreliability of jailhouse informant testimony.

Although prior research on jailhouse informants and legal decision-making has uncovered the above findings, this research has been conducted only at the juror level. No study has investigated the impact of jailhouse informant testimony on juries. The absence of jury-level research in this legal context is not unique (Bornstein & Kleynhans, 2019; Devine et al., 2001), yet despite calls for more jury-level research, "surprisingly little is known about the deliberation process that gives rise to jury verdicts" (Salerno & Diamond, 2010, p. 174; see also Bornstein, 2017; Nuñez et al., 2011). The scarcity of jury-level research is understandable given the difficulty of conducting such studies (see Bornstein & Kleynhans, 2019)—recruiting and coordinating groups of participants, videotaping deliberations, and the need for additional participants due to statistical power issues. However, deliberation can exert both positive and negative types of influence, such as facilitating or impeding evidence recall (Hirst & Stone, 2017) or comprehension (Hans et al., 2011). It can also exacerbate or limit individual biases (Koehler & Meixner, 2017), depending on a variety of juror and case characteristics, such as jurors' race/ethnicity (Sommers & Ellsworth, 2003; Thomas, 2007, 2010) or case-relevant attitudes (Hans et al., 2011). Moreover, courts sometimes dismiss jury simulation research precisely because so much of it is based on individuals and not groups, among other concerns (Koehler & Meixner, 2017; Rose, 2017).

Thus, without jury-level research (no matter how difficult to conduct), there has been a widening gap in our understanding of legal decision-making (Devine, 2012). Specifically, researchers are genuinely in the dark about critical components of a jury trial, such as the deliberative process leading to a group judgment, the ultimate consensus verdict rendered, and the impact of the deliberation on individual jurors (for example, postverdict dissonance or dissatisfaction; Hirst & Stone, 2017; Koehler, & Meixner, 2017; Rose, 2017). It is entirely possible that some variable found to influence individual judgments would be overshadowed in the deliberative context or vice versa. In addition, some variables that pertain only to the deliberation process can influence jury decisions. For example, analyses of Capital Jury Project data have found that, even when controlling for legally relevant variables, jurors' lingering doubt about guilt, expressed during deliberations, reduced the likelihood of the jury's sentencing the defendant to death (Devine & Kelly, 2015), whereas a relatively positive group climate increased it (Connell, 2009).

In the present study involving jailhouse informants, our use of a jury context allows us to examine these issues. Specifically, how mock jurors discuss a jailhouse informant's testimony was investigated. This included both what was said about the jailhouse informant and the impact of that discussion on the group's verdict. Thus, the goal was to learn more about the legal decision-making process than can be gleaned from investigating individual mock jurors alone.

The Present Study

In the present study the impact of jailhouse informant testimony on mock juror judgments, jury verdicts, and the deliberative

process was examined. Undergraduates (primarily in groups of six) listened to a tape of a murder case in which (a) a jailhouse informant testified for the prosecution and acknowledged receiving a reduction in sentence as an incentive for his testimony (that is, Jailhouse Informant Incentive condition); (b) a jailhouse informant testified for the prosecution but stated that he did not receive an incentive for his testimony (that is, Jailhouse Informant No Incentive condition); and (c) a different witness (a neighbor) testified for the prosecution-no mention was made of receiving an incentive for testifying (i. e., no Jailhouse Informant condition). After the trial, each participant rendered a verdict and stated why they chose this verdict. Participants also answered questions about the defendant (for example, credibility, sympathy). For those participants who heard the testimony of the jailhouse informant, they also answered questions about the jailhouse informant (for example, credibility). Next, the participants deliberated as a mock jury to render a verdict—the deliberations were videotaped and transcribed. Finally, after the deliberation, each participant again made individual judgments concerning the verdict and the case.

Based on prior research, several testable hypotheses were generated.

Hypothesis 1: Jury Verdicts

Although there have not been any prior jury-level research studies investigating jailhouse informants, prior research involving individual mock jurors can be used to guide predictions about jury verdicts (Devine et al., 2001). Thus, it was predicted that the number of guilty verdicts rendered by juries that received jailhouse informant testimony would be higher than that of juries that did not receive this testimony. Moreover, it was predicted that this pattern would be true regardless of knowing whether the jailhouse informant received an incentive or not (Neuschatz et al., 2012).

Hypothesis 2: Predeliberation Individual Verdict Judgments

It was predicted that mock jurors who heard jailhouse informant testimony (regardless of whether the jailhouse informant received an incentive or not) would render more guilty verdicts than participants who did not hear jailhouse informant testimony. This prediction was based on many prior studies that have shown the impact of a jailhouse informant's testimony toward a guilty verdict (for example, Neuschatz et al., 2008; Wetmore et al., 2020).

Hypothesis 3: Individual Change in Verdict

When investigating jury decision-making, it is of interest to investigate how the deliberative process affects individual jurors. Does an individual change their perception of the case based on the deliberation, or does their thinking about the case remain the same before and after deliberation? Given jury research that has shown greater leniency by jurors after deliberating (Golding et al., 2007; MacCoun & Kerr, 1988), it was predicted that mock jurors would be more likely to change their guilty verdict and render a not-guilty verdict than maintain a guilty verdict after deliberating or switch from not-guilty to guilty (that is, a leniency main effect of pre- versus postdeliberation).

Hypothesis 4: Mediation

It was predicted that the impact of jailhouse informant testimony would result in evidence of mediation through the variables measuring perception of the defendant's credibility and sympathy toward the defendant. For example, jailhouse informant testimony (in either condition) would lead to lower defendant credibility and less sympathy for the defendant, resulting in more guilty verdicts than when no jailhouse informant testimony was presented. Mediation involving perceptions of the defendant in a jailhouse informant testimony trial has been found in other investigations (for example, Golding et al., 2020; Le Grand et al., 2021).

Hypothesis 5: Jury Deliberations

Jury deliberations were investigated in two ways. First, quantitative coding was conducted of how often the deliberation comments mentioned the jailhouse informant. This included both positive (for example, believed the jailhouse informant) and negative (for example, did not believe the jailhouse informant) statements generated about the jailhouse informant. The coding was done for juries that heard the jailhouse informant received an incentive and those that did not, as well as for juries that rendered a guilty verdict or a not-guilty verdict. A Verdict × Statement interaction was predicted. Juries that rendered guilty verdicts, regardless of incentive condition, should generate more positive statements about the jailhouse informant than negative statements, but the opposite should occur for juries that render not guilty verdicts.

Second, to better understand how the testimony of a jailhouse informant influences deliberations, cognitive networks of mock juries were constructed using Pathfinder analysis (for example, Golding et al., 2020; Le Grand et al., 2021; Magyarics at al., 2015). Pathfinder analysis is a psychometrically established scaling technique used to derive and formally represent networks from various forms of data including text (Cooke, 1992; Schvaneveldt, 1990; Zemla & Austerweil, 2018). The resulting networks elucidate conceptual structures (see Johnson et al., 1994, for a review) in that they represent the most important concepts discussed by mock jurors during their deliberations, as well as the psychologically salient relations among these concepts.

From the jury transcripts, Pathfinder was used to derive four cognitive networks. Each network represented the deliberations of mock juries that received a certain type of case including a jailhouse informant (that is, jailhouse informant incentive, jailhouse informant no incentive) and reached a verdict type (guilty, not guilty). Based on prior jailhouse informant research examining individual mock jurors' attributions as a function of their verdict (see Neuschatz & Golding, in press, for a review; Golding et al., 2020; Le Grand et al., 2021), we predicted that mock juries that reached a guilty verdict after hearing jailhouse informant testimony would conceptualize the case based on this testimony. Thus, their networks would include deliberation statements that placed high value on the jailhouse informant's testimony (that is, centrally located nodes) as well as statements pertaining to the defendant's guilt. The same results were expected regardless of whether the jailhouse informant received an incentive. The predictions for not-guilty networks were such that for juries presented with jailhouse informant testimony, the jailhouse informant's testimony would not be central to the deliberation (that is, less centrally located nodes), and these juries would focus more on the deficiencies or unreliability of the evidence.

Method

Participants

The initial sample consisted of 377 Introduction to Psychology students (76.4% female, n=288, $M_{\rm age}=19.07$, $SD_{\rm age}=2.98$) who received class credit in exchange for their participation. All participants were United States citizens and were at least 18 years of age. Forty-four participants were dismissed prior to jury deliberations to keep jury size at six members, leaving 335 participants. Finally, an additional 44 participants were excluded from analyses, as they belonged to juries that did not reach a unanimous verdict (that is, "hung" juries; see below). This left a final data analysis sample of 291 participants (72.9% female, n=212, $M_{\rm age}=18.94$, $SD_{\rm age}=1.11$).

There were up to ten participants recruited for each time slot, with the goal of having six-member juries. Six-member juries were chosen, the minimal size in U.S. jurisdictions, because of limitations in the availability of participants given the number of mock juries necessary to complete the study. If additional participants showed, random selection was used to dismiss jurors. The initial number of juries was 57; however, seven juries were unable to reach a unanimous verdict (that is, hung juries) and their data were excluded from all analyses. Of the 50 juries used for data analysis, nine juries consisted of only five mock jurors.

Design

The experiment used a one-way design with three levels of Jailhouse Informant (Jailhouse Informant—incentive for testifying, Jailhouse Informant—no incentive for testifying, no Jailhouse Informant), with verdict (individual and jury), case judgments (individual predeliberation and change in verdict after deliberation), and deliberation protocols as the dependent variables. Participants completed a predeliberation questionnaire and a postdeliberation questionnaire, as detailed below.

Material

Trial Summary Recording

Three separate audio recordings of the case were each about 7–8 minutes long and were all recorded by the same female undergraduate research assistant. More specifically, the research assistant narrated the entire trial which included: charges, judge's instructions, all descriptions of the witnesses' testimony, and closing statements. Before each piece of the trial, the narrator would indicate the part of the trial (that is, "prosecution's case") and then would state whose testimony they were describing (that is, "Witness Number 1, James Miller.") The narrator then stated what each witness said on direct and cross-examination. This fictional trial summary was adapted from previous individual mock-juror studies investigating jailhouse informants (Neuschatz et al., 2008, 2012). In this case a defendant was charged with first-degree murder (that is, a man stabbing another man to death). The trial

summary included a fictional description of the trial, the prosecution's case, and the defendant's case. The general description was the same for each condition and included information about when and where the incident allegedly occurred, when charges were filed against the defendant, and a description of the charges filed. Two witnesses provided testimony for the prosecution (jailhouse informant or local homeowner and a fiber expert), and two for the defense (defendant's boss and the defendant). For the two conditions in which the jailhouse informant testified for the prosecution, the jailhouse informant was the second witness. The jailhouse informant testified that while the two in jail, they became friends and that the defendant made a private confession to him that he had killed someone. In the condition without the jailhouse informant's testimony, the second witness for the prosecution was described as a local homeowner. The testimony of the homeowner stated that he was coming home late after going to a movie and saw a white van that had the name of a moving company painted on it. He stated that the man in the van was the defendant.

It was necessarily the case that the jailhouse informant and the homeowner gave different testimony because the latter was not privy to the information the jailhouse informant claimed to have obtained from the defendant (that is, the secondary confession). Note that testimony offered by a jailhouse informant is considered a secondary confession (Neuschatz et al., 2008), because the jailhouse informant offers the confession secondhand. We decided to use the homeowner as a no-jailhouse informant condition to be sure that no other witness presented a secondary confession while controlling for the total number of witnesses. If the homeowner had presented the same information as the jailhouse informant, it would no longer serve as an appropriate control. ¹

In the scenarios, the prosecution's case was based on the testimony of a forensic investigator and either a jailhouse informant or a local homeowner. In the Jailhouse Informant conditions, the jailhouse informant was described as either receiving an incentive or no incentive. In the Incentive condition, the jailhouse informant received five years off his 10-year sentence. In the No Incentive condition, the jailhouse informant claimed to testify because of personal experience with a cousin being killed, and the subsequent effect on his family. The local homeowner said he saw the defendant and the victim together the night of the murder. The defense's case included testimony by the defendant, who denied the allegation of manslaughter, and the employer of the defendant, who testified that on the day of the murder the defendant acted in a normal manner. All witnesses underwent direct- and cross-examination. After the trial recording presentation, participants heard the judge's instructions. These instructions included a description of the elements that must be satisfied before rendering a verdict of guilty of first-degree manslaughter. Finally, participants heard closing arguments from the prosecution, the defense, and the prosecution again.

Pre- and Postdeliberation Questionnaires

The participants responded to a pre- and postdeliberation questionnaire. The two questionnaires were comparable, except in two ways. The first is that demographic questions were asked only at

Additional information regarding the trial summary (including the summary itself) can be obtained from the corresponding author.

the end of the predeliberation questionnaire and the second is that witness rating questions were only asked in the postdeliberation questionnaire. Participants were required to render a verdict of guilty or not guilty. Note that although "undecided" is a legitimate predeliberation position, we followed the convention in other deliberation research that presents only the options that they will ultimately have postdeliberation (see Devine, 2012; Devine et al., 2001). On a 10-point scale with only the end points labeled, all completely)² and their confidence in their verdict (1 = not at all, 10 = confident). Following these first three questions, participants responded to an open-ended item that asked, "What led to your verdict?" Note that prior to deliberations we did not include any questions about the presence of a jailhouse informant, whether the jailhouse informant received an incentive or not, or any follow-up questions about a jailhouse informant to avoid highlighting this testimony as the mock jurors entered deliberations.

The remaining witness rating questions answered by all participants were on a 10-point scale with the endpoints labeled (1 = not at all, 10 = completely). First, we assessed the credibility of each witness (including the defendant), as well as the believability of the defendant, and the level of sympathy and anger felt toward the defendant. There were four other questions answered only by participants in the two jailhouse informant conditions. All were asked whether a jailhouse informant testified (yes or no) in the trial summary recording. If participants indicated that a jailhouse informant testified in the trial summary that they heard, they answered the additional questions. All were rated on a scale with only the endpoints labeled (1 = not at all, 10 = completely). These items asked how credible the jailhouse informant was, how much his testimony influenced their verdict, and the fairness of the jailhouse informant receiving a reduced sentence for his testimony.³

Verdict Tracking Sheet

In addition to the informed consent and pre- and postdeliberation questionnaires, a verdict tracking sheet was included in the materials. This was a half sheet of paper with six lines to represent up to six jury votes. Each time that the jury took a vote to reach a verdict, each mock juror tracked their own vote on this sheet of paper. The range of votes taken to reach a final verdict was one to six, and the modal number of votes was two.

Procedure

Participants entered a classroom and were directed by one of the researchers (all females) to choose one of ten seats at the far end of the table. Materials (informed consent, pre- and postdeliberation questionnaires, verdict tracking sheet) were in a manila folder at each seat, and participants were instructed not to look at the materials until directed to do so. Participants were further directed to take out a pen, and to put any phones, computers, backpacks, or purses out of reach for the duration of the study. Once all participants were present and seated, they read and signed an informed consent sheet. The consent sheet and the experimenter informed the participants that they would be videotaped during the experiment. Each participant gave informed consent and then indicated that he or she would assume the role of a juror for this study. Following informed consent, the researcher played a recording of the randomly assigned case summary (jailhouse informant–incentive,

jailhouse informant—no incentive, or no jailhouse informant). Once the case summary recording concluded, participants were instructed to work silently on their own to complete the predeliberation questionnaire.

Prior to deliberations, the researcher dismissed extra mock jurors if there were more than six participants, and their data were not used for any analyses. The dismissal of extra participants was done randomly, except that the researchers tried to have at least one male on each jury to be more realistic. No further attempt was made to manipulate gender composition of each jury, given that there was no reason to expect any effect of participant gender based on prior research involving jailhouse informants in murder trials (see Neuschatz & Golding, in press).

In the room, participants selected a jury foreperson. Once participants had selected the foreperson, the researcher gave verbal and written instructions to the jury regarding deliberation, started recording on the digital video camera, and exited the room. In the hallway, the researcher debriefed the nondeliberating participants, informed them that overrecruitment was necessary for this study, and told them that they would still receive full credit for participation.

Participants who partook in deliberation were instructed to take an initial public vote for the verdict by a show of hands. Each participant recorded their vote(s) on the verdict tracking sheet so researchers could later track individual changes. If the initial jury vote was not unanimous, the participants began deliberation. Participants were told that deliberation could last up to 20 minutes. If the jury could not come to a unanimous decision, they were considered a "hung jury." There were seven hung juries (one no jailhouse informant jury, three incentive jailhouse informant juries, and three no incentive jailhouse informant juries). The data from hung juries were excluded from all analyses, except those involving predeliberation judgments, resulting in a total of 50 juries used for statistical analyses. Mock juries that took additional votes did so in the same manner as the initial vote. After the participants reached a unanimous verdict or time had expired, each participant completed the postdeliberation questionnaire. Finally, the participants were debriefed about the experiment. The entire procedure took about 1 hr.

Analysis Plan

Preliminary analyses focused on missing data, outlier detection, and skewness of continuous variables. Missing data was extremely low for juror level variables (.0% to 8.4%) and was nonexistent at the jury level. Thus, missing data were handled with case-wise deletion. Next, a case's Cook's distance (Cook, 1977) and externally studentized residuals were examined to assess potential outlier influence and discrepancy, respectively. No cases violated these statistics at either level, and no cases were deemed to be outliers. As a final preliminary analysis, continuous variables were

 $^{^2}$ We did analyze the guilt rating but decided to analyze only verdict results for parsimony and because guilt rating and verdict were so highly correlated—guilt rating and both pre- and postverdicts were correlated at r > .78.

 $^{^3}$ All analyses involving the jailhouse informant (e.g., credibility) are available upon request from the third author.

examined for skewness. No variables were skewed, so no remedial action was implemented.

Following preliminary analyses, primary analyses focused on the initial non-nested model. In this case, the initial non-nested model was used to test Hypothesis 1. Because juries gave an overall verdict, the data are non-nested, as there is no higher level of nesting (that is, this analysis is only at the jury level). Therefore, simple logistic regression was used, with jury verdict as the dependent variable, and two dichotomous variables signifying to which Jailhouse Informant condition the jury belonged. As a note, the individual postdeliberation verdicts and overall jury verdicts are the same, as all juries used for analyses reached a unanimous decision. Therefore, this dependent variable is at the group level and is unable to be used as a dependent variable in nested models (that is, for multilevel modeling, the dependent variable must be an individual level variable).

After assessing the non-nested model, analyses then focused on nested models. Given that jurors were nested in juries, multilevel modeling (MLM) was required, with level one being the juror level (that is, individual) and level two being the jury level (that is, group). Specifically, logistic MLM (LMLM) tested Hypotheses 2 and 3 to assess whether individual level characteristics and group level characteristics (for example, experimental conditions) impacted individual predeliberation verdicts and whether a juror changed their individual verdict after deliberation. Given the relatively even distribution of these dependent variables, overdispersion was not an issue. A standard model taxonomy was followed, first computing the null model and obtaining the intraclass correlation (ICC). The computation of the ICC for LMLMs is different than for MLMs with a continuous outcome. Thus, the estimate of the level one variance follows previous guidelines (Snijders & Bosker, 2011), using the formula $\pi^2/3$, because this is the standard estimate of the variance for a logistic distribution. Individual model ICCs are reported below. Next, control variables were added into the model. Nonsignificant variables were trimmed from the model for parsimony, an especially important part of model specification for MLM (Snijders & Bosker, 2011). Finally, the last model entered the experimental conditions, which were dummy coded to compare each Jailhouse Informant condition against the No Jailhouse Informant condition.

To test for mediation between juries and their rendered verdicts, the PROCESS macro was used (Hayes, 2017). This utility allows for the bootstrapping of the indirect effect, using 5,000 samples, and defines a significant indirect effect as one whose 95% confidence interval does not include zero (Hayes, 2017). Further, because individual postdeliberation verdicts varied only at the group level (see above for more information), mediation models were non-nested and were analyzed only at the group level. Therefore, mediation models focused on whether the group average of defendant ratings mediated the relationship between the conditions and jury verdict.

Finally, we analyzed the deliberation data. Frequency data were analyzed using a 2 (Verdict: Guilty versus Not Guilty) \times 2 (Jailhouse Informant Present: incentive for testifying versus no incentive for testifying) \times 2 (Jailhouse Informant Statement: Positive versus Negative) mixed-factor ANOVA conducted with Jailhouse Informant Statement as a within-participants factor. The deliberation data was also analyzed using the Pathfinder scaling algorithm (Schvaneveldt et al., 1988) to derive four cognitive networks.

Each network represented the combined deliberations of mock juries in each Jailhouse Informant condition (that is, jailhouse informant incentive, jailhouse informant no incentive) that rendered a particular verdict type (guilty, not guilty). Pathfinder analysis generates a network representation of key terms in text by measuring the relative degree of association (for example, similarity, distance) between these key terms. A cognitive network is made up of nodes and links. In this case, nodes represent meaningful terms used by mock juries, and links indicate associations between nodes.

To construct the networks, we used the vector space model (Salton et al., 1975) to represent the statements given by jurors. Each statement was converted into a row vector with dimension equal to the number of unique terms in the combined deliberation. Each cell in the resulting vector space model contained the frequency of occurrence of each unique term for a given statement. The average number of unique terms mentioned during deliberation across juries was the following: no incentive guilty: 606; no incentive not guilty: 1,007; incentive guilty: 525; incentive not guilty: 922. We used the $tf \times idf$ global weighting method (Jones, 1972), a widely used statistic for automatic key term extraction, to rank order these unique terms by importance. From this rank ordering, we retained the top ten terms for each condition because this number seemed to provide the most useful visualization of major themes. In addition, research suggests networks of a minimum of five key terms can be valid representations of knowledge in a domain (see Goldsmith et al., 1991). From this reduced vector space model, we computed the pairwise cosine similarities (Gomaa & Fahmy, 2013) between the 10 terms. This similarity matrix represented a fully connected network (all nodes are connected to all other nodes) with terms as nodes and similarities as link strengths. This network was then scaled using the Pathfinder Scaling algorithm to represent the conceptual organization of the

Results

Table 1 presents the means, standard deviations, and correlations between study variables at the juror and the jury levels. All quantitative analyses used in this study used a p value of .05 to determine statistical significance.

Hypothesis 1: Jury Verdicts

Hypothesis 1 was supported. Overall, 50 juries reached a verdict. For the Jailhouse Informant conditions, 13 juries (41%) voted guilty, and 19 juries (59%) voted not guilty. The No Jailhouse Informant condition had two juries (11%) voted guilty, and 16 juries (89%) voted not guilty. The model with both Jailhouse Informant conditions as dummy variables was not significant, $\chi^2(2) = 5.55$, p = .062, and coefficients were not interpreted. However, as a post hoc analysis, Jailhouse Informant conditions were collapsed. The logistic model was significant, $\chi^2(1) = 5.30$, p = .021. Compared with juries in the No Jailhouse Informant condition, juries in a Jailhouse Informant condition were more likely to render a guilty verdict compared with a not guilty verdict, B = 1.70, p = .041, DR = 5.47. Examining the DR, juries in the Jailhouse Informant condition(s) were 5.47 times more likely than juries in the no Jailhouse

 Table 1

 Means, Standard Deviations, and Correlations Among Study Variables

Variable	1	2	3	4	5	6	7	8	9
Juror level									
 Defendant credibility 	_								
2. Defendant sympathy	.45***								
3. Pre-delib. verdict ^a	42***	24***	_						
 Change in verdict^a 	05	.13*	.48***						
Jury level									
5. Defendant credibility					_				
6. Defendant sympathy					.69***	_			
7. Incentivized JI ^a					29*	21			
 Unincentivized JI^a 					34*	25	47**	_	
 Verdict^a 					64***	62***	.24	.08	_
M	5.22	4.00	0.61^{b}	0.38^{b}	5.24	4.01	0.36^{b}	0.28^{b}	0.30^{b}
SD	1.79	2.10	0.49	0.49	1.27	1.27	0.48	0.45	0.46

Note. JI = jailhouse informant; Delib. = deliberation.

Informant condition to render a guilty verdict than a not-guilty verdict.

Hypothesis 2: Predeliberation Individual Judgments

The ICC for this model was .18, indicating that 18% of the variance in predeliberation verdicts was due to nesting. Overall, Hypothesis 2 was supported. Compared with jurors in the no Jailhouse Informant condition, jurors in both the unincentivized Jailhouse Informant condition, $\gamma = 1.58, p < .001$, OR = 4.85, and the Incentivized Jailhouse Informant condition, $\gamma = 1.40, p < .001$, OR = 4.05, were more likely to give an initial guilty verdict, each controlling for the other condition. The large ORs indicate that participants in both Jailhouse Informant conditions were over four times as likely to render a guilty verdict than participants in the No jailhouse Informant condition.

Hypothesis 3: Individual Change in Verdict

To test Hypothesis 3, that deliberation may lead to changes in verdict, and that a change in verdict may differ for experimental conditions, a change verdict dependent variable was derived where a value of 1 indicated that a juror changed their verdict, regardless of the direction, and a value of 0 indicated that a juror stayed with their initial decision. Overall, 111 jurors changed their verdict (38.4%). Of these 111, 11 (9.9%) changed from not guilty to guilty, whereas the remaining 100 (90.1%) went from guilty to not guilty, $\chi^2(1) = 65.82$, p < .001.

The ICC for this model was .17, indicating that 17% of the variance in a juror changing their vote was due to nesting. Hypothesis 3 was supported. Neither Jailhouse Informant condition, compared with the No Jailhouse Informant condition, was associated with whether individual jurors changed their verdict or not, controlling for initial verdict. However, a juror's initial verdict was associated with whether they changed their verdict, $\gamma = 1.74$, p = .002, OR = 5.72, controlling for dummy-coded conditions, such that jurors who gave an initial guilty verdict were 5.72 times more likely to change their verdict. These results suggested evidence of greater

leniency overall following jury deliberation (see MacCoun & Kerr, 1988).

Hypothesis 4: Mediation

The results provide support for Hypothesis 4. For both models using the group level average of ratings of the defendant (for example, credibility of and sympathy for), the models had a significant indirect effect (see Figure 1). Defendant credibility fully mediated the relationship between whether a jury heard from a jailhouse informant or not and verdict (indirect effect 95% CI [1.19, 8.70]). The direct effect was not significant, B = .10, p =.94. When juries heard from a jailhouse informant, compared with when they did not, juries reported lower defendant credibility, B =-1.66, p < .001, which, in turn, resulted in more guilty verdicts, B = -1.73, p = .002. Similarly, sympathy for the defendant fully mediated the relationship between whether a jury heard from a jailhouse informant or not and verdict (indirect effect 95% CI = .66, 5.86). The direct effect was not significant, B = 1.59, p = .20. When juries heard from a jailhouse informant, compared with when they did not, juries reported lower sympathy for the defendant, B = -1.22, p = .001, which, in turn, resulted in more guilty verdicts, B = -1.53, p = .002.

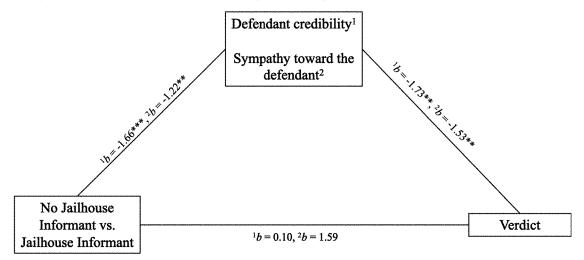
Hypothesis 5: Jury Deliberations

Nine of the 50 jury deliberations (seven in the Jailhouse Informant condition, two in the No Jailhouse Informant condition) could not be transcribed owing to equipment or researcher error. The difference in deliberation time was not significant between the Incentive (M = 8.04, SD = 3:50) and No-Incentive Jailhouse Informant conditions (M = 8:04, SD = 3:50), t(24) = -.36, p = .72—their scores were collapsed. The overall mean deliberation time was 8:04 (SD = 3:50) for juries that were presented with a jailhouse informant and 5:42 (SD = 2:27) for juries that were not presented with a jailhouse informant. This difference was significant, t(40) = -2.21, p = .03, providing one (albeit cursory) indication that participants spent time talking about the jailhouse informant, or that

^a Dichotomous variable where 1 equals a guilty verdict, a changed verdict, or belonging to a condition. ^b The mean of a dichotomous variable represents the percentage of the people in the 1 category.

^{*}p < .05. **p < .01. ***p < .001.

Figure 1
Ratings of the Defendant Mediated the Relationship Between Experimental Conditions and Jury Verdict



Note. Superscript denotes which coefficients are related to the corresponding mediators in the mediation model. *p < .05. **p < .01. ***p < .001.

the testimony from the jailhouse informant caused a more thorough discussion of the evidence presented.

From the transcriptions of the 41 mock jury deliberations, we coded the number of times jurors in each jury generated a positive statement (for example, "The criminal [jailhouse informant] came up and gave a very detailed story with no, like removal of his time in jail") or a negative statement (for example, "He also had five years cut off his sentence, if he came forward, so it's kind of like he came up with a bullshit story and said, you know, whatever") about the jailhouse informant. Note that there were also neutral statements about the jailhouse informants (for example, "We don't know the relationship he [the defendant] had with the cellmate") that were included as part of the total number of jailhouse informant statements made by each jury. Given the hypothesis, only the positive and negative jailhouse informant statement proportions were analyzed in the data presented in Table 2. A 2 (Verdict: Guilty versus Not Guilty) × 2 (Jailhouse Informant Present: incentive for testifying versus no incentive for testifying) \times 2 (Jailhouse Informant Statement: Positive versus Negative) mixedfactor ANOVA was conducted with Jailhouse Informant Statement as a within-participants factor. As predicted, this analysis yielded a significant Verdict x Jailhouse Informant Statement interaction, F $(1, 19) = 22.83, p < .001, \eta_p^2 = .19$. Juries (in both jailhouse informant present conditions) that rendered guilty verdicts generated more positive statements about the jailhouse informant than negative

Table 2 *Mean (Standard Deviations) Positive and Negative Jailhouse Informant Statements as a Function of Jury Verdict*

Jailhouse informant statement	Guilty verdicts	Not guilty verdicts
Positive	.68 (.30)	.17 (.19)
Negative	.14 (.21)	.44 (.22)

Note. Columns do not add to 1.00 because (as explained in the text) neutral statements were omitted.

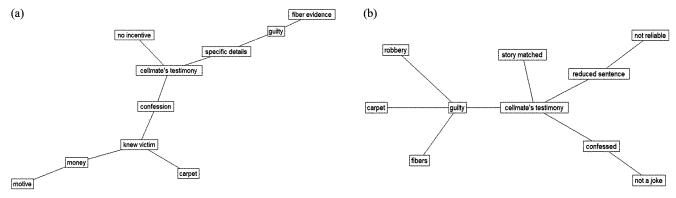
statements, but the opposite occurred for juries that rendered not guilty verdicts.

From the transcriptions of the 41 mock jury deliberations, we derived four cognitive networks to represent all possible combinations of two levels of Jailhouse Informant and the two verdict types. The networks for guilty verdicts supported all predictions. When juries were presented with jailhouse informant testimony, the case was conceptualized based on this testimony (see Figure 2a—no-incentive juries and Figure 2b—incentive juries). The jailhouse informant was a central node, and this node was linked to nodes indicating the defendant's guilt. Figure 2a shows that the most central nodes in the no incentive, guilty network were "cellmate's testimony" and "knew victim." Figure 2b shows the network for guilty verdict when the jailhouse informant received an incentive—both "cellmate's testimony" and "guilty" were the most central nodes in this network.

The networks for not guilty verdicts (see Figure 3a – no-incentive juries and Figure 3b – incentive juries) again supported our prediction. Juries that received jailhouse informant testimony did not include this testimony as a central part of their deliberations. Instead, these juries focused on the lack of evidence. As seen in Figure 3a, the network for the No-Incentive Jailhouse Informant had the node "cellmate's story" far from the center of the network—one of the least important nodes in the network. In addition, Figure 3a had "circumstantial evidence" as its most central node.

The network for the not guilty, jailhouse informant incentive juries veered a bit from the prediction, in that the jailhouse informant testimony was more central to the jury deliberations. As seen in Figure 3b, the nodes "cellmate testimony," "circumstantial," and "confession" were the most central nodes of the network. Contrary to our hypothesis, this indicates that the cellmate testimony was a major consideration in the deliberations of mock juries in the incentive condition who voted not guilty. Rather than minimizing the jailhouse informant's testimony, it appeared that participants focused on it. It could be that when mock jurors focused on

Figure 2
Pathfinder Networks of Deliberations From Juries Rendering a Guilty Verdict



Note. Pathfinder networks derived from deliberations for mock juries who voted guilty in the (a) no-incentive condition and (b) incentive condition.

this testimony, it raised doubt about the credibility of the case, leading them to render a not guilty verdict. Our prediction that participants would find the jailhouse informant's testimony not credible was supported, in that the nodes "reduced sentence" and "unreliable" were directly linked to "cellmate testimony."

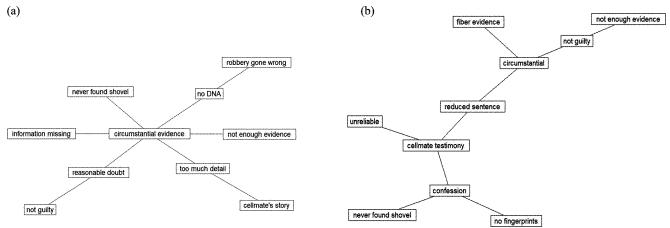
Discussion

The present experiment offered a unique glimpse into jury deliberations involving a trial in which a jailhouse informant testified. There were four primary results. First, there were more guilty verdicts for both initial perceptions of the case by individual jurors (H2) and after deliberation by juries (H1) when the case included jailhouse-informant testimony than when no such testimony was presented. Second, consistent with prior research, deliberation produced a leniency effect, such that individuals were more likely to acquit after deliberation than beforehand, regardless of whether a jailhouse informant testified (H3). Third, the mediation analyses showed an indirect effect whereby how each jury perceived the defendant (both credibility of and sympathy for) predicted final

verdicts (H4). Finally, analyses of jury deliberations showed that jailhouse informant testimony (when present) was a substantive point of discussion during deliberation. Moreover, mock jurors were sensitive to the specific content of that testimony (that is, presence/absence of an incentive) and interpreted the evidence differently depending on whether their jury convicted or acquitted the defendant (H5).

The finding that jailhouse informant testimony led to more guilty verdicts in a jury context than when there was no jailhouse informant testimony is consistent with prior mock juror research (Neuschatz & Golding, in press). Thus, as has been found with much other legal decision-making research that moved from individual to group judgments (see Diamond, 1997), the predicted effect was shown regardless of whether an individual or group was rendering a verdict. Such a finding across legal decision-making contexts argues strongly that jailhouse informant testimony is perceived as credible and serves to lower defendant credibility. This perception continues to be found in the lab (Le Grand et al., 2021; Neuschatz, 2008) and in the real world (Neuschatz et al., 2020), despite several studies showing that jailhouse informants are

Figure 3
Pathfinder Networks of Deliberations From Juries Rendering a Not Guilty Verdict



Note. Pathfinder networks derived from deliberations for mock juries who voted not guilty in the (a) no-incentive condition, and (b) incentive condition.

unreliable in a real-world context (Garrett, 2011; Natapoff, 2009). The latter includes overturned cases in which a jailhouse informant was found to have fabricated their testimony.

Additional support for the strength of jailhouse informant testimony in the present study was shown in the mediation analyses that found an indirect effect of perceptions of the defendant in cases in which jailhouse informant testimony was presented. Specifically, within each jury, a jailhouse informant led to lower ratings of the defendant's credibility and sympathy for the defendant, which led to an increase in guilty verdicts. The use of mediation was a valuable analytic tool in the present jury context, although prior published jury research (for example, Golding et al., 2007) has not used this technique to investigate indirect effects.

Although it was important that the present mock jury verdict results replicated prior results involving mock juror verdict findings, the present study offers a wealth of new information about the impact of the deliberative process when jailhouse informant testimony is provided. This new information includes finding that the deliberative process attenuated the impact of the jailhouse informant's testimony, resulting in a leniency effect (MacCoun & Kerr, 1988). Jury verdicts fell well short of the 70% guilty mark observed in both the present predeliberation verdict data and prior mock-juror research (for example, Neuschatz, 2012; Neuschatz et al., 2008). Instead, the present results examining pre- and postdeliberation verdicts clearly showed that jury deliberations allowed various aspects of the jailhouse informant to be discussed, including the possibility that his testimony might not be reliable. We elaborate on this point when discussing the cognitive network results below.

Regarding cognitive networks, the present study used these networks to offer a look, heretofore unseen (for example, Golding et al., 2007, used frequency counts of jury statements), into the deliberative process when a jailhouse informant testifies. The cognitive networks used Pathfinder analysis (Schvaneveldt, 1990) to formally represent the most important concepts (and their relationship) that mock jurors discussed with their fellow jury members (Cooke, 1992; Johnson et al., 1994; Schvaneveldt, 1990; Zemla & Austerweil, 2018). Thus, like previous studies that have used cognitive networks to represent the thinking of individual mock jurors in various types of victimization cases (for example, sexual assault: Golding et al., 2020; alcohol-facilitated rape: Le Grand et al., 2021; stalking: Magyarics at al., 2015; adult rape), the present cognitive networks offered an additional measure about how mock jurors reasoned in their specific case.

In the present study, we constructed four cognitive networks to represent the deliberations of each type of trial that involved a jailhouse informant (that is, incentive, no incentive) for both a guilty verdict and a not-guilty verdict. Consistent with data from mock juror research (for example, Wetmore et al., 2020) asking why participants rendered a guilty verdict, the deliberation networks from jailhouse informant mock juries (both incentive and no incentive) that rendered guilty verdicts focused on the reliability of the jailhouse informant. These networks also showed how other comments about the jailhouse informant and the defendant's guilt were connected.

Another interesting aspect of the cognitive networks was that they showed important differences between those that heard the jailhouse informant received an incentive and those that did not. This was the only time differences between these conditions were

observed, showing that although both conditions led to similar judgments of the case, the not-guilty verdict deliberations focused on different points depending on whether an incentive was received. Network nodes in the no-incentive mock juries suggest that the jailhouse informant's testimony had "too much detail" to be believed by juries. However, those juries that heard about an incentive argued that the evidence in the case was circumstantial and that the jailhouse informant's testimony was unreliable. These findings make clear that one reason that the number of guilty verdicts for the No-Incentive condition was not significantly different from that of the Incentive condition was that even in the No-Incentive condition, several mock jurors brought their suspicions about the jailhouse informant into the jury room. A final point to note about the cognitive networks was that they convincingly showed that mock juries that heard jailhouse informant testimony deliberated about many points that, of course, could not be raised by those mock juries that did not hear this testimony.

Limitations

Despite the interesting results of the present study, it has a few limitations. First, we used undergraduates as mock jurors. It can be argued that undergraduates have a limited age range and limited life experiences, including, presumably, being less likely to have served on a jury. Some research suggests that the attitudes of former jurors differ from those in the general population (for example, Thomas, 2020), although research on this point is mixed (Devine & Caughlin, 2014). Additionally, the undergraduates in the present study were jury-eligible, and a recent meta-analysis has shown that when using nonwritten trial materials (as in the present study), student-nonstudent differences are minimal to nonexistent (Bornstein et al., 2017). Nonetheless, as with all jury research, it is important to replicate the present findings using diverse samples and multiple methods (for example, Bornstein, 2017; Thomas, 2007). Second, the trial in the present study was relatively short. It is possible that the impact of the jailhouse informant would be different in the context of additional evidence. However, as noted by archival analysis of DNA exonerations involving jailhouse informants, these witnesses usually testify when there is a lack of other evidence (see Neuschatz et al., 2020).

A third possible limitation is jury size; specifically, juries in the present study contained six persons—the constitutional minimum in the United States. Compared with smaller juries, larger juries are more diverse, collectively remember more evidence, and produce verdicts that are more predictable and in line with community sentiment; however, they also deliberate longer and reduce the likelihood of individual participation (Bornstein & Greene, 2017; Watanabe, 2020). Statistical models show that optimal jury size balancing considerations like verdict accuracy and efficiency (that is, costs to both courts and jurors themselves)—varies depending on community factors (for example, opinion homogeneity) but is about nine to 12 (King & Nesbit, 2009; Watanabe, 2020). Given larger juries' tendency to recall more evidence and discuss it more accurately (Saks & Marti, 1997), we expect that the effects of jailhouse informant testimony observed here would, if anything, be less with larger juries. Finally, the time to deliberate was constrained to a maximum of 20 minutes. It is possible that if there had been more time to deliberate, the mock juries would have talked longer and discussed different issues or discussed the

jailhouse informant in different ways. Although we cannot entirely discount this possibility, we should note that the vast majority were able to deliberate until a verdict was rendered. Future research should include larger juries and longer deliberation times.

Practical Policy Implications

It is clear from our data that jailhouse informants influence jurors and jury deliberations, as every jury that was exposed to a jailhouse informant mentioned the jailhouse informant in the deliberations. Moreover, 72% of the participants in the Jailhouse Informant conditions voted guilty predeliberation, and 40% of these juries voted unanimously guilty. We acknowledge that the use of truthful jailhouse informants can benefit the legal system by allowing prosecutors and police access to information and evidence that they would have no way of obtaining otherwise. However, it is important to note that when relying on criminals, there is always the possibility that these criminals will give false testimony—as evidenced by the 15% of DNA exonerations in murder cases that involve false jailhouse informant testimony (National Registry of Exonerations, 2017). Because decisions about using a jailhouse informant and how to ensure informant testimony's reliability and proper use by juries are under the control of legal professionals, they constitute "system" variables. Research on jailhouse informants, like other system variable research, is therefore "likely to produce findings that improve the quality of the decisions that jurors render, influence policy, and increase the justice that defendants and victims receive" (Kovera, 2017, p. 290; see also Steblay, 2019). This research should expand on the limited number of investigations that have examined the impact of special jury instructions regarding jailhouse informant testimony (but see Wetmore et al., 2020), and whether jurors are affected by expert testimony on jailhouse informants (but see Maeder & Pica, 2014; Neuschatz et al., 2012), as well as investigating the motivations of prosecutors who employ jailhouse informants (see Joy,

Regarding changes to the judicial system in cases involving jailhouse informants, we should note that some states have introduced legislation to guide prosecutors, judges, and defense attorneys to prevent (or at the very least reduce) false testimony from jailhouse informants (see Neuschatz & Golding, in press for more information). For example, Illinois Senate Bill 1830 (IL S.B. 1830, 2018) expanded pretrial reliability hearings of jailhouse informants in certain types of violent crimes. Moreover, this bill requires prosecutors to disclose any benefits a jailhouse informant received, the jailhouse informant's past criminal record, and any history of past cooperation of the jailhouse informant with the prosecution. Other states, such as Oklahoma, Nebraska, and Texas, have also made similar policy changes (see Neuschatz & Golding, in press, for a more exhaustive list). Along with changes in laws, there are also current legal standards that may improve the quality of legal decisions. For example, defense attorneys have the right to challenge the admissibility of jailhouse informant testimony based on the Federal Rules of Evidence (Michigan Legal Publishing, 2019; see also Joy, 2007)-defense attorneys often allow decisions about jailhouse informant testimony to proceed unchallenged (Sevilla & Wefald, 2005). In addition, defense attorneys may request to have all discovery material related to a jailhouse informant released to them under the Brady rule (Brady v. Maryland, 1963).

In conclusion, we hope that the actions described above for prosecutors, judges, and defense attorneys will occur. If not, we argue that the use of jailhouse informant testimony will continue to interfere with a defendant's due process and contribute to more false convictions. Currently, the legal system is designed to offer jailhouse informants great leeway in what they present in court and what they receive for testifying. Regarding the former, we know of very few cases where jailhouse informants have been prosecuted for perjury, despite the many indisputable cases in which jailhouse informants have given false testimony (see Neuschatz & Golding, in press). As for incentives, jailhouse informants continue to testify and are richly rewarded (e.g., reduced jail time, conjugal visits, money), typically without fear of punishment for false testimony. Without some action by the principal players in the legal system, it is likely that some jailhouse informants will continue to lie on the stand, given that the chance of being caught and punished for lying is so small and the payoff for testifying is so large.

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