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ORIGINAL ARTICLE

Modeling the Influence of Investigator Bias on the Elicitation of True and False Confessions

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Abstract The aim of this study was to model various social and cognitive processes believed to be associated with true and false confessions by exploring the link between investigative biases and what occurs in the interrogation room. Using the Russano et al. (Psychol Sci 16:481–486, 2005) paradigm, this study explored how perceptions of guilt influenced the frequency and type of interrogation tactics used, suspect's perceptions of the interrogation process, the likelihood of confession, and investigator's resulting perceptions of culpability. Results suggested that investigator bias led to the increased use of minimization tactics and thereby increased the likelihood of false confessions by innocent participants. In contrast, the manipulation of investigator bias had no direct or indirect influence on guilty participants. These findings confirm the important role of investigator bias and improve our understanding of the decision-making process associated with true and false confessions.

Keywords Confessions · Interrogations ·
Investigator bias · Confirmation bias

Current police interrogative practices have been a source of debate and interest within the psychological, sociological, criminological, and legal fields for several decades (see Gudjonsson, 2003; Kassin, 1997, 2005; Kassin & Gudjonsson, 2005; Kassin et al., 2010; Leo, 2008). One point of concern has involved research indicating that modern day, psychologically based interrogation practices can lead individuals to provide false confessions for crimes that they did not commit. According to data from the Innocence Project (www.innocenceproject.org), between 20 and 25% of the over 200 cases of wrongful conviction known to date have been due, at least in part, to a false admission or confession (also see Drizin & Leo, 2004). Survey data collected by Gudjonsson and Sigurdsson (1994; Gudjonsson and Sigurdsson 1996; Gudjonsson, Sigurdsson, Asgeirsdottir, & Sigfusdottir, 2006) in Iceland indicated that between 7 and 12% of individuals who have been interrogated report having provided a false confession, whereas a recent survey of police investigators in the U.S. estimated that 5% of "innocent" suspects provide a false admission of guilt (Kassin et al., 2007). Taken together, these data suggest that the false confession phenomenon occurs in our criminal justice system to a significant degree.

Given the growing awareness of this phenomenon, social scientists have begun to examine factors that may lead individuals to implicate themselves in a crime that s/he did not commit (see Kassin et al., 2010). The overwhelming data from these studies suggest that two primary factors appear to be associated with the elicitation of false confessions, namely, the implementation of psychologically manipulative interrogation techniques and individual difference characteristics that make some suspects more vulnerable to interrogation than others (including the age, mental ability, suggestibility, and psychological state of the individual; for a review, see Gudjonsson, 2003). More recently, research has suggested that pre-interrogation biases of "guilt" on the part of investigators may lead to

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the use of heavy-handed interrogation tactics that are more likely to produce false confessions—a process that results in confirmation bias in the evaluation of confession evidence (Kassin, Goldstein, & Savitsky, 2003; Meissner & Kassin, 2004). This study investigates this link between investigative biases and the conduct of interrogations in an attempt to better understand the social and cognitive processes that underlie the process of confirmation bias in both the production and evaluation of confession evidence.

Interrogation Techniques that Increase the Likelihood of False Confessions

Kassin and McNall (1991) have suggested that most interrogation techniques can be categorized into either of the two groups, namely, minimization or maximization. Techniques that employ minimization are considered the "gentler" of the two groups. Such techniques use a more subtle form of persuasion when attempting to convince a suspect to confess—for example, the interrogator might underplay the seriousness of the act/crime and lull the suspect into a false sense of security by offering sympathy, face-saving excuses, and moral justification for why he or she may have committed the crime. In contrast, maximization techniques involve a more aggressive form of persuasion when attempting to convince a suspect to confess, including methods that exaggerate the seriousness of the crime and/or the magnitude of the offense. Under this class of techniques, the interrogator might also offer false evidence (such as an eyewitness identification or DNA evidence) in an effort to intimidate the suspect.

The first laboratory study to examine the phenomenon of false confessions was conducted by Kassin and Kiechel (1996). In their now-famous "Alt key" paradigm, participants were asked to complete a typing task in which they were explicitly instructed not to hit the "ALT" key because it would cause the computer to crash. After the typing task began, the computer would crash, and the experimenter would accuse the participant of hitting the forbidden key (despite each participant being actually "innocent" of the act). Kassin and Kiechel found that the increased vulnerability on the part of the suspect (i.e., memory uncertainty) and the presentation of false evidence (i.e., false eyewitness testimony) significantly increased the false confession rate. Researchers have continued to employ the Kassin and Kiechel paradigm to investigate other possible influences, such as a pre-existing state of stress (Forrest, Wadkins, & Miller, 2002), the gender of the interrogator or suspect (Abboud, Wadkins, Forrest, Lange, & Alavi, 2002), the suspect's age (Redlich & Goodman, 2003), individual difference variables such as locus of control and authoritarianism (Forrest, Wadkins, & Larson, 2006), the

consequences of confession (Horselenberg, Merckelbach, & Josephs, 2003), and the use of minimization and maximization techniques (Klaver, Lee, & Rose, 2008).

Most recently, Russano, Meissner, Narchet, and Kassin (2005) developed a novel experimental paradigm to explore factors that may influence the likelihood of true and false confessions. The Russano et al. paradigm takes advantage of the culture of an academic setting by inducing participants to engage in a transgression that carries significant consequences for students within a university environment, namely, cheating on an academic task. Only half of the participants were actually guilty of the transgression (via experimental manipulation); however, both the guilty and the innocent alike were later interrogated by the experimenter. During the interrogation, participants were exposed to techniques that included aspects of *minimization* and/or were provided an *explicit offer of leniency* in exchange for their confession. These techniques were compared to that of a basic accusatorial control condition in which a direct accusation of guilt was made, the seriousness of the transgression was stressed, and suspect denials were shut down followed by a request for compliance (providing a confession to cheating with the confederate). Importantly, this paradigm permitted researchers to examine the influence of certain interrogation techniques on confession rates generated from both the innocent and guilty participants—thereby allowing for an analysis of the diagnostic value of the interrogation technique (the ratio of true-to-false confessions generated). The use of minimization and/or an offer of leniency increased both true and false confession rates when compared with the control condition. Furthermore, diagnosticity was reduced by 40% with the use of one technique and by 74% with the use of both techniques in combination. Through this study, it was sought to extend this paradigm to a more natural interrogative situation in which experimenters were trained in the use of 15 different tactics and were permitted to apply these tactics in any manner they felt appropriate. This study also sought to examine the role of pre-interrogative biases—or perceptions of the suspects' guilt or innocence—on the conduct of interrogations, the elicitation of confession evidence, and both interrogators' and suspects' perceptions of the interrogation.

Behavioral Confirmation in the Interrogation Room

Behavioral confirmation refers to a social interaction in which an individual's social expectations influence the actions of another and thereby confirm the individual's expectations. Researchers suggest individuals seek and interpret information in a manner to support their beliefs (Darley & Fazio, 1980; Snyder, Tanke, & Berscheid,

1977). This finding has been demonstrated in many different venues including education (e.g., Rosenthal & Jacobson, 1968) and workplace settings (e.g., McNatt, 2000). Researchers have suggested that interrogators may be predisposed to perceive guilt on the part of the suspect, and that this bias toward guilt may activate a process of confirmatory hypothesis testing that extends into the interrogation room (Meissner & Kassin, 2004). In one study, Kassin, Meissner, and Norwick (2005) found that, consistent with decades of research on deception detection (Bond & DePaulo, 2006), laypersons and police officers were no better than chance levels at distinguishing between true and false confessions made by prison inmates. While police officers were more confident in their abilities, they were actually less accurate than college students and were more likely to demonstrate a bias toward perceiving "guilt" in the confession statements (see Meissner & Kassin, 2002, 2004).

Kassin, Goldstein, and Savitsky (2003) explored whether a perception of guilt on the part of investigators might create a process of behavioral confirmation. Kassin and colleagues argue that if an interrogator enters the interrogation under the assumption that a suspect is guilty, then he or she would only attend to cues that confirm their beliefs and discard contradictory cues as insignificant. In the end, this would lead an investigator to conduct a more guilt-presumptive interrogation. Kassin and colleagues randomly assigned participants to play the role of an interrogator or a suspect in a mock theft scenario. After being advised of the likelihood that the suspect was guilty or innocent, interrogators were instructed to select up to six techniques that they might use during the interview. Participants assigned to the role of suspect were instructed to convince the interrogator of their innocence. Kassin and colleagues' findings indicated that interrogators with an expectation of guilt used more interrogative techniques overall, selected more guilt-presumptive questions, perceived the suspect as more likely to be guilty, and exerted more pressure on the suspect to secure a confession—and these effects were magnified for those investigators paired with an innocent suspect. Based on these findings, Kassin and colleagues suggested that investigative biases may contribute to the false confession phenomenon through the application of highly coercive and aggressive interrogative methods—a hypothesis put to test by this study (see also Meissner & Kassin, 2004).

In a later study, Hill, Memon, and McGeorge (2008) extended the research on confirmation bias in investigative interviews. Using a confession paradigm similar to Russano et al. (2005), individuals were recruited to participate in an intelligence task. After initial instructions by the experimenter, the participant was left with a confederate in a room with the answers for the intelligence task. The confederate would ultimately "find" the answers and invite the participant to use them. If the participant used the answers, then he or she was classified as "guilty". When the experimenter returned to the room, he or she noticed that the answer sheet had been moved and the confederate was removed from the room. The participant was then interrogated with either 10 guilt-presumptive questions (e.g., Are you ashamed of what you did?) or 10 neutral questions (e.g., What happened when the researcher left the room?). Although questioning style did not directly influence confession and denial rates, it did influence the ratings of independent observers who listened to tapes of the interrogations. Suspects responding to guilt presumptive questions were perceived as more culpable than those responding to neutral questions, particularly those participants who remained innocent of the act. The authors suggest that the self-fulfilling prophecy phenomenon may account for these results. This current study sought to extend this prior research by assessing the influence of investigator bias on both the conduct of an interrogation and the resulting impact on both true and false confessions.

Theories of Confession

Psychologically based interrogation techniques are believed to encourage confessions largely as a result of social influence processes that have been shown to produce powerful effects in psychological studies of conformity (Asch, 1952), obedience to authority (Milgram, 1974), and compliance to requests (Cialdini, 2001). In addition, several specific theories have been developed to account for the cognitive and social psychological processes leading to confession (Berggren, 1975; Gudjonsson, 1989a, 1989b; Hilgendorf & Irving, 1981; Moston, Stephenson & Williamson, 1992; Ofshe & Leo, 1997; see Gudjonsson, 2003).

In his Cognitive–Behavioral Model, Gudjonsson (1989a, 1989b) extended prior theories of confession to propose that five factors should be considered when assessing why suspects confess. These five components include *social factors* (e.g., the suspect's feelings of isolation and their need for approval or affiliation), *emotional factors* (e.g., the suspect's feelings of distress or anxiety), *cognitive factors* (e.g., the suspect's thoughts and interpretations of the interrogation situation, including the strength of evidence presented), *situational factors* (e.g., pre-existing circumstances associated with the suspect, such as his or her experience with the legal system), and *physiological factors* (e.g., the suspect's aroused physical state, including heart rate, blood pressure, and perspiration). In addition, while it is possible that a suspect could evaluate both the immediate and long-term consequences associated with confessing, it would appear that focusing a suspect on

immediate consequences (e.g., feelings of approval) would more likely yield a confession.

To date, Gudjonsson's model (as well as other proposed theoretical models, e.g., Hilgendorf & Irving, 1981) has provided an intuitive explanation of the social and cognitive psychological processes associated with confession; however, little empirical research has been conducted to examine their validity or to assess the extent to which such models might appropriately explain both true and false confessions. This study will attempt to address this paucity in the literature by providing an empirical test of factors associated with a participant's decision to confess using the Russano et al. (2005) paradigm.
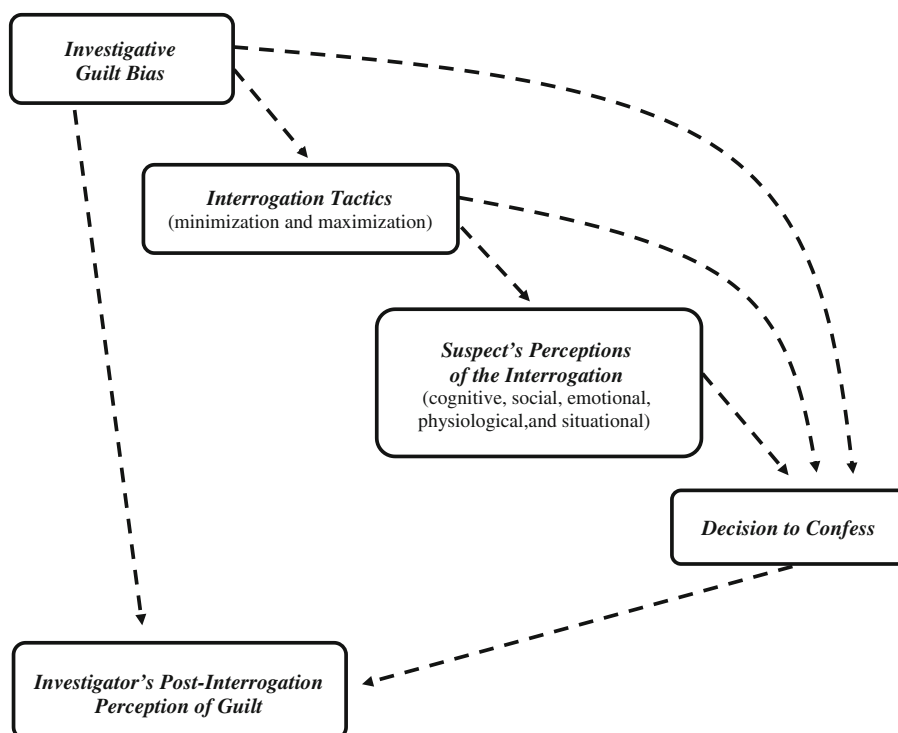
Overview of this Study

The purpose of this study was to model various cognitive and social processes that are believed to be associated with true versus false confessions, including the effects of investigator bias. By manipulating investigator bias, this study sought to explore the social interactions that may occur in the interrogation room and to examine whether an expectation of guilt or innocence might lead interrogators to employ more guilt-presumptive interrogation techniques (Kassin et al., 2003). The guilt expectation condition attempts to mirror police investigations in which a suspect is interrogated after his/her guilt is established during a pre-interrogation interview that is supposed to differentiate between guilty and innocent individuals. In the past experiments, the interrogator has typically been restricted to the use of a few interrogation techniques, standardized by condition. In this present study, however, the interrogators were permitted to employ any of 15 different interrogation techniques for which they had received training (including aspects of minimization, maximization, and more generalized investigative interviewing). Furthermore, this study assessed the role of proposed theoretical factors underlying the decision-making process in the interrogation room (Gudjonsson, 1989a, 1989b). Following the interrogation, participants completed a questionnaire indicating why they did or did not sign the confession statement, which allowed for the assessment of Gudjonsson's (1989a, 1989b) five-factor model.

To examine the role of investigative biases in the interrogation process, a path model was proposed to assess the processes leading to both true and false confessions. Traditionally, theorists have assumed that true and false confessions are mediated by similar processes (e.g., see Gudjonsson, 2003). As such, this study examines whether the same factors account for both true and false confessions. As displayed in Fig. 1, it is proposed that an investigator bias toward perceiving guilt will be associated with an increase in the use of minimization and maximization techniques. These techniques are expected to then influence the participants' perceptions of the emotional, cognitive, physiological, situational, and social elements associated with interrogations (e.g., by increasing pressure

Fig. 1 Generalized path model for the likelihood of confession

to confess), and thereby increase the likelihood of confession for both innocent and guilty participants. Finally, the experimenter's post-interrogation perception of the guilt or innocence of the participant is expected to be related to the signing of the confession statement and to the experimenter's initial belief in the participant's guilt or innocence.

Method

Participants

Two hundred and 10 students (mean age = 20 years) from a large southeastern university participated in the experiment. Men represented 36% of the sample, and the self-reported racial/ethnic background of the participants included 69% Hispanic, 16% Caucasian (non-Hispanic), 7% African-American or Black Caribbean, 4% Asian American, and 4% of the participants classified themselves as the "other." Participants received course credit in exchange for participation in the study. Twenty-seven participants were omitted because they refused to share information or initiated cheating. Three participants exercised their right to withdraw from the experimental session and were excluded from analysis. All the participants were fully debriefed, regardless of when the experimental session was terminated.

Design

A 2 (guilt vs. innocence of participant) × 3 (investigator bias: no bias vs. guilt bias vs. innocence bias) between-participants factorial design was used. The dependent measures for this study included the number of minimization and maximization techniques used by the interrogator, the participant's perceptions of the interrogation process, the participant's decision to confess, and the interrogator's post-interrogation assessment of the participant's guilt or innocence.

Materials

A questionnaire was developed to assess Gudjonsson's Cognitive–Behavioral Model of confession (1989a, 1989b). Cognitive elements included the suspect's perception of the potential consequences, the severity of consequences, the proof of evidence against them, and their feelings of guilt. Emotional elements included the participant's perceived levels of stress and anxiety. Physiological elements assessed the self-reported arousal state of the participant (e.g., heart rate). Situational elements included pre-existing factors associated with the participant (e.g.,

whether the participant has been in a similar situation). Finally, social elements included the participant's feelings of isolation and the perceived pressure to confess. Responses to each question were provided on a seven-point Likert scale.

Factor analysis was performed on this 22-item questionnaire to determine whether the five predicted factors would emerge. The items were analyzed via principle component analysis with Varimax rotation.[1] A cutoff of 0.60 was employed when assessing the factor loadings (Hinkin, 1995). The proposed five elements of the interrogation process failed to emerge as expected. Four factors emerged from the principal component analysis. The first factor was composed of nine items assessing the physiological and emotional responses (e.g., My heart was beating fast when the experimenter accused me of cheating) associated with the interrogation situation (labeled *Affective*, with an eigenvalue of 4.96, accounting for 22.6% of the variance; $\alpha = .90$). The second factor was labeled *Consequences* (with an eigenvalue of 2.90, accounting for 13.2% of the variance: $\alpha = .81$). It consisted of four cognitive items that assessed participants' perceptions of the severity of consequences associated with providing a confession (e.g., I would have been in less trouble if I admitted to cheating on the triangle problem). The third factor consisted of four items that assessed cognitive items (e.g., I would have been in more trouble if I admitted to cheating on the triangle problem) associated with participants' feelings of guilt and perceptions of the proof against them (labeled *Proof/Guilt*, with an eigenvalue of 2.90, accounting for 13.2% of the variance; $\alpha = .76$). The fourth factor was composed of two items that assessed the situational aspects of the interrogation (e.g., I have been in a situation similar to the current one), namely, whether the participant had ever been in a similar situation (labeled *Situational*, with an eigenvalue of 1.70, accounting for 7.8% of the variance; $\alpha = .77$). Finally, perceptions of *Pressure* to confess failed to load onto one of the factors; however, given prior research on the importance of this variable (see Russano et al., 2005), this single item representing the social pressures of the interrogation was used in subsequent analyses.

In addition, experimenters were asked to complete a post-interrogation questionnaire. The questionnaire included items, such as the type of techniques used and whether the experimenters believed the participant was actually guilty or innocent. The questionnaire also asked the experimenter to express a confidence rating (0–100%) regarding his or her decision. Finally, lab managers, who

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[1] Separate factor analyses were conducted for guilty and innocent participants; however, the emerging factors were not notably distinctive. The results of the factor analysis were, therefore, collapsed across participants' guilt or innocence.

were responsible for supervising the experimental session, completed a questionnaire that assessed the length of the interrogation and the number of techniques used (assessed via closed-circuit video). Lab managers were blind to hypotheses. When coding for the variables associated with the interrogation, inter-rater reliability among the five lab managers was $r = .90$.

Procedure

Pre-training of Experimenters as Interrogators. Eight men were recruited to play the role of interrogator, ranging in age from 20 to 25 years old. Experimenters underwent approximately 5 weeks of training; each read an abbreviated version of an interview and interrogation training manual, including a variety of techniques that had been used by investigators in the field (Gordon & Fleisher, 2006; Holmes, 2002; Inbau, Reid, Buckley, & Jayne, 2001; Schafer & Navorro, 2004; Zulawski & Wicklander, 2001). During initial training sessions, tapes of previous interrogations conducted in the Russano et al. (2005) paradigm were shown and critiqued for tone and mannerism. In addition, the experimenters were given demonstrations regarding how to effectively employ 15 different interrogation techniques both in isolation and in combination with other techniques. The techniques included: alternate question, appeal to self-interest, buddy technique, exaggeration of the offense, expressing a firm belief in participant's guilt, explicit offer of leniency, face-saving excuses, inquisitorial approach, isolation, possible leniency, presentation of implied false evidence, presentation of false evidence, silence, and shutting down denials. The experimenters were encouraged to vary their use of interrogation techniques and, in particular, were encouraged to tailor their interrogation strategy to each individual participant's reactions. Overall, experimenters were instructed that their goal was to obtain *true* confessions and to avoid obtaining *false* confessions.

Russano et al. (2005) Paradigm. In general, the procedures of the Russano et al. (2005) paradigm were followed. Participants were recruited under the guise that they would be participating in a problem-solving study. They were met by the experimenter and a female confederate posing as another participant. The experiment was divided into five phases: (1) the rapport building phases, (2) the problem-solving phase, (3) filler task phase, (4) the interrogation phase, and (5) debriefing phase.

In the rapport- building phase, the experimenter explained that the premise of the study was to examine individual versus team problem-solving skills. After obtaining informed consent, the experimenter instructed participants that they would spend a few minutes getting to know one another since they would be working together for the remainder of the session. The experimenter then left the room for 5 min while the confederate engaged the participant in a brief rapport-building conversation.

For the problem-solving phase, the experimenter returned to the room and provided participants with three questionnaire packets: a "team" problem-solving packet and two "individual" problem-solving packets. The experimenter instructed the participants that they would have to solve the individual problems on their own, whereas the team problems had to be solved together. They were told to alternate between the sets of problems, beginning with an individual problem. The experimenter stressed that they were not allowed to collaborate on or discuss the individual problems. The participants were instructed to alert the experimenter once they completed the problems so that he could prepare them for another questionnaire. At that point, the experimenter left the room and the participants began working on the individual and team problems.

Before the start of the experimental session, participants were randomly assigned to either the guilty or innocent condition. In the guilty condition, the confederate feigned difficulty with the second individual problem (referred to as the "triangle problem") and asked the participant for assistance. When information was shared with the confederate, the participant became "guilty" of breaking the rules of the experiment. In the innocent condition, the confederate did not seek information from the participant.

After completing the individual and team problems, the experimenter provided participants with a post-session questionnaire (filler task) that explored their experience with the problem-solving session along with a demographic questionnaire. The experimenter instructed the participants to notify him when they had completed the questionnaires. While the participants were completing the filler task, the variable of investigator bias was manipulated with the assistance of a lab manager. For each session, experimenters were randomly assigned to one of the three investigator bias conditions. All experimenters were randomly assigned to complete approximately the same number of participants in each condition. In the *guilt expectation condition*, the lab manager informed the experimenter that based upon what he or she saw on video, they believed that the participants may have shared information. In contrast, the *innocent expectation condition* involved experimenters being informed by the lab manager that they did not believe that the participant shared information with the confederate. Finally, a *control condition* was also included in which the lab manager claimed that he or she did not see the video, and so was unable to determine whether the participant and the confederate had shared information. No experimenters expressed suspicion

concerning the investigator bias manipulation. Following the filler task, the experimenter entered the room and claimed that he had reviewed the problem-solving packets and that based upon what he saw there might be a problem. He indicated that he needed to speak with each participant separately and asked the confederate to exit the room with him first. The participant was isolated in the room for 7 min.

Following this period of isolation, the experimenter, who was blind to the actual guilt or innocence of the participant, returned to the room and confronted the participant with the accusation of cheating. In particular, experimenters were instructed, regardless of condition, to explain that the participant and the confederate had the same wrong answer on the triangle problem, and that based upon this he believed that the pair had cheated by sharing information on the individual problems. Participants were told that if they did share information, this would constitute a major problem because they broke the rules of the experiment and compromised the integrity of the study. The experimenter explained that he had called his professor for instructions on how to handle the situation. He stated that his professor seemed pretty upset about the situation, and that the professor might treat this as a cheating violation. At this point, experimenters were instructed to begin employing one or more of the techniques they had received training on. Because of the use of human subject restrictions, experimenters were permitted to interrogate participants under these conditions for up to 15 min.

In the end, the experimenter asked the participant to sign a written statement admitting to cheating. This statement constituted an admission of guilt on the part of the participant. If the participant signed the confession statement, then the experimenter also asked the participant to recount in as much detail as possible what happened during the problem-solving phase of the experiment. If the participant refused to sign the statement, then the experimenter claimed he was going to call the professor and see how he was to proceed with the situation. Upon exiting the room, the experimenter completed the experimenter's post-interrogation questionnaire. Following the interrogation, the lab manager handled the debriefing phase of the study. The lab manager explained that they were terminating the experimental session early. After probing for suspicion (i.e., the lab manager asked the participants to describe the true purpose of the study), participants were told that the accusation of cheating had been part of the experiment, and that further details would be provided after they had completed one final questionnaire. Participants were then asked to complete the 22-item debriefing questionnaire. Following completion of this questionnaire, the lab manager fully informed the participant regarding the true purpose of the experiment, making certain that the

participant understood the necessity for use of deception and the collection of covert videotaping of the session. Participants were given the option of signing a waiver allowing for the use of their data and video images for research purposes.

Results

Experimenter Effects

Because this study employed eight different experimenters, the data were initially tested for experimenter effects. No systematic experimenter effects were observed on either true confessions, $\chi^2(7) = 11.43$, $p = .12$, or false confessions, $\chi^2(7) = 3.40$, $p = .85$. Across experimenters, true confession rates ranged from 72 to 100% ($M = 89\%$), whereas false confession rates ranged from 15 to 50% ($M = 29\%$). Consistent with prior research (Russano et al., 2005), true confessions were significantly more likely than false confessions, $\chi^2(1, N = 210) = 78.45$, $p < .001$, OR = 20.40, $CI_{95} = 9.61$, 43.28. As might have been expected, experimenters varied significantly in the frequency with which they employed minimization, $F(7,209) = 6.75$, $p < .001$, $\eta^2 = .18$, $CI_{95} = .08$, .25, and maximization, $F(7,209) = 7.81$, $p < .001$, $\eta^2 = .21$, $CI_{95} = .10$, .28, techniques; however, this main effect of experimenter did not interact with the manipulation of experimenters' pre-interrogation expectation of guilt or innocence, $Fs(14,163) < .50$, $ps > .95$, $\eta^2 s < .02$.

Influence of Investigator Bias and Interrogation Tactics on True and False Confessions

A nested Analysis of Variance (ANOVA) was used to assess the effect of manipulating experimenters' perceptions of guilt (control vs. guilt vs. innocence) and participants' guilt or innocence on the likelihood of confession, with the participants nested within experimenters. Results indicated a significant main effect of the participants' guilt or innocence, $F(1,204) = 64.59$, $p < .001$, $\eta^2 = .24$, $CI_{95} = .15$, .33, and a main effect of the experimenters' perceptions of guilt, $F(2,204) = 3.17$, $p < .05$, $\eta^2 = .03$, $CI_{95} = .00$, .07. As displayed in Table 1, guilty participants were significantly more likely to confess than innocent participants, while experimenters' who were predisposed to believe the participant to be "guilty" were significantly more likely to yield confessions when compared with the no-bias control condition, $p > .05$. The interaction term failed to reach significance, $F(2,204) = 1.66$, $ns.$, $\eta^2 = .02$, $CI_{95} = -.01$, .06.

A nested ANOVA was also used to assess the influence of the experimenters' pre-interrogation perceptions of guilt

Table 1 Proportion of true and false confessions as a function of the experimenter's bias toward guilt or innocence

	True confession	False confession	Diagnostic value
No bias (control)	0.83	0.20	4.15
Innocent bias	0.89	0.26	3.42
Guilt bias	0.89	0.47	1.89

and the participants' guilt/innocence on experimenters' post-interrogation assessments of guilt/innocence. Results indicated a significant main effect of the participants' guilt/innocence, $F(1,204) = 153.29$, $p < .001$, $\eta^2 = .43$, $CI_{95} = .33$, .51, and a main effect of the experimenters' perceptions of guilt, $F(2,204) = 11.73$, $p < .001$, $\eta^2 = .10$, $CI_{95} = .03$, .18. In addition, a significant interaction was observed, $F(2,204) = 7.39$, $p < .01$, $\eta^2 = .07$, $CI_{95} = .01$, .13. Simple effects tests revealed that guilty participants were perceived as "guilty" regardless of experimenters' pre-interrogation expectation, $F(2,102) = 1.42$, *ns.*, $\eta^2 = .03$, $CI_{95} = -.04$, .10. In contrast, a main effect of experimenter expectation was observed across innocent participants, $F(2,102) = 17.13$, $p < .001$, $\eta^2 = .25$, $CI_{95} = .11$, .37. As displayed in Table 2, innocent participants believed to be "guilty" (via pre-experimental manipulation) were significantly more likely to be perceived as "guilty" following the interrogation when compared with those in the control and innocence conditions, $ps < .001$.

Finally, this study explored the relationship between the type of interrogation tactics employed by the interrogators and the guilt or innocence of the participants on the likelihood of confession. Interrogations were reviewed and assessed for whether experimenters employed non-coercive interview techniques, minimization tactics, maximization

Table 2 Experimenters' post-interrogation perceptions of guilt as a function of their pre-interrogation bias of guilt or innocence and the participant's guilt or innocence

	Guilty participant	Innocent participant
No bias (control)	0.75	0.13
Innocent bias	0.87	0.02
Guilt bias	0.89	0.50

tactics, or a combination of minimization and maximization tactics. A nested ANOVA indicated a significant main effect of guilt or innocence (consistent with the prior analysis), $F(1,204) = 127.35$, $p < .001$, $\eta^2 = .38$, $CI_{95} = .28$, .47, and a significant interaction, $F(2,204) = 8.35$, $p < .001$, $\eta^2 = .08$, $CI_{95} = .02$, .15. As displayed in Table 3, minimization and maximization tactics were associated with increased false confession rates by innocent participants, and thereby reduced the diagnostic value of the confession evidence.

Path Models Assessing the Role of Investigative Bias on True and False Confessions

The tests as listed above assessed the relationship between investigative biases and interrogation tactics and true versus false confessions. It is important, however, to understand the manner in which these variables work to create a process of behavioral confirmation involving both direct and indirect effects. This process is believed to begin with an investigator's belief in a suspect's guilt, leading to a more aggressive interrogation being conducted. Such an interrogation should lead to a manipulation of the suspect's psychological perception of the interrogation and the value of certain decisions associated with confession. As such, the suspect should be more likely to provide a confession when social pressure is the greatest and when the benefits associated with providing a confession appear the greatest. Finally, a confession on the part of the suspect should reinforce the investigator's belief in the suspect's guilt—thereby completing the process of behavioral confirmation.

A path model consistent with the above process (see Fig. 1) was assessed using the data set obtained in this study. Variables in the model included (a) the pre-interrogation *investigator bias* manipulation of guilt (guilt vs. innocence/control); (b) the frequency of *minimization* (e.g., alternate question, appeal to self-interest, buddy technique, offers of leniency, and face-saving excuses) and *maximization* techniques (e.g., exaggeration of offense, exaggeration of seriousness of offense, presentation of false evidence, and shutting down denials) employed; (c) participants' perceptions of the interrogation via their perceptions of their *affective* reaction, their perception of the *consequences* associated with confessing, their perception of *proof* and feelings of *guilt*, their perception of

Table 3 The relationship between interrogation tactics and the proportion of true and false confessions

	True confession	False confession	Diagnostic value
Non-coercive interview	0.96	0.03	32.00
Minimization	0.98	0.22	4.45
Maximization	0.92	0.11	8.36
Minimization and maximization	0.73	0.43	1.70

the *pressure* placed upon them to confess, and their perception of *situational* elements associated with the interrogation; (d) participants' decision to *confess*; and (e) experimenters' *post-interrogation perceptions of participants' guilt*. The same path model to participants in both the guilty and innocent conditions was applied, and the extent to which the same parameters emerged. When evaluating the fit of each model, we relied upon the following indicatorswere relied on: χ^2/df ratio, the Comparative Fit Index (CFI), the Goodness-of-Fit Index (GFI), and the Root-Mean-Squared Error of Approximation (RMSEA). For good model fit, the ratio of the Chi-Square value to the degrees of freedom should not exceed 2.0. The goodness-of-fit indices (i.e., the CFI and GFI) are standardized and range from 0 to 1, with 1 representing perfect fit. Finally, a RMSEA value below .08 is generally believed to indicate good fit (Joreskog & Sorbum, 2000). Table 1 presents the standardized parameter estimates and significance values of each path in the innocent and guilty models, as well as significance tests for differences across the two models.

Innocent Model. The innocent path model produced good overall fit to the data, $\chi^2(12, N = 105) = 9.38$, $p = .67$, with $\chi^2/df = .78$. Both of the standardized indices also suggested good model fit, CFI = 1.00 and GFI = .98, with RMSEA = .00. Consistent with prior research (Kassin et al., 2003) and predictions, a pre-interrogation investigator bias toward guilt significantly increased experimenters' use of both minimization and maximization techniques when interrogating innocent participants. In addition, minimization tactics yielded the strongest effects on participants by increasing their perceptions of pressure to confess and their affective reactions to the interrogation process. Both the use of minimization techniques and strong perceptions of pressure to confess were associated with an increased likelihood of participants providing a false confession. Such confessions by the innocent were also more likely to be associated with participants' perceptions of greater proof and feelings of guilt during the interrogation. Finally, experimenters were significantly more likely to falsely perceive the participants as having been "guilty" when they provided a confession, and when they had initially been led to believe that the participants were guilty (i.e., the presence of an investigative bias).

Taken together, the innocent model explained 32.6% of the variance in false confessions, and 33.1% of the variance in experimenters' post-interrogation perceptions of guilt. While the manipulation of investigator bias of this study had only a marginally significant direct effect on the elicitation of a false confession ($p = .08$), the impact of investigator bias appeared to have been moderated by its effect on the increased use of minimization techniques which, both

directly and indirectly through participants' perceptions of pressure, was associated with an increased likelihood of false confessions. Consistent with this interpretation, investigator bias produced a significant indirect effect on participants' perceptions of pressure to confess ($b = 0.37$, $CI_{95} = 0.01$, 0.73, $p = .04$), whereas a marginally significant indirect effect of minimization techniques was observed on the elicitation of false confessions ($b = 0.04$, $CI_{95} = -0.01$, 0.07, $p = .07$). This production of false confessions led to a rather prominent effect of "confirmation bias" in that the experimenters were significantly more likely to incorrectly associate a false confession with an attribution of guilt. Importantly, the indirect effect of investigator bias on post-interrogation perceptions of guilt (i.e., the cycle of confirmation bias) was also significant ($b = 0.08$, $CI_{95} = 0.02$, 0.16, $p = .04$). The use of minimization tactics ($b = 0.04$, $CI_{95} = 0.01$, 0.06, $p = .02$), along with participants' perceptions of pressure ($b = 0.03$, $CI_{95} = 0.01$, 0.05, $p = .009$) and feelings of guilt ($b = 0.03, CI_{95} = 0.01, 0.07$, $p = .02$), also demonstrated significant indirect effects in reinforcing investigators' post-interrogation attributions of guilt.

Guilty Model. The guilty path model also produced good fit to the data, $\chi^2(12, N = 105) = 13.70$, $p = .32$, with $\chi^2/df = 1.14$. Both of the standardized indices suggested good model fit, CFI = .99 and GFI = .98, with RMSEA = .04. Unlike the innocent model, manipulation of investigator bias had no significant influence on the use of minimization or maximization techniques; however, when used, these techniques did exert a powerful influence on guilty participants' perceptions of the interrogative situation and their resulting decision to confess. Specifically, minimization tactics were associated with increased participants' perceptions of "pressure" to confess (consistent with that observed in the innocent model). Minimization and maximization techniques also influenced participants' perceptions of proof and feelings of guilt during the interrogation. With regard to confessions by the guilty, participants were more likely to admit to cheating if they perceived greater pressure to confess, if they perceived fewer consequences associated with confessing, and if they perceived greater proof and feelings of guilt during the interrogation. Finally, experimenters were more likely to make an attribution of guilt post-interrogation if participants had provided a confession (consistent with that of the innocent model). Once again, however, manipulation of investigator bias of this study was not directly related to the experimenters' post-interrogation attributions of guilt.

Overall, the guilty model accounted for 31.9% of the variance in true confessions, and 17.5% of the variance in the experimenters' post-interrogation perceptions of guilt.

Contrary to the innocent model, the indirect effect of investigator bias was non-significant with respect to the experimenters' post-interrogation attributions of guilt (i.e., the cycle of confirmation bias; $b = -0.001$, $CI_{95} = -0.10$, 0.04, ns.). No significant indirect effects were noted on the elicitation of true confessions; however, both the use of minimization ($b = -0.03$, $CI_{95} = -0.05$, -0.01, $p = .05$) and maximization techniques ($b = -0.03$, $CI_{95} = -0.06$, -0.01, $p = .04$), and participants' perceptions of pressure to confess ($b = 0.03$, $CI_{95} = 0.01$, 0.05, $p = .005$), their perceptions of the consequences associated with confessing ($b = 0.03$, $CI_{95} = 0.01$, 0.06, $p = .02$), and their perceptions of proof and feelings of guilt ($b = 0.04$, $CI_{95} = 0.01$, 0.08, $p = .009$), all of these indirectly influenced the experimenters' post-interrogation attributions of guilt.

Innocent vs. Guilty Models. A multiple-group analysis was conducted to statistically evaluate the differences in model fit across innocent and guilty participants. The overall analysis indicated significant variation in the fit of paths across these two groups, $\Delta\chi^2(22, N = 210) = 49.75$, $p = .001$. Several significant differences in paths were noted when assessing pairwise effects. Most importantly, the powerful effects of investigator bias were

isolated to increasing the use of minimization and maximization tactics against the innocent participants ($zs = 2.05$ and 1.99, $ps = .04$ and .05, respectively), and with the investigators' post-interrogation perceptions of guilt for innocent participants ($z = 2.65$, $p = .008$). In addition, minimization tactics were significantly more likely to yield false confessions of the innocent when compared with that of true confessions by the guilty ($z = 2.63$, $p = .009$). These results suggest that the influence of investigative bias on the innocent can be clearly seen as a behavioral confirmation process that begins by increasing the use of interrogation tactics that elicit false confessions, ultimately allowing investigators to confirm their belief in a suspect's guilt (Kassin et al., 2003; Meissner & Kassin, 2004).

Complete Model. Finally, a single path model was also created, which included both the main effects of expectation and guilt/innocence, along with the interaction term. This model produced good fit to the data, $\chi^2(13, N = 210) = 15.13$, $p = .30$, with $\chi^2/df = 1.16$, CFI = 1.00, GFI = .99, with RMSEA = .03. The pattern of effects in this model largely confirmed those observed in the separate analyses of guilty vs. innocent participants (Table 4), and so

Table 4 Path estimates for innocent and guilty models of confession

	Innocent model				Guilty model			
	b	CI_{95}	z	p	b	CI_{95}	z	p
Minimization ← Investigator bias	**0.63***	**0.12, 1.14**	**2.41**	**0.02**	−0.06	−0.47, 0.35	0.27	0.79
Maximization ← Investigator bias	**0.73***	**0.22, 1.24**	**2.82**	**0.01**	0.06	−0.37, 0.48	0.26	0.79
Affective ← Minimization	**0.31**	**0.04, 0.58**	**2.19**	**0.03**	−0.04	−0.26, 0.19	0.34	0.74
Consequences ← Minimization	0.04	−0.27, 0.35	0.23	0.82	−0.03	−0.32, 0.25	0.23	0.82
Proof/guilt ← Minimization	0.016	−0.08, 0.40	1.28	0.21	**−0.32**	**−0.58, −0.07**	**2.47**	**0.01**
Pressure ← Minimization	**0.41**	**0.07, 0.75**	**2.32**	**0.02**	**0.38**	**0.05, 0.71**	**2.25**	**0.02**
Situational ← Minimization	−0.02	−0.33, 0.29	0.15	0.88	−0.23	−0.57, 0.11	1.33	0.18
Affective ← Maximization	−0.06	−0.33, 0.21	0.39	0.70	0.07	−0.14, 0.29	0.65	0.51
Consequences ← Maximization	0.03	−0.28, 0.34	0.20	0.84	−0.04	−0.32, 0.23	0.31	0.76
Proof/guilt ← Maximization	−0.10	−0.33, 0.14	0.83	0.41	**−0.26**	**−0.50, −0.01**	**2.06**	**0.04**
Pressure ← Maximization	0.16	−0.19, 0.50	0.92	0.36	−0.10	−0.41, 0.22	0.58	0.56
Situational ← Maximization	0.05	−0.26, 0.36	0.32	0.75	−0.27	−0.60, 0.06	1.63	0.10
Confess ← Investigator bias	0.14	−0.02, 0.30	1.76	0.08	0.00	−0.11, 0.10	0.04	0.97
Confess ← Minimization	**0.07**	**0.01, 0.14**	**2.04**	**0.04**	−0.05	−0.10, 0.01	1.66	0.09
Confess ← Maximization	−0.02	−0.09, 0.05	0.62	0.53	−0.04	−0.09, 0.02	1.42	0.16
Confess ← Affective	−0.02	−0.07, 0.03	0.82	0.41	0.00	−0.06, 0.06	0.08	0.94
Confess ← Consequences	−0.04	−0.08, 0.01	1.74	0.08	**−0.07**	**−0.11, −0.02**	**3.14**	**0.002**
Confess ← Proof/guilt	**0.07**	**0.01, 0.12**	**2.27**	**0.02**	**0.07**	**0.03, 0.11**	**3.52**	**0.001**
Confess ← Pressure	**0.08**	**0.04, 0.12**	**3.96**	**0.001**	**0.06**	**0.02, 0.09**	**3.37**	**0.001**
Confess ← Situational	−0.02	−0.06, 0.02	0.99	0.32	0.01	−0.02, 0.04	0.82	0.41
Post-interrogation guilt ← Confess	**0.36**	**0.22, 0.50**	**4.94**	**0.001**	**0.46**	**0.27, 0.66**	**4.67**	**0.001**
Post-interrogation guilt ← Investigator bias	**0.29**	**0.15, 0.43**	**4.11**	**0.001**	0.04	−0.09, 0.16	0.55	0.58

Note: Bolded parameters were significant at $p < .05$.

let us now focus briefly on the most unique and informative findings. Most importantly, both the main effect of experimenter expectation (bs = 0.63 [CI$_{95}$ = 0.17, 1.09] and 0.73 [CI$_{95}$ = 0.26, 1.20], ps < .01) and the interaction term (bs = −0.69 [CI$_{95}$ = −1.34, −0.03] and −0.67 [CI$_{95}$ = −1.33, −0.01], ps < .05) produced significant direct effects on the use of minimization and maximization tactics, respectively, indicating that guilt expectations increased the use of these techniques, particularly when an innocent suspect was being interrogated. In addition, significant direct and indirect effects were observed on the experimenters' post-interrogation perceptions of guilt for both the main effect of expectation (b = 0.28 [CI$_{95}$ = 0.15, 0.41] and 0.20 [CI$_{95}$ = 0.13, 0.28], ps < .05, respectively) and the interaction term (b = −0.25 [CI$_{95}$ = −0.43, −0.06] and −0.08 [CI$_{95}$ = −0.17, −0.01], ps < .05, respectively), indicating that prior expectations of guilt–innocence significantly influenced post-interrogation perceptions of the suspect throughout the process of interrogation, and that innocent participants were particularly susceptible to this process of behavioral confirmation.

Discussion

The purpose of this present study was to examine the process of behavioral confirmation by manipulating experimenters' perceptions of guilt or innocence and assessing the extent to which this manipulation influenced the use of interrogation techniques, participants' perceptions of the interrogation, and ultimately participants' decision to confess. Furthermore, experimenters were asked to provide a post-interrogation assessment of the likely guilt or innocence of the participant. It was predicted that investigative biases would have a significant influence on the frequency of minimization and maximization techniques employed, and that this would initiate a process that would increase the likelihood of confession, particularly by those who were innocent. Finally, both the decision to confess and experimenters' preliminary biases toward guilt or innocence were expected to influence the experimenters' post-interrogation assessments of the guilt or innocence. This present study adds to our knowledge by examining an interrogation and its outcomes from the perspectives of both the interrogator and the suspect. From the perspective of the interrogator, it provided preliminary insight into the social processes (i.e., confirmatory feedback via post-interrogational assessments) that influence the interrogation situation. We believe one of the major strengths of this study was that the combination of the ability to choose from a variety of interrogation techniques and the manipulation of interrogator biases enabled the authors to better approximate some of the realities of everyday police

interrogations. In addition, this study provided insights regarding why suspects confess by examining the decision-making processes that they consider during interrogation.

Key Findings

When examining the direct effects of interrogation techniques on confession rates, the findings indicated that the use of minimization and maximization techniques increased the probability of obtaining a false confession when compared to the use of non-coercive interview techniques. Due to an increase in false confessions, diagnosticity (i.e., the ratio of true to false confessions) was considerably reduced with the use of minimization and maximization techniques, most notably when these techniques were used in conjunction.

As predicted, our results indicated a differential impact of investigator bias on innocent and guilty participants such that investigator bias increased the likelihood of confessions by innocent participants (mediated by the effect of minimization tactics), but had no effect on the likelihood of eliciting confessions from guilty participants. These findings confirm the role of investigator bias in increasing the use of pressure-filled interrogation tactics (Kassin et al., 2003), and further demonstrate the cycle of confirmation bias leading to false confessions and false beliefs in a suspect's guilt (Meissner & Kassin, 2004). For example, it is interesting to note the differential effect of a pre-existing bias on an interrogator's post-interrogation assessment of guilt. Pre-interrogation guilt bias did not affect post-interrogation assessment of guilt for suspects who were actually guilty (i.e., investigators who had no pre-interrogation bias were equally likely to judge guilty suspects as "guilty" post-interrogation), whereas investigators armed with a guilt bias were more likely to judge innocent suspects as "guilty" post-interrogation as compared with investigators with no pre-interrogation bias. In other words, actual guilt appeared to "shine through" in the interrogation room; actual innocence did not. As such, innocent participants are prone to increased risk to the effects of investigative biases in the interrogation room.

Some consistent effects were also observed across guilty and innocent models. In particular, minimization tactics were associated with increased participants' perceptions of pressure to confess, while perceptions of increased pressure to confess and greater feelings of guilt and perceptions of proof increased the likelihood of both true and false confessions. Finally, the production of a confession led experimenters to infer guilt (regardless of actual guilt or innocence).

Overall, the cognitive and social elements of the Gudjonsson (1989a, 1989b) model appear to have been supported by the data presented in this study. The

emergences of the social and cognitive elements as strong predictors of confession further enhance our understanding the process of interrogation and confession from the suspect's perspective. Individuals who confessed reported stronger social pressure to confess and stronger perceptions of the proof against them. The findings also suggest guilty suspects who weighed the negative consequences of confessing as high were less likely to confess. Further research seems warranted to help us improve the measures of self-reported perceptions during the interrogative process adopted in this study.

Applications of the Findings of this Study

Inbau and colleagues (2001) contend that laboratory findings cannot be generalized to the real-world because "it is impossible to reproduce the real life motivational incentives of someone facing serious consequences as in an actual interrogation" (p. 443). While it is clear that the pressures and reality of real world interrogations can never be completely accounted for within a laboratory setting (or ethically reproduced in a controlled experimental scenario), we believe that the current paradigm provides for the transposition of relevant psychological processes associated with interrogation (see Meissner, Russano, & Narchet, 2010). In particular, the authors argue that students immersed in a university culture are necessarily concerned with avoiding the commonly-understood consequences that accompany charges of academic misconduct (e.g., suspension from the university, the loss of a scholarship, or the public stigma associated with cheating). Similarly, criminal suspects who are accused of violating laws in the real world are concerned with avoiding the negative consequences that accompany admission of a criminal act. Both of these scenarios represent implicit understandings that admissions of wrong-doing are associated with significant negative consequences in their respective environments. Just as most criminal suspects experience distress and anxiety in the context of an interrogation (Gudjonsson, 2003), our student participants in this study proclaim a sincere degree of social pressure and a significant level of stress related to dealing with a charge of academic misconduct—a situation that supports the validity of relevant cognitive processes via experimental realism (Russano et al., 2005). The authors believe that it is precisely because of the motivational context that the paradigm of this study is embedded within (i.e., a student attempting to avoid the consequences associated with a university sanction), which allows for the transposition of psychological processes and dynamics that are similarly experienced within the motivational context of real-world interrogation (i.e., a suspect attempting to avoid the consequences of admission of a criminal act).

On a similar note, it may be tempting to dismiss the validity of the current paradigm by arguing that the confession rates elicited using this laboratory method fail to represent the base rates of true and false confessions elicited in the real world. We believe that such an analysis is inappropriate for a number of reasons. For example, a variety of factors can influence the absolute levels of confessions across real-world and laboratory-interrogative settings, including the magnitude of the actual or perceived consequence associated with confessing, the length of an interrogation, and the number of techniques applied. In this current study, true and false confession rates were somewhat higher when compared with the study conducted by Russano et al. (2005) (+17% for true confessions, +5% for false confessions); however, this is most likely attributable to a more intensive interrogation phase and the application of multiple interrogative techniques by experimenters (when compared with the more restrictive, script-based approach used by Russano et al., 2005). Again, our data regarding confession rates are not intended to replicate confession rates that may be observed under real-world conditions; rather, the authors believe that the generalizability of our research lies in the ability of the current paradigm to model (and manipulate) the social and cognitive processes that interrogators and suspects undergo and to assess the effects of such variables on the increased/decreased likelihood of confession.

Conclusions

Taken together, this study provides compelling evidence of the role of investigative biases in producing more guilt-presumptive and pressure-filled interrogations, leading to a process of behavioral confirmation in which innocent suspects are placed at great risk to providing a false confession (Kassin et al., 2003; Meissner & Kassin, 2004). In addition, this study was the first of its kind to explore the social and cognitive factors associated with both guilty and innocent participants' decisions to confess and, as such, our findings provide some validity to the models of confession proposed over the years (Gudjonsson, 1989a, 1989b; Hilgendorf & Irving, 1981). Clearly, further research is warranted to continue the investigation of the psychological processes leading to confession, and to better understand the vulnerability of innocent suspects within the interrogation room (Meissner et al., 2010). The authors believe that the current paradigm provides for the transposition of these important processes within a controlled, laboratory setting, yet maintains important legal and ethical considerations in the protection of human subjects. While this study has identified an important risk factor associated with false confessions (namely, the role of investigative biases), it

will be important for researchers to begin assessing interrogative approaches that assist law enforcement by maximizing the diagnostic value of a confession (Meissner, Hartwig, & Russano, 2010). By identifying some of the decision-making processes associated with suspect confessions, we hope that this study has provided researchers with a manner in which to validate and further develop theoretical models of interrogation that will promote the creation of novel approaches to achieving true confessions while protecting the innocent suspect who may 1 day find themselves in the interrogation room.

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