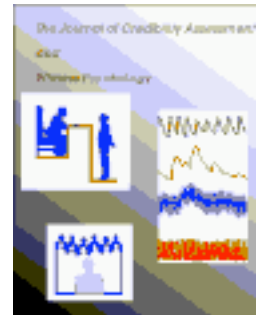


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The Role of Preexisting Stress on False Confessions: An Empirical Study

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□ABSTRACT: Several researchers have investigated the power of the interrogation (Kassin & Kiechel, 1996; Leo, 1996; Leo & Ofshe, 1998), yet few have focused on situational characteristics that occur in addition to the interrogation. Kassin and Kiechel suggested that anxiety as it relates to suspect vulnerability should be investigated. In the present study, participants exposed to stressed, relaxed, or control conditions completed Kassin and Kiechel's laboratory paradigm for eliciting false confessions. Women in the no-stress condition confessed to and internalized responsibility for a computer crash at higher rates than men. Men in the stress condition were more likely to sign a written confession and internalize the event than were men in the no-stress condition. In contrast, women in the stress condition confessed and internalized at similar rates when compared to women in the no-stress condition. □

The Role of Preexisting Stress on False Confessions: An Empirical Study

Introduction

One goal of many police investigators is to get the suspect to confess. After all, a confession is the single most incriminating piece of evidence presented to a jury, surpassing eyewitness testimony and even physical evidence (Kassin & Neumann, 1997; Leo & Ofshe, 1998). Judges, juries, and the public commonly believe that suspects only confess if truly guilty and that if innocent, suspects can or should do everything possible to maintain their innocence. This belief appears so strong that researchers have demonstrated that mock jurors who recognized a confession as coerced were still more likely to convict the defendant than if the confession was not admitted into evidence at all (Kassin & Sukel, 1997).

Assuming that only the guilty confess disregards the powerlessness that suspects may feel when confronted with interrogation strategies whose sole purpose is to elicit a written confession. Detectives are trained to isolate the suspect, confront his or her guilt, reject statements of denial, appear sympathetic and understanding, and provide rationalization for the behavior in question (Inbau, Reid, Buckley & Jayne, 2001). Although Inbau and his colleagues (2001) suggest that the third degree and techniques like it are no longer acceptable, they continue to support “psychological tactics and techniques which involve trickery and deceit, (p. xii, 2001)” because they are more powerful than other types of interrogation strategies. In response, several psychological researchers argue that innocent people may now be even more susceptible to falsely confessing during a police interrogation (Kassin, 1997; Leo & Ofshe, 1998; Ofshe & Leo, 1997).

Frequencies And Types Of False Confessions

There is disagreement in the literature on the extent to which false confessions actually occur. For example, Cassell (1996) suggests that the frequency of convictions based on false confessions range between 10 and 394 annually in the United States and are therefore a rare event. It is important to note that his conservative estimate excludes those false confessions that did not lead to wrongful convictions. Many reports, both empirical and observational, have consistently demonstrated that innocent suspects can and do confess to incidents for which they are not responsible (Gudjonsson, 1999; Gudjonsson, 1992; Gudjonsson & MacKeith, 1990; Kassin & Kiechel, 1996; Leo & Ofshe, 1998; Ofshe & Watters, 1994). In one study, Gudjonsson and Sigurdsson (1994) found that 12% of 229 Icelandic prisoners reported making a false confession at some point in their lives. In turn, 78% of those who had

falsely confessed believed that retracting the confession was pointless and therefore they never did.

In addition to a greater than expected frequency of false confessions, it appears that three different kinds of false confessions can occur (Kassin & Wrightsman, 1985). A voluntary false confession occurs when a suspect falsely confesses to a crime without influence from others. Usually, voluntary false confessions are explained by some psychiatric abnormality of the confessor and tend to accompany high-profile crimes (Wrightman, 2001). The second type of false confession, coerced-compliant, is a confession made in order for a suspect to avoid duress, or to gain a benefit. Because the suspect is fully aware that he or she did not commit the crime and yet confesses anyway, this kind of confession is a form of compliance. The third type of confession, coerced-internalized, also involves police coercion. However, instead of confessing to get out of an uncomfortable situation or to gain leniency, the suspect unconsciously incorporates the information presented during the interrogation into his or her own memory of the incident. In a coerced-internalized confession, suspects can come to believe that they were truly responsible for the event although no initial memory for the incident exists. These new memories can last for hours, days, or weeks (Gudjonsson, 1995; Ofshe & Watters, 1994; Santilla, Alkiora, Magnus, & Niemi, 1999) that may depend in part, on the length of the interrogation by the police.

Factors Influencing False Confessions And Internalizations

Factors influencing false confessions are often examined from two perspectives: the interrogation situation (for example see Kassin, 1997; Kassin & Keichel, 1996; Leo and Ofshe, 1997; Ofshe & Leo, 1998), and characteristics associated with the individual suspect (for example see, Blagrove, 1996; Gudjonsson, 1992).

The power of the situation. Studies by Kassin (1997) and Leo and Ofshe (1998) suggest that the interrogation process alone can be powerful enough to cause innocent suspects to confess to a crime. Leo and Ofshe (1998) describe 60 cases in which the confession given by the suspect was disputed by other evidence or inconsistencies in the confession itself. Thirty-four of these cases involved proven false confessions or suspects who could not have possibly committed the crime, for example, the murder victim was still alive or the suspect was in prison at the time of the crime. What kinds of techniques elicited false confessions from innocent suspects? Officers used the same techniques that elicit confessions from the guilty. Leo's (1996) qualitative analysis of actual police interrogations, described the following as common strategies for questioning and interrogating suspects: a) undermining the suspects' confidence in the denial of guilt, b) identifying contradictions in the suspects' stories, c) appealing to the importance of cooperation, d) offering

moral justifications or psychological excuses, e) confronting suspects with false evidence of their guilt, f) using praise or flattery, g) appealing to detective expertise or authority, h) appealing to the suspects' consciences, and i) minimizing the moral seriousness of the offense.

Kassin and Kiechel (1996) completed the most innovative experimental work in this area by creating a situation that parallels as closely as ethically possible an event and an interrogation. Participants agreed to participate in a reaction time experiment that involved typing letters into a computer. Participants were randomly assigned to a high or low vulnerability condition (pace of task) and a confederate ("witnessed" or "non-witnessed" condition). During the instructions for a typing task, the experimenter warned participants not to hit the "ALT" key or the computer would crash. During the typing task the computer did crash and the experimenter accused the participant of hitting the "ALT" key. According to Kassin and Kiechel (1996) participants often denied hitting the "ALT" key at first but once the experimenter verified that the data was gone, many participants answered "Yes" to the direct question: "Did you hit the "ALT" key?" and then signed a written confession. Participants in the high vulnerability condition (typing at a fast pace) were more likely to confess than were participants in the low vulnerability condition. One hundred percent of the participants in the high vulnerability/witness present condition signed written false confessions. Sixty-five percent of the participants in the high vulnerability/witness present condition went on to describe to a nearby student (a confederate) that they were personally responsible for making the computer crash. Admitting their responsibility for the event to the confederate was labeled internalization and demonstrates the ease with which an internalized false confession may be obtained (Kassin & Kiechel, 1996). When individuals are unsure of what to do in a given situation, they are subject to informational social influence (Sherif, 1936). Thus, they look to others for an explanation of what to do. In Kassin and Kiechel's study, participants in the eyewitness present condition confessed at higher rates. This increase may have occurred because they incorrectly inferred that those witnesses had more information about the experience than they did.

What makes the Kassin and Kiechel paradigm so powerful is the way it captures the ambiguity of a complex situation involving the actor, the observer, and the environment. However the computer paradigm for investigating false confessions could be criticized for ignoring motivations for falsely confessing, artificiality, and failure to provide adequate consequences for falsely confessing.

Inbau and his colleagues (2001) suggest that to generalize from the behaviors elicited in the Kassin and Kiechel paradigm to police interrogations ignores the different personal motivations suspects have for making false confessions. Much of their concern with psychological evaluations of false confessions centers around the idea that suspects know whether or not they

have committed a crime. This criticism ignores the ambiguous nature of many criminal incidents. For example, do victims remember everything that happens when they are involved in an automobile accident? How about when the accident was their fault? Often drivers rely on passengers or officers at the scene to sort out these issues, because they are too dazed, sore, or angry to do it themselves. Even in Kassin and Kiechel's (1996) study where 100% of the participants signed written confessions in the high vulnerability/witness present condition there were differences in internalization rates.

Inbau et al. (2001) also suggest that this experimental paradigm lacks the mundane realism necessary to apply its findings to "real world" interrogations. We agree. Due to ethical constraints, researchers are not able to design experiments that replicate the exact psychological environment created by a law enforcement interrogation. Despite the limitations based on ethical standards, several studies using this paradigm have resulted in consistent findings. Participants sign false confessions indicating responsibility for the computer failure and many of those participants internalize responsibility for the event immediately after it occurs (Abboud, Wadkins, Forrest, Alavi, & Lange, 2001; Alavi & Lange, 2001; Kassin & Kiechel, 1996; Redlich, 1999). These results suggest that this paradigm has experimental realism.

A third concern raised by critics has been the lack of consequences associated with falsely confessing. Although we agree that falsely confessing to losing computer data does not compare to falsely confessing to a crime that can result in spending time in prison, there are consequences for falsely confessing. First, when the crash happens, the participant is required to reschedule the experiment for another day. That means more time out of his or her schedule later. Second, the participant has to wait while the experimenter leaves the room for his or her calendar. The uncertainty of the final outcome to this exercise should be somewhat taxing to the participant. Finally, there is the embarrassment of having "botched" the experiment. Although embarrassment is not the same as incarceration, it is a consequence that most people prefer to avoid (Tangney & Fischer, 1995).

Although the power of the situation contributes to a person's likelihood of falsely confessing, not all participants in experiments or suspects who are interrogated are equally susceptible to making a false confession. Understanding how personal characteristics contribute to suspects' willingness to make false confessions may tell us why some people come to internalize responsibility and others do not.

Personal Characteristics. One factor that has been associated with behavior during an interrogation is a person's suggestibility (Gudjonsson & Clark, 1986; for a review see Gudjonsson, 1992). Although the use of leading questions (questions involving material not occurring during the event) and negative feedback (informing a suspect that he/she did not do well and has to try

harder) is often successful during interrogations, not all suspects are equally influenced. Psychological, physiological, and demographic variables have all been shown to influence a suspect's suggestibility (Gudjonsson, 1983; Gudjonsson, 1992) and, in turn, his or her confession rate.

Psychological variables relating to suggestibility and false confession rates include intelligence, eagerness to please, and trust in authority. Many interrogations that resulted in false confessions involve defendants who have low IQ or who are mentally retarded (Clare & Gudjonsson, 1993; Gudjonsson, 1993; Kassin, 1997; Leo & Ofshe, 1998). However, it is important to note that suspects do not have to be mentally retarded to be led into a false confession (Gudjonsson & Mackeith, 1990). Gudjonsson (1991) demonstrates that even when controlling for intelligence, false confessors have higher levels of suggestibility than do resisters, (those who do not confess but are convicted based on other evidence) and forensic patients (those who confess but do not retract their confession). Eagerness to please and trust in authority also appear to influence one's likelihood to falsely confess. Ofshe (1989) suggests that individuals interviewed as witnesses to crimes begin to trust the authority figures questioning them. When the interview becomes an interrogation, innocent suspects are still trusting, which may be detrimental to their case. In assessing a specific false confession case in Britain, Gudjonsson (1995) demonstrates how a suspect who is eager to assist authorities in whom he or she has high trust, may ultimately confess to a crime she or he did not commit.

Physiological variables such as intoxication, withdrawal and sleep deprivation also affect the likelihood that a suspect will make a false confession. Ofshe (1989) suggests that suspects most prone to making coerced-internalized false confessions are those who cannot remember events occurring at the time of the incident. Under these conditions, officers may present real or deceptive physical evidence linking the suspect to the crime and then convince the suspect that he or she may not remember the event itself due to intoxication or blacking out (see Ofshe & Leo, 1997). Suspects may also be more susceptible to coerced-compliant confessions as a function of physiological influences. If police officers interrogate a suspect experiencing drug or alcohol withdrawal, they risk eliciting a false confession (Santtila, et al., 1999). Finally, sleep deprivation is also linked to an increase in suggestibility. An empirical study by Blagrove (1996) demonstrates that sleep deprived college students yield to more leading questions and score higher in overall suggestibility than do students who are not sleep deprived. He concludes that although true confessions may be more likely when interrogations occur after sleep deprivation, so are false confessions.

Another variable that influences suggestibility and confession rate is the gender of the suspect. Wrightsman (2001) asked introductory psychology students about their likelihood of confessing to a crime that they knew they did not commit. Compared to men, women indicated that they believed they were

significantly less likely to confess. Redlich (1999) also found that women were less likely to sign a written false confession than were men. On the other hand, Gudjonsson and Sigurdsson (1994) have found that incarcerated women were more likely to report having made a false confession than were men. In their replication of Kassin & Kiechel's (1996) study, Alavi and Lange (2001) found that women were significantly more likely to confess and internalize than were men. These inconsistencies in the findings suggest that the relationship between gender and false confession rates is not a simple one. The nature of the study (survey or experimental) as well as the gender of the interrogator may moderate the relationship between gender and false confession rate.

The Role Of Stress

In addition to understanding how the interrogation and personal characteristics can affect the likelihood of obtaining false confessions, Kassin and Kiechel (1996) suggest that anxiety as it relates to suspect vulnerability should be investigated. Although anxiety could be examined as either a situational or personal variable, Gudjonsson (1992; 1993) recommends that state anxiety should be investigated because compared to trait anxiety it has been linked to higher levels of suggestibility. We believe that a suspect's level of stress, above and beyond the immediate arrest situation, may be powerful enough to elicit a false confession. For example, a person who has witnessed a brutal crime or accident may experience stress unrelated to his or her role as a suspect. In turn, this stress could affect the suspect's response to interrogation by increasing his or her (a) willingness to comply with the interrogator and/or (b) susceptibility to remembering the event inaccurately.

We already know that stress can affect the way eyewitnesses comply with police instructions and remember events (Wells, 1993; Wells et al., 1998; Wrightsman, Greene, Neitzel & Fortune, 2002). For example, when an eyewitness is shown a line-up by the police, he or she may work hard to identify someone in that line-up in order to please the officer (Wrightman, et al., 2002). When eyewitnesses do not see someone that matches their recollections specifically, they often rely on their "best guess," also called relative judgment. Thus, eyewitnesses choose the suspect that best corresponds with their memory of the suspect (Wells, et al., 1998). Stress can also cause people to encode information incorrectly by unintentionally narrowing their focus when witnessing an event (Wrightman, et al., 2002). Clifford and Scott (1978) demonstrate that participants witnessing a violent act remember less information than those participants who witness a non-violent act. A similar effect may occur with a suspect.

The Current Study

While several studies have investigated the power of the interrogation (Kassin & Kiechel, 1996; Leo, 1996; Leo & Ofshe, 1998), and characteristics of the suspect such as suggestibility (see Gudjonsson, 1995; Gudjonsson, 1992), few studies focus on situational characteristics that may occur in addition to the interrogation itself. Our goal was to investigate the effects of a prior stressful or relaxing event on a participant's a) willingness to sign a written false confession, and b) susceptibility to internalization. Using the paradigm established by Kassin and Kiechel (1996), we expected that participants who are exposed to a stressor prior to the computer activity would be more likely to sign a written confession and more likely to internalize responsibility for the incident than were participants who were not stressed. We also expected that compared to participants in the stress and no-stress conditions, participants who were exposed to a relaxing event would be less likely to sign the written confession or accept responsibility for the incident. Finally, after considering the conflicting results associated with suspect gender, it appeared that females confessed at a comparable rate to males to female interrogators (Abboud et al., 2002; Kassin & Kiechel, 1996). However, females were significantly more likely to confess to male interrogators (Alavi & Lange, 2001). Because our interrogators are male we hypothesize that women would confess to and internalize the event at greater rates than would the men.

Method

Participants: Fifty-six undergraduate students (28 women and 28 men) at a Midwestern university volunteered to participate in return for extra credit in their introductory psychology class. After completing a consent form, participants were verbally reminded of their right to leave the study at any time. In all cases, the same male experimenter conducted the study. Participants were debriefed immediately after completing the study.

Design: The experiment was a 3 Stress (Relaxed, Control, Stressed) x 2 Gender x 2 Suggestibility (Low, High) factorial design. The dependent variables included the presence or absence of a written confession and the presence or absence of internalization. Participants were randomly assigned to the stress conditions and the interrogator was unaware of their assignment prior to administering the computer task.

Materials: *Stress Induction.* To create stress, the experimenter showed participants a series of 12 accident slides. The slides were displayed automatically for 8 seconds each in a pre-programmed PowerPoint presentation. These accident slides were provided by local police and ranged from mild (clothes scattered on the highway after an accident) to graphic (deceased victim at the accident scene). We chose viewing accident scenes as

our stressful event based on their availability as stimuli materials as well as research by Brown, Fielding & Grover (1999). Their study examined the frequency and perceived stressfulness of various stressors on a sample of 593 police officers. Nineteen percent of their sample had responded to a fatal road traffic accident in the previous six months and rated the event 2.84 on a stress scale of 1 (*not stressful*) to 4 (*extremely stressful*). Because this event was easily depicted in pictures and rated as stressful by police professionals, we believed it would serve as a stressor comparable to what a victim or witness could experience prior to police questioning.

Relaxation Induction. In order to create relaxation, the experimenter showed a series of 12 nature slides (i.e., pastures, mountains and oceans) developed for use in this study. Like the slides in the stress condition, these images were also set to play automatically for 8 seconds each in a pre-programmed PowerPoint presentation. We chose these types of images to produce relaxation based on previous research showing that viewing nature scenes reduces stress (Ulrich et al., 1991; Ulrich, 1979).

Parallel Form of the Gudjonsson Suggestibility Scale. After reading a detailed story about a young boy losing control of his bike on a hill, the experimenter asked the participant to recall as many facts in the story as possible. The experimenter then asked a series of 20 interrogation style questions about the story, many of which were leading questions. After all of the questions were answered, the experimenter stated, "You have made a number of errors. It is therefore necessary to go through the questions once more and this time try to be more accurate." The experimenter then read each question again, recording the participants' second answers. This task assesses a participant's suggestibility to wrong information (yield) and willingness to change answers as a function of negative feedback from the experimenter (shift). The number of yields is added to the number of shifts to determine the participants overall suggestibility score. For the current sample the mean number of yields was 4.64 with a standard deviation of 3.00. The mean number of shifts for the overall sample was 4.35 with a standard deviation of 2.65. The average suggestibility score for the sample was 8.98 with a standard deviation of 4.38. These means are comparable to the means previously reported for normal populations (Gudjonsson, 1987; Gudjonsson, 1992).

Stress Arousal Checklist. The SACL (Mackay, Cox, Burrows, & Lazzerini, 1978) is a 30-item instrument intended to assess a person's psychological experience of stress and arousal. The stress dimension consists of the subjective response to the immediate situation using descriptors that range from pleasant to tense. The arousal dimension represents a sense of alertness and consists of descriptors ranging from lively to drowsy. Only the stress dimension was used in the present study. An individual's stress dimension score can range from 0 (*no stress*) to 18 (*high stress*).

Strategies for Confession Checklist. The first author created a standardized interrogation script based on Leo (1996) for use in studies using Kassin and Kiechel's laboratory paradigm. These statements were always presented in the same order and in a consistent manner (see Appendix A). For example, when the experimenter wanted to appeal to cooperation, he would try to convince the subject to confess by saying, "*My professor will be really upset about this. I won't be able to run any more participants unless I tell her how this happened. I need you to help me out.*"

Procedure: The experimenter told participants they were completing a photo and reaction time experiment. The participants then sat at a desk that included a computer and monitor. Participants were randomly assigned to a nature, accident or no slide condition. After the slideshow was completed or two minutes had passed, participants completed the Stress Arousal Checklist (SACL). The experimenter then administered the Parallel form of the Gudjonsson Suggestibility scale. After completing the suggestibility scale, participants completed another SACL to assess their stress level at that point of the study.

Participants then entered another room where an experimenter introduced his study on reaction time using the procedure devised by Kassin & Kiechel (1996). The experimenter told participants that pressing the ALT key causes the computer to crash and all of the data to be lost. The experimenter read letters from a list and participants began typing. After 60 seconds passed, the computer crashed (the experimenter hit the reset button on the electrical strip to which the computer was plugged). At this point, the experimenter appeared upset, accused the participant of messing up the experiment and asked the participant, "Did you hit the 'ALT' key?" If the participant said yes, he or she was asked to sign a written confession stating: "I hit the 'ALT' key and caused the computer to crash. Data were lost." If the participant said no, the interrogator proceeded to read the prepared interrogation statements until either the participant confessed or the interrogator had read all of the available statements. In order to measure internalization, or the extent to which participants truly believed they hit the "ALT" key, participants were asked to wait while the experimenter got his appointment book to reschedule the experiment at a later time. A confederate seated outside the room said to the waiting participant, "I heard a lot of noise. What happened?" The participant's verbatim response was then recorded. Statements suggesting "I hit the 'ALT' key" or "I messed up the experiment," were coded as statements of internalization. If there was any doubt as to whether the participant believed he or she hit the "ALT" key (e.g., I may have hit the "ALT" key) then the statement was not coded as internalization.

Results

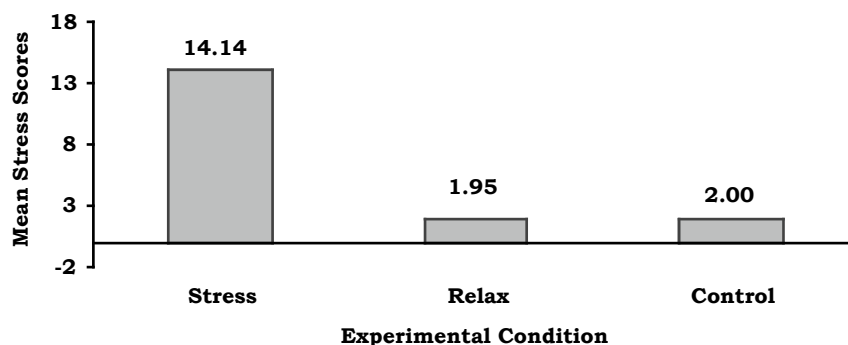
Overall, 61% of the 56 participants signed a written confession and 36% of the sample internalized the event to the confederate. After testing whether our experimental manipulations created stress and relaxation as expected, we investigated the effects of suggestibility, gender and stress on rates of confession and internalization. Finally, we examined whether men and women differed in confession and internalization rates as a function of stress.

Preliminary Analyses

Manipulation check. The mean stress score for the entire sample was 8.27 with a standard deviation of 7.11 at time 1. At time 2, the mean stress score for the entire sample was 10.50 with a standard deviation of 4.88.

A univariate analysis indicated that our stress manipulation was successful in increasing stress scores on the SACL, $F(2, 55) = 77.97, p < .01$. Post hoc analyses (Tukey's) indicated that participants in the stress condition were significantly more stressed ($M = 14.14, SD = 4.15$) than were participants in either the relaxed condition ($M = 1.95, SD = 3.36$) or control condition ($M = 2.00, SD = 1.15$). Figure 1 illustrates these differences. Because participants in the relaxed and control conditions were not significantly different from one another on the stress dimension, data from the participants in those two conditions were combined for subsequent analyses. To confirm the differences between the stress and no-stress (relaxed/control) conditions, an independent t -test comparing SACL scores for participants in the stress and no-stress conditions indicated that participants in the stress condition perceived themselves as more stressed than did participants in the no-stress condition, $t(1, 56) = -12.61, p < .01$. The mean stress scores for the stress and no-stress

Figure 1. Mean stress scores by experimental condition.



conditions were 14.14 and 1.96 respectively.

Stress and gender. Independent *t*-tests were used to determine whether men and women reacted differently to the stress manipulation. There were no significant differences between the mean stress scores for men and women in the stress condition, $t(1, 27) = 1.61, p = .13$. Men in the stress condition ($M = 12.69, SD = 5.59$) reported stress levels comparable to women in the stress condition ($M = 15.31, SD = 1.96$).

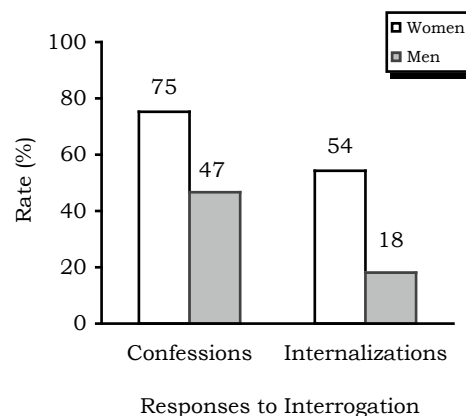
Factors Affecting Confession And Internalization

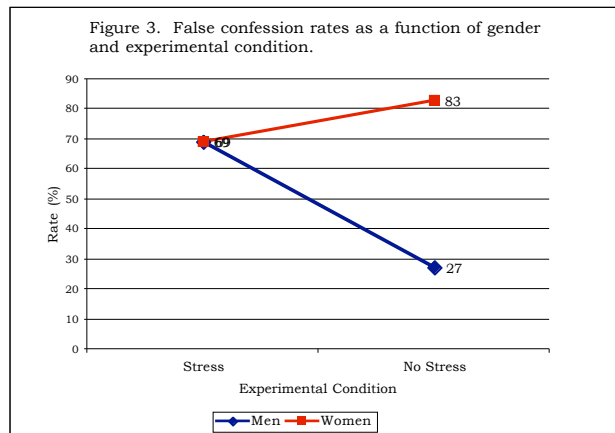
Suggestibility. To determine whether differences in suggestibility predicted differences in confession and internalization rates, we used a median split to categorize participants as suggestible or non-suggestible and tested confession and internalization rates using Chi Square analyses. Suggestible participants (64%) were as likely to sign a written confession as were non-suggestible participants (57%), $\chi^2(1, N = 56) = 0.97, p > .05$. Suggestible participants (33%) and non-suggestible participants (40%) were equally likely to internalize the event, $\chi^2(1, N = 56) = 0.83, p > .05$. Because there were no differences in false confession and internalization rates as a function of suggestibility scores, suggestibility was not used in subsequent analyses.

Gender. We also tested for differences in confession and internalization rates between men and women. A Chi Square analysis indicated that women were significantly more likely to confess than were men, $\chi^2(1, N = 56) = 4.79, p < .05$. Seventy-five percent of the women signed a written confession. In comparison, 47% of the men signed a written confession. Women were also more likely to internalize the event, $\chi^2(1, N = 56) = 7.78, p < .01$. The internalization percentages were 54% for women and 18% for men (See Figure 2).

Stress. Participants in the stress condition were no more likely to sign a written confession than were participants in the no-stress condition, $\chi^2(1, N = 56) = 1.71, p > .05$, although the differences were in the predicted direction. Sixty-nine percent of those participants in the stress condition signed written confessions. Fifty-two percent of the participants in the no-stress conditions signed written confessions. We also examined the effects of stress on participant internalization. There was no significant difference in the percentage of participants internalizing

Figure 2. Confession and internalization rates as a function of gender.

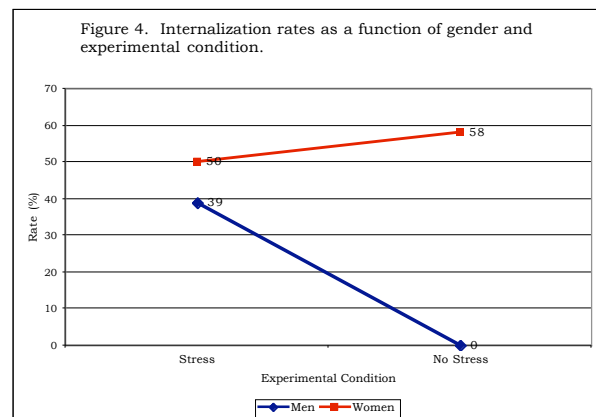




the event across the stress and no-stress conditions, $\chi^2(1, N = 56) = 2.18, p > .05$. While the differences did not reach significance, these data were also in the predicted direction. Forty-five percent of participants in the stress condition internalized the event compared to 26% of the participants in the no-stress condition.

Because of the tendency for men and women to confess and internalize at different rates, we

conducted additional analyses of the effects of stress on men and women. Women confessed at similar rates across the stress and no-stress conditions, $\chi^2(1, n = 28) = 0.78, p > .05$. Sixty-nine percent of the women exposed to stress confessed while 83% of the women in the no-stress conditions confessed. A Chi Square analysis conducted for men showed a different pattern, $\chi^2(1, n = 28) = 5.07, p < .05$. Sixty-nine percent of the men in the stress condition confessed. In the no-stress condition, 27% of the men confessed (See Figure 3). We found similar results when examining the internalization rates of women and men. Women internalized at similar rates across the stress and no-stress conditions, $\chi^2(1, n = 28) = 0.19, p = .66$. The percentages for women in the stress and no-stress conditions were 50% and 58% respectively. Figure 4 shows that men in the stress condition were significantly more likely to internalize the event (39%) than were their counterparts in the no-stress condition (0%), $\chi^2(1, n = 28) = 7.02, p < .01$.



Discussion

Participants who were exposed to stress (viewing accident slides) prior to participating in the “reaction time study” were no more likely to sign a written confession than those participants who were not exposed to stress. Therefore the results did not support our first hypothesis. Moreover, the results did not support our hypothesis that participants exposed to the stress condition would be more likely to internalize the event than those participants who were not stressed. Stress, as operationalized in our study, was not powerful enough to increase a suspect’s likelihood of signing a written confession or internalizing

the event. However, further research in this area is needed, because although the overall findings were not significant, they were in the predicted direction.

We believe one of the reasons for this marginal effect of stress on confession and internalization rates was the administration of the suggestibility scale. Administering the suggestibility scale to all participants may have reduced the differences between those in the stress and those in the no-stress conditions. After participants viewed the stressful slides, they completed the Parallel Gudjonsson Suggestibility Scale. Designed to simulate an interrogative questioning style, the scale itself is stressful for participants. Another Stress Arousal Checklist administered after the Gudjonsson demonstrated that the anxiety created by participating in that task was comparable to viewing the accident slides in the stress condition. Although it appears that the participants who participated in the stress condition and then completed the suggestibility scale experienced the most prolonged stress, participants who viewed relaxing slides or sat quietly also experienced stress when completing the suggestibility scale. Their SACL scores increased from a mean of 1.96 after viewing the relaxation slides to a mean of 9.35 after completing the Gudjonsson Suggestibility Scale. This difference was significant, $F(1,25) = 62.61, p < .05$. Therefore, the differences between the stress and no-stress conditions appear to have been minimized by the administration of this suggestibility measure.

Gender Differences In Confession And Internalization Rates

Without the presence of a stressor, women were significantly more likely than were men to sign a written confession and internalize responsibility for the staged event. Why are women more likely to sign a written confession and falsely internalize an event than are men? Three explanations for this difference are suggested in the forensic and social psychology literature.

Eagerness to please and acquiescence. Previous research has suggested that compared to men, women are more likely to focus on socioemotional needs in groups and relationships (Eagly, 1987; Hyde, 1990). It is possible that the desire to maintain harmony could also occur in experimental situations such as ours. Two ways to maintain this harmony, especially in a situation where one lacks power is to (a) work harder to please other members of the group or situation and (b) acquiesce.

Gudjonsson (1995) calls the desire to help “eagerness to please” and suggests that eagerness to please contributes to false confessions, more specifically to “coerced-internalized” confessions. Therefore, the effects of eagerness to please may not be limited to written false confessions but may also contribute to a participant’s willingness, albeit unintentional, to internalize responsibility for an event. In our study, participants were asked to sign a written confession stating that they hit the “ALT” key and all data were lost.

One strategy the experimenter used for eliciting a written confession was, "I'm going to be in big trouble, help me out." Women may be more likely than men to provide that kind of assistance. However, a recent case suggests that in the "real" world, men sometimes confess in order to help the investigating officer. Eddie Lloyd, was released from prison in August, 2002 after serving 17 years for the brutal rape and murder of Michelle Jackson. Lloyd indicated that he falsely confessed to the crime because the interrogating officer suggested that his confession would help "flush out the real killer." Lloyd was exonerated by DNA testing (DNA Evidence, 2002).

In addition to eagerness to please, women are more likely than are men to report responding to conflict by acquiescing, especially in situations where they feel powerless (Mainero, 1986 as cited in Carli, 1999). While this tendency to acquiesce would explain gender differences in written false confessions, it does not adequately explain why women would be more likely to internalize responsibility for the event. In order to explain those findings, we turn to attribution theory.

Attributions for success and failure. Heider (1958) suggests that we make one of two attributions for our own or others' behavior. If we believe that the cause lies within the person we make an internal attribution. If we believe that the cause lies outside the person, we make an external attribution. One area of attribution research particularly relevant to our study involves gender differences in attributions for academic success and failure. Dweck (1981) found that females were more likely to attribute academic failures to internal and stable factors such as aptitude or ability. On the other hand, males were more likely to attribute their academic failures to external and unstable factors such as task difficulty or effort. These findings may apply to other situations. Perhaps female participants in our study came to believe they were responsible for the computer crash because like the attributions they make about academic achievement, they also made internal stable attributions about their failure to complete the computing task.

Conformity. Women are more likely to conform to group pressure, especially when others are physically present and are therefore aware of whether or not conformity is taking place (Eagly, 1987). Eagly and Carli (1981) suggest that conformity may occur more for women because many of the experiments examining conformity have used tasks that appear to be more masculine. When unsure of the task or its solution, women rely on informational social influence and do what the expert in the situation suggests. Our task involved typing, which for a college student should be gender neutral. Resolving a computer crash, however, may be perceived as a more masculine task and therefore more ambiguous to women.

The Role Of Stress

Once stress enters the picture, the difference in confession rates for men and women significantly decreases. In our study, men and women exposed to the accident slides scored comparably on the stress dimension of the SACL suggesting that they both perceived the slides as similarly stressful. However, after exposure to stress, women's confession and internalization rates were somewhat reduced, while the men's scores increased significantly. Although stress researchers are just beginning to understand that men and women respond to and cope with stress differently, the following studies may provide reasons why our stress manipulation influenced men more than women.

Men's physiological responses to stress are different from those of women. According to Matthews, Gump and Owens (2001), men exposed to acute stress showed higher elevated diastolic blood pressure than did women. Recovering from acute stress took longer for men in their study as evidenced by their higher levels of systolic blood pressure and epinephrine during the restorative period following their exposure to the stressor. Kirschbaum, Wust and Hellhammer (1992) demonstrated that requiring men and women to engage in public speaking tasks elicited higher levels of cortisol in men than in women. This suggests that men and women respond to the task differently which accounts for the differences in cortisol, a chemical released from the adrenal gland which is capable of affecting the immune system. Other researchers have demonstrated that when compared to women, men respond to small hassles with greater heart rate increases and natural killer cell reactivity (Delahanty, et al., 2000). Both of these physiological changes are thought to be related to significant health problems for men (Delahunty et al., 2000; Kirschbaum et al., 1992).

In addition to physiological differences, men and women may interpret and cope with varying stressors differently based on gender roles (Efthim, Kenny, & Mahalik, 2001; Eisler, 1995; Eisler & Blalock, 1991). Women reported more stress in their daily lives (Almeida & Kessler, 1998) and to use more approach techniques in responding to stress. Examples include accessing social support, and working to reduce the cause of the stress. In contrast, men have been shown to use more avoidant techniques than have women in dealing with stress. Examples include isolation, drug and alcohol use (Parkes, 1990). Bray, Camlin, Fairbank, Dunteman, and Wheelless (2001) found that men were more likely than were women to respond to their stressors with negative coping mechanisms such as drinking and drug use which in turn significantly affected work performance. Bray et al. (2001) also found that military personnel described comparable amounts of occupational stress regardless of their gender. However female military personnel reported greater amounts of family stress than did their male counterparts. Interestingly enough, family stress only appeared to affect work performance for male personnel. These findings

suggest that because males are more likely to use avoidance techniques that can initially reduce stress, other aspects of their lives suffer. On the other hand, women appear to learn more effective coping strategies as a result of their greater exposure to family-related stress.

While avoidance techniques may temporarily benefit the user by reducing stress initially, the long-term effects may include “interference with the appropriate action, emotional numbness, intrusions of threatening material, disruptive avoidance behaviors and lack of awareness of relationship to trauma” (Roth & Cohen, 1986; p. 817). In the current study, both men and women appear to use avoidance techniques in coping with stress. Across all conditions, women were significantly more likely to falsely confess than were men. Signing a written confession is the quickest way out of this stressful situation and the willingness to do so could be construed as an avoidance technique. Perhaps male participants were more likely to confess and internalize after exposure to the accident scenes because they had a more difficult time identifying the source of their stress. One cost of an avoidance reaction to stress may be the misattribution of one’s symptoms to events that are not the primary cause of stress (Roth & Cohen, 1986). For example, it may be more acceptable for men to believe that the stress they are feeling is associated with the computer crash than to the accident slides (Efthim et al., 2001).

Regardless of the nature of the relationship between stress, suspect gender and interrogation response, we believe that these findings are important because police often interview witnesses and suspects immediately after an incident. The stress associated with witnessing or experiencing the event may be at its peak during that time. We already know that being questioned, interviewed or interrogated by the police is stressful. Our study confirms that experiencing interrogation style questions yields stress scores that are comparable to those generated after witnessing a stressful event such as viewing an accident. Many of the proven and probable false confessions described in Leo and Ofshe’s (1998) article start with interrogations that lasted 10 hours or more. Our findings suggest that cumulative stress may contribute to a male suspect’s willingness to sign a written confession even when the suspect knows that he did not commit the crime. This leads to a major concern--a coerced-compliant confession without any obvious evidence of police coercion.

Historically, when we think about situational characteristics leading to coerced-compliant confessions we envision long interrogations, accompanied by the withholding of restroom, water and sleep privileges. In reality, interrogation techniques have become more psychological and in law enforcements words “more coercive.” Leo and Ofshe (1998) suggest that poor training and negligence are more responsible for false confessions than maliciousness because police officers are unaware of how their methods for

questioning can lead to false confessions. In addition to being more aware of their methods, officers need to be more cognizant of when and under what conditions they use these methods. For example, Wells (1993) suggests that if an event is especially complex, stressful or violent, the suspect may fail to remember the event accurately. Our study suggests that interrogating soon after a stressful event does not just increase a guilty suspect's likelihood of confessing, but an innocent suspect's likelihood of falsely confessing as well.

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Appendix A

Interrogation Strategies Checklist.

a. Appeal to suspects self interest	<i>"I'm sure your professor would understand that it was just an accident if you confessed."</i>
b. Confront suspect with existing evidence of guilt	<i>"Look, the computer says shut down improperly."</i>
c. Undermine suspect's confidence	<i>"Are you sure you didn't hit that ALT key? I think it would be hard to type letters that quickly without making a mistake."</i>
d. Identify contradictions in story	<i>Have participants tell what he/she thinks happen in steps and then have him or her recount those steps.</i>
e. Appeal to the importance of cooperation	<i>"My professor will be really upset about this. I won't be able to run any more participants unless I tell her how this happened. I need you to help me out."</i>
f. Offer moral justifications or psychological excuses	<i>"You didn't mean to hit the ALT key. Anyone could have done it. It was just an accident."</i>
g. Confront suspect with false evidence of guilt	<i>"I have run over 30 participants in the past three weeks. The computer hasn't crashed any of those other times."</i>
h. Use praise or flattery	<i>"I'm not angry with you. It takes a special kind of person to even sign up to participate in a study like this. Not everyone cares about research like you."</i>
i. Appeal to detective (experimenter) expertise	<i>"I have worked on this computer for hours. I know that the only way that this computer crashes is when the ALT key is hit."</i>
j. Appeal to this suspects conscience	<i>"Doesn't it bother you that this happened. You're not even taking responsibility for your actions."</i>
k. Minimize the seriousness of the offense.	<i>"Its no big deal, I have another copy of the file at home. Most of the data is in that ."</i>