

The Effects of Differential Exposure to Gruesome Photographs on Mock Jurors'

Emotions & Legal Judgments

by

Samantha Rae Bean

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Graduate Supervisory Committee:

Jessica Salerno, Chair  
Nicholas Schweitzer  
Nicholas Duran

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## ABSTRACT

In a trial, jurors are asked to set aside their emotions and make judgments based solely on evidence. Research suggests jurors are not always capable of this, particularly when exposed to gruesome photographic evidence. However, previous research has not looked at the potentially moderating effect of when and for how long jurors are exposed to emotionally disturbing photographs, nor how many photographs they see. In two experiments I tested the impact of the timing of and extent of exposure to gruesome photographs on jurors' emotions, verdicts, and punishment recommendations. In Study 1, I investigated the effect of timing and exposure duration to a single gruesome photograph of a victim in a murder case (no exposure, brief early exposure, brief late exposure, and prolonged exposure) on mock jurors' emotions and case judgments. Prolonged exposure (relative to no or brief exposure, regardless of timing) increased disgust, which in turn was associated with harsher punishment. Contrary to previous research, the photograph manipulation did not influence verdicts. The results were mixed and inconclusive regarding brief early versus late exposure. In Study 2, I compared repeatedly viewing a single gruesome photograph to viewing a set of four similar, but unique gruesome photographs—holding the exposure time constant—to assess the impact of quantity of photos on jurors' emotions and case judgments. Viewing multiple gruesome photos (relative to no photos) led to increase in guilty verdicts through increased disgust, replicating previous research. Viewing a single gruesome photo (relative to no photo) led to increase in guilty verdicts through disgust, differing from Study 1 findings. Viewing multiple gruesome photos and a single gruesome photo led to more disgust, compared to viewing no photo. However, differing from Study 1, gruesome photographs did not lead

to an increase in punishment recommendations. There were no significant differences between exposure to a single or multiple gruesome photos on disgust, verdicts, or punishments. Overall, greater exposure to gruesome evidence led to increased disgust and punitiveness, relative to those with less exposure. However, jurors with greater exposure to the same or different photographs did not differ in reported emotions, verdicts, or punitiveness.

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## TABLE OF CONTENTS

	Page
LIST OF TABLES .....	vii
LIST OF FIGURES.....	viii
CHAPTER	
1 INTRODUCTION .....	1
Gruesome Photographs in Court .....	1
2 LITERATURE REVIEW .....	6
Gruesome Photographs and Emotions .....	6
Desensitization.....	8
Primacy and Recency .....	10
3 RESEARCH OVERVIEW .....	12
Hypotheses.....	13
Exposure Duration Hypotheses.....	13
Timing Hypotheses.....	13
Quantity Hypotheses .....	14
4 STUDY 1 METHOD .....	15
Participants, Design, and Procedure.....	15
Materials.....	17
Trial Stimulus .....	17
Manipulations .....	18
Measures .....	19
Attention and Manipulation Checks.....	20

CHAPTER	Page
5	STUDY 1 RESULTS ..... 20
	Emotions ..... 21
	Guilt Judgments ..... 22
	Punishment..... 23
	Mediation Analyses ..... 24
	Prolonged Exposure versus All Other Conditions..... 24
	Brief Exposure: Primacy versus Recency ..... 25
6	STUDY 1 DISCUSSION ..... 25
7	STUDY 2 INTRODUCTION..... 27
	Hypotheses ..... 27
8	STUDY 2 METHOD ..... 28
	Participants, Design, and Procedure ..... 28
	Materials..... 30
	Trial Stimulus ..... 30
	Manipulations ..... 31
	Measures ..... 31
	Attention and Manipulation Checks..... 32
9	STUDY 2 RESULTS ..... 33
	Emotions ..... 35
	Guilt Judgments ..... 35
	Punishment..... 37
	Conviction Proneness ..... 37

CHAPTER	Page
Mediation Analyses .....	37
10 STUDY 2 DISCUSSION .....	38
11 GENERAL DISCUSSION .....	39
Greater Exposure .....	40
Timing .....	41
Theoretical Contributions .....	42
Legal Implications .....	42
Limitations and Future Directions .....	44
Conclusion .....	46
REFERENCES .....	48
APPENDIX	
A IRB APPROVAL .....	51
B MATERIALS FROM STUDY 1 .....	53
C MATERIALS FROM STUDY 2 .....	76

## LIST OF TABLES

Table	Page
1. Pearson Correlation Matrix for Continuous Variables, Study 1 .....	20
2. Descriptive Statistics for Dependent Variables, Study 1 .....	21
3. Pearson Correlation Matrix for Continuous Variables, Study 2 .....	32
4. Descriptive Statistics for Dependent Variables, Study 2.....	34

## LIST OF FIGURES

Figure	Page
1. Timeline of Manipulations, Study 1 .....	17
2. The Effect of Photograph Condition on Disgust, Study 1 .....	22
3. The Percent of Guilty Verdicts as a Function of Condition, Study 1 .....	23
4. The Effect of Photograph Condition on Punishment Recommendations, Study 1 ..	24
5. Timeline of Manipulations, Study 2 .....	30
6. The Effect of Photograph Condition on Disgust, Study 2 .....	35
7. The Percent of Guilty Verdicts as a Function of Condition, Study 2 .....	37

## **Introduction**

In many criminal and civil trials, jurors are exposed to extremely emotionally disturbing evidence of violent moral transgressions—in great detail— and are instructed to avoid letting their emotions prejudice their decision. Yet, this evidence can be horrific, often including crimes caught on video or hundreds of gruesome images of victims of violence. When jurors are exposed to this emotional evidence—despite being well-intentioned— they may make decision-making errors, such as allowing their emotional reactions, non-factual evidence, and extralegal factors to influence their legal judgments.

The current research evaluates how varying three aspects of how emotional evidence is presented in a trial can diminish or exacerbate emotional reactions to this evidence, as well as ultimate decisions of guilt and punishment: the duration, timing, and quantity of gruesome photograph exposure. Across two experiments, I tested the effects of when and how often jurors are exposed to this evidence, as well as how many pieces of unique evidence they are shown, to evaluate potential interventions courts could use to decrease the prejudicial effect of emotionally evocative evidence on jurors. Drawing from psychological theories of emotion, primacy and recency, and desensitization, I present competing hypotheses for how varying when and how jurors view this evidence could lead to differential emotional responses to the same photographs and the consequences for legal judgments.

### **Gruesome Photographs in Court**

Previous research demonstrates that seeing emotionally evocative evidence, primarily operationalized as gruesome photographs, can make jurors more conviction prone and/or more punitive in their sentencing recommendations (e.g., Finkelstein &

Bastounis, 2010; for meta-analysis, see Grady et al., 2018), relative to receiving the same information in written or oral formats. Further, research shows the relationship of gruesome photographs on increased convictions is mediated by an increase in jurors' negative emotions, specifically feelings of anger (Bright & Goodman-Delahunty, 2006) and disgust (Salerno, 2017). This effect, in part, is driven by jurors' emotional responses biasing their interpretation of other evidence to support blaming *someone* for the horrible things they have seen (Salerno & Peter-Hagene, 2013; Salerno, 2017), which can potentially contribute to wrongful convictions. However, research thus far has not yet evaluated simple interventions the legal system could try to mitigate these prejudicial effects of gruesome photographs regarding how often, how many, and when the photographs are presented.

There are several adversarial perspectives and motivations in a courtroom to consider when thinking about when and how photographs should be presented to jurors. There might be competing intuitions and strategies about the quantity, timing, and duration of the photograph presentation. Regarding quantity, prosecutors or plaintiff attorneys may attempt to show hundreds of gruesome photographs in efforts to make their case as strong as possible to the jury. This might be motivated by providing as much relevant information about the victim's injuries as possible or to "rile up" the jury emotionally about the harm committed. In contrast, *defense* attorneys may frequently attempt to limit the number of photographs the jury is exposed to, in an attempt to limit potential emotional reactions from jurors as much as possible. These efforts from the respective attorneys are based on an intuition about what will be better for their case.

Regarding timing, prosecutors or plaintiff attorneys might be strategic in deciding *when* to show the photographs during the trial. They may believe that showing these emotional photographs early on, such as in opening statements, may create a stronger emotional response or connection to the victim from the beginning, which could sway jurors to the prosecution's side early on and motivate them to process the rest of the evidence through their narrative. On the other hand, prosecutors and plaintiff attorneys may believe showing an emotionally evocative photograph at the end of the trial, right before deliberation, might be more salient and stay longer in jurors' minds and perhaps be more influential in their decisions.

Finally, regarding duration, attorneys must make decisions regarding how often or for how long they want to display each gruesome photograph. A prosecutor may believe that showing the photograph only once will maximize the impact of the photograph and heighten jurors' emotions without allowing them to become used to or desensitized to the evidence. However, a prosecutor could also assume that showing the photographic evidence whenever possible (i.e., during all relevant testimony and also during opening and closing statements) could increase the impact it has on the jury, perhaps arousing their emotions even more so than is possible with a single instance of exposure. They need to decide, for example, during opening and closing statements if they should flash it quickly while talking about the victim or to leave it up throughout the whole statement. In both of these instances, the attorney makes an important assumption about how jurors will react to this evidence based only on their intuition. However, because previous research has not yet explored the potentially moderating effects of differential exposure of these photographs— such as different exposure duration, quantity of photographs, and

different temporal points of exposure—these efforts may be unnecessary or might even backfire.

Of course, it is not all up to the attorneys. If a certain way of presenting the photographs is more prejudicial than others, the judge can limit the attorneys' choices. The judge in a trial is in charge of refereeing these two different perspectives and goals of specific attorneys. The judge is supposed to act as a gatekeeper by listening to the attorneys' arguments (when raised) and deciding whether and how photographs are presented. They are ideally allowing evidence that is sound and pertinent to the case and screening out evidence that does not meet this standard. Rule 403b of the Federal Rules of Evidence, outlines a balancing test that judges must perform for each piece of evidence that is challenged by one of the attorneys (Fed. R. Evid. 403). This rule states that the prejudicial impact of a piece of evidence must not outweigh its probative value, meaning, judges must decide if the biasing effect of the evidence is greater than the information it provides. However, judges often allow gruesome evidence to be admitted in a trial, giving the prosecution leeway to present their case and any evidence that may be relevant to a jury's decision (Bandes & Salerno, 2014). This gruesome evidence is also admitted into court to demonstrate aspects of the crime, beyond what verbal testimony communicates (2014). For example, in one case, a trial judge allowed photographs of a deceased infant to be admitted so the jury could picture the size of the infant, in addition to testimony the jury heard describing the weight of the infant (*State v. Collins*, 1998).

The timing and exposure duration of this evidence could enhance or diminish the prejudicial effects on jurors. For example, it is possible that seeing a gruesome photograph very early and repeatedly throughout a trial, could bias the jury more than

viewing the same photograph only once in the middle of the trial. Perhaps the way the photograph is presented might balance the scale by reducing the emotional response, such that the photograph might be more probative than prejudicial. Not only would these discoveries lend psychological insight into how and why people's blame judgments are affected by emotionally evocative visuals presented in different ways, but will provide important and easily implemented interventions to limit the biasing effect of these photographs in court.

The current research explores how we might psychologically mitigate the emotion-driven need to blame and punish that can result from exposure to emotionally disturbing evidence, by investigating the impacts of how and when emotional evidence is presented to jurors. First, I will review the literature on the impact of gruesome photographs on mock jurors' emotions and judgments. Second, I will review literature on the psychological principles of primacy and recency, to understand how the timing of when these photographs are presented to jurors might impact emotional reactions and decisions. Third, I will review research demonstrating support for desensitization theories from other contexts dealing with violent stimuli to assess how variations in the quantity and duration of gruesome photograph exposure might impact jurors' reactions to gruesome evidence. I then describe how I tested competing hypotheses about these factors by conducting two experiments that varied timing and exposure duration of a single gruesome photograph (Study 1) as well as the quantity of unique photographs presented (Study 2) and assessed their impacts on jurors' emotions, verdicts, and punishment recommendations.

## Literature Review

### Gruesome Photographs and Emotions

Previous research suggests that different emotions, such as anger and sadness, influence social information processing strategies in different ways. This finding is theorized to be explained by different emotions being associated with different levels of certainty. The cognitive appraisal of emotion theory describes how unpleasant emotions like anger and disgust are positively associated with certainty, while emotions of sadness are positively associated with *uncertainty* (Smith & Ellsworth, 1985). Emotions associated with certainty, such as anger, do not motivate deep processing of information because they are already confident. In contrast, emotions associated with uncertainty, such as sadness, *do* motivate deeper processing and less reliance on heuristics and shortcuts because they are not confident (Tiedens & Linton, 2001)). This theory has been demonstrated in legal contexts wherein jurors' emotions can increase or decrease their depth of processing via the level of certainty associated with each emotion (Feigenson & Park, 2006). For example, an angry person is more likely to rely on heuristics and peripheral cues (such as a defendant's race), compared to a person who is sad or in a neutral mood (Bodenhausen, Sheppard, & Kramer, 1994). Research using gruesome photographs has demonstrated that they can induce negative emotions in jurors—such as anger and disgust—and these emotions, in turn, are associated with increased convictions, resulting in more pro-prosecution outcomes in criminal trials (e.g., Bright & Goodman-Delahunty, 2006; Salerno, 2017). The combination of anger and disgust can be particularly potent given that it predicts moral outrage and increased desire to blame and punish, which predicts more guilty verdicts (Salerno, 2017).

The Culpable Control Model of blame explains how these negative emotions can indirectly increase blame judgments by instigating biased information processing of other information; information consistent with this desire to blame is paid more attention to and remembered more than information that is inconsistent with blaming the target (Alicke, 2000). In a trial setting, with an abundance of conflicting information, heightened anger and disgust might decrease processing overall or bias the processing to support their need to blame (e.g., biasing processing toward prosecution evidence and away from defense evidence). This phenomenon could potentially lessen jurors' abilities to disentangle strong from weak arguments and increase their reliance on heuristics (Feigenson, 2006). Previous research on gruesome photographic evidence demonstrates this indirect effect: viewing gruesome photographs can reduce sensitivity to a strong defense evidence, which was associated with more convictions (Salerno, 2017). Additionally, gruesome photographs can result in a greater tendency to convict the defendant and rate the same prosecution evidence as stronger than when they did not see the photographs (Bright & Goodman-Delahunty, 2006).

Thus, we know how gruesome photographs can elicit negative emotions that can bias processing of case information and can lead to an increase in guilty verdicts and a need to punish. However, we do not know how prolonged exposure to this emotionally evocative evidence might enhance or diminish its impact on jurors. On the one hand, repeatedly seeing a gruesome photo could create a cumulative effect that increases emotions of disgust and anger with increased exposure, leading to more confidence in a guilty verdict, relative to less exposure. Greater exposure could be operationalized in two different ways: through repeatedly viewing the same individual photograph of a victim or

viewing several unique photographs of the same victim. In the latter, jurors may be exposed to many unique gruesome photographs, however they may be simply depicting the same injury but taken from different angles—perhaps technically providing additional, but redundant, information. This prediction regarding greater exposure is in line with defense attorneys’ intuitions that lead to attempts to limit the number of gruesome photographs of a murder victim as much as possible. On the other hand, increased exposure to gruesome photos could desensitize the observer, ultimately leading to a leveling-off or even a decrease in emotions of disgust and anger, which in turn could lead to a decrease in guilty verdicts. The current research seeks to compare these two possibilities by varying the number of times mock jurors are exposed to a single gruesome image (Study 1), as well as varying the number of unique images they are shown (Study 2).

### **Desensitization**

An important theoretical perspective to consider comes from other research contexts that test the impact of violent, graphic, or emotional stimuli. Desensitization refers to the psychological phenomena described as “tuning out” or “turning off” of typical emotional reactions to certain events (Cline, Croft, & Courier, 1973). Past research on desensitization investigated how people repeatedly exposed to violence (via video games or television) become accustomed to that violence, show less empathy, and are psychologically and physiologically desensitized to it, compared to those with less exposure to violence (see meta-analysis Anderson et al., 2010). This effect of desensitization has been found in participants’ physiological responses as well. Participants with high exposure to television violence show less of an autonomic arousal

during exposure to a moderately violent film, compared to those with low previous exposure to television violence (Cline, Croft, & Courier, 1973). Further, this physiological desensitization has also been found after short periods of exposure. Carnagey, Anderson, & Bushman (2007) exposed participants to either a violent or non-violent video game for a short period of time (20 minutes), then exposed them to a video of real violence. They found that those who played the violent video game showed less physiological arousal to the real-life violence, compared to those who played the non-violent video game.

Previous research also investigated whether this desensitization effect influences one's ability to make decisions and to take the perspective of another. Participants who were repeatedly exposed to a shocking or thrilling image demonstrated a desensitization effect on emotional perspective taking—they were more likely to assume that someone else viewing the image for the first time would find it much less shocking than they did (Campbell et al., 2014). They also found that participants were largely unaware of this desensitization effect, and those who were aware showed little appreciation for how this effect could produce inaccurate predictions (2014). Overall, desensitization research demonstrates that those with high or repeated exposure to a particularly violent or shocking stimuli often show less or lowered reactions to subsequent similar stimuli and estimate that others will be similarly desensitized when viewing it for the first time.

Although the effect of repeated exposure to violent or emotionally evocative evidence has not yet been studied in a legal evidentiary setting, these studies suggest that jurors might become desensitized to gruesome photographs over repeated or prolonged exposure—potentially making the photographs less emotionally impactful and thereby

less influential on their verdict decisions. Thus, I hypothesized that greater exposure might lead to jurors becoming desensitized (i.e., report less intense emotional reactions), relative to less exposure across two operationalizations of “greater exposure”. First, I predicted that jurors exposed to the same exact gruesome photograph for a longer duration and more frequently during a trial may be desensitized, relative to jurors that view the photograph less frequently and for a shorter duration (Study 1). Second, I predicted that jurors exposed to multiple unique photographs of the victim (that are relatively redundant with each other), may be desensitized relative to jurors who see only one photograph—holding the time they are exposed to gruesome photographs constant (Study 2).

### **Primacy and Recency**

There is also reason to argue that *when* gruesome photographs are presented might determine their level of impact on jurors’ emotions and verdicts. In a trial setting, jurors receive information and evidence throughout the process of opening statements, testimony and cross examination of witnesses and experts, evidentiary exhibits, and closing statements. There is conflicting research regarding whether the same information presented at the beginning or end of a trial exerts a stronger influence in how jurors understand and incorporate this information into their decision-making. The literature on this topic is mixed and presents support for both the psychological principles of primacy and recency.

Primacy theories suggest that information presented earlier receives more credibility than information presented later (Turvey & Freeman, 2012). Early on, research by Lund (1925) investigated primacy and recency effects and led to his proposal for the

“Law of Primacy in Persuasion” hypothesis, in which he claimed that earlier information has greater influence and persuasive impact on individuals’ opinions, compared to the same information presented later. Theories of social cognition propose that people receive and process information in organized frameworks called schemata (Bayly, 1988). Applying this to juror decision-making, jurors may develop and apply these schemas and perceptions of credibility based on information they develop early on, which in turn, could influence their view of later information. The Story Model of juror decision-making proposes that information received earlier in a trial is incorporated in jurors’ minds as a story, and later information that fits the story is assimilated while conflicting information is disregarded (Pennington & Hastie, 1992). Furthermore, when mock jurors were given jury instructions from a judge suggesting the defendant should be found guilty in a case (i.e. judge’s opinion), they were more likely to vote guilty, relative to getting the same instruction post-testimony (Hart, 1995). Additionally, research on how the order of when testimonies occur can affect verdicts revealed that when a strong prosecution witness is heard earlier in a trial, as compared to later in a trial, participants chose guilty verdicts more often (Pennington, 1982).

On the other hand, recency theories suggest that information received later will be better remembered and recalled more than earlier information, and therefore can be more persuasive (Miller & Campbell, 1959). Jurors receive instructions from the judge traditionally at the end of a trial presentation due to beliefs consistent with recency theory, which suggests that this information will be better recalled and used in deliberation, compared to if the information was presented earlier, due to its more recent processing (Wrightsmann, 1987). Recency effects have also been found in juror decision-

making research regarding how jurors form opinions about a case. Costabile & Klein (2010) found that participants were more likely to vote guilty in a trial when they heard incriminating evidence later in a trial, compared to the same evidence presented early in a trial; this effect was mediated by participants' better recall of the evidence. Further, opinions about source credibility (Wilson, 1971) and order of argument presentation (Wallace & Wilson, 1969) also evince recency effects, such that sources and arguments presented later were more persuasive and accounted for a larger effect on mock jurors' opinions, relative to the same arguments and sources presented earlier.

Thus, previous research supports conflicting hypotheses about whether the impact of a gruesome photograph will have a stronger influence on jurors' emotions and verdicts when it is viewed at either the beginning (i.e., primacy) versus the end (i.e., recency) of a trial. Although these findings might not lead to courts being willing to specify when the prosecution enters them into evidence via testimony, either finding would have important implications for whether prosecutors should be allowed to include them in their opening or closing statements.

### **Research Overview**

Two experiments investigate how varying the timing, duration of exposure, and quantity of gruesome photographs might affect mock jurors' emotions, verdicts, and punishment recommendations. Participants in both studies viewed a trial video about a man accused of murdering his wife by slitting her throat with a knife. In this video, all participants watched the same opening and closing statements from prosecution and defense attorneys, testimony and cross examination from three prosecution witnesses and one defense witness, and jury instructions from a judge. One of the prosecution witnesses

is a pathologist who verbally describes the victim's injuries in detail, so all participants heard a description of the injuries regardless if they viewed the gruesome photograph(s) of her injuries. Study 1 compared the impact of (a) seeing a single gruesome photograph for a relatively shorter or longer duration (i.e., length of exposure) and (b) seeing the photograph earlier versus later in the trial (i.e., timing). Study 2 compared the impact of seeing a single gruesome photograph versus several photographs depicting unique angles of the same victim's injury (i.e., quantity of images). Mock jurors chose a verdict and sentencing recommendation and reported their emotional responses.

### **Hypotheses**

**Exposure duration hypotheses.** I had competing hypotheses about exposure duration, tested in Study 1. I hypothesized that, consistent with attorneys' intuitions, there could be a cumulative effect of viewing a gruesome photo more often and for a longer amount of time. More specifically, participants who view the gruesome photograph more often and for a longer duration of time will report increased levels of disgust, more guilty verdicts, and give longer sentencing recommendations, relative to those who do not see the photograph or see it more briefly. However, the desensitization literature also supported my competing hypothesis that there could be a desensitization effect. More specifically, participants who view the photograph more often and for a longer duration of time, will report decreased disgust, less guilty verdicts, and give shorter sentencing recommendations, relative to those who view the same photograph briefly.

**Timing hypotheses.** Due to the conflicting research on how primacy and recency influence persuasion, I also had competing hypotheses for timing effects, tested in Study 1. If there is a primacy effect, I hypothesized that participants who view a gruesome

image earlier in a trial (i.e., during opening statements and pathologist testimony) will report increased disgust, guilty verdicts, and give longer sentencing recommendations, relative to seeing the same photograph later (i.e., during pathologist testimony and closing statements) and for the same duration of time. However, if there is a recency effect, I hypothesized that participants who view a gruesome image later in a trial (i.e., during pathologist testimony and closing statements) will report increased disgust, guilty verdicts, and give longer sentencing recommendations, relative to seeing the same photograph earlier (i.e., opening statements and pathologist testimony) and for the same duration of time. Additionally, I hypothesized that viewing the gruesome photograph in either of the brief conditions—early or late—would increase emotions of disgust, guilty verdicts, and punishment recommendations, relative to the no gruesome photograph control condition.

**Quantity hypotheses.** Regardless of whether Study 1 demonstrates a desensitization or cumulative effect, Study 2 will tease apart the effect of prolonged exposure to a single gruesome image versus prolonged exposure to multiple unique, but similar, gruesome photographs (controlling for duration of total exposure). First, I hypothesized a general gruesome photograph effect, such that jurors who see either a single or multiple gruesome photographs would report more disgust, more guilty verdicts, and longer sentences.

I had competing hypotheses, however, for how viewing a single versus multiple gruesome photographs (for the same amount of total time) may impact jurors' emotions of disgust, verdicts, and punishment recommendations. If greater exposure to a single photograph (i.e., Study 1) results in a cumulative effect, I predicted that jurors who see

multiple gruesome (but largely informationally redundant) photographs would result in even more disgust, guilty verdicts, and harsher sentences than if they saw one photograph for the same amount of time. If greater exposure to a single photograph (i.e., Study 1) results in a desensitizing effect, I did not have strong *a priori* hypotheses. It is possible that jurors who see multiple unique images might be even more desensitized and report less disgust, guilty verdicts, and shorter sentences than those who see only one photograph for the same prolonged amount of time. Yet, it is also possible that each unique image will create a new emotional reaction and result in less desensitization than jurors who see the same image for the whole time and have a lesser emotional reaction to the gruesome evidence as a result.

## Study 1 Method

### Participants, Design, and Procedure

**Participants.** Participants were 614 adults from Amazon's Mechanical Turk. I excluded participants that failed any of the five attention checks or one manipulation check (27.4% failure), which left a sample of 446 participants (60% female, 79% White, 10% Black, 5.6% Asian, 0.9% American Indian or Alaska Native, 4.5% other). The sample size for this study was determined from an *a priori* power analysis that revealed a sample size of 436 participants was needed to have 90% power to detect an effect of partial eta squared of .032, which was an effect size of gruesome photographs in previous research in our lab. This study was pre-registered on the Open Science Framework prior to data collection ([https://osf.io/3pkry/?view\\_only=7ebd89c3c14749a7b16b320ec59648b8](https://osf.io/3pkry/?view_only=7ebd89c3c14749a7b16b320ec59648b8)).

**Design.** The experiment was a one-way between-subjects design with four conditions. In three of the four conditions, participants saw one autopsy photograph depicting the victim's wounds superimposed over scenes in the trial video. Participants were randomly assigned to see (a) no gruesome photograph (no exposure control), or a gruesome photograph (b) during the prosecutor's opening statement and pathologist's testimony (brief exposure - primacy), (c) during the pathologist's testimony and prosecutor's closing statement (brief exposure - recency), or (d) during the prosecutor's opening statement, pathologist's testimony, and the prosecutor's closing statement (prolonged exposure). Participants in the brief primacy and recency conditions saw the photograph for a total 30 seconds. Participants in the prolonged exposure condition saw the photograph for a total of 6 minutes (see Figure 1).

	Opening Statements	Locksmith Testimony	Pathologist Testimony	Closing Statements
Control				
Brief Primacy	 13 seconds		 17 seconds	
Brief Recency			 17 seconds	 13 seconds
Prolonged Exposure	 71 seconds		 200 seconds	 102 seconds

Figure 1. Timeline of Manipulations, Study 1.

Note. The first second of exposure for Brief Primacy and Prolonged Exposure in Opening Statements is at the same time. The last second of exposure for the Brief Recency and Prolonged Exposure is at the same time.

**Procedure.** Before the video, participants were given informed consent and asked to indicate they knew they could see graphic images from a real murder case (see Appendix A for IRB approval). After the video, participants responded to the measures of the survey and filled out demographic information.

## Materials

**Trial stimulus.** Participants viewed a trial video, which has been used in several previous research studies in our laboratory and has elicited an approximate 50% split between guilty and not guilty verdicts. The video is approximately 27 minutes long. The

case in the video is about a man accused of murdering his wife by slitting her throat with a knife, while the defense argues that she committed suicide. The trial contains opening statements from the prosecution and defense attorneys, testimony and cross examination from three prosecution witnesses and one defense witness, closing statements from both attorneys, and jury instructions from a judge. The prosecution witnesses were the victim's sister who lived with the couple, an expert locksmith, and a pathologist; the defense's witness was a neighbor who testified that the wife was severely depressed. The gruesome photograph was a real autopsy photograph of the victim that depicts a deep wound in her throat. For participants assigned to one of the three gruesome photograph conditions, the photograph is superimposed on the right half of the screen with the attorney or expert who is testifying still visible on the left half.

**Manipulations.** Participants were randomly assigned to view the trial video with no gruesome photograph, or the same trial video with the gruesome photograph superimposed according to one of three experimental conditions. Participants in both the brief primacy and brief recency conditions viewed the gruesome photograph superimposed for 17 seconds at the same time points in the pathologist's testimony. What differed, is that they also saw the photograph for 13 seconds during either the prosecution's opening statement (brief primacy) or closing statement (brief recency). Participants assigned to the prolonged exposure condition viewed the gruesome image in the prosecution's opening statement (71 seconds), throughout the pathologist's testimony (200 seconds), and in prosecution's closing statement (102 seconds) for a total of 6 minutes across the trial (Figure 1).

## Measures

Participants completed a dichotomous verdict, continuous measures of the likelihood of guilt and the likelihood the defendant committed the crime, on 11-point scales ranging from 0% to 100%, in increments of 10%. They also completed a set of scales assessing the degree to which they felt different emotions while viewing the trial evidence, including: 4 items assessing disgust (e.g., “I felt grossed-out”;  $\alpha = .93$ ), 4 items assessing anger (e.g., “I felt infuriated”;  $\alpha = .93$ ), 3 items assessing sadness (e.g., “I felt sad”;  $\alpha = .79$ ), 2 items assessing fear (e.g., “I felt fear”;  $\alpha = .80$ ), 2 items assessing sympathy (e.g., “I felt sympathy for the victim”;  $\alpha = .78$ ), and 2 items assessing empathy (e.g., “I felt empathy for the victim”;  $\alpha = .87$ ) on five-point scales from *Not at all* to *Very much*. Participants were asked to assume that irrevocable proof was provided that the defendant had definitely committed the crime and to suggest an open-ended sentencing recommendation (in years) for the defendant. Participants completed other measures that were not analyzed (see Appendix B for complete list of measures). See Table 1 for bivariate correlations of continuous dependent measures.

Table 1  
*Pearson correlation matrix for continuous variables, Study 1.*

	1	2	3	4	5	6	7	8
1. Likely Vote Guilty								
2. Likely He Did It	.75**							
3. Punishment	-.01	-.03						
4. Disgust Scale	.24**	.28**	.07					
5. Anger Scale	.31**	.38**	.11*	.70**				
6. Fear Scale	.14**	.15**	.05	.63**	.60**			
7. Sadness Scale	.05	.08	.08	.68**	.69**	.65**		
8. Sympathy Scale	.08	.16**	.12*	.49**	.54**	.38**	.63**	
9. Empathy Scale	.11*	.18**	.10*	.45**	.50**	.34**	.56**	.82**

\* $p < .05$  \*\* $p < .01$

**Attention and Manipulation Checks.** Participants completed two attention checks within the survey and four manipulation checks. Attention checks asked participants to select a particular answer to ensure they were fully reading each question. Manipulation checks at the end of the survey asked participants to recall what evidence they saw—such as autopsy photographs of the victim—to verify that they correctly recalled the manipulation, according to condition.

### Study 1 Results

I conducted several one-way between-subjects ANOVAs to analyze the effect of what condition participants were in on continuous dependent measures, including two continuous measures of guilt, sentencing recommendations, and six emotion scales. I

conducted logistic regression analyses on dichotomous verdicts. See Table 2 for descriptive measures on all dependent variables.

Table 2.  
*Descriptive statistics for dependent variables, Study 1.*

	Control <i>N</i> = 114	Brief Primacy <i>N</i> = 120	Brief Recency <i>N</i> = 108	Prolonged Exposure <i>N</i> = 104	Total <i>N</i> = 446
Guilty Verdicts	48.2%	45.8%	51.9%	50.0%	48.9%
Likely Vote Guilty	5.36 (3.59)	5.41 (3.56)	6.03 (3.55)	5.64 (3.39)	5.60 (3.52)
Likely He Did It	6.66 (3.05)	6.61 (3.22)	7.12 (2.95)	7.08 (2.67)	6.85 (2.99)
Punishment	70.79 (94.69)	74.97 (100.23)	81.86 (105.42)	92.46 (112.93)	79.65 (103.31)
Disgust Scale	2.76 (1.36)	3.13 (1.31)	3.02 (1.28)	3.54 (1.23)	3.10 (1.32)
Anger Scale	2.52 (1.32)	2.44 (1.29)	2.46 (1.29)	2.88 (1.23)	2.57 (1.29)
Fear Scale	1.99 (1.01)	2.02 (1.19)	2.04 (1.18)	2.31 (1.26)	2.09 (1.16)
Sadness Scale	2.84 (1.03)	2.74 (1.23)	2.96 (1.14)	3.15 (0.99)	2.91 (1.11)
Empathy Scale	4.02 (1.12)	3.88 (1.25)	4.09 (1.08)	4.26 (0.95)	4.05 (1.12)
Sympathy Scale	3.80 (1.15)	3.63 (1.23)	3.83 (1.16)	3.96 (1.02)	3.80 (1.15)

*Note.* Likely Vote Guilty and Likely He Did It were on 11-point scales ranging from 0% (0% Likely) to 100% (100% Likely). Punishment was an open-ended sentencing recommendation in years. All emotion scales were on 5-point scales ranging from 1 (Not at all) to 5 (Very much).

## Emotions

A one-way between-subjects ANOVA revealed that duration of exposure affected disgust,  $F(3, 442) = 6.02, p < .001, \eta_p^2 = .043$ : Tukey post-hoc tests revealed that participants in the prolonged exposure condition were significantly more disgusted than those in the control,  $p < .001$ , and recency conditions,  $p = .02$ . Their disgust level was not significantly different, however, from participants in the primacy condition  $p = .09$  (see Figure 2). The primacy and recency conditions did not differ,  $p = .94$ . There was also a significant effect of condition on emotions of sadness,  $F(3, 442) = 2.85, p = .04, \eta_p^2 = .019$ . Tukey post-hoc tests revealed that participants in the prolonged exposure condition reported feeling more sadness than those in the primacy condition,  $p = .03$ . The manipulation did not affect any other emotions,  $F_s < 2.73, p_s > .19$ .

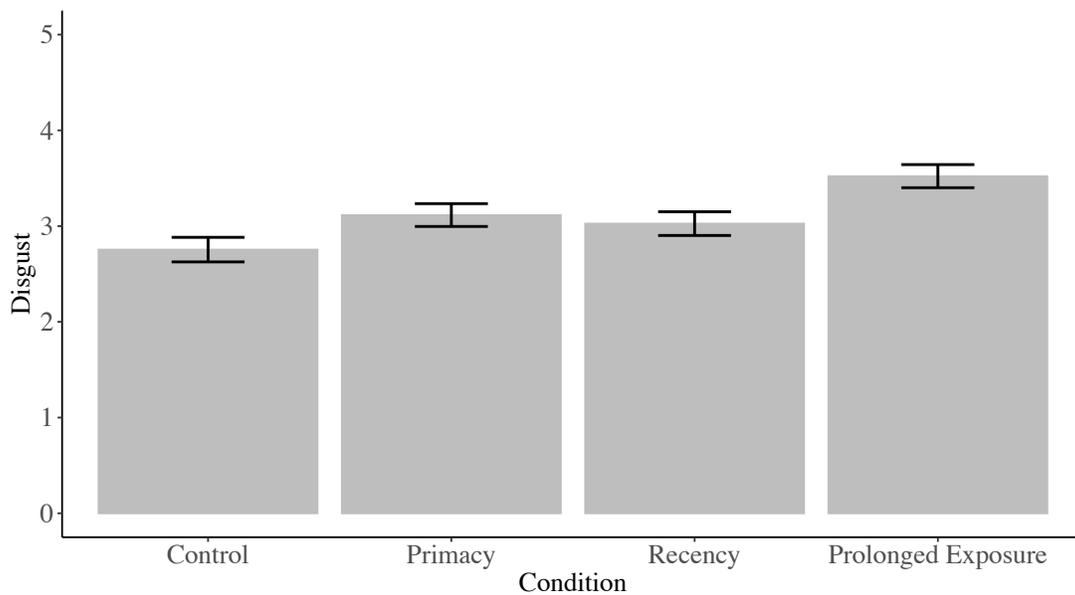


Figure 2. The effect of photograph condition on disgust, Study 1.

## Guilt Judgments

A logistic regression revealed that the manipulation did not significantly predict dichotomous verdicts,  $\chi^2(3, N = 446) = 0.99, p = .83$ . All conditions produced between 45.8-51.9% guilty verdicts and none of the gruesome photograph conditions differed from control, all  $Bs < |.29|$ , all  $ps > .59$  (see Figure 3). One-way ANOVAs on likelihood of guilt,  $F(3, 442) = 0.83, p = .48, \eta_p^2 = .006$ , and on likelihood that the defendant committed the crime,  $F(3, 442) = 0.91, p = .44, \eta_p^2 = .006$ , also revealed no significant differences between conditions.

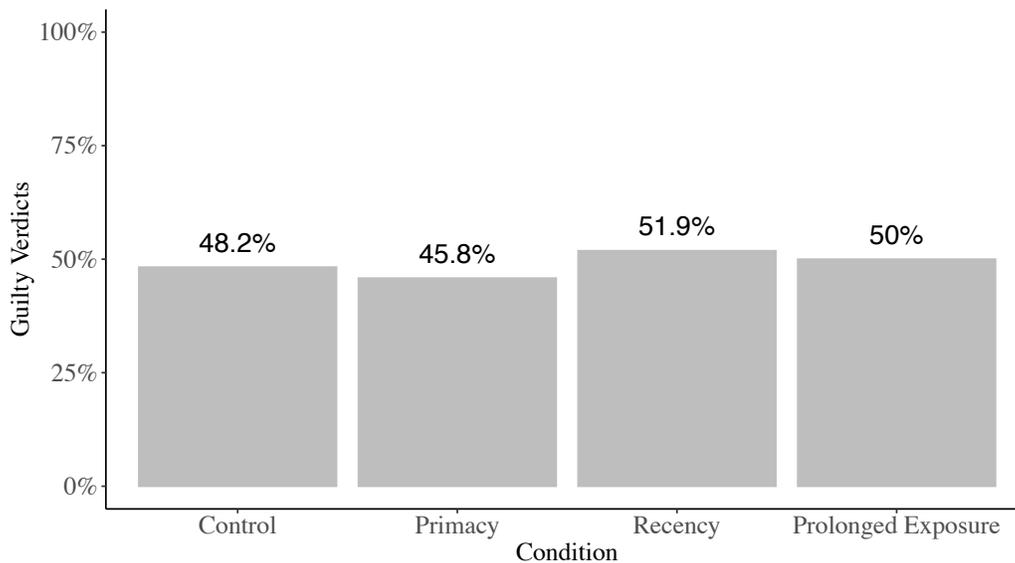


Figure 3. The percent of guilty verdicts as a function of condition, Study 1.

## Punishment

Participants' open-ended sentencing recommendations were not normally distributed, so I log transformed their responses in order to analyze it. There was only one participant that recommended 0 years and was left out of this analysis. There was a significant effect of photograph exposure condition on punishment,  $F(3, 435) = 4.11, p =$

.01,  $\eta_p^2 = .028$ . Tukey post-hoc tests revealed that mock jurors with prolonged exposure to the photograph recommended longer sentences than mock jurors in the control,  $p = .01$ , and primacy  $p = .03$ , conditions (Figure 4). The prolonged exposure and recency conditions did not differ,  $p = .34$ . Again, the primacy and recency conditions did not differ,  $p = .74$ .

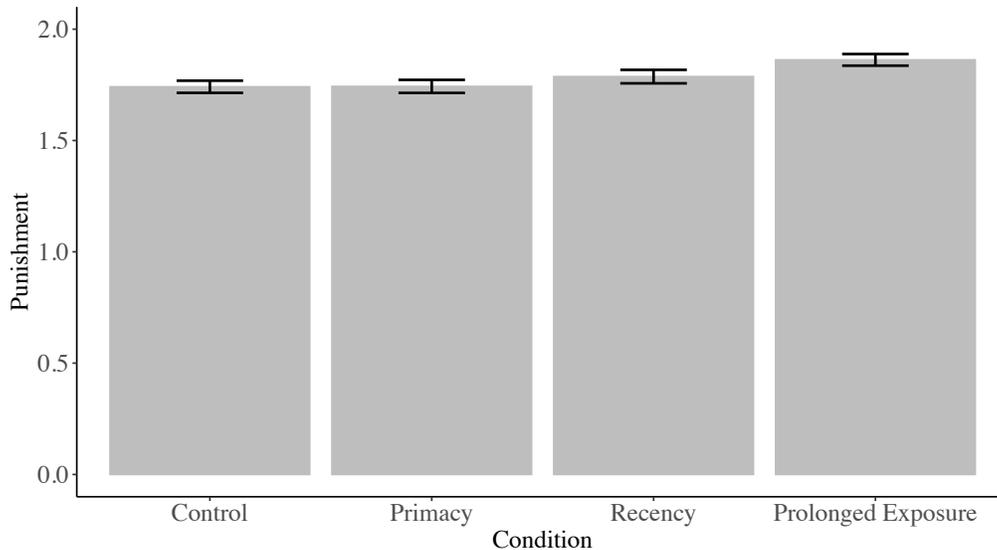


Figure 4. The effect of photograph condition on punishment recommendations, Study 1.

### Mediation Analyses

I conducted a series of mediation analyses in order to test whether the effect of exposure to gruesome photographs on sentencing was mediated by increased disgust.

**Prolonged exposure versus all other conditions.** Prolonged exposure to the gruesome photograph significantly increased punishment through disgust relative to not being exposed,  $M_{IndirectEffect} = -.02$ , 95% CI [-.04, -.002], being briefly exposed early,  $M_{IndirectEffect} = -.01$ , 95% CI [-.03, -.003], and being briefly exposed late,  $M_{IndirectEffect} = -.01$ , 95% CI [-.03, -.001]. Relative to prolonged exposure, all other conditions reported significantly less disgust, all  $Bs < |3.01|$ , all  $ps < .02$ , and disgust was positively

associated with sentencing recommendations,  $B = .01$ ,  $SE = .71$ ,  $p = .02$ . Thus, prolonged exposure had a cumulative effect, such that seeing the gruesome photograph more often and for longer time periods increased disgust, which in turn was associated with recommending longer sentences relative to not seeing the photograph or seeing the same photograph more briefly.

In an exploratory analysis, prolonged exposure to the gruesome photograph also significantly increased punishment through anger relative to being briefly exposed early,  $M_{IndirectEffect} = -.01$ , 95%  $CI [-.03, -.002]$ , and being briefly exposed late,  $M_{IndirectEffect} = -.01$ , 95%  $CI [-.03, -.001]$ . Relative to prolonged exposure, those in brief early and late conditions reported significantly less anger, all  $B$ s  $< |1.89|$ , all  $p$ s  $< .01$ , and anger was positively associated with sentencing recommendations,  $B = .01$ ,  $SE = .003$ ,  $p = .01$ . No other emotion scale was a significant mediator, all indirect effects  $< |.02|$ , all confidence intervals included zero.

**Brief Exposure: Primacy versus Recency.** Relative to the no-photograph control condition, jurors who were briefly exposed to a gruesome photograph early (primacy) felt more disgust,  $B = 1.51$ ,  $SE = .68$ ,  $p = .03$ , which was associated with recommending longer sentences,  $B = .16$ ,  $SE = .06$ ,  $p = .01$ ,  $M_{IndirectEffect} = .23$ , 95%  $CI [.003, .59]$ . The indirect effect of recency (versus control) on verdicts through disgust was not significant,  $M_{IndirectEffect} = .17$ , 95%  $CI [-.05, .52]$ . Thus, relative to not seeing a photograph of the victim, a gruesome photograph of the victim early in the trial indirectly increased punishment through disgust but seeing the same photograph for the same amount of time later in the trial did not. Yet, it is difficult for me to draw strong conclusions about primacy versus recency effects because comparing primacy and recency conditions

directly did not evince a significant indirect effect on sentencing through disgust,  $M_{IndirectEffect} = -.12, 95\% CI [-.41, .08]$ .

### **Study 1 Discussion**

I presented competing hypotheses regarding how the timing of a gruesome photograph could impact mock jurors' emotions and decisions. Participants in the primacy and recency conditions did not significantly differ in their reported emotions, specifically on emotions of disgust. This finding suggests that showing a single gruesome photograph for the same amount of time in either opening versus closing statements in a trial, does not lead to jurors feeling more or less disgusted. Similarly, participants in both the primacy and recency conditions did not differ in their guilty verdicts or in the recommendations for how long the defendant should spend in prison.

Additionally, I presented competing hypotheses for how duration of exposure to a gruesome photograph could impact mock jurors' emotions and decisions. Prolonged exposure to the same gruesome photograph had a cumulative effect relative to seeing the same photograph for less time—making mock jurors more disgusted, and in turn more punitive. However, participants' verdicts were not affected by gruesome photographs—suggesting that viewing a single gruesome photograph, even for a prolonged period of time, does not make jurors more conviction prone, relative to brief exposure or even no exposure at all to the gruesome evidence.

This first study provides support that being exposed to a gruesome photograph more often and for longer time periods in a trial can produce a cumulative effect on punishment, such that those with more exposure report feeling more disgusted and recommend longer years in prison for a defendant. My finding that viewing the gruesome

photograph did not increase convictions in any condition contradicts previous research demonstrating that viewing gruesome photographs increase convictions—despite the fact that much of that previous research used the same trial stimulus and photograph. A key difference, however, that might explain this discrepancy is that my study presented only one photograph, whereas previous research used the same photograph in the context of a set of four gruesome photographs. This suggests that there might be a cumulative effect of seeing many distinct photographs on verdicts, but not from seeing the same photograph more often. In the real world, this is an important distinction because a single image is likely to not be the only image shown in a trial and understanding the impact of multiple additional photographs is necessary to decisions about how many photographs to allow into court. Thus, a second study was needed to replicate these effects and compare the effect of prolonged exposure to a single image to a condition consistent with previous research that includes a set of unique, but informationally somewhat redundant, gruesome photographs of a victim's injury.

### **Study 2 Introduction**

In the first study, I found some support for the cumulative effect hypothesis of prolonged exposure to a gruesome photograph on mock jurors' reported emotions of disgust and their punishment recommendations. However, I did not find that viewing a single gruesome photograph in a trial lead to an increase in guilty verdicts. This result deviates from previous research on gruesome photographs that did find an increase in guilty verdicts, relative to not viewing a gruesome photograph. This second study will directly compare using a single photograph to multiple unique, but similar photographs and will seek to synthesize my first study and previous research, as well as increase

understanding of jurors' emotional responses to different quantities of gruesome photographic evidence.

## **Hypotheses**

Based on Study 1 results, I predicted that prolonged exposure a single gruesome photograph would not lead to an increase in guilty verdicts, compared to viewing no gruesome photograph. However, I predicted that seeing multiple gruesome photographs (Photos exhibits A, B, C, *and* D) would render more guilty verdicts than those exposed to a single photograph (randomized to view photograph exhibit A, B, C, *or* D) for the same amount of time, and those who did not view gruesome photographs (control). I predicted these effects will be mediated by increased levels of disgust, such that viewing multiple unique photographs will indirectly increase guilty verdicts through increased emotions of disgust.

Regarding participants' recommendations for punishment, based on the results of Study 1, I predicted that participants in both the single and multiple photograph conditions would recommend longer punishments for the defendant than those in the no-photograph control condition. I also predicted that those exposed to the set of multiple gruesome photographs would recommend longer punishments than those who view a single gruesome photograph. If this is the case, I again predicted that the impact of gruesome photograph condition on punishment would be mediated by disgust.

## **Study 2 Method**

### **Participants, Design, Procedure**

**Participants.** Participants were 741 adults from Amazon's Mechanical Turk. I excluded participants that failed either of the two attention checks or one manipulation

check (17.3% failure), which left a sample of 613 participants (56% female, 81% White, 10% Black, 5.7% Asian, 0.3% American Indian or Alaska Native, 0.2% Native Hawaiian or Pacific Islander, 2.6% other). The sample size for this study was determined using an *a priori* power analysis that revealed a sample size of 606 participants was needed to have 95% power to detect an effect of partial eta squared of .032, which was an effect size of gruesome photographs in previous research in our lab. This study was pre-registered on the Open Science Framework prior to data collection ([https://osf.io/3pkry/?view\\_only=7ebd89c3c14749a7b16b320ec59648b8](https://osf.io/3pkry/?view_only=7ebd89c3c14749a7b16b320ec59648b8)).

**Design.** This experiment was a one-way between-subjects design with three conditions. Participants were assigned to see (a) no gruesome photograph (control condition), (b) one of four single gruesome photographs in the pathologist's testimony and prosecution's closing statement, or (c) a set of all four of the gruesome photographs in the pathologist's testimony and prosecution's closing statement. Participants assigned to the single gruesome photograph condition viewed one of the four photographs from the set used in the multiple photograph condition. Participants that viewed a single photograph saw the photograph at the same time points and for the same duration of time as participants in the multiple photograph condition (see Figure 5).

	Opening Statements	Locksmith Testimony	Pathologist Testimony	Closing Statements
Control				
Single Photograph			 95 seconds	 77 seconds
Multiple Photographs			    95 seconds	    77 seconds

Figure 5. Timeline of Manipulations, Study 2.

Note. Participants in the Single Photograph condition viewed one of the four photographs from the set used in the Multiple Photographs condition.

**Procedure.** Prior to the video, participants were given informed consent and asked to indicate they knew they might see graphic images from a real murder case. After the video, participants responded to survey measures and completed demographic information.

## Materials

**Trial stimulus.** Participants viewed the same trial video used in Study 1, which was again altered based on condition. Gruesome photographs were superimposed on the right side of the screen, with the attorneys and witnesses still visible, for each of the four single photograph condition versions and for the multiple photograph condition with the set of four images (see Figure 5).

**Manipulations.** Participants were randomly assigned to view either the trial video with (a) no photographs superimposed (control), (b) one of four single gruesome photographs or (c) the set of four gruesome photographs. Participants assigned to the control condition heard the same testimony from the pathologist regarding the victim's injuries but did not see the photographs superimposed. Participants in the two experimental conditions saw the gruesome photograph (s) superimposed on the right half of the screen for 1 minute and 35 seconds during the pathologist's testimony and for 1 minute and 17 seconds during the prosecution's closing statement for a total of 2 minutes and 52 seconds. Participants assigned to view a single image in the trial were further randomly assigned to view one of four videos, each containing one gruesome image from the set of four. This stimulus sampling approach was used to ensure that any effect from the single photograph condition was not idiosyncratically due to one of the photographs. These four subgroups were collapsed into one single photograph condition for analyses. Participants in the multiple photo condition saw the set of four photographs one at a time during this same time duration (see Figure 5).

## **Measures**

Participants completed the same measures as Study 1. Additionally, I took measures of conviction proneness by asking participants questions from a scale used in our laboratory's previous research aimed at assessing their inclination to be more easily persuaded by the prosecution or the defense. This scale initially included 3 items ( $\alpha = .64$ ), but one was dropped to improve scale reliability ( $\alpha = .78$  with two items). The first item asked participants how hard another juror would have to work to convince them to vote guilty. The second asked in a case such as this whether they thought the prosecution

or defense would have a harder time convincing them to vote with them. Other measures were assessed in this survey that were not analyzed for this thesis (see Appendix C for full measures). See Table 3 for bivariate correlations of continuous dependent measures.

Table 3.  
*Pearson correlation matrix for continuous variables, Study 2.*

	1	2	3	4	5	6	7	8	9
1. Likely Vote									
Guilty									
2. Likely He Did It	.76**								
3. Punishment	.03	.09*							
4. Disgust Scale	.20**	.23**	-.01						
5. Anger Scale	.34**	.33**	.01	.64**					
6. Fear Scale	.09*	.07	-.06	.56**	.58**				
7. Sadness Scale	.07	.09*	-.01	.64**	.69**	.65**			
8. Sympathy Scale	.10*	.15**	.05	.53**	.53**	.36**	.63**		
9. Empathy Scale	.16**	.20**	.08*	.52**	.53**	.34**	.58**	.83**	
10. Conviction	-	-	-.03	-	-	-.10*	-.08*	-.10*	-
Proneness	.77**	.69**		.21**	.29**				.17**

\* $p < .05$  \*\* $p < .01$

**Attention and Manipulation Checks.** Participants completed two attention checks and one manipulation check in the survey. One attention check instructed participants to specify a certain answer to ensure they were reading carefully, the other verified that they recalled viewing photographic evidence from the expert locksmith. The manipulation check asked participants to indicate what evidence they viewed in the trial video, which was used to ensure they correctly identified that they did or did not view photographs of the deceased victim.

## **Study 2 Results**

I conducted similar analyses to Study 1. See Table 4 for descriptive measures on all dependent variables.

Table 4.  
*Descriptive statistics for dependent variables, Study 2.*

	Control N = 196	Single photograph N = 202	Multiple photographs N = 215	Total N = 613
Guilty Verdicts	44.4%	53.5%	57.7%	52.0%
Likely Vote Guilty	5.30 (3.45)	5.78 (3.54)	6.13 (3.47)	5.75 (3.50)
Likely He Did It	6.54 (2.80)	6.93 (2.86)	7.15 (2.95)	6.88 (2.88)
Punishment (years)	56.37 (36.20)	65.93 (79.95)	62.23 (72.87)	61.58 (66.25)
Disgust Scale	2.70 (1.26)	3.22 (1.30)	3.36 (1.20)	3.10 (1.28)
Anger Scale	2.37 (1.23)	2.53 (1.27)	2.63 (1.26)	2.51 (1.25)
Fear Scale	2.00 (1.12)	2.10 (1.18)	2.25 (1.23)	2.12 (1.18)
Sadness Scale	2.68 (1.10)	2.82 (1.12)	2.93 (1.09)	2.81 (1.11)
Empathy Scale	3.87 (1.22)	3.93 (1.14)	4.00 (1.09)	3.93 (1.15)
Sympathy Scale	3.58 (1.18)	3.64 (1.16)	3.76 (1.08)	3.66 (1.14)
Conviction Proneness	2.94 (1.33)	2.67 (1.40)	2.67 (1.36)	2.75 (1.37)

*Note.* Likely Vote Guilty and Likely He Did It were on 11-point scales ranging from 0% (0% Likely) to 100% (100% Likely). Punishment was an open-ended sentencing recommendation in years. All emotion scales were on 5-point scales ranging from 1 (Not at all) to 5 (Very much). Conviction Proneness was on a 5-point scale ranging from 1 to 5, with lower numbers indicating more conviction prone.

## Emotions

A one-way between-subjects ANOVA revealed a significant effect of quantity of gruesome photographs on emotions of disgust,  $F(2, 610) = 15.41, p < .001, \eta_p^2 = .05$ .

Tukey post-hoc tests revealed those in the control condition reported feeling significantly less disgusted than those in the single photograph condition,  $p < .001$ , and those in the multiple photograph condition,  $p < .001$  (see Figure 6). There was no significant difference between those in the single photograph and multiple photograph conditions,  $p = .49$ . There were no other significant effects of photograph condition on emotion scales,  $F_s < 2.76, p_s > .06$ .

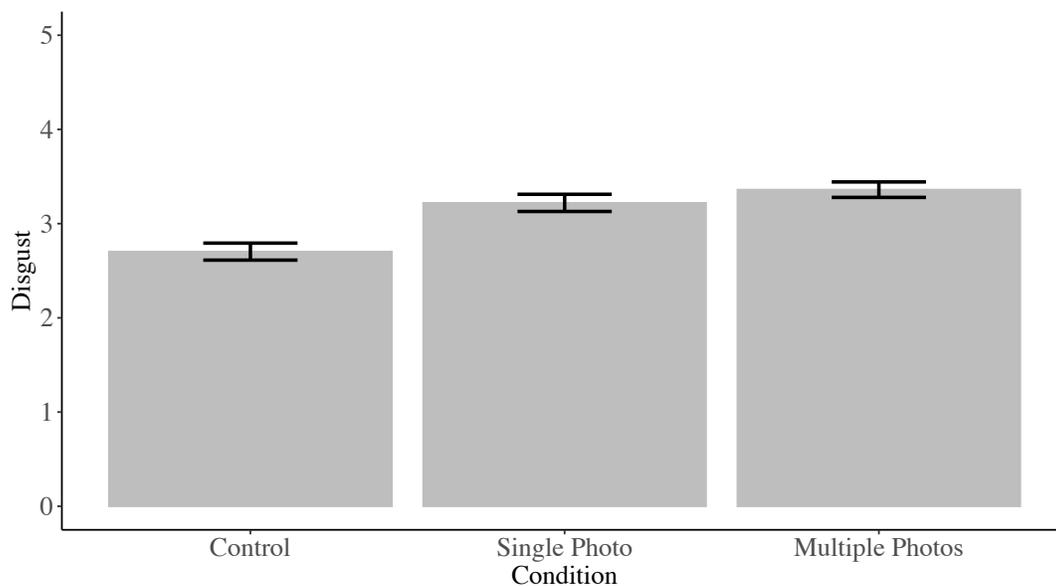


Figure 6. The effect of photograph condition on disgust, Study 2.

## Guilt Judgments

Participants in the three conditions voted guilty between 44% and 58% (see Figure 7). A logistic regression revealed photograph manipulation significantly predicted verdicts,  $\chi^2(2, N = 613) = 7.51, p = .02$ . Participants who viewed the four gruesome

images were more likely to vote guilty compared to those who did not view a gruesome image (control condition),  $B = 0.54$ ,  $Wald = 7.20$ ,  $p = .01$ , Odds ratio ( $OR$ ) = 1.71, 95%  $CI$  [1.16, 2.52]. Participants in the single photograph condition were not more likely to vote guilty compared to those in the control condition,  $B = 0.36$ ,  $Wald = 3.27$ ,  $p = .07$ ,  $OR = 1.44$ , 95%  $CI$  [0.97, 2.14]. A logistic regression with the multiple photograph condition as the reference group, however, revealed no significant difference between those who viewed multiple gruesome photographs and those who viewed a single gruesome photograph,  $B = -0.17$ ,  $Wald = 0.75$ ,  $p = .39$ .

Two one-way ANOVAs were conducted to assess the effect of condition on the two continuous measures of guilt. First, there was a significant effect of condition on participants' reports that they were likely to vote guilty in the case,  $F(2, 610) = 2.98$ ,  $p = .05$ ,  $\eta_p^2 = .01$ . Tukey post-hoc tests revealed that those in the multiple photograph condition reported being more likely to vote guilty compared to those in the control condition,  $p = .04$ , but not more likely to vote guilty than those in the single photograph condition,  $p = .56$ . There was no significant difference between those in the single photograph condition and those in the control condition on likely to vote guilty,  $p = .35$ . There was no significant effect of condition on how likely participants were to think the defendant committed the crime,  $F(2, 610) = 2.34$ ,  $p = .10$ ,  $\eta_p^2 = .008$ .

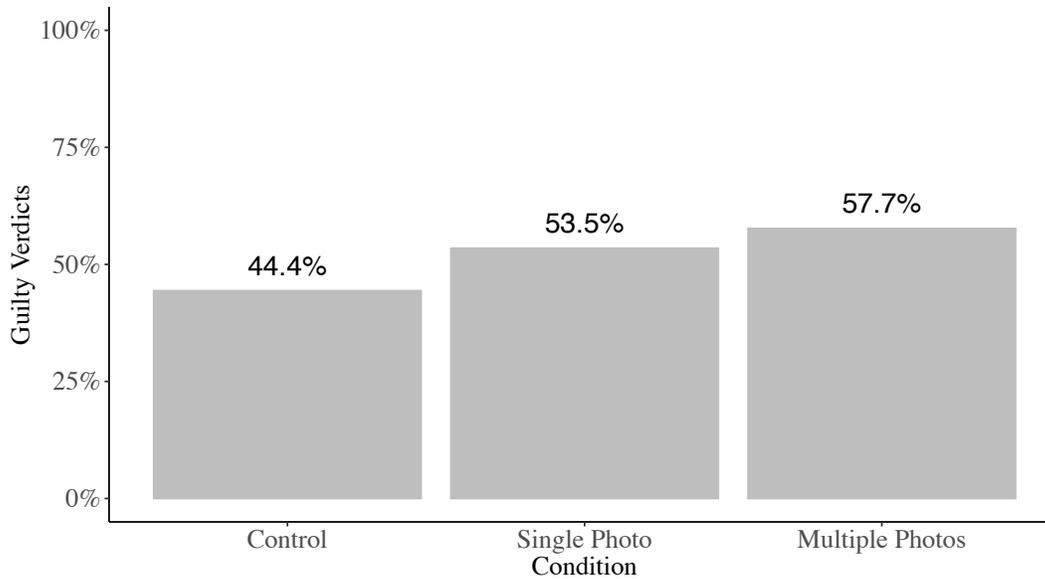


Figure 7. The percent of guilty verdicts as a function of condition, Study 2.

### **Punishment**

Participants' open-ended sentencing recommendations were not normally distributed, so I log transformed their responses in order to analyze it. There were 3 participants that recommended 0 years that were not included in this analysis. A one-way ANOVA revealed no significant effect of condition on punishment,  $F(2, 607) = 1.30, p = .27, \eta_p^2 = .004$ .

### **Conviction Proneness**

A one-way ANOVA of condition on conviction proneness revealed no significant effect,  $F(2, 607) = 2.64, p = .07, \eta_p^2 = .009$ .

### **Mediation Analyses**

I conducted a series of mediation analyses similar to Study 1 in order to test whether the effect of exposure to gruesome photographs on verdicts was mediated by increased disgust.

Exposure to multiple gruesome photographs significantly increased guilty verdicts through disgust relative to not being exposed,  $M_{IndirectEffect} = 0.19$ , 95% *CI* [.10, .32]. Exposure to a single gruesome photograph significantly increased guilty verdicts through disgust relative to not being exposed,  $M_{IndirectEffect} = 0.15$ , 95% *CI* [.07, .26]. Relative to the no exposure control condition, those who viewed multiple gruesome photographs reported more disgust,  $B = .66$ ,  $SE = .12$ ,  $p < .001$ , and those in the single photograph condition also reported more disgust,  $B = .52$ ,  $SE = .13$ ,  $p < .001$ , and disgust was positively associated with guilty verdicts,  $B = .29$ ,  $SE = .07$ ,  $p < .001$ . Exposure to multiple gruesome photographs did not significantly increase guilty verdicts through disgust relative to exposure to a single gruesome photograph,  $M_{IndirectEffect} = -.05$ , 95% *CI* [- .14, .04].

## Study 2 Discussion

I replicated the Study 1 finding that viewing a single gruesome photograph did not increase convictions relative to seeing no gruesome photographs. I hypothesized, however, that viewing a set of four unique, but similar, gruesome photographs *would* lead to more guilty verdicts—consistent with previous research that used several photographs. I found some support for this hypothesis: mock jurors were more likely to vote guilty after viewing four gruesome photographs, compared to no exposure to a gruesome photograph—which again was not the case for the single photograph condition. However, there was no significant difference when directly comparing those who viewed multiple gruesome photographs and those who viewed a single gruesome photograph on guilty verdicts. Additionally, similar to findings from previous research, I predicted, and found support, that viewing either a single photograph or multiple gruesome photographs would

lead to participants feeling more disgust, relative to a no exposure control condition—although I found no difference between those two conditions. As predicted, disgust significantly mediated the relationship of condition on mock jurors’ verdicts. Participants exposed to either a single or multiple gruesome photographs reported significantly more disgust, relative to those with no exposure, and disgust was positively associated with guilty verdicts. Again, there was no difference between the single and multiple photograph conditions. I did not replicate the effect of photographs on sentencing from Study 1—participants in all three conditions recommended similar punishments and there were no significant differences between conditions.

### **General Discussion**

Investigating the effects of differential exposure of emotionally evocative evidence is vital to the pursuit of justice in the legal system. Previous research has found that gruesome photographs can increase negative emotions, guilty verdicts, and the desire to punish someone for the crime at hand. However, research should also understand how the way in which jurors are exposed to this evidence could lessen or exacerbate these prejudicial effects. I designed two experiments in order to investigate how varying timing, duration, and quantity of exposure to gruesome photographs in a trial setting could moderate previously found prejudicial effects on mock jurors’ emotions and legal judgments. I presented three competing hypotheses for these varying exposure methods, drawing on previous research in different realms of psychology, and found mixed support for two of these hypotheses.

## **Greater Exposure**

I found some support for the cumulative, rather than desensitizing, effect hypothesis. I found this support through operationalizing greater exposure in two ways—duration of exposure and quantity of evidence. Regarding duration, mock jurors with greater exposure times were more disgusted, relative to those with less or no exposure to the gruesome evidence. Further, this increase in emotional response led to longer sentencing recommendations for those with greater exposure duration compared to those with less or no exposure. Regarding quantity, mock jurors with greater exposure to more gruesome evidence, relative to less evidence, were not more disgusted and did not differ in their likelihood to blame and convict the defendant. However, similar to previous research, those exposed to more gruesome evidence were more disgusted and, in turn, more likely to vote guilty, relative to those with no exposure to gruesome evidence. Overall, I found evidence that greater exposure, relative to less or no exposure, leads to increased disgust, as well as some mixed evidence that increased disgust can lead to increased punitiveness (Study 1) and increased convictions (Study 2).

In Study 1, I found that greater exposure to a single gruesome photograph, relative to less or no exposure, did not lead to increased convictions as some previous research has found. However, this study is one of the only studies to use only a single gruesome photograph, rather than multiple gruesome photographs. In ten published research studies (see Grady et al., 2018), nine studies used three or more gruesome photographs in their experiments and only one study used a single gruesome photograph. This one study assessed juries' sentencing recommendations (i.e., punishment measures) for a defendant, but did not assess any measures of guilt (Finkelstein & Bastounis, 2010).

Therefore, the current finding of no effect on guilty verdicts may not be an inconsistent finding but rather a difference in methodologies. Moreover, because previous studies used multiple gruesome photographs, future research should further investigate and seek to replicate the findings from the current research that exposure to less gruesome evidence (i.e., a single gruesome photograph) does not lead to increased guilty verdicts, while exposure to more gruesome evidence (i.e., multiple gruesome photographs) does lead to increased guilty verdicts. Future research should further investigate at what point greater exposure leads to an increase in jurors' blame judgments (i.e., from one to two photographs, or from two to three photographs)—and if greater quantity always leads to greater conviction rates or punishment recommendations, or if at a certain quantity they are no longer more impactful, relative to less.

### **Timing**

Study 1 directly compared primacy versus recency theories and, although there was some weak support here and there for one or the other, there was not consistent overall support for either theory. Mock jurors who viewed a gruesome photograph early on in a trial felt more disgust during the trial, relative to a control condition, while viewing the same photograph later in the trial did not increase disgust relative to control. However, when directly comparing the brief primacy and recency conditions there were no significant differences for disgust, verdicts, or punishment recommendations.

For the legal system, these results do not suggest there is a difference for jurors that view gruesome photograph evidence early in a trial (such as in opening statements) or later in a trial (such as in closing statements). However, more research could be done to evaluate this differential timing in longer cases or in cases with deliberation

components as well. The trial video used in this study was relatively short, relative to real-life trials, and this varying of timing could lead to different results with greater time between different trial components.

### **Theoretical Contributions**

The current research extends previous findings regarding how emotionally disturbing stimuli can impact people's emotions and decisions, by investigating when and how often they are exposed to this stimuli. This research suggests that greater exposure to emotionally evocative stimuli can affect people's desires to blame and punish, as well as increases their emotional responses. Contrary to evidence in other realms that increased exposure to emotional or violent stimuli leads to a desensitization effect, I found evidence that increased exposure led to increased emotions, whether people were increasingly exposed to the same *type* of stimuli or even the same *exact* stimuli. These findings create support for a cumulative effect of emotionally evocative evidence on an individual's emotional responses. There is also some support that increases in exposure can affect people's desires to blame and punish, due in part to their increased emotional reactions.

In directly comparing how timing of exposure impacts people's emotions and decisions, this research found no differences based on theories of primacy and recency. This suggests that there is not a strong effect of receiving emotionally evocative stimuli early or late on an individual's emotional reactions or on their corresponding judgments and decisions.

### **Legal Implications**

These findings suggest some support for limiting the quantity of gruesome photographs that jurors are exposed to in legal settings. In both Study 1 and Study 2,

there is evidence that viewing a single gruesome photograph, relative to no gruesome photograph, can lead to jurors feeling more disgust. There is some evidence that viewing a single gruesome photograph can indirectly increase guilty verdicts, through disgust, but there was no evidence for an overall total effect. This finding could mean this specific case stimulus was not strong enough to evince large verdict differences. However, because viewing multiple gruesome photographs did increase guilty verdicts, there is support that limiting the quantity of gruesome evidence can temper prejudicial effects.

These findings suggest that even with greater duration exposure, but limited quantity of *unique* photographs, jurors might be able to separate their emotional responses from their ultimate verdict decisions, not allowing the gruesome photograph to prejudice their decisions. However, when exposed to multiple gruesome photographs, compared to none, jurors felt more disgust which did lead to an increase in convictions. This set of four gruesome photographs—depicting three different angles of the victim’s wound and one crime scene photograph—did not communicate additional information or evidence to jurors, yet viewing this set of photographs led jurors to be more conviction prone. This suggests courts should seek to limit the number of gruesome photographs that jurors are exposed to because additional photographs could prejudice jurors and increase their desire to punish someone for the crime.

The current research found some evidence that greater exposure to a single gruesome photograph can increase jurors’ punitiveness. However, in a real trial guilt and sentencing phases are often separated, so finding that gruesome photographs increased disgust and in turn punishment recommendations, is not necessarily a worrisome result. In the sentencing phase of a trial, jurors are instructed to punish according to the loss that

has occurred and the heinousness of crime, meaning that greater disgust and punitiveness does not necessarily mean jurors are acting in a biased manner. Nevertheless, because the current research yielded mixed results, future research should further investigate the impact of greater exposure on punishment recommendations.

### **Limitations and Future Directions**

The current research had limitations. First, while the results from both studies are interesting and in part replicate previous research, there are distinct differences in findings between the two. Study 1 found that jurors with prolonged exposure to gruesome photographs recommended significantly longer punishments for the defendant compared to those with brief early or brief late exposure and no exposure. However, these findings were not replicated in Study 2—there were no significant findings on punishment recommendations between those who saw multiple gruesome photographs, a single gruesome photograph, or the control no-exposure condition. Due to this difference, these results should be interpreted with caution. One potential explanation for finding an effect on punishment in Study 1, but not Study 2 is that exposure duration in Study 1 was twice as long (6 minutes) compared to Study 2 (2 minutes and 52 seconds). Given that I found that longer exposure times indeed can make gruesome photographs more impactful on punishment (Study 1), it is possible that mock jurors in Study 2 did not see the photographs long enough to affect their punishment decisions. Future research could focus on these differences and possibly take more measures of punishment and individual punitiveness, which could be used as a potential mediator. Second, in investigating potential desensitization effects of emotional responses to this gruesome evidence, this research may have not had enough photographs to find at what point there is a leveling-

off or decrease in emotional responses. In real trials, attorneys may show many more than four gruesome photographs to the jury, so it is possible there is cumulative response only to a certain point, before a leveling-off or even decrease occurs.

Another limitation of this research is potentially the set of gruesome photographs that were used in Study 2. This set contained three autopsy photographs of the victim and one crime scene photograph. Because the crime scene photograph contained different content than the other photographs, it is possible this could have impacted the findings. To address this, I previously conducted a pilot of these photographs to compare the information they contained individually and as a set. This pilot yielded no significant differences between any individual photograph; however, this was with a small sample size.

It is important to note that our design does not enable us to draw conclusions about whether the exposure duration effects from Study 1 are due to the increase in length of time (i.e., 30 seconds in the less exposure conditions versus 373 seconds in the greater exposure conditions), the increase in frequency (i.e., seeing the photo twice in the less exposure conditions versus seeing the photo three times in the greater exposure condition), or both. I considered these to be two facets of the concept of exposure time, but I am unable to fully disentangle whether effects of increased disgust and punishment recommendations were due to the increased duration of exposure, increased number of times exposed, or a combination of both. This would be an important next step for future research.

I have designed two additional experiments to further test the effects of desensitization and timing of gruesome evidence on jurors' emotion and legal judgments.

The first study (in progress), uses many more gruesome photographs to assess at what point desensitization may occur, and uses psychophysiological monitoring to assess how emotional responses change and vary with each exposure, in real time. This study will also directly compare self-reported and physiological emotional reactions to this emotionally disturbing evidence. Another future study would address a potential limitation this current research had in testing theories of timing. While I compared brief early and brief late exposure, based on primacy and recency literature, the evidence was still presented to jurors in the middle of the trial via the pathologist's testimony. In another study I would change the order of the trial so participants would either hear the pathologist as the first witness or the last witness. This design would more clearly allow for conclusions to be drawn regarding how early or late exposure to the gruesome photographic evidence could impact jurors' emotions and decisions about the case.

## **Conclusion**

Jurors are often exposed to emotionally disturbing evidence in a trial and previous research has found this evidence can create a biasing effect by increasing emotions of disgust and desires to blame and punish someone for the crime at hand. The current research investigated how varying the quantity of gruesome evidence, as well as how and when jurors are exposed to this evidence, could diminish or exacerbate jurors' emotional responses, guilty verdicts, and punitiveness—actions that could be used as simple interventions in trial settings. Across both studies, I found mock jurors with greater exposure to gruesome photographic evidence (either to additional photographs or longer duration to the same photograph) were significantly more disgusted. There was also some support that this increased emotional response could lead to mock jurors voting guilty

more often or punishing the defendant more harshly. The current findings suggest courts should seek to limit the quantity and length of time that jurors are exposed to gruesome photographic evidence in order to reduce prejudicial effects on jurors.

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APPENDIX A  
IRB APPROVAL

**To:** Jessica Salerno

**From:** Mark Roosa, Chair   
Soc Beh IRB

**Date:** 11/07/2012

**Committee Action:** **Exemption Granted**

**IRB Action Date:** 11/07/2012

**IRB Protocol #:** 1211008502

**Study Title:** Evidence and Jurors' Judgments

The above-referenced protocol is considered exempt after review by the Institutional Review Board pursuant to Federal regulations, 45 CFR Part 46.101(b)(2) .

This part of the federal regulations requires that the information be recorded by investigators in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects. It is necessary that the information obtained not be such that if disclosed outside the research, it could reasonably place the subjects at risk of criminal or civil liability, or be damaging to the subjects' financial standing, employability, or reputation.

You should retain a copy of this letter for your records.

APPENDIX B  
MATERIALS FROM STUDY 1

Welcome to the Juror Judgments Study. Before you begin, please read the information we have provided below. You may also print a hard copy of this page for your records.

You are being asked to participate in a research study. The purpose of the study is to investigate opinions about court cases. If you agree to participate, you will be asked to watch a trial video about a court case and then to complete a questionnaire assessing your opinions about the case. The survey will take approximately 45 minutes to complete. If you participate in this survey, you will receive \$2.00 for your participation. We ask that only those individuals over the age of 18 participate.

#### RISKS

We believe that the current study poses minimal to no risk to you. You may feel uncomfortable watching a murder case presentation. You will see one of several cases. Some of the cases include potentially disturbing photographs of murder victims, some of which will show blood. The presentation is not more upsetting than what you would encounter if you were called to serve on a real capital jury.

#### BENEFITS

There is no direct benefit to you anticipated from your participation in this study.

#### CONFIDENTIALITY

The data we collect will not be linked to your identity in any way. Although you will be asked to provide us with some personal demographic information (age, education, etc.), we will not ask your name or any other question that could identify who you are.

#### RIGHT TO REFUSE OR WITHDRAW

You may change your mind about being in the study at any time, and quit after the study has started.

#### QUESTIONS

If you have any questions about this research project or if you think you may have been harmed as a result of your participation, please contact Dr. Jessica M. Salerno at [jessica.salerno@asu.edu](mailto:jessica.salerno@asu.edu).

If you have any questions regarding your rights and participation as a research subject, or if you feel you have been placed at risk, please contact the Arizona State University Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788.

Please read carefully -- if you do not read the instructions, you will not understand what to do during this hit. The experiment typically takes roughly 30-45 minutes to complete. Please only participate if you have enough time to finish it in one sitting. Today you will be asked to play the role of a juror in a capital murder trial. You will watch a presentation on the computer of case facts and evidence from a real trial. Here is what will happen during this hit: 1. First, you will see a video of selections from a real murder trial that

lasts roughly 25 minutes. Obviously a jury would get more information –we do not have time to show you all of the evidence. But your opinions based on just these key points are very informative. Please pay close attention to the trial evidence--we will ask you specific questions about what you remember about the trial evidence. 2. After the evidence presentation is done, you will hear the judge read jury instructions. You will be asked about your opinions about the case.

Please, try your best to treat this like you are a real juror serving real jury duty. Studies just like this are published and are often presented to the Supreme Court in legal briefs to help them make decisions about how the legal system is run. So, it is really important that you take your role seriously and make the same judgments that you would make and act how you would act if you were a real juror in this case.

[Captcha Before you proceed to the survey, please complete the verification below]

Next you will see video of selections from a real murder trial and then jury instructions.

Please watch and listen to all evidence carefully because you will NOT be able to go back and watch it again. Before continuing, we want to make sure that you are aware that you are going to be randomly assigned to view evidence from one of several different cases. Some of these cases include disturbing descriptions of real murder victims that real jurors would hear about and some include graphic photographs of real murder victims.

If you are aware of this and agree to participate please type the exact phrase (note that it IS case sensitive): I am aware

If you type anything other than the exact phrase you will be rerouted to the end of the survey.

Type "I am aware" here:

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[Video Instructions, Video Primacy, Recency, Control, and Prolonged Exposure] Please turn your sound up before starting the video. Note that there is no sound for the first two frames that include text. The sound begins at approximately 1 minute, 10 seconds. The video will last 30 minutes and it is important for you to watch the entire video. The website will not let you advance on to answer questions until 30 minutes has elapsed.

After the video begins please click on the full screen option in the bottom right-hand corner (the icon that looks like a broken square) so that you can see the video large on your screen.

If the video does not start at the beginning, please back it up and watch from the beginning.

JURY INSTRUCTIONS: YOU HAVE TWO VERDICT OPTIONS IN THIS CASE:

1. FIND THE DEFENDANT, MICHAEL STEVENS, GUILTY OF FIRST-DEGREE MURDER.

2. FIND THE DEFENDANT, MICHAEL STEVENS, NOT GUILTY.

To sustain the charge of first degree murder, the State (the Prosecution) must prove the following Propositions:

1. First Proposition: That the defendant, Michael Stevens, performed the acts which caused the death of Stacy Stevens.

AND

2. Second Proposition: That when the defendant, Michael Stevens, did so, he intended to kill Stacy Stevens.

Choose NOT GUILTY if: If you find from your consideration of all the evidence that any one of these propositions has not been proved beyond a reasonable doubt, you should return a verdict of Not Guilty. In other words, if you think that either the First Proposition OR the Second Proposition described above was not proved, you should vote Not Guilty.

Choose GUILTY if: If you find from your consideration of all the evidence that each one of these propositions has been proved beyond a reasonable doubt, you should return a verdict of Guilty. In other words, if you think that BOTH First Proposition AND the Second Proposition described above was proved, you should vote Guilty.

Verdict Is the defendant "not guilty" or "guilty"?

Not Guilty

Guilty

How likely would you be to vote guilty in this case?

- 0% Likely
- 10%
- 20%
- 30%
- 40%
- 50%
- 60%
- 70%
- 80%
- 90%
- 100% Likely

To prove you are reading, select the third answer that begins with "m." We've included this question to make sure you are working carefully on each question.

- Yes
- No
- Maybe
- I'd need more information

Regardless of whether the prosecution met the burden of proof, how likely do you think it is that the defendant killed the victim?

- 0% Likely
- 10%
- 20%
- 30%
- 40%
- 50%
- 60%
- 70%
- 80%
- 90%
- 100% Likely

Open Q1 Case Factors What aspects of the case factored into your decision?

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**Q1484 GRID INSTRUCTIONS:**

Please use this grid to indicate how angry and disgusted you feel right now. You can be high in both, low in both, or high in one and not the other. Along the bottom of the grid is how disgusted you feel, with low disgust on the left through high disgust on the right. Along the left side of the grid represents how angry you feel, from low anger on the bottom to high anger at the top. Please enter the number of the box that best represents how angry and disgusted you feel.

For example if you were extremely angry and not at all disgusted you would enter a 5-1. If you were not at all angry and extremely disgusted you would enter 1-5. If you were not at all angry and not at all disgusted you would enter a 1-1. If you were extremely angry and very disgusted you would enter a 5-4.

Please use this grid to indicate how angry and disgusted you feel SPECIFICALLY ABOUT THE VICTIM'S INJURIES. Her injuries can make you feel high in both, low in both, or high in one and not the other. Along the bottom of the grid is how disgusted you feel about her injuries, with low disgust on the left through high disgust on the right. Along the left side of the grid represents how angry you feel about her injuries, from low anger on the bottom to high anger at the top.

Please enter the number of the box that best matches with your level of disgust and anger SPECIFICALLY ABOUT THE VICTIM'S INJURIES.

<b>ANGER</b>	Extremely angry	5-1	5-2	5-3	5-4	5-5
	Very angry	4-1	4-2	4-3	4-4	4-5
	Angry	3-1	3-2	3-3	3-4	3-5
	Somewhat Angry	2-1	2-2	2-3	2-4	2-5
	Not at all angry	1-1	1-2	1-3	1-4	1-5
		Not at all disgusted	Somewhat disgusted	Disgusted	Very disgusted	Extremely disgusted
		<b>DISGUST</b>				

Please enter the number of the box that lines up with your level of disgust and your level of anger.

---

Using the scale below, please indicate how much you were feeling each of the following emotions when you heard the evidence of the victim's injuries.

	Not at all	Slightly	Somewhat	Moderately	Very Much
I felt anxiety	<input type="radio"/>				
I felt contempt	<input type="radio"/>				
I felt grossed-out	<input type="radio"/>				
I felt outrage	<input type="radio"/>				
I felt sadness	<input type="radio"/>				
I felt unhappiness	<input type="radio"/>				
I felt empathy for the victim	<input type="radio"/>				
I felt sympathy for the victim	<input type="radio"/>				
I felt pity	<input type="radio"/>				
I felt anger	<input type="radio"/>				
I felt disgust	<input type="radio"/>				
I felt repulsed	<input type="radio"/>				
I felt fear	<input type="radio"/>				
I felt compassion for the victim	<input type="radio"/>				
I felt depression	<input type="radio"/>				

I felt  
infuriated



I felt  
sickened



Please answer the following questions:

	Not at all	Slightly	Moderately	Much	Very Much
I feel a compelling need to punish the defendant	<input type="radio"/>				
I feel a desire to hurt the defendant	<input type="radio"/>				
I believe the defendant is evil to the core	<input type="radio"/>				
I feel morally outraged by the defendant	<input type="radio"/>				

Please answer the following questions:

	Extremely Weak	Weak	Somewhat Weak	Somewhat Strong	Strong	Extremely Strong
How strong was the prosecution's case evidence?	<input type="radio"/>					
How strong was the defense's case evidence?	<input type="radio"/>					

Please indicate how much you agree with each statement below:

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat Agree	Agree	Strongly Agree
The fact that the victim threatened to leave the defendant suggests that the defendant killed her.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The victim's history of depression suggests that she committed suicide.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The marital problems between the victim and the defendant probably led to the defendant killing the victim.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The defendant probably knew how to pick the lock to his bedroom door.

The victim's statement "You will be sorry when I'm gone" was a suicidal threat.

The fact that the bedroom door was locked from the inside suggests that the victim committed suicide.

The fact that the victim was wearing jewelry when she died suggests she was killed rather than committing suicide.

The defendant called a marriage counselor on June 18 because he was trying to mend his marriage.



The defendant asked his neighbor for help on June 18 because he did not know his wife was already dead.



The defendant's sister did not hear a struggle on June 17 because the victim committed suicide.



The lack of blood found on the defendant's clothing indicates that he did not murder the victim.



The bedroom door could be locked from the outside in a way that made it appear it was locked from inside.

This question is designed to make sure survey respondents are paying attention. Please choose "somewhat agree" to answer this question.

The defendant's behavior on Sunday evening and Monday morning is suspicious.

We would like to test your memory for some of the case evidence. Please check boxes next to each of the things that you saw during your trial video. Please check ALL that you saw.

- I saw photographs of the deceased, Stacy Stevens
- I saw photographs of the lock on Stacy's bedroom door.
- I saw photographs of the defendant, Michael Stevens.
- I saw video testimony from the defendant, Michael Stevens.

Display This Question:

If We would like to test your memory for some of the case evidence. Please check boxes next to each... = I saw photographs of the deceased, Stacy Stevens

How many separate times did you see a photo of the deceased, Stacy Stevens, during the trial video?

---

Imagine that you are about to serve as a juror in a case in which the prosecutor has asked for the death penalty. Which statement below expresses your position on the death penalty?

- I would never vote to impose the death penalty
- I would consider voting to impose the death penalty in some cases.

Imagine new evidence came to light, such as a video of the defendant committing the crime, that proved the defendant committed the crime beyond a reasonable doubt. How many years do you think he should serve in prison?

Please answer with the number of years (please do not include any symbols or letters)

---

Imagine how aware you are of your body processes. Select the answer that most accurately describes you. Rate your awareness on each of the characteristics described below using the following 5-point scale During most situations I am aware of:

	Never	Occasionally	Sometimes	Usually	Always
swallowing frequently	<input type="radio"/>				
a ringing in my ears	<input type="radio"/>				
an urge to clear my throat	<input type="radio"/>				
my body swaying when I am standing	<input type="radio"/>				
my mouth being dry	<input type="radio"/>				
how fast I am breathing	<input type="radio"/>				
watering or tearing of my eyes	<input type="radio"/>				
my skin itching	<input type="radio"/>				
noises associated with my digestion	<input type="radio"/>				
eye fatigue or pain	<input type="radio"/>				

People disagree about many things. But that doesn't matter right now. We are giving you the answer here. You should pick the middle answer choice - the one that contains "mix" in the answer. This will prove you were reading.

- Based on the situation described, I believe people are most responsible for what happens in their life. Luck doesn't matter much.
- Based on the situation described, I believe life is a mix of luck and decisions.
- Based on the situation described, I believe that most of life is luck.

Have you participated in another study about this case?

- Yes
- No

Display This Question:  
If Have you participated in another study about this case? = Yes

Please briefly describe the study

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---

How old are you (in years)?

---

gender What is your gender?

Male

Female

Other \_\_\_\_\_

ethnicity What is your ethnicity?

White

Black or African American

American Indian or Alaska Native

Asian

Native Hawaiian or Pacific Islander

Other \_\_\_\_\_

PO When it comes to politics, how liberal or conservative are you?

- Extremely liberal
  - Liberal
  - Slightly liberal
  - Moderate
  - Slightly conservative
  - Conservative
  - Extremely conservative
- 

In political circles, there are disagreements about a number of things. But you don't have to disagree about this question. Are you reading right now? If so, pick independent. This is a test to make sure you are working carefully.

- Republican
- Democrat
- Independent
- Green Party

What is your current religion? That is, what is your current denominational preference?  
CIRCLE ALL THAT APPLY:

- Fundamentalist Christian
- Christian
- Catholic
- Jewish
- Muslim
- Hindu
- Buddhist
- Non-denominational
- Agnostic/Spiritual
- Atheist/Not Religious

religiosity How religious do you consider yourself to be?

- Strongly not religious
- Not religious
- Neither religious nor not religious
- Religious
- Strongly religious

APPENDIX C  
MATERIALS FROM STUDY 2

Welcome to the Juror Judgments Study. Before you begin, please read the information we have provided below. You may also print a hard copy of this page for your records. You are being asked to participate in a research study. The purpose of the study is to investigate opinions about court cases. If you agree to participate, you will be asked to watch a trial video about a court case and then to complete a questionnaire assessing your opinions about the case. The survey will take approximately 45 minutes to complete. If you participate in this survey, you will receive \$2.00 for your participation. We ask that only those individuals over the age of 18 participate.

#### RISKS

We believe that the current study poses minimal to no risk to you. You may feel uncomfortable watching a murder case presentation. You will see one of several cases. Some of the cases include potentially disturbing photographs of murder victims, some of which will show blood. The presentation is not more upsetting than what you would encounter if you were called to serve on a real capital jury.

#### BENEFITS

There is no direct benefit to you anticipated from your participation in this study.

#### CONFIDENTIALITY

The data we collect will not be linked to your identity in any way. Although you will be asked to provide us with some personal demographic information (age, education, etc.), we will not ask your name or any other question that could identify who you are.

#### RIGHT TO REFUSE OR WITHDRAW

You may change your mind about being in the study at any time, and quit after the study has started.

#### QUESTIONS

If you have any questions about this research project or if you think you may have been harmed as a result of your participation, please contact Dr. Jessica M. Salerno at [jessica.salerno@asu.edu](mailto:jessica.salerno@asu.edu).

If you have any questions regarding your rights and participation as a research subject, or if you feel you have been placed at risk, please contact the Arizona State University Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788.

#### INSTRUCTIONS

Please read carefully -- if you do not read the instructions, you will not understand what to do during this hit. The experiment typically takes roughly 35-45 minutes to complete. Please only participate if you have enough time to finish it in one sitting. Today you will be asked to play the role of a juror in a capital murder trial. You will watch a presentation on the computer of case facts and evidence from a real trial. Here is what will happen during this hit: 1. First, you will see a video of selections from a real

murder trial that lasts roughly 25-30 minutes. Obviously a jury would get more information –we do not have time to show you all of the evidence. But your opinions based on just these key points are very informative. Please pay close attention to the trial evidence--we will ask you specific questions about what you remember about the trial evidence.

2. After the evidence presentation is done, you will hear the judge read jury instructions. You will be asked about your opinions about the case.

Please, try your best to treat this like you are a real juror serving real jury duty. Studies just like this are published and are often presented to the Supreme Court in legal briefs to help them make decisions about how the legal system is run. So, it is really important that you take your role seriously and make the same judgments that you would make and act how you would act if you were a real juror in this case.

[Captcha Before you proceed to the survey, please complete the verification below]

Next you will see video of selections from a real murder trial and then jury instructions.

Please watch and listen to all evidence carefully because you will NOT be able to go back and watch it again. Before continuing, we want to make sure that you are aware that you are going to be randomly assigned to view evidence from one of several different cases. Some of these cases include disturbing descriptions of real murder victims that real jurors would hear about and some include graphic photographs of real murder victims.

If you are aware of this and agree to participate please type the exact phrase (note that it IS case sensitive): I am aware

If you type anything other than the exact phrase you will be rerouted to the end of the survey.

Type "I am aware" here:

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You will see one of several different cases that we are showing to participants. Each of following trial videos contains a set of testimony, expert witnesses, and exhibits from the case.

However, we did not have access to all exhibits used in the whole trial. Therefore, you may only see some of the exhibits referred to in the video and we understand this could be confusing. However, please do your best to make decisions based on the evidence you were provided.

[Video Instructions, Video A/B/C/D/Multiple Photo Condition/Control]

Please turn your sound up before starting the video. Note that there is no sound for the

first two frames that include text. The sound begins at approximately 1 minute, 10 seconds.

The video will last 30 minutes and it is important for you to watch the entire video. The website will not let you advance on to answer questions until 30 minutes has elapsed.

After the video begins please click on the full screen option in the bottom right-hand corner (the icon that looks like a broken square) so that you can see the video large on your screen.

If the video does not start at the beginning, please back it up and watch from the beginning.

**JURY INSTRUCTIONS: YOU HAVE TWO VERDICT OPTIONS IN THIS CASE:**

**1. FIND THE DEFENDANT, MICHAEL STEVENS, GUILTY OF FIRST-DEGREE MURDER.**

**2. FIND THE DEFENDANT, MICHAEL STEVENS, NOT GUILTY.**

To sustain the charge of first degree murder, the State (the Prosecution) must prove the following Propositions:

1. First Proposition: That the defendant, Michael Stevens, performed the acts which caused the death of Stacy Stevens.

**AND**

2. Second Proposition: That when the defendant, Michael Stevens, did so, he intended to kill Stacy Stevens.

Choose **NOT GUILTY** if: If you find from your consideration of all the evidence that any one of these propositions has not been proved beyond a reasonable doubt, you should return a verdict of Not Guilty. In other words, if you think that either the First Proposition **OR** the Second Proposition described above was not proved, you should vote Not Guilty.

Choose **GUILTY** if: If you find from your consideration of all the evidence that each one of these propositions has been proved beyond a reasonable doubt, you should return a verdict of Guilty. In other words, if you think that **BOTH** First Proposition **AND** the Second Proposition described above was proved, you should vote Guilty.

Verdict Is the defendant "not guilty" or "guilty"?

- Not Guilty
- Guilty

How likely would you be to vote guilty in this case?

- 0% Likely
- 10%
- 20%
- 30%
- 40%
- 50%
- 60%
- 70%
- 80%
- 90%
- 100% Likely

To prove you are reading, select the third answer that begins with "m." We've included this question to make sure you are working carefully on each question.

- Yes
- No
- Maybe
- I'd need more information

LikelyDidit Regardless of whether the prosecution met the burden of proof, how likely do you think it is that the defendant killed the victim?

- 0% Likely
- 10%
- 20%
- 30%
- 40%
- 50%
- 60%
- 70%
- 80%
- 90%
- 100% Likely

Case Factors What aspects of the case factored into your decision?

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Imagine you were going into deliberation now with other jurors. How hard would another juror have to work to convince you to vote guilty?

- Not at all hard
- Slightly hard
- Somewhat hard
- Very hard
- Extremely hard

In a case such as this, do you think the prosecution or defense would have a harder time convincing you?

- The defense would have a much harder time convincing me the defendant is innocent
- The defense might have a slightly more difficult time convincing me the defendant is innocent
- Neither
- The prosecution might have a slightly more difficult time convincing me the defendant is guilty
- The prosecution would have have a much harder time convincing me the defendant is guilty

In a criminal case like this, the prosecution has to prove their case. The "burden of proof" is that the plaintiff must prove things "beyond a reasonable doubt". The law does not require that the government prove guilt beyond all possible doubt; proof beyond a reasonable doubt is sufficient to convict. This is the highest standard of proof, meaning that it requires that jurors reach the highest level of certainty in order to convict a criminal defendant, and it mandates acquittal in the absence of that. Reasonable doubt is not a mere doubt; because everything relating to human affairs, and depending on the moral evidence, is open to some possible or imaginary doubt. One way to think about reasonable doubt is that it is a serious and well-founded misgiving that is substantial, fair, based on reason, and could be explained. Another way to think about it is that reasonable doubt is present when the facts of the case are consistent with another theory (i.e., an alternative theory that is not the defendant murdering the victim). Some people think that

this standard to convict is appropriate, others think it is too low, and still others think it is too high.

How do you feel about the burden of proof? The burden of proof necessary to convict the defendant is:

- Way too low (the prosecution should be required to an even higher level of proof for jurors to convict)
- A little bit too low
- Neither too low nor too high
- A little bit too high
- Way too high (the prosecution should be required to reach a lower level of proof for jurors to convict)

#### GRID INSTRUCTIONS:

Please use this grid to indicate how angry and disgusted you feel right now. You can be high in both, low in both, or high in one and not the other. Along the bottom of the grid is how disgusted you feel, with low disgust on the left through high disgust on the right. Along the left side of the grid represents how angry you feel, from low anger on the bottom to high anger at the top. Please enter the number of the box that best represents how angry and disgusted you feel.

For example if you were extremely angry and not at all disgusted you would enter a 5-1. If you were not at all angry and extremely disgusted you would enter 1-5. If you were not at all angry and not at all disgusted you would enter a 1-1. If you were extremely angry and very disgusted you would enter a 5-4.

Please use this grid to indicate how angry and disgusted you feel **SPECIFICALLY ABOUT THE VICTIM'S INJURIES**. Her injuries can make you feel high in both, low in both, or high in one and not the other. Along the bottom of the grid is how disgusted you feel about her injuries, with low disgust on the left through high disgust on the right. Along the left side of the grid represents how angry you feel about her injuries, from low anger on the bottom to high anger at the top.

Please enter the number of the box that best matches with your level of disgust and anger SPECIFICALLY ABOUT THE VICTIM'S INJURIES.

<b>ANGER</b> ↑	Extremely angry	5-1	5-2	5-3	5-4	5-5
	Very angry	4-1	4-2	4-3	4-4	4-5
	Angry	3-1	3-2	3-3	3-4	3-5
	Somewhat Angry	2-1	2-2	2-3	2-4	2-5
	Not at all angry	1-1	1-2	1-3	1-4	1-5
		Not at all disgusted	Somewhat disgusted	Disgusted	Very disgusted	Extremely disgusted
		<b>DISGUST</b> →				

Please enter the number of the box that lines up with your level of disgust and your level of anger.

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Using the scale below, please indicate how much you were feeling each of the following emotions when you heard the evidence of the victim's injuries.

	Not at all	Slightly	Somewhat	Moderately	Very Much
I felt anxiety	<input type="radio"/>				
I felt contempt	<input type="radio"/>				
I felt grossed-out	<input type="radio"/>				
I felt outrage	<input type="radio"/>				
I felt sadness	<input type="radio"/>				
I felt unhappiness	<input type="radio"/>				
I felt empathy for the victim	<input type="radio"/>				
I felt sympathy for the victim	<input type="radio"/>				
I felt pity	<input type="radio"/>				
I felt anger	<input type="radio"/>				
I felt disgust	<input type="radio"/>				
I felt repulsed	<input type="radio"/>				
I felt fear	<input type="radio"/>				
I felt compassion for the victim	<input type="radio"/>				
I felt depression	<input type="radio"/>				

I felt infuriated	<input type="radio"/>				
I felt sickened	<input type="radio"/>				

Please answer the following questions:

	Not at all	Slightly	Moderately	Much	Very Much
I feel a compelling need to punish the defendant	<input type="radio"/>				
I feel a desire to hurt the defendant	<input type="radio"/>				
I believe the defendant is evil to the core	<input type="radio"/>				
I feel morally outraged by the defendant	<input type="radio"/>				

Please answer the following questions:

	Extremely Weak	Weak	Somewhat Weak	Somewhat Strong	Strong	Extremely Strong
How strong was the prosecution's case evidence?	<input type="radio"/>					
How strong was the defense's case evidence?	<input type="radio"/>					

Please indicate how much you agree with each statement below:

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat Agree	Agree	Strongly Agree
The fact that the victim threatened to leave the defendant suggests that the defendant killed her.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The victim's history of depression suggests that she committed suicide.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The marital problems between the victim and the defendant probably led to the defendant killing the victim.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The defendant probably knew how to pick the lock to his bedroom door.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The victim's statement "You will be sorry when I'm gone" was a suicidal threat.

The fact that the bedroom door was locked from the inside suggests that the victim committed suicide.

The fact that the victim was wearing jewelry when she died suggests she was killed rather than committing suicide.

The defendant called a marriage counselor on June 18 because he was trying to mend his marriage.

The defendant asked his neighbor for help on June 18 because he did not know his wife was already dead.



The defendant's sister did not hear a struggle on June 17 because the victim committed suicide.



The lack of blood found on the defendant's clothing indicates that he did not murder the victim.



The bedroom door could be locked from the outside in a way that made it appear it was locked from inside.



This question is designed to make sure survey respondents are paying attention.

Please choose "somewhat agree" to answer this question.

The defendant's behavior on Sunday evening and Monday morning is suspicious.

We would like to test your memory for some of the case evidence. Please check boxes next to each of the things that you saw during your trial video. Please check ALL that you saw.

- I saw photographs of the deceased, Stacy Stevens
- I saw photographs of the lock on Stacy's bedroom door.
- I saw photographs of the defendant, Michael Stevens.
- I saw video testimony from the defendant, Michael Stevens.

Display This Question:

If We would like to test your memory for some of the case evidence. Please check boxes next to each... = I saw photographs of the deceased, Stacy Stevens

Did you see just one photo of the deceased, Stacy Stevens, or multiple different photos of the deceased?

- I saw only one photo of the deceased
- I saw multiple different photos of the deceased
- I did not see any photos of the deceased

Imagine that you are about to serve as a juror in a case in which the prosecutor has asked for the death penalty. Which statement below expresses your position on the death penalty?

- I would never vote to impose the death penalty
- I would consider voting to impose the death penalty in some cases.

Imagine new evidence came to light, such as a video of the defendant committing the crime, that proved the defendant committed the crime beyond a reasonable doubt.

How many years do you think he should serve in prison?

Please answer with the number of years (please do not include any symbols or letters)

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Imagine how aware you are of your body processes. Select the answer that most accurately describes you. Rate your awareness on each of the characteristics described below using the following 5-point scale During most situations I am aware of:

	Never	Occasionally	Sometimes	Usually	Always
swallowing frequently	<input type="radio"/>				
a ringing in my ears	<input type="radio"/>				
an urge to clear my throat	<input type="radio"/>				
my body swaying when I am standing	<input type="radio"/>				
my mouth being dry	<input type="radio"/>				
how fast I am breathing	<input type="radio"/>				
watering or tearing of my eyes	<input type="radio"/>				
my skin itching	<input type="radio"/>				
noises associated with my digestion	<input type="radio"/>				
eye fatigue or pain	<input type="radio"/>				

Have you participated in another study about this case?

Yes

No

Display This Question:

If Have you participated in another study about this case? = Yes

Please briefly describe the study

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How old are you (in years - please enter only numbers, no letters or symbols please)?

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Are you a United States citizen?

Yes

No

What is your gender?

Male

Female

Other \_\_\_\_\_

What is your ethnicity?

White

Black or African American

American Indian or Alaska Native

Asian

Native Hawaiian or Pacific Islander

Other \_\_\_\_\_

When it comes to politics, how liberal or conservative are you?

- Extremely liberal
- Liberal
- Slightly liberal
- Moderate
- Slightly conservative
- Conservative
- Extremely conservative

What is your current religion? That is, what is your current denominational preference?  
CIRCLE ALL THAT APPLY:

- Fundamentalist Christian
- Christian
- Catholic
- Jewish
- Muslim
- Hindu
- Buddhist
- Non-denominational
- Agnostic/Spiritual
- Atheist/Not Religious

How religious do you consider yourself to be?

- Strongly not religious
- Not religious
- Neither religious nor not religious
- Religious
- Strongly religious

What device did you take this survey on?

- Laptop computer
- Desktop computer
- Mobile phone
- iPad
- Other \_\_\_\_\_

Thank you for your participation. If there is anything you noticed and would like to share with us, or any comments you have for us, please write them here.

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