MITIGATING THE BIASING IMPACT OF EMOTIONS AND MORALITY: COGNITIVE TRAINING, JUROR EMOTIONALITY, AND JUROR DECISION-MAKING

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ABSTRACT

Previous research suggests that gruesome color photographs can induce high levels of emotion in jurors, which may detract from the probative value of trial evidence. Further, these gruesome photos may unduly increase conviction rates and punitiveness in jurors. The current study explored the impact of gruesome trial evidence (gruesome photos vs. non-gruesome images) and investigated possible interventions against the extralegal bias associated with such photos utilizing different methods of cognitive training (holistic, analytical, or control). In addition, the impact of jurors' disgust sensitivity and Moral Foundations Theory were examined in relation to juror decision-making. Analyses revealed that jurors' experiences of several emotions were related to verdict. The moral foundations and jurors' post-trial emotions were significantly correlated to case-related judgments. Further, evidence gruesomeness and the moral foundations were significantly associated with jurors' post-trial emotions.

BIOGRAPHICAL SKETCH

Kayla Burd graduated with a Bachelor of Arts degree in Psychology from Hofstra University in 2010. She attended Arizona State University and earned her Master of Science degree in Psychology in 2013. She is pursuing her Ph.D. in Human Development with a concentration in Law, Psychology, and Human Development. Her research explores decision-making within juries and jurors, how extra-legal factors influence legal decision-making, and how psychology can inform policy change within the judicial system.

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TABLE OF CONTENTS

Page

LIST OF TABLES

Mitigating the Biasing Impact of Emotions and Morality: Cognitive Training, Juror Emotionality, and Juror Decision-making

Criminal trials often convey vivid, graphic, emotionally charged evidence and witness testimony. Previous research suggests that legal decision-making and confidence in decision-making may be greatly impacted by one's moral leanings and/or experiences of emotions (e.g., Ask & Pina, 2011; Burd, 2015; Lerner, Goldberg, & Tetlock, 1998; Salerno, 2015; Salerno & Peter-Hagene, 2013). For instance, jurors' experiences of several emotions can predict confidence in guilt, make them more willing to punish, and to be more punitive. In addition, mock jurors' differential reliance upon various moral foundations impacts their decision making for criminal trials (Burd, 2015).

Taken together, jurors may be at risk of making biased decisions based (unintentionally) on non-probative evidence, their own emotional experience of the trial, and preexisting moral beliefs. When legal decisions are improperly made, lives may hang in the balance. Therefore, it is important for probative evidence alone to be the basis of jurors' decision-making. The current study investigated an intervention aimed at reducing bias in juror and jury decision-making that may be instigated by emotional evidence and pre-existing moral beliefs.

Emotion, Morality, and the Law

Emotion. Previous research indicates that juror decision-making can be influenced by the experience of several emotions. Anger, for example, can greatly affect decision-making and can cause individuals to rely on heuristics when processing important information and to be more punitive compared to neutral individuals (Lerner et al., 1998). Further, Ask and Pina (2011) found that angry individuals judged ambiguous behaviors as more intentional, believed perpetrators had more causal control over situations, and were more likely to punish offenders

compared to neutral participants (Ask & Pina, 2011). Here, anger impacted decision making over and above the probative value of the evidence.

Researchers also suggest that different emotions impact decision making in distinct ways: For instance, Semmler and Brewer (2002) found that participants induced to experience a sad mood were able to more accurately report inconsistencies in testimony compared to a neutral mood. Conversely, anger was associated with impaired information processing and a reduction in participants' ability to detect testimonial inconsistencies. Further, anger was positively related to participants' ratings of the prosecution's credibility and probability that the defendant was guilty of committing the crime (Semmler & Brewer, 2002). Thus, research suggests that emotions may impact juror decision making over and above the probative evidence presented at trial, which indicates that jurors may be susceptible to biased decision-making. What can be done to mitigate the impact of these emotions?

Morality. Generally, many foundations of morality, such as fairness, reciprocity, and the protection of others, help humans thrive and work together within groups (Haidt & Joseph, 2004). Specifically, Moral Foundations Theory suggests that morality is based on separate yet related bases: Care/harm, Fairness/cheating, Loyalty/betrayal, Authority/subversion, and Sanctity/degradation (Haidt & Joseph, 2004). The foundation of Care/harm focuses on the avoidance of pain and suffering and the intent to minimize them. The Fairness/cheating foundation focuses on equality and justice, while the Loyalty/betrayal foundation is based on attachments to groups and social cohesion. The Authority/subversion foundation focuses on the history of humans' creation of hierarchical structures in society and emphasizes obedience and leadership ability. Lastly, the Sanctity/degradation foundation is closely linked with emotions of

disgust as related to biological and social contaminants (*see* Haidt & Graham, 2007; Haidt & Joseph, 2004).

These foundations lead us to react to external stimuli differently and inform our attitudes relating to moral issues. Haidt and colleagues argue that these moral foundations govern much of our morality and moral decision making, and that these foundations lead us to react to moral stimuli in fast, automatic ways: The moral foundations tell us what is immoral or moral *intuitively* rather than deliberatively or rationally (e.g., Haidt, 2001; Haidt & Joseph, 2004). While the foundations are highly related to individuals' moral judgments, the moral foundations alone do not form moral judgments. Instead, the Social Intuitionist Model of moral reasoning is the mechanism by which our reliance on the moral foundations *forms* moral intuitions that in turn *inform* our moral judgments.

Previous models of moral reasoning suggest that such reasoning is the direct cause of moral judgments. However, the Social Intuitionist Model of moral judgment and reasoning suggests that moral emotions and intuitions precede moral judgments. This model proposes that moral intuitions are automatic and fast and often co-occur with moral emotions, such as disgust and anger (Haidt, 2001). Although we subjectively feel that we deliberate about moral stimuli and then form moral judgments, we instead have fast, automatic moral intuitions first. A *moral intuition* is defined as "…the sudden appearance in consciousness of a moral judgment, including an affective valence (good – bad, like – dislike), without any conscious awareness of having gone through steps of searching, weighing evidence, or inferring a conclusion" (Haidt, 2001, p. 818). In this case, one would see a stimulus (e.g., a moral event) and then would automatically feel disapproval or approval. Thus, the moral intuition would cause a moral judgment. We form judgments and justifications for our moral beliefs *after* reaching a conclusion or consensus about

what we think is right or wrong, moral or immoral. Haidt (2001) argues that we often never even begin to reason about our moral intuitions.

The Social Intuitionist Model is the mechanism by which one's reliance on the moral foundations informs our moral decision-making. Innately, we rely more or less on certain foundations (e.g., Fairness, Authority), and this reliance influences how we respond to and think about moral issues. Taken together, the moral foundations and the Social Intuitionist Model help explain how we make decisions about moral and morally-laden policy issues (e.g., Haidt, 2001; Haidt, Graham, & Joseph, 2009; Koleva, Graham, Iyer, Ditto, & Haidt, 2012).

Previous research indicates that the moral foundations strongly predict one's political affiliation and ideology. Using a scale that measures the degree to which certain foundations are endorsed, the Moral Foundations Questionnaire, researchers compared foundation endorsement to individuals' self-subscribed political affiliations. This work revealed that liberals and conservatives differ systematically in their endorsement of the moral foundations (Graham, Haidt, & Nosek, 2009; Haidt & Graham, 2007). For instance, liberals strongly endorse Care/harm and Fairness/cheating while conservatives endorse all five foundations equally (Graham, et al., 2009; Haidt & Graham, 2007). Further, these differences between conservatives and liberals relate to their moral/political judgments: Koleva and colleagues (2012) found that the reliance on the moral foundations predicts and explains participants' moral judgments about such issues as immigration and abortion, among others.

Moral Foundations Theory suggests that differences in the reliance on the moral foundations relates to dissimilarities in moral *and* political beliefs. Therefore, it follows that differential reliance on the moral foundations may impact juror and jury decision-making during criminal trials. In this way, jurors may make fast, automatic, intuitive judgments about morally

repugnant crimes, and these intuitions may drive "decision-making" over and above probative evidence.

Emotion, morality, and decision making. Haidt (2001) argues that moral intuitions and judgments are often associated with and co-occur alongside moral emotions. For example, Wheatley and Haidt (2005) found that inducing disgust increases the severity of moral judgments. In addition, Salerno and Peter-Hagene (2013) explored the effects of anger and disgust in a mock jury study involving graphic photographic murder evidence. Here, disgust was a better predictor of moral outrage than anger, and moral outrage mediated the relation between disgust and verdict confidence for all levels of anger. This study lends further support to the idea that Sanctity/degradation values are the strongest predictors of moral intuitions for certain kinds of moral transgressions (Koleva et al., 2012). Further, it serves as evidence that moral intuitions and emotions do in fact affect juror decision making in important ways.

New research indicates that the differential reliance on the moral foundations may in fact influence legal decision-making. Burd (2015) examined the influence of mock jurors' reliance on the moral foundations in relation to their judgments across several crimes (child molestation, armed robbery, and murder). Analyzing mock jurors' scores from the Moral Foundations Questionnaire, results indicate that participants' Authority/subversion scores were positively related to conviction rates for murder. Further, Care/harm and Authority/subversion were significantly and positively related to confidence in guilt and perceptions of case strength, despite the presentation of an overall weak case. In addition, across all crimes, Loyalty/betrayal, Authority/subversion, and Sanctity/degradation were significantly and positively related to the experiences of several moral emotions, including anger, anxiety, contempt, and disgust (Burd, 2015).

Haidt states, "…people rarely override their initial intuitive judgments just by reasoning privately to themselves because reasoning is rarely used to question one's own attitudes or beliefs" (Haidt, 2001, p. 819). This indicates that, left unquestioned, peoples' initial judgments will stick unless confronted with deliberate reasoning, and even then the reasoning may not be able to overcome the initial, gut judgment. These works indicate that emotion and morality may interact in the courtroom to create biased decision-making amongst jurors and juries. In addition, for gruesome crimes, graphic evidence may lead to strong moral intuitions in jurors, and jurors may not engage in deliberative reasoning. Verdicts in such trials may be biased as jurors may be incapable of balancing probative evidence with strong moral intuitions about emotionally-charged evidence. Thus, the question remains: What can be done to combat extra-legal bias?

Juror aids and innovations. Scholars have investigated several innovations and interventions to reduce juror bias. Research by Kaplan and Miller (1978) suggests that increasing the trustworthiness and reliability of trial evidence can reduce such biases. In addition, rehabilitative voir dire has been used in an attempt to diminish bias in jurors. During voir dire, potential jurors may indicate an inability to remain impartial during trial. When this occurs, judges may attempt to "rehabilitate" potential jurors by asking them to ignore their biases and to base decision-making and verdicts solely on the law and evidence presented. However, in one study, Crocker and Kovera (2010) found that rehabilitation reduced perceptions of guilt in a case involving an insanity defense for biased *and* unbiased participants. Overall, research on juror bias reduction is mixed. However, other interventions may successfully increase the cognitive processing of evidence by jurors, which in turn could increase jurors' reliance on probative evidence.

Scholars have explored several ways to help jurors process, remember, and utilize complex trial evidence and information. Researchers have employed such aids as note-taking, allowing jurors to ask questions during trial, implementing juror check-lists for complex scientific evidence, creating jury notebooks, utilizing judicial pre-instruction, allowing jurors access to trial transcripts during deliberation, and utilizing combinations of these innovations (*see* Dann, Hans, & Kaye, 2004; ForsterLee & Horowitz, 2003; Hannaford, Hans, & Munsterman, 2000). Results have been mixed regarding such aids, with some assisting jurors more than others.

Several teams of researchers have investigated the impact of note taking and the use of notebooks on juror comprehension of trial evidence. In a study conducted by ForsterLee and Horowitz (2003), note taking allowed jurors to make proper distinctions in regards to injury severity, helped jurors remember more case facts, helped jurors distinguish between the least and most deserving plaintiffs in terms of damage awards, and gave jurors a greater satisfaction of the trial process compared to jurors not allowed to take notes. Generally, note taking facilitated juror comprehension of complex evidence and led to greater jurors satisfaction than no innovations.

Pre-instruction may also assist jurors with trial evidence comprehension. Pre-instruction informs jurors of case-specific laws *before* trial evidence is presented. ForsterLee and Horowitz (2003) found that pre-instruction enhanced jurors' cognitive processing, helped jurors recall more probative evidence, increased correct verdicts, and did not prejudice jurors against either party (prosecution or defense) unless evidence was extremely complex. Thus, pre-instruction has many benefits and may improve juror processing of trial evidence.

Researchers have also explored the combined impact of juror aids on juror comprehension of trial evidence. ForsterLee and Horowitz (2003) found that jurors who were

given pre-instructions *and* allowed to take notes had a superior ability to organize complicated case facts and appointed more appropriate awards than those who could not utilize such aids. However, these effects were strongest when the case was moderately complex, as note taking was not as helpful when the evidence complexity was extremely high. ForsterLee and Horowitz (2003) also discovered that note taking was more effective than allowing jurors to review trial transcripts. In fact, note taking alone was more effective than combining note taking with the allowance of trial transcripts. Thus, note taking may facilitate more understanding and a clearer organization of complex trial material than other aids.

In addition, Dann and colleagues (2004) studied the impact of juror note taking during trial and found that jurors were enthusiastic about the ability to take notes during trial. Given the opportunity to take notes, most jurors took notes and found it very helpful and believed that note taking helped them to remember and understand evidence. However, no effect of note taking on juror comprehension was found before deliberation (Dann et al., 2004). Nevertheless, data suggest that the use of multiple innovations in combination may be helpful to juror comprehension of complex trial evidence compared to note taking alone. Although results were mixed, some aids did in fact increase juror comprehension of complex evidence, even when controlling for juror education.

Field research suggests that allowing jurors to deliberate during trial is helpful in increasing juror comprehension of evidence. Hannaford and colleagues (2000) found that allowing discussion amongst jurors during trial was subjectively helpful to jurors, and jurors perceived such discussions to be helpful in resolving confusion. However, this aid did not objectively improve juror judgments or understanding of the law or evidence (Hannaford et al., 2000).

A promising new innovation? New research conducted by Talhelm, Haidt, Oishi, Zhang, Miao, and Chen (2015) investigated the impact of different forms of simple cognitive training on liberal and conservatives' endorsement of policy-related issues. In a series of experiments, Talhelm and colleagues (2015) discovered that liberals are more analytical in thought style than moderates and conservatives. Further, researchers found that brief cognitive training can lead participants to think more analytically (more like liberals) or more holistically (more like conservatives). Importantly, this brief cognitive training was effective for liberals *and* conservatives and was not impacted by participants' preexisting political beliefs.

Could such an intervention be used in the jury system, and might this training increase analytical processing in jurors? If so, such training could increase the focus on and processing of probative evidence to reduce biased decision-making during morally and emotionally charged trials. The current study aimed to investigate the potential effects of analytical and holistic training on jurors' decision-making and emotionality during emotional and gruesome trials.

The present study. Research suggests that decision-making in many contexts is highly malleable; however, cognitive training may help jurors effectively process emotionally- and morally-laden trial testimony in order to hone in on probative evidence alone. The current study investigated a potential technique to reduce bias in the decision-making processes of jurors in an attempt to activate more analytical, balanced information processing and decision-making, particularly when emotion is highly salient and moral intuitions may be strong. It was hypothesized that analytical training would mitigate the effects of jurors' pre-existing moral intuitions and emotions. Conversely, it was posited that holistic training would exacerbate the biasing impact of jurors' moral leanings and experience of moral emotions on legal decision-making. Lastly, it was posited that jurors' differential reliance on the moral foundations would

impact decision-making and would be related to jurors' experiences of post-trial emotions. Taken together, this research examined a simple technique to reduce moral and emotional bias in jurors in an attempt to help refocus juror attention on probative evidence.

Methodology

Participants

Approximately three hundred participants completed all assigned tasks as part of the current study. Nearly three hundred forty participants were recruited from Amazon's Mechanical Turk, but several did not complete all measures. In addition, ten individuals were excluded from analyses as they did not answer all manipulation check questions correctly.

All participants received $0.50 for their participation. Participants' ages ranged from 18 to 72 (M = 36.57, SD = 13.08). Participants were 46.2% female. The participants were 6% Black/African American, 79.9% White/Caucasian, 6.7% Hispanic, 1% Native American, 5.4% Asian/Pacific Islander, and 1% "other". Less than one percent (.7%) of participants had less than four years of high school, 10.3% graduated high school or had a GED, 36.2% had some college education, 37.5% had a college degree, 6% had some graduate school education, and 9.3% had a graduate degree.

Design

The current study employed a 2 (Gruesome evidence: High vs. Low) x 3 (Cognitive training: Analytical vs. Holistic vs. Control) fully randomized between-subjects design. Participants were randomly assigned to one of six experimental conditions. (See Table 1).

Table 1

Study Design

		Cognitive Training		
		Analytical	**Holistic**	**Control**
Gruesome evidence	**High**	High, Analytical	High, Holistic	High, Control
	Low	Low, Analytical	Low, Holistic	Low, Control

Materials

Evidence presentation. All participants read an abbreviated evidence presentation detailing a gruesome murder wherein a husband was accused of murdering his wife in their home. The evidence presentation included a brief case summary; preliminary instructions from the judge; summaries of the prosecution and defense's opening statements; a coroner's report; a timeline of events; a map of the victim and defendant's home; summaries of key witnesses, including a locksmith, a pathologist for the prosecution, the defendant, the defendant's neighbor, a forensic scientist for the defense, and a pathologist for the defense; summaries of the prosecution and defense's closing statements; and closing instructions from the judge. Evidence presentation materials were based on work by Bright and Goodman-Delahunty (2006), Salerno (2015), and an actual murder trial (*R v. Valevski, 2000*).

Experimental manipulations. In the *high gruesome evidence* conditions, the coroner's report included four graphic, gruesome color photographs of the murder victim, whereas in the *low gruesome evidence* conditions, these photographs were excluded. Instead, in the *low gruesome evidence* conditions, four blank pages from a coroner's report were included. All other evidence presented in the coroner's report remained the same with the exception of the four photographs or four blank pages from the coroner's report. As mentioned above, the gruesome photos were based on work by Bright and Goodman-Delahunty (2006), Salerno (2015), and an actual murder trial (*R v. Valevski, 2000*).

All participants also engaged in a version of the triad task (Chiu, 1972; Talhelm et al., 2015). Following the procedures of Talhelm and his colleagues (2015), mock jurors were randomly assigned to one of three cognitive training conditions utilizing a version of the triad task (*analytical* vs. *holistic* vs. *control*). In all cognitive training conditions, participants saw several groups of three items and are asked to indicate which two are most related. Directions for this task varied by condition: In the *analytical* conditions, subjects were asked to pair objects based on their abstract categories and were given an example of the task. In the *holistic* conditions, participants were asked to group objects that shared a relationship or because one of them used the other. In the *control* conditions, mock jurors were asked to indicate which two of the three were most closely related to one another.

Previous work by Burd (2015) indicated that mock jurors' moral foundations predicted case-related judgments, including verdict, even though all mock jurors read the same case descriptions and all evidence was held equal. Therefore, this cognitive training manipulation may help mock jurors think more analytically (more like liberals) who made more legally correct decisions in previous research.

Measures

Emotion questionnaire. All participants completed a questionnaire regarding their current state of emotions (e.g., fear, anger, anxiety, shame, happiness, calm, sadness). These items were taken from the PANAS-X, but not all items from the PANAS-X were used (Watson & Clark, 1999). Participants were asked to "*... answer the following questions about how you feel, right now, using the scale below."* Participants responded using a Likert scale ranging from 1 (Very slightly or not at all) to 5 (Extremely). Participants completed the emotion questionnaire immediately before the cognitive training task and again immediately after the evidence presentation.

Manipulation checks. Participants were asked several questions pertaining to the evidence presentation in order to determine if they paid adequate attention to materials and stimuli. Participants who did not respond accurately to all questions were excluded from the data (n = 10).

Case-related judgments questionnaire. Participants responded to several case-related judgments. Questions measured mock jurors' perception of guilt, confidence in guilt, prison sentence assigned (for mock jurors who deemed the defendant guilty), questions regarding case strength, likelihood the defendant took the life of the victim, evidence sufficiency/strength, and how much sympathy they felt for the victim.

Disgust Scale-Revised (DS-R). Disgust sensitivity was measured using the Disgust Scale – Revised (Haidt, McCauley & Rozin, 1994; Olatunji et al., 2009). This questionnaire measures participants' trait sensitivity to disgust. Participants respond to questions such as "*It bothers me to hear someone clear a throat full of mucus*." Previous research indicates that disgust sensitivity or the experience of disgust is related to increased severity in moral judgments. Therefore, mock

jurors who are more prone to disgust might be more prone to convict the defendant and may be more punitive than those less easily disgusted.

Moral Foundations Questionnaire. The Moral Foundations Questionnaire (Graham, Haidt, Nosek, Iyer, Koleva, & Ditto, 2008) measures the degree to which certain moral foundations are endorsed. Previous work suggests that the moral foundations are related to individuals' endorsements of morally-relevant political policies (e.g., abortion, immigration) (e.g., Koleva et al., 2012). Further, recent work suggests that the moral foundations are predictive of mock jurors' decision-making (Burd, 2015).

Demographic questionnaire. Lastly, participants responded to several demographic questions, including questions regarding age, gender, race, political ideology, education, and household income.

Procedures

All participation for this study occurred online. All materials and measures were displayed online using Qualtrics surveys, all of which were administered on Amazon's Mechanical Turk. Participants were randomly assigned to one of six experimental conditions.

First, mock jurors gave consent for their study participation. Next, participants completed the emotions questionnaire in order to establish participants' baseline emotional states. Then, participants completed one version of the triad task based on random assignment (either the control, holistic, or analytical task). Upon completing the training, participants were again reminded of the potential to view graphic trial evidence from a real murder and were asked to give consent again by typing "I am aware." Next, participants were presented with the evidence presentation. Here, they were randomly assigned to the gruesome evidence conditions (high vs. low). The evidence presentation included the brief case summary; preliminary instructions from

the judge; summaries of the prosecution and defense's opening statements; a coroner's report; a timeline of events; a map of the victim and defendant's home; summaries of key witnesses, including a locksmith, a pathologist for the prosecution, the defendant, the defendant's neighbor, a forensic scientist for the defense, and a pathologist for the defense; summaries of the prosecution and defense's closing statements; and closing instructions from the judge. After reading the evidence presentation, participants again completed the emotion questionnaire. Next, participants completed manipulation checks and responded to case-related judgment questions. Participants then completed the Disgust Scale – Revised. Lastly, participants completed the Moral Foundations Questionnaire and answered several demographic questions.

Data Analyses and Results

Verdict

Overall verdict. Overall, 61% of participants rated the defendant not guilty while 39% found the defendant guilty.

Impact of the moral foundations, disgust sensitivity, cognitive training / gruesomeness evidence, and juror emotion. A hierarchical logistic regression was conducted to determine the effects of the moral foundation, disgust sensitivity, cognitive training and gruesome evidence, and juror emotion on verdict. The five moral foundations were entered at step 1, disgust sensitivity at step 2, gruesome evidence and cognitive training at step 3, and finally, juror emotions at step 4. The analyses revealed no outliers, and all variables had standard errors less than two indicating no multicollinearity existed. The omnibus test of the model was significant (Block probability = 50.35, $p < .001$). The accuracy rate of the model was 74.5%.

Analyses revealed that fear, anger, disgust, inspiration, and strength significantly predicted verdict when the moral foundations, disgust sensitivity, gruesome evidence, and

cognitive training were controlled for. Results indicated that a higher experience of fear resulted in a 47% decreased likelihood of conviction (b = -.63, SE = .28, Wald = 5.10, p = .02, odds ratio = .53). In addition, an increase in the experience of anger resulted in a 63.2% increase in likelihood to convict (b = .49, SE = .27, Wald = 3.19, p = .07, odds ratio = 1.63). Further, an increase in disgust resulted in a 113.9% increase in likelihood to convict (b = .76, SE = .19, Wald = 15.68, p < .001, odds ratio = 2.139). An increase in the experience of inspiration led to a 139.4% increase in the likelihood to convict (b = .87, SE = .27, Wald = 10.60, p = .001, odds ratio = 2.394). Lastly, an increase in the experience of strength was associated with a 37.1% decrease in likelihood to convict (b = -.46, SE = .197, Wald = 5.52, p = .02, odds ratio = .63). The experience of all other juror emotions was not significantly associated with verdict decision. (See Table 2).

A follow-up model was tested which included education at step 1, the five moral foundations at step 2, disgust sensitivity at step 3, gruesome evidence and cognitive training at step 4, and finally, juror emotions at step 5. The model remained significant (p = .003), and again only some of the moral emotions remained significant predictors while controlling for all other variables (education, moral foundations, disgust sensitivity, and gruesome evidence and cognitive training).

Table 2

Percentage of Guilty Verdicts by Condition

		Cognitive Training		
		Analytical	**Holistic**	**Control**
Gruesome evidence	**High**	21 (7.2%)	17 (5.8%)	17 (5.8%)
	Low	15 (5.1%)	23 (7.9%)	21 (7.2%)

Impact of individual differences. A chi-square test of independence was performed to examine the relation between gender and verdict. This analysis revealed a significant relation, X^2 (2, N = 292) = 20.97, p < .001. Women were more likely than men to convict the defendant. Age, education, ethnicity, and income were not significantly related to verdict, *ps* >.05.

Verdict Confidence

Overall verdict confidence. Verdict confidence ranged from zero to one hundred with a mean of 69.85 (*SD* = 20.08).

Impact of gruesome evidence and cognitive training. In order to test the hypothesis that gruesome evidence and cognitive training would affect juror confidence in verdict, a two-way analysis of variance (ANOVA) was conducted. The omnibus test of the main effect of gruesome evidence was not significant, F (1, 287) = 1.51, p = .22, η_p^2 = .005. In addition, the omnibus test of the main effect of cognitive training was not significant, F (2, 287) = .41, p = .67, η_p^2 = .003. Lastly, the interaction between emotion and cognitive training was also not significant, F (2, 287) = .68, p = .51, η_p^2 = .005.

Impact of the moral foundations, disgust sensitivity, and juror emotions. In order to test the hypothesis that the moral foundations, disgust sensitivity, and juror emotions would affect verdict confidence, a multiple regression was performed. Analyses revealed that the moral foundations, disgust sensitivity, and juror emotions were not significantly related to verdict confidence, p > .05.

Sentencing

Overall sentencing. Sentencing ranged from twenty-five to one hundred years with a mean of 72.05 years (*SD* = 29.88 years).

Impact of gruesome evidence and cognitive training. In order to test the hypothesis that gruesome evidence and cognitive training would affect juror punitiveness as measured by sentence, a two-way analysis of variance (ANOVA) was conducted. The omnibus test of the main effect of gruesome evidence was not significant, F (1, 105) = .004, p = .95, $\eta_p^2 < .001$. In addition, the omnibus test of the main effect of cognitive training was not significant, F (2, 105) = .21, p = .82, η_p^2 = .004. The interaction between emotion and cognitive training was also not significant, F (2, 105) = .16, p = .85, η_p^2 = .003. (See Table 3).

Table 3

Means and Standard Deviations of Sentencing by Condition

	M	*SD*
1. Highly Gruesome / Analytical Training	72.40	29.14
2. High Gruesome / Holistic Training	67.94	32.26
3. High Gruesome / Control Training	76.24	31.76
4. Low Gruesome / Analytical Training	70.87	32.48
5. Low Gruesome / Holistic Training	71.96	30.27
6. Low Gruesome / Control Training	72.63	27.61

Impact of the moral foundations, disgust sensitivity, and juror emotions. In order to test the hypothesis that the moral foundations, disgust sensitivity, and juror emotions would affect juror punitiveness as measured by sentence, a multiple regression was performed. Analyses revealed that the moral foundations, disgust sensitivity, and juror emotions were not significantly related to sentencing, $p > .05$.

Case Related Judgments

Impact of gruesome evidence and cognitive training. Next, analyses were conducted to explore the relation between gruesome evidence and cognitive training on jurors' case related judgments. A two-way MANOVA revealed that cognitive training did not significantly predict case related judgments, Wilks' $\lambda = .729$, F (28, 140) = .857, $p = .674$, $\eta_p^2 = .146$. In addition, gruesome evidence did not significantly impact case related judgments, Wilks' $\lambda = .865$, F (14, 70) = .777, $p = .690$, $\eta_p^2 = .135$. Lastly, there was no significant interaction, Wilks' $\lambda = .791$, F (28, 140) = .624, $p = . 928$, $\eta_p^2 = .111$.

Impact of the moral foundations. Next, analyses were performed to explore the relation between the moral foundations and case related judgments. Analyses revealed that the moral foundations were significantly related to several case related judgments. Overall, mock jurors with higher scores on the "binding" foundations (Authority, Loyalty, and Sanctity) were more likely to favor the prosecution and to perceive the defense's witnesses and evidence as weaker. Interestingly, mock jurors with higher Care scores were also more likely to favor the prosecution and more likely to perceive the defense's case as weak. (See Table 4).

Impact of juror emotions. Analyses were conducted to explore the relation between jurors' post-trial emotions and case-related judgments. Analyses revealed that jurors' post-trial emotions were significantly related to several case-related judgments. Overall, jurors' experiences of higher levels of negative post-trial emotions was associated with a stronger, more favorable perception on the prosecution and a weaker, worse perception of the defense. For example, higher scores on anger, contempt, disgust, sadness, and upset were significantly and positively related to perceptions of the prosecution's witnesses and evidence and significantly and negatively related to perceptions of the defense's witnessed and evidence. Conversely, mock

jurors' experiences of positive post-trial emotions were significantly and positively related to perceptions of the defense and significantly and negatively related to perceptions of the prosecution. (See Tables 5 and 6).

Juror Emotions

Impact of gruesome evidence and cognitive training. Next, analyses were conducted to explore the relation between gruesome evidence and cognitive training on jurors' experience of emotion post-trial. A two-way MANOVA revealed a significant multivariate effect for gruesome evidence, Wilks' $\lambda = .834$, $F\,(19, 219) = 2.291$, $p = .002$, $\eta_p^2 = .166$. There was no significant effect for cognitive training, Wilks' $\lambda = .859$, $F\,(38, 438) = .908$, $p = .630$, $\eta_p^2 = .073$. In addition, there was no significant interaction, Wilks' $\lambda = .896$, $F\,(38, 438) = .651$, $p = .947$, $\eta_p^2 = .053$.

Given the significance of the overall test, the univariate main effects were examined. Significant univariate main effects for gruesome evidence were obtained. Gruesome evidence was significantly related to disgust ($F\,(1, 237) = 14.650$, $p < .001$, $\eta_p^2 = .058$), sadness ($F\,(1, 237) = 4.410$, $p = .037$, $\eta_p^2 = .018$), surprise ($F\,(1, 237) = 7.835$, $p = .006$, $\eta_p^2 = .032$), and upset ($F\,(1, 237) = 7.972$, $p = .005$, $\eta_p^2 = .037$).

Table 4

Correlations Between the Moral Foundations and Case-related Judgments

	Care/ Harm	Fairness/ Cheating	Loyalty/ Betrayal	Authority/ Subversion	Sanctity/ Degradation
1. Verdict confidence	.002	.027	.082	.153**	.080
2. Prison sentence	.051	.174	-.046	.001	.025
3. Defense case strength	-.067	-.033	-.064	-.058	-.179**
4. Likelihood defendant took the victim's life	.203**	.150*	.191**	.155**	.221**
5. Prosecution's evidence sufficiency	.158**	.110	.177**	.169**	.231**
6. Strength of physical evidence	.087	.051	.130*	.154**	.188**
7. Strength of coroner's report	.161**	.095	.197**	.230**	.209**
8. Strength of locksmith's testimony	.099	.039	.154**	.158**	.187**
9. Strength of prosecution's pathologist	.101	.091	.153**	.173**	.207**
10. Strength of defendant's testimony	.004	-.001	.092	.099	.027
11. Strength of neighbor's testimony	.133*	.065	.050	.058	.038
12. Strength of defense's forensic scientist	-.047	-.035	-.195**	-.097	-.150*
13. Strength of defense's pathologist	-.019	-.024	-.123*	-.036	-.117*
14. Sympathy felt for victim	.215**	-.194	.048	.061	.076

Note. * $p < .05$, ** $p < .01$

Table 5

Correlations Between Jurors' Negative Post-trial Emotions and Case-related Judgments

	Fear	Anger	Anxiety	Shame	Contempt	Disgust	Guilt	Hostility	Irritability	Jittery	Sadness	Upset
1. Verdict confidence	-.081	.036	.011	-.019	.087	.088	.010	.055	-.040	-.030	.018	.027
2. Prison sentence	.109	.081	.056	-.020	.140	.139	.010	.100	.096	.090	.118	.153
3. Defense case strength	-.100	-.175**	-.052	-.112	-.141*	-.264**	-.058	-.112	-.097	-.089	-.136*	-.183*
4. Likelihood defendant took the victim's life	.091	.174**	.109	.050	.153**	.300**	.039	.062	.096	.060	.119*	.170**
5. Prosecution's evidence sufficiency	.157**	.221**	.161**	.159**	.157**	.262**	.112	.147*	.153**	.126*	.175**	.182**
6. Strength of physical evidence	.154**	.182**	.122*	.138*	.138*	.265**	.094	.110	.103	.124*	.164**	.173*
7. Strength of coroner's report	.089	.141*	.112	.090	.088	.264**	.034	.018	.060	.084	.151*	.144*
8. Strength of locksmith's	.063	.068	.048	.085	.049	.161**	.019	.050	.052	.087	.051	.067
9. Strength of prosecution's pathologist	-.010	.049	.053	.008	.025	.178**	-.063	-.012	-.026	-.009	.053	.056
10. Strength of defendant's testimony	-.170**	-.139*	-.042	-.067	-.113	-.211**	.013	-.199**	-.211**	-.082	-.137*	-.191**
11. Strength of neighbor's testimony	-.089	-.057	.017	-.066	-.079	-.050	-.077	-.181**	-.139*	-.052	.035	-.050
12. Strength of defense's forensic scientist	-.076	-.088	-.075	-.119*	-.093	-.209**	-.120	-.057	-.069	-.051	-.082	-.139*
13. Strength of defense's pathologist	-.046	-.069	-.046	-.098	-.088	-.186**	-.084	-.034	-.036	-.040	-.042	-.088
14. Sympathy felt for victim	.163**	.152**	.127*	.081	.141*	.292**	.015	.088	.133*	.117*	.250**	.242**

Note. * $p < .05$, ** $p < .01$

Table 6

Correlations Between Jurors' Positive Post-trial Emotions and Case-related Judgments

	Attentive	Calm	Enthusiastic	Happy	Inspired	Strong	Surprised
1. Verdict confidence	.052	.079	.045	.075	.078	.038	.034
2. Prison sentence	-.060	-.196*	-.066	-.216*	-.151	-.098	-.103
3. Defense case strength	.124*	.157**	.176**	.183**	.109	.166**	-.012
4. Likelihood defendant took the victim's life	-.051	-.165**	-.147*	-.088	-.059	-.117*	.091
5. Prosecution's evidence sufficiency	-.121*	-.162**	-.134*	-.079	-.051	-.118*	.067
6. Strength of physical evidence	-.089	-.181**	-.147*	-.059	-.049	-.116*	.044
7. Strength of coroner's report	-.014	-.137*	-.159**	-.038	-.046	-.108	.077
8. Strength of locksmith's	-.073	-.024	-.022	-.021	.033	-.072	.030
9. Strength of prosecution's pathologist	-.056	-.119*	-.102	-.045	.005	-.114	.051
10. Strength of defendant's testimony	.143*	.184**	.192*	.226**	.241**	.177**	-.056
11. Strength of neighbor's testimony	.144*	.116*	.181**	.163**	.159**	.189**	-.021
12. Strength of defense's forensic scientist	.131*	.094	.102	.090	.066	.124*	-.049
13. Strength of defense's pathologist	.146*	.089	.122*	.095	.109	.149*	.015
14. Sympathy felt for victim	.104	.122*	-.003	-.081	.009	-.010	.104

Note. * p <.05, ** p <.01

To explore these differences further, an independent-samples t-test was conducted. Results indicated that jurors in the low gruesome evidence conditions (M = 2.06, SD = 1.233) were significantly less disgusted than jurors in the high gruesome evidence conditions, M = 2.68, SD = 1.32, t (241) = -3.798, $p < .001$. In addition, jurors in the low gruesome evidence conditions (M = 2.07, SD = 1.258) were significantly less sad than jurors in the high gruesome evidence conditions, M = 2.42, SD = 1.296, t (241) = -2.094, p = .037. Further, jurors in the low gruesome evidence conditions (M = 1.82, SD = 1.115) were significantly less surprised than jurors in the high gruesome evidence conditions, M = 2.26, SD = 1.297, t (241) = -2.832, p = .005. Lastly, jurors in the low gruesome evidence conditions (M = 1.85, SD = 1.143) were significantly less upset than jurors in the high gruesome evidence conditions, M = 2.28, SD = 1.205, t (241) = -2.866, p = .005.

Impact of the moral foundations. Next, analyses were conducted to explore the relation between the moral foundations and jurors' experiences of post-trial emotions. Analyses revealed that the moral foundations were significantly related to several post-trial emotions. Overall, jurors' scores on Care, Fairness, and Sanctity were significantly and positively related to jurors' experiences of several negative emotions post-trial. However, jurors' scores on Loyalty and Authority were only significantly and positively associated with disgust. Further, Care score were not significantly associated with any positive emotion post-trial. However, Fairness scores were related positively to attentiveness and surprise, Loyalty scores were related to happiness and inspiration, and Authority scores were related to attentiveness, calmness, enthusiasm, happiness, and inspiration. Lastly, Sanctity scores were only related to feelings of surprise. (See Tables 7 and 8).

Juror Demographics

Next, analyses were conducted to explore the relation between the moral foundations and jurors' demographic information. Analyses revealed that the moral foundations were significantly related to jurors' demographic information in many instances. As would be expected, jurors' Care and Fairness scores were significantly and negatively related with political ideology while Authority, Loyalty, and Sanctity were significantly and positively related (with higher scores indicating higher conservatism). In addition, Authority, Loyalty, and Sanctity were significantly and negatively related to education. (See Table 9).

Table 7

Correlations Between the Moral Foundations and Jurors' Negative Post-trial Emotions

	Fear	Anger	Anxiety	Shame	Contempt	Disgust	Guilt	Hostility	Irritability	Jittery	Sadness	Upset
1. Care	.158*	.096	.159*	.082	.140*	.213**	.021	-.046	.073	.044	.215**	.131*
2. Fairness	.180**	.172**	.221**	.038	.120	.173**	-.015	.023	.107	.140*	.165**	.248**
3. Loyalty	-.054	.078	.029	-.007	.079	.216**	.060	-.028	-.040	-.086	.092	.062
4. Authority	-.057	.053	-.032	-.017	.048	.140*	.011	-.034	-.059	-.104	.050	-.008
5. Sanctity	.044	.130*	.018	.078	.154*	.273***	.054	.038	.046	.013	.100	.107

Note. * p <.05, ** p <.01, *** p <.001

Table 8

Correlations Between the Moral Foundations and Jurors' Positive Post-trial Emotions

	Attentive	Calm	Enthusiastic	Happy	Inspired	Strong	Surprised
1. Care/harm	.095	-.017	.040	-.013	.024	-.063	.107
2. Fairness/cheating	.171**	-.045	-.028	-.029	.024	.031	.156*
3. Loyalty/betrayal	.094	.123	.102	.138*	.153*	.017	.213*
4. Authority/subversion	.179**	.190**	.169**	.188**	.167**	.118	.133*
5. Sanctity/degradation	.078	.101	.065	.113	.118	.052	.233**

Note. * p <.05, ** p <.01

Table 9

Correlations Between the Moral Foundations and Juror Demographics

	Disgust Sensitivity	Education	STEM Courses	Political Ideology	Income
1. Care/harm	.320**	-.112	-.033	-.200**	-.037
2. Fairness/cheating	.215**	-.105	.000	-.345**	-.109
3. Loyalty/betrayal	.245**	-.146*	-.066	.353**	.088
4. Authority/subversion	.226**	-.117**	-.058	.410**	.105
5. Sanctity/degradation	.385**	-.155**	-.139*	.378**	-.033

Note. * $p < .05$, ** $p < .01$

Discussion

This study examined the influence of brief cognitive training (analytical vs. holistic vs. control) and trial evidence gruesomeness (high vs. low) on mock juror decision-making. Overall, 39% of mock jurors found the defendant guilty. However, results did not support the main hypothesis that cognitive training would reduce juror emotional and moral bias: Neither analytical nor holistic cognitive training had an impact on juror verdict, sentencing, or case-related judgments. Instead, results suggest that jurors' experiences of strong emotions post-trial may drive decision-making in many ways, over and above probative evidence, cognitive training, and more.

In the current study, juror post-trial fear, anger, disgust, inspiration, and strength impacted verdict: Higher levels of anger, disgust, and inspiration were associated with an increased likelihood of conviction. Conversely, higher levels of fear and strength were related to a decreased likelihood of conviction while controlling for the moral foundations, disgust sensitivity, trial evidence gruesomeness, and cognitive training. The impact of anger and disgust on punitiveness is well supported in the literature (e.g., Lerner et al., 1998; Salerno, 2015; Wheatley & Haidt, 2005). Overall, jurors' experiences of positive *and* negative post-trial emotions were related to the conviction of the defendant in meaningful ways.

Unexpectedly, cognitive training, trial evidence gruesomeness, the moral foundations, disgust sensitivity, and jurors' post-trial emotions were not related to verdict confidence or sentencing. These results stand in contrast to previous works that indicate negative emotions can impact verdict confidence and sentencing, specifically, and moral judgments, generally (e.g., Burd, 2015; Lerner et al., 1998; Salerno, 2015; Wheatley & Haidt, 2005).

Surprisingly, cognitive training, trial evidence gruesomeness, and disgust sensitivity were not significantly related to jurors' case-related judgments. However, as anticipated, the moral foundations were in fact associated with several case-related judgments. Overall, the "binding" foundations (Loyalty, Authority, and Sanctity) were significantly and positively related to case-related judgments in favor of the prosecution. For instance, mock jurors who scored higher on the binding foundations were more likely to perceive the prosecution's witnesses and evidence to be stronger than those with lower scores. In addition, mock jurors who scored high on the binding foundations were more likely to perceive the defense's witnesses and evidence as weak. These findings are supported by previous research that found that higher scores on the binding foundations were related to a favoring of pro-prosecution evidence, and that conservatives may be more conviction-prone than liberals (Burd, 2015). Interestingly, in the current study, mock jurors with higher Care scores made decisions and held beliefs similar to individuals with high binding foundation scores. Although these groups sometimes differ in their moral assessments, because the crime here was a gruesome murder, it follows that individuals with high scores on Care and the binding principles would favor the prosecution.

Jurors' experiences of post-trial emotions were related to several case-related judgments. Overall, the experience of negative emotions (e.g., anger, contempt, disgust, sadness, upset) was associated with an increased perception of the prosecution and a decreased perception of the defense. Conversely, the experience of positive emotions (e.g., inspiration, enthusiasm) was associated with an increased preference for the defense and a decreased assessment of the prosecution. Here, the experience of positive emotions, such as inspiration and enthusiasm, may reflect a desire to protect others or may indicate increased civic engagement.

In addition, trial evidence gruesomeness was associated with jurors' experiences of several emotions, including disgust, sadness, surprise, and upset. Previous work exploring the impact of gruesome evidence has found that such evidence can in fact increase the experiences of negative emotions in mock jurors (e.g., Bright & Goodman-Delahunty, 2006; Salerno, 2015; Salerno & Peter-Hagene, 2013). Further, previous work suggests that the moral foundations (and in particular, Sanctity) are associated with an increased experience of negative emotions in mock jurors (e.g., Burd, 2015).

Lastly, the moral foundations were related to jurors' experiences of several emotions. Generally, Care, Fairness, and Sanctity were related to several negative emotions while Loyalty and Authority were associated only with disgust. In addition, Fairness, Authority, and Loyalty were associated with several positive emotions, including attentiveness, calmness, enthusiasm, and happiness. Again, the experience of these positive emotions may relate to an increased desire to be civic.

In sum, the intended interventions (cognitive training) did not have a significant impact on jurors' decision-making or their experiences of post-trial emotions. However, jurors' moral foundations and post-trial emotions were strongly related to several case-related judgments, and the moral foundations were significantly associated with several post-trial emotions and juror demographics.

Implications

The current study highlights the importance of exploring the role of juror emotions in legal decision-making. Here, jurors' experiences of emotions (both positive *and* negative) significantly predicted verdict over and above cognitive training, the gruesomeness of the evidence, and the moral foundations. Importantly, jurors' experiences of such emotions were

predictive of conviction across all conditions, despite all verbal evidence being held equal. In addition, the moral foundations and jurors' post-trial emotions were associated with several case-related judgments. More research is needed to further explore the impact of the moral foundations and the experience of moral emotions on juror decision-making: If individual jurors' emotions and moral leanings are impacting conviction and sentencing, how can we help jurors to focus on probative evidence alone when making such important decisions?

This study suggests that Moral Foundations Theory may hold predictive power for attorneys, especially in cases involving gruesome or morally-laden evidence and testimony. For instance, if during voir dire attorneys asked questions pertaining to jurors' disgust sensitivity or asked jurors to explain their political affiliation, lawyers could use this information as a loose proxy for their moral foundations. If attorneys could estimate potential jurors' moral leanings, they could use their challenges to remove jurors from cases where they might be prone to bias, or in the least, attorneys could use this information to avoid discussing evidence in ways that might polarize jurors. Further, lawyers could construct their evidence presentations with jurors' moral leanings in mind such that they avoided or crafted arguments in a way that would be appealing to jurors and could avoid discussing evidence in a way that would be repulsive or unsettling to them. The above findings suggest that the prosecution and defense may often be at odds in the best way to approach jurors for their particular side.

Limitations and Future Directions

The current study investigated the impact of cognitive training and gruesome trial evidence for only one crime: murder. Future research should explore the effectiveness of cognitive training for other criminal and civil cases. For example, liberals and conservatives (or those with high Care and Fairness vs. Authority, Loyalty, and Sanctity scores) might engage with

evidence from different crimes in very different ways. In the above murder trial, the crime and evidence were so heinous that they may have brought juror decision-making closer together. However, in more abstract cases or some civil cases, the divide amongst these individuals may be greater. As an example, an intellectual property law case without graphic evidence might trigger different moral foundations (e.g., Fairness) rather than those triggered in the above case.

In addition, the current research utilized photo presentations of evidence. Other presentations might be more realistic and effective at conveying information to jurors (e.g., video tapes of mock trials). Further, the current study did not investigate the impact of jury deliberation on similar cases: Perhaps deliberation helps diminish juror biases. In this venue, jurors must verbalize and argue for their perceptions of the case. This act may increase jurors' deliberative processing, which may attenuate the impact of the moral foundations and emotions on juror decision-making (*see* Haidt, 2001).

In the future, researchers should investigate the impact of the moral foundations and juror emotion in a wide range of cases (e.g., other criminal cases, such as robbery or assault, and in civil cases as well). Further, researchers should explore how jury deliberation may attenuate the impact of the moral foundations and moral emotions on juror and jury decision-making. Lastly, the impact of other juror aids (e.g., note taking, deliberating during trial) on the influence of the moral foundations and emotions should be examined.

Jurors are tasked with an enormous burden: they are asked to sift through enormous amounts of complex evidence; listen to, encode, and remember volumes of testimony; and to provide impartial decisions of justice. In a system so complex, it is easy to see the difficulty in separating your personal life, beliefs, emotions, and morals from decisions made during trial. Therefore, more research is needed to help lessen the impact of juror extra-legal bias in the

courts. Mitigating bias in the courtroom allows for fairer, more balanced trials, which in turn lead to fairer, more consistent trial outcomes. Ensuring a focus on probative evidence will give strength to the justice system, and a further understanding of juror emotions and the moral foundations may shed light on how to change this focus.

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