Crime, Punishment, and Abuse: The Effect of Post-Crime
Mitigating Evidence on Sentencing Decisions

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Abstract

A common element of American criminal trials is the presentation of mitigating evidence, any fact pertaining to the defendant or the crime that may result in reduced sentences. Empirical psychology research on the use of mitigating evidence has found that jurors assign lesser punishments if they consider certain hardships faced by a defendant before his or her crimes (Barnett, Brodsky, & Price, 2007; Sandys, Pruss, & Walsh, 2009). This paper investigates if jurors also evaluate post-crime hardships as mitigating. It also examines potential psychological mechanisms by which to explain interpretations of post-crime mitigation. Two vignette-based studies were conducted using participants from Amazon Mechanical Turk. In the first study, we found that after reading a hypothetical crime vignette that includes details of post-crime childhood abuse experienced by a defendant, mock jurors give reduced sentences compared to a control condition in which no abuse was mentioned in the vignette. Moreover, in the second study we found that retributive punishment and postdictive processing mechanisms do not explain evaluations of post-crime mitigation while a measure of empathy does. Implications of these findings as well as avenues for future research are discussed.

1. INTRODUCTION

On April 29, 2015, Clarence Young plead guilty to ten counts of securities fraud in a Washington State trial court. Young, who had worked as an accountant between 1974 and 1996, now faced a standard sentence range of 51 to 60 months in prison. Prior to sentencing decisions, the defendant's legal team filed a motion in support of an exceptional sentence. Young suffered from multiple serious medical conditions, they argued. He was also at the age of 69 and had few years of life remaining. In part because of these new pieces of mitigating evidence, the trail court granted Young an exceptional sentence of six months on work release, six months on home detention, and restitution payments.

It is well established in our everyday moral reasoning and American legal systems that people view negative life circumstances as mitigating. In other words, people assign lesser punishments if a convicted criminal has suffered severe negative circumstances than if no such events occurred (Greene & Cahill, 2012; Tetterton, & Brodsky, 2007; Sandys, Pruss, & Walsh, 2009). Despite ubiquitous use of mitigating evidence in American courts, mitigation is defined broadly in law as any fact or circumstance pertaining to the defendant or the crime that would merit a reduction in his or her punishment (Byrne Hessick, 2008). However, this definition is limited to the extent that it finds meaning in the consequences of mitigators without identifying which types of facts and circumstances are mitigators. Legislatures commonly classify mitigating evidence via state statutory law, leaving perspectives on mitigation across the nation multiplex and incoherent (Stetler, 2007). Meanwhile, legal scholars assert theories of what ought to be considered mitigating factors (see Markel, 2003 and Steiker & Steiker, 1992 for two such perspectives). And in the case of Clarence Young, the Washington Court of Appeals later ruled that the defendant's age and health issues were not sufficient justifications for an exceptional sentence. Contentions over definitions of mitigation, however, are not limited to sources of law.

If legal literature and precedent defines what ought to be treated as mitigating evidence,

psychology literature seeks to identify which factors judges and jury members actually treat as

mitigating evidence.

Prior work in psychology has investigated the mitigating effects of a defendant's negative

life experiences, such as childhood abuse and psychological illness, in contexts where these

experiences preceded his or her crime (Barnett et al., 2004; Robbins & Litton, 2018; Sandys et

al., 2009). Yet no studies have investigated whether jurors treat a defendant's post-crime

negative life events as mitigating. Given both murky legal definitions of mitigation and often life

or death stakes of criminal trails, delineating how jurors evaluate negative life events that have

taken place after a defendant's crime would be of particular use to the law. Empirical

observations about punishment allocations in cases where actors of the law consider post-crime

negative life events could have practical importance for attorneys as they present information in

trial. Research in this direction may also continue to inform American legal systems as judicial

and legislative definitions of mitigating evidence evolve. Across two vignette-based studies, the

current paper asks the following novel questions: Do jurors treat post-crime negative life events

experienced by a defendant as mitigating? If yes, then what are the psychological processes

underlying this behavior?

Under the framework of the Theory of Dyadic Morality (TDM), we propose that jurors

do treat a defendant's post-crime negative life events as mitigating. We also propose that jurors'

evaluations of post-crime mitigation are explained by retributive punishment and postdictive

processing mechanisms.

In the remainder of this paper, we review pertinent literature on TDM, retributive

punishment, and postdictive processing. These discussions then lead to our predictions as noted

above. Next, we test our predictions in two vignette-based surveys using participants from Amazon Mechanical Turk (MTurk). We find evidence that (1) jurors evaluate a defendant's post-crime negative life events as mitigating and (2) retributive punishment and postdictive processing mechanisms do not explain evaluations of post-crime mitigation while a measure of empathy does.

1.1 Literature Review

In this section we divide a literature review into three subsections: *Theory of Dyadic Morality*, *Retributive Punishment*, and *Postdictive Processing*. From each section we derive one hypothesis for the present research. All hypotheses are listed together in section 1.2.

Theory of Dyadic Morality

In developing new research, a useful springboard is to ask if jurors treat post-crime negative life events as mitigating. Robbins and Litton (2018) cite TDM to contextualize pre-crime negative life events, and the theory provides a valuable framework in moral cognition by which to consider post-crime negative life events. TDM asserts that how we morally interpret and judge a situation involving a character or characters is determined by whether we view these characters as moral agents or moral patients (Gray & Wegner, 2009; Gray, Young, & Waytz, 2012; Schein & Gray, 2017). Polarity exists whereby moral agents are those that perform morally good or bad actions and moral patients are those that receive the morally good or bad actions of others. The degree to which we view a character as being a moral agent or a moral patient influences judgment and decision-making on the part of punishers. Gray and Wegner (2011) found that viewing a transgressor as victim of a harmful event makes the transgressor

seem less blameworthy. This finding is qualified by evidence from Robbins and Litton (2018), which found that subjects gave more lenient sentences to a transgressor when his violent disposition was caused by a pre-crime negative life event than when it was caused by genes. Perhaps the predictive power of TDM also umbrellas cases in which a transgressor experiences a post-crime negative life event. With moral agent and moral patient typecasting in mind, it would make sense that the degree to which a punisher sees a transgressor as a moral agent is attenuated by information regarding post-crime negative life events. Accordingly, subjects should also treat post-crime negative life events as mitigating. Pairing facts about a defendant's crime with facts about his post-crime negative life events may lead punishers to give reduced sentences compared to when facts about post-crime negative life events are not presented at all.

While TDM supports the prediction that post-crime negative life events are evaluated as mitigating, a more nuanced framework needs to be set in order. It is also useful to consider how the psychological processes underlying a punisher's decisions differ between the contexts of pre-crime harms and post-crime harms. Existing literature as well as conventional wisdom suggest that reduced sentencing decisions in contexts of a defendant's pre-crime harms are due to a causal effect that physical and mental hardships might have in leading him to commit a crime (Hawkins, 1981; Barnett, Brodsky, & Price, 2007). In light of the temporal reversal of events in the context of post-crime harms, new psychological explanations are needed.

Retributive Punishment

Given that people's desire for punishment is often retributive (Darley, 2002; Darley, Carlsmith, & Robinson, 2000; Okimoto, Wenzel, & Feather, 2012; Tyler, Boeckmann, Smith, & Huo, 1997; Vidmar, 2000), a potential hypothesis is that post-crime harms are mitigating because

they are intuitively thought to reflect a form of punishment in their own right. In a review of

existing literature on retributive punishment, Darley and Pittman (2003) developed a model of

justice assignment following a case of criminal harm-doing. Within the model, justice outcomes

are a function of a transgressor's judged state of mind, the perceiver's moral reactions, and the

perceiver's retributive or restorative impulses. Cases in which the transgressor's actions are

perceived to be intentional invoke high moral outrage, leading perceivers, now punishers, to

mete out justice via a just deserts theory of punishment. Under this system of punishment,

punishers find justice in a penalty that is commensurate to the perceived severity of the crime. In

other words, the harsher the crime, the harsher the punishment.[1]

In the present context, the significance of just deserts as an account for the mitigating

effects of post-crime harms is as follows. With severe crimes, it may be the case that post-crime

harms experienced by the defendant share the weight of justice with judiciary systems of

punishment. That is to say, the extent to which punishers view a defendant's negative life events

as already existing as a form of punishment should have an inverse relationship with the severity

of their recommended sentencing decisions. This relationship would make sense under a just

deserts theory. To mete out an aggregate punishment equal to the severity of a crime, punishers

may have to perform a form of moral calculus to estimate how much negative life events already

account for punishment. Intuitively, it would also make sense that punishers are more likely to

rate post-crime harms as a form of punishment compared to pre-crime harms, since punishment

for a transgression follows the perceived wrongdoing in our everyday systems of moral thought

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[1] In their justice assignment model, Darley and Pittman (2003) use the terms 'retribution' and 'just deserts' interchangeably. This paper will follow suit.

and law. Altogether, just deserts may do well to differentiate juror attitudes in contexts of pre-crime harms versus post-crime harms.

Postdictive Processing

　　　Another account for evaluations of post crime mitigators may be offered by the phenomenon of postdictive processing. In visual cognition, postdiction describes that a currently perceived stimulus can alter how we perceive events in the immediate past (Dennett, 1991; Mitroff & Scholl 2004; Eagleman & Sejnowski, 2003; Newman, Choi, Wynn, & Scholl, 2008). As Newman et al. (2008) submitted, the effect of postdictive processing "…illustrates that our conscious perception of the world is not an instantaneous moment-by-moment construction, but rather is formed by integrating information over short temporal windows."

　　　Research on causal perception has investigated the spatiotemporal dynamics of two objects in canonical launching events (Michotte, 1946/1963; Gordon, Day, & Stecher, 1990; Hubbard & Ruppel, 2002). Studies have extended this work to find that our perceptual interpretations of an event involving two objects is influenced by the properties of other independent objects and events in a given visual context. Scholl and Nakayama (2002), for example, reported one such contextual effect on the perception of collision events. In a canonical launching event, object (A) moves toward a stationary object (B) until A and B are next to each other. At this point, A comes to a halt and B moves along the same path, and people perceived this exchange to be a causal event. However, in a second sequence in which A and B fully overlap before B starts to move, people perceived this exchange as a non-causal pass. In a third sequence, people interpreted the overlapping test event as causal when an independent context launch event occurs in the same display. Interestingly, for this "causal capture" to occur, the

context event needed to be present for 50 ms surrounding the impact in the test event. However, capture deteriorated from 200 ms of temporal asynchrony between the context and test events. Studies conducted after Scholl and Nakayama (2002) corroborated the finding that causal launchings are perceived within a window of temporal offset between test and context stimuli (Choi & Scholl, 2004, 2006). Taken together, this research demonstrates the parameters of the short temporal windows by which we integrate information for visual processing. Postdictive effects within a current temporal window begin to disappear once stimuli appear outside of the window.

Recent studies have examined postdictive effects across different contexts including spatial memory, personal agency, and epistemic logic (e.g., Eppe & Bhatt 2015; Shimojo, 2014; Synofzik, Vosgerau, & Voss, 2013). As new research extends beyond domains of visual perception, it may be useful to investigate whether contexts of crime and punishment also have a postdictive analogue. With respect to the mitigating effect of post-crime harms, postdictive processing may underlie a punisher's decision-making. That is, the presentation of evidence for post-crime harms may influence how punishers interpret the event of the crime. Analogous to previously noted findings in which current visual stimuli lead us to reinterpret past events as causal, perhaps in processing post-crime harms, punishers reevaluate a crime as having causal links to imagined pre-crime harms experienced by a defendant. If post-crime harms are found to be mitigating, then postdiction in this sense may help to explain allocations of reduced sentences. However, as noted above, visual postdictive effects are qualified by a time component. The effects disappear once stimuli are presented outside of current temporal window. Applied to the context of punishment, this rule would suggest that the postdictive effects of post-crime harms

begin to disappear as the temporal gap between the time of the defendant's crime and his or her post-crime negative life event widens.

1.2 The Present Study

The current paper extends past research on the factors pertinent to jurors' allocations of punishment in criminal law cases. Across two studies, we use a hypothetical crime vignette design in which the defendant's post-crime negative life event is childhood abuse.

Importantly, Barnett et al. (2004) suggested that the way in which studies present mock jurors information can heavily influence how they interpret mitigating evidence. In part for this reason, disagreements arise in psychology literature as to which factors mock jurors view as mitigating. In the case of childhood abuse, evidence is mixed. Some studies have found evidence that mock jurors treat this negative life event as aggravating (Scurich & Appelbaum, 2016; Stevenson, Bottoms, & Diamond, 2010). Meanwhile, others have found evidence that mock jurors treat childhood abuse as mitigating (Robbins & Litton, 2018; Tetterton & Brodsky, 2007). Yet as Robbins and Litton (2018) pointed out, vignettes used by past research on childhood abuse tend to simply state that the defendant suffered, when in fact "…details might matter because of their power to make the causal information salient by engaging participants' imagination." Moreover, adding details about potential mitigating evidence beyond stating that a defendant was abused bears more resemblance to the manner in which jury members receive personal histories in the courtroom (Eades, 2008; McKinley, 1997). Accordingly, this paper uses detailed vignettes adapted from Robbins and Litton (2018) to investigate post-crime mitigation.

Taken together, context set in this introduction leads to the following hypotheses about mock jurors' sentencing decisions:

Hypothesis 1 (*Mitigation*): Mock jurors will treat post-crime childhood abuse experienced by a defendant as mitigating. That is, in a crime vignette survey, mean sentencing decisions will be significantly smaller in an experimental condition that mentions post-crime childhood abuse than in a control condition that does not mention childhood abuse.

Hypothesis 2 (*Retributive Punishment*): Mock jurors will be more likely to rate post-crime childhood abuse as punishment for the defendant's crime compared to pre-crime childhood abuse.

Hypothesis 3 (*Postdictive Processing*): Compared to a control condition in which no abuse is mentioned, mock jurors who read about "shortly after" post-crime abuse will be more likely to find a causal connection between a crime and imagined pre-crime negative life events. This effect, however, will disappear in a "long after" post-crime abuse condition.

This paper now tests these hypotheses in two vignette studies. Study 1 tests Hypothesis 1 and provides evidence that mock jurors do treat post-crime negative life events as mitigating. Study 2 tests both Hypothesis 2 and Hypothesis 3 to investigate the underlying psychological processes involved in mock jurors' sentencing decisions.

2. STUDY 1

Study 1 examines mock jurors' sentencing decisions after reading a hypothetical crime vignette adapted from Robbins and Litton (2018). The goal of the study is to test Hypothesis 1:

mock jurors will treat post-crime childhood abuse as mitigating. In the results section, we employ a one-way ANOVA test to compare mean sentencing decisions across two experimental conditions and one control group.

2.1 Method

Participants

Four hundred and ninety-four participants were recruited from MTurk.[2] Participation was limited to individuals who had an overall MTurk approval rating of greater than or equal to 95%. Of those who did participate, all were offered $0.30 to complete a vignette survey approximately three minutes in duration. One hundred and twenty-two participants were not included in the analysis of results. Excluded participants were those who either failed the manipulation check or were not from the United States. Of the participants included in the analysis of results, gender distribution was as follows: 52.6% male, 46.8% female, 0.6% other.

Materials and Procedure

In an introductory screen to the MTurk survey, participants were told that they were going to read about a hypothetical trial involving first-degree murder. Additionally, they were told that as a current member of the jury, their task was to recommend sentencing to the judge. Participants were then randomly assigned to one of three conditions (pre-crime, no abuse, or post-crime) in which they read a vignette about a hypothetical murder in a crime. In each of the three conditions, participants read about details pertaining to the hypothetical murder. The no

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[2] MTurk participants tend to be more demographically diverse than both American college and standard internet samples (Buhrmester, Kwang, & Gosling, 2011; Mason & Suri, 2012).

abuse control condition did not mention that the defendant was abused. In the pre-crime condition, however, participants read that the defendant had been abused by his parents before the time of the crime. And in the post-crime condition, participants read that the defendant was abused by his parents after the time of the crime. To increase the salience of the time period during which the defendant was abused, in the childhood abuse description the words "before" and "after" were bolded for the pre-crime and post-crime conditions, respectively. Below is the vignette used for the post-crime abuse condition (vignettes used for all three conditions are included in the Appendix).

Brian is 14 years old. He was recently arrested for murder. He got into an argument with a store clerk. The argument escalated and Brian assaulted the clerk. Brian repeatedly kicked the clerk in the head after he had fallen to the ground, which caused his death. A short time later, Brian was caught by the police.

*During testimony, it is revealed that **after** the crime, Brian suffered severe physical and emotional abuse. His drug-addicted parents whipped him daily with a tree branch. They would lock him in his room for days at a time and then beat him for urinating on the floor. In order to survive, he ran away from home and learned to fend for himself on the streets.*

All participants were then asked how many years of prison the defendant deserved for killing the clerk on a sliding scale of 0 to 50 years. After providing a sentence, participants were brought to a separate screen in which they answered for a manipulation check. Participants

indicated if the abuse mentioned in the vignette occurred before the crime, after the crime, or if there was no abuse mentioned at all.

2.2 Results and Discussion

A one-way ANOVA showed that there was a significant difference in sentencing decisions between the three conditions $F(2, 369) = 9.271$, $p < .001$ (See Figure 1). We conducted follow-up t-tests from the one-way ANOVA test using an alpha of .0167 to account for multiple comparisons. As predicted, sentencing assignments in the post-crime condition ($M = 22.72$, $SD = 15.24$) were significantly smaller than in the control condition where no abuse was mentioned ($M = 28.10$, $SD = 14.90$), $t(210) = 2.44$, $p = .016$. Sentencing assignments in the pre-crime condition ($M = 20.50$, $SD = 16.22$) were also significantly smaller than in the control condition, $t(302) = 4.24$, $p < .001$. Moreover, there was no significant difference between sentencing assignments in pre-crime and post-crime conditions, $p = .115$.
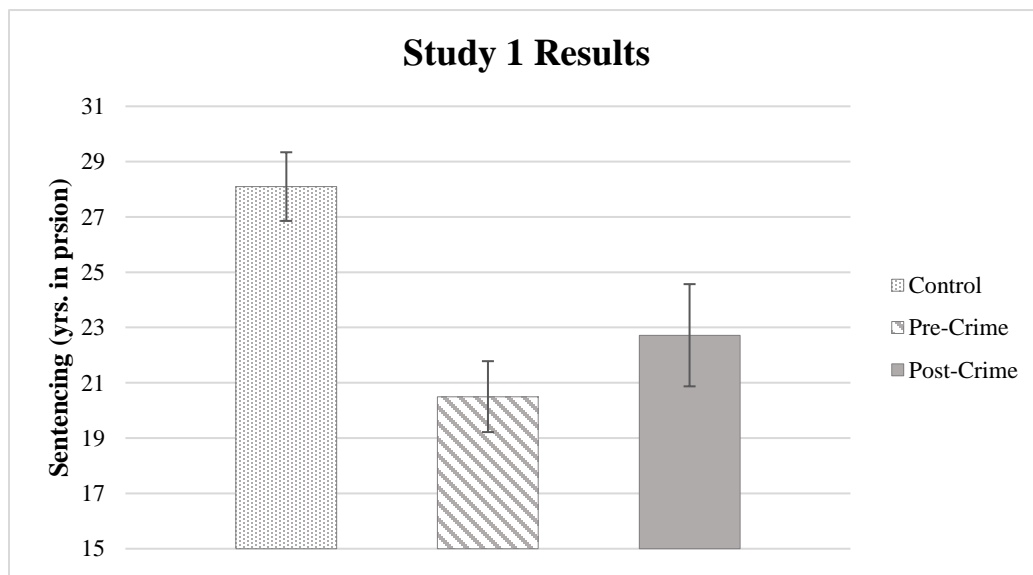

Figure 1. Results from the one-way ANOVA conducted in Study 1. Sentencing decisions in pre-crime and post-crime conditions were each significantly smaller than sentencing decisions in the control condition. The two experimental conditions did not differ.

Study 1 supports the hypothesis that mock jurors treat post-crime childhood abuse as mitigating. Sentencing decisions in the post-crime condition were significantly smaller than those in the control condition. Given the results reported here, we conducted a second study to understand the psychological underpinnings of mock jurors' mitigation evaluations of post-crime negative life events.

3. STUDY 2

With Study 1 providing evidence that mock jurors treat post-crime childhood abuse as mitigating, Study 2 investigates the psychological processes involved in this behavior. Specifically, we're interested in underlying psychological mechanisms that distinguish mock jurors' evaluations of pre-crime mitigating and post-crime mitigating evidence. One mechanism that may be unique to post-crime evaluations is retributive punishment. As noted in Hypothesis 2, we expect mock jurors will be more likely to rate post-crime childhood abuse as punishment for the defendant's crime compared to pre-crime childhood abuse. We also expect that postdictive processing may help explain evaluations of post-crime mitigating evidence. Hypothesis 3 accounts for this prediction: compared to a control condition in which no abuse is mentioned, mock jurors who read about "shortly after" post-crime abuse will be more likely to find a causal connection between a crime and imagined pre-crime negative life events. This effect, however, will disappear in a "long after" post-crime abuse condition. A measure of empathy was also included to capture additional dimensions of mock jurors' moral perceptions and punishment. Past research has shown that empathy reduces punitiveness (Unnever & Cullen,

2009; Unnever, Cullen, & Fisher, 2005). Here, we expect that there will be no difference in empathy ratings between pre-crime and shortly after conditions.

In the results section, we employ a one-way ANOVA for each of four dependent variable measures (sentencing, retributive punishment, causation, and empathy) to compare mean ratings across three experimental conditions and one control condition. We also employ multiple linear regression tests to learn more about the relationship between retributive punishment, causation, and empathy as predictor variables and sentencing as the dependent variable.

3.1 Method

Participants

Seven hundred and three participants were recruited from MTurk. Participation was limited to individuals who had an overall MTurk approval rating of greater than or equal to 95%. Of those who did participate, all were offered $0.30 to complete a vignette survey approximately three minutes in duration. Two hundred and forty participants were not included in the analysis of results. Excluded participants were those who either failed the manipulation check or were not from the United States. Of the participants included in the analysis of results, gender distribution was as follows: 54.0% male, 45.6% female, 0.4% other.

Materials and Procedure

Participants first read that they were going to read about a hypothetical trial involving first-degree murder. Participants also read that as a current member of the jury, their task was to recommend sentencing to the judge. The crime vignette used in this study was adapted from the one used in Study 1. However, Study 2 added an additional condition such that participants were

randomly assigned to one of four conditions (pre-crime, no abuse, shortly after crime, or long

after crime). In each of the four conditions, participants read about details pertaining to the

hypothetical murder. The control condition did not mention that the defendant was abused. In the

pre-crime condition, however, participants read that the defendant had been abused by his

parents before the time of the crime. In the shortly after crime condition, participants read that

the defendant was abused by his parents shortly after the time of the crime. And in the long after

crime condition, participants read that the defendant was abused by his parents long after the

time of the crime. As in Study 1, indicators of the time frame during which the defendant was

abused were set in bold for all experimental conditions. The vignettes used for all four conditions

are included in the Appendix.

　　　After reading the vignette, participants were asked how many years of prison the

defendant deserved for the murder on a sliding scale of 0 to 50 years. As in the first study, Study

2 then employed a manipulation check displayed on a separate screen. Here, participants

indicated if the abuse mentioned in the vignette occurred before the crime, shortly after the

crime, long after the crime, or if there was no abuse mentioned at all. Following the manipulation

check, participants were presented three additional dependent variable measures. The sequence

by which participants read these measures was randomized in order to avoid an order-effect. To

test for retributive punishment, participants were asked on a 9-point scale (1 = not at all, 9 = to a

very great extent) to what extent negative external events punished the defendant for his crime.

To test for postdictive processing in post-crime conditions, participants in all conditions

answered a causation measure in which they were asked on a 9-point scale (1 = not at all, 9 = to

a very great extent) to what extent negative life events in the defendant's life caused him to

commit the crime. Finally, to test for empathy, participants were asked on a 9-point scale (1 =

not at all, 9 = very much) how badly they felt for the defendant. All measures used for this study can be found in the Appendix.

3.2 Results and Discussion

Sentencing

There was a significant difference in sentencing decisions between the four conditions F(3, 459) = 10.497, $p < .001$. We conducted follow-up t-tests using an alpha of .0083 to account for multiple comparisons. Consistent with the results of Study 1, sentencing assignments in the pre-crime condition (*M* = 19.88, *SD* = 15.60) were significantly smaller than in the control condition, where no abuse was mentioned (*M* = 29.75, *SD* = 14.74), $t(278) = -5.43$, $p < .001$. Sentencing assignments in the shortly after crime condition (*M* = 24.39, *SD* = 15.09) were also significantly smaller than in the control condition $t(231) = -2.72$, $p = .007$. However, there was no significant difference between the long after crime condition (*M* = 27.13, *SD* = 15.29) and the control condition, $p = .204$. Moreover, sentencing decisions were significantly smaller in the pre-crime condition compared to the long-after crime condition, $t(228) = -3.43$, $p = .001$. All other effects were non-significant, all $p \geq .027$.

Retributive Punishment

There was a significant difference in retributive punishment evaluations between the four conditions F(3, 459) = 10.528, $p < .001$. We conducted follow-up t-tests using an alpha of .0083 to account for multiple comparisons. Contrary to our prediction, there was no significant difference in punishment ratings between the pre-crime (*M* = 4.94, *SD* = 2.66) and shortly after crime conditions (*M* = 4.19, *SD* = 2.53), $t(239) = 2.22$, $p = .028$. Punishment ratings in the pre-crime condition were larger than in the long after crime condition (*M* = 3.62, *SD* = 2.35) $t(228) =$

3.83, $p < .001$ and larger than in the control condition ($M = 3.43$, $SD = 2.07$) $t(278) = 5.29$, $p <$ .001. All other effects were non-significant, all $p \geq .013$.

Postdictive Processing

There was a significant difference in causation evaluations between the four conditions F(3, 459) = 35.174, $p < .001$. We conducted follow-up t-tests using an alpha of .0083 to account for multiple comparisons. Contrary to our prediction, there was no significant difference in causation ratings between the shortly after crime condition ($M = 4.28$, $SD = 2.65$) and the control conditions ($M = 4.33$, $SD = 1.96$), $t(231) = -.17$, $p = .862$. Causation ratings in the long after crime condition ($M = 3.31$, $SD = 2.27$) were significantly smaller than in the control condition, $t(220) = -3.54$, $p < .001$. Moreover, causation ratings in the pre-crime condition ($M = 6.19$, $SD = 2.10$) were significantly larger than in the shortly after crime condition [$t(239) = 6.22$, $p < .001$], the long after crime condition [$t(228) = 9.74$, $p < .001$], and the control condition [$t(278) = 7.64$, $p < .001$]. There was no significant difference between shortly after and long after crime conditions, $p = .009$.

Empathy

There was a significant difference in empathy ratings between the four conditions F(3, 459) = 42.211, $p < .001$. We conducted follow-up t-tests using an alpha of .0083 to account for multiple comparisons. Empathy ratings in the pre-crime condition ($M = 5.79$, $SD = 2.43$) were significantly higher than in shortly after condition ($M = 4.53$, $SD = 2.27$), $t(239) = 4.07$, $p < .001$. Ratings in the pre-crime condition were also higher than in the long after condition ($M = 3.64$, $SD = 3.64$), $t(228) = 6.62$, $p < .001$. Ratings in the pre-crime condition were larger than in the

control condition ($M = 2.85$, $SD = 2.04$), $t(278) = 10.96$, $p < .001$. Empathy ratings in the shortly

after condition did not differ from the long after condition, $p = .010$. Ratings in the shortly after

condition were larger than in the control condition, $t(231) = 5.91$, $p < .001$. Finally, empathy

ratings in the long after condition were larger than in the control condition, $t(220) = 2.69$, $p =$

.008.

Multiple Linear Regressions

   A multiple linear regression was run for each condition using the retributive punishment,

causation, and empathy measures as predictors of sentencing decisions. For the pre-crime

condition, a significant regression equation was found ($F(3, 140) = 18.028$, $p < .001$), with an R^2

of .279. For the shortly after crime condition, a significant regression equation was also found

($F(3, 93) = 6.714$, $p < .001$), with an R^2 of .178. A significant regression equation was found for

the long after crime condition ($F(3, 82) = 7.848$, $p < .001$), with an R^2 of .223. Finally, a

significant regression equation was found for the control condition, ($F(3, 132) = 10.350$, $p <$

.001), with an R^2 of .190. For each condition, empathy was the only significant predictor of

sentences (see Table 1 for details).

   Overall, Study 2 does not find underlying psychological mechanisms by which to

differentiate mock jurors' evaluations of pre-crime mitigation and post-crime mitigation. With

respect to our retributive justice predictions, mock jurors are not more likely to rate post-crime

childhood abuse as punishment for the defendant's crime compared to pre-crime childhood

abuse. Moreover, the retributive justice measure was not a good indicator of sentencing decisions

across all conditions. Contrary to Hypothesis 3, it also appears that mock jurors who read about a

defendant's childhood abuse that takes place shortly after the crime do not engage in postdictive

processing. In fact, the causation measure employed in the study was not a significant predictor

of sentencing decisions, and this was the case for all conditions. Finally, this study found that

empathy was a significant negative predictor of sentencing decisions in each condition.

Study 2 - Multiple Linear Regressions by Condition				
Condition	Predictor	*B*	*SE B*	p-values
Pre-crime	Retributive Punishment	-0.31	0.50	0.539
	Causation	-0.97	0.72	0.184
	Empathy	-2.66	0.57	0.000
Shortly after crime	Retributive Punishment	-0.74	0.68	0.281
	Causation	0.05	0.66	0.937
	Empathy	-2.43	0.68	0.001
Long after crime	Retributive Punishment	-1.33	0.67	0.051
	Causation	-0.97	0.77	0.211
	Empathy	-1.77	0.78	0.025
Control	Retributive Punishment	0.35	0.69	0.615
	Causation	1.32	0.71	0.068
	Empathy	-3.48	0.64	0.000

Table 1. Multiple linear regression results in Study 2. Empathy was a significant predictor of sentencing decisions in all four conditions. However, in all conditions retributive punishment and causation were not significant predictors of sentencing.

4. GENERAL DISCUSSION

This paper explored jurors' evaluations of post-crime harms experienced by a defendant.

Prior research on mitigating factors has shown that notifying jurors about a defendant's

particular pre-crime hardships leads to more lenient sentences than when pre-crime hardships are

not presented at all (Sandys et al., 2009). This effect may be due to the causal effect perceived between one's negative life circumstances and his crime (Hawkins, 1981; Barnett et al., 2007). The current paper addresses the same topics in the context of a defendant's post-crime childhood abuse. Specifically, it investigates if jurors rate post-crime childhood abuse as mitigating, and if so, what psychological mechanisms underlie such evaluations.

Consistent with our prediction, results from Study 1 found that mock jurors evaluated post-crime childhood abuse experienced by a defendant as mitigating. Such a finding also exhibits compatibility with TDM. Descriptions of the defendant's post-crime negative life events may have attenuated the extent to which punishers perceived his moral agency, thereby leading to reduced sentences. We may also apply the same line of thought to the mitigation results of our pre-crime condition. Hence, TDM offers a useful theoretical framework by which to consider evaluations of mitigating events, regardless of whether they take place before or after a defendant's crime.

Given the finding in Study 1 that mock jurors treat post-crime childhood abuse as mitigating, it was important to test for psychological underpinnings of such evaluations. Study 2 found that contrary to our prediction, retributive punishment was not a predictor of sentencing unique to punishers in post-crime abuse conditions. In fact, the retributive punishment measure was not a significant predictor of sentencing decisions across all conditions.

It is certainly plausible that jurors did not reason with just deserts to counterbalance environmental harms and judicial systems of punishment. The model of punishment developed by Darley and Pittman (2003) offers a useful tool by which to determine when punishers use just desert theories, but it doesn't provide a comprehensive account of all systems of punishment. Past research has also identified a "deterrence" theory whereby prevention of future crime is the

chief end and justification of punishment (Darley et al., 2000; Gibbs, 1968). With this account in mind, it is possible that our retributive justice survey question failed to exclusively measure retributive justice. Some participants may have engaged in deterrence theories whereby they saw systems of punishment as being fit for the crime to the extent that these systems prevented future crime. Unlike childhood abuse, incarceration as quantified by sentencing decisions is likely to have fit into deterrence theories since this type of punishment entails a form of forced quarantine. All told, a deterrence theory of punishment may lead punishers to reason that environmental harms are not sufficient forms of punishment for a crime.

Also plausible is that participants who engaged in a just deserts theory did not counterbalance environmental harms with judicial forms of punishment at all. In the context of a criminal trial, perhaps just punishments *for* a particular crime are seen as only those that are derived by judicial procedure. Empirical research on belief in a just world (BJW) demonstrates that people can perceive accidental or intended environmental harms as punishments for transgressions (Furnham, 2003; Lerner 1980). Yet future research would need to examine how punishers weigh together environmental, government-sanctioned, or even genetic harms as forms of justice and how these evaluations might change under different circumstances.

Also in contrast with predictions, postdictive processing did not explain sentencing decisions in the shortly after crime condition. This result in particular suggests that the process of interpreting visual info via temporal windows does not have an analogue in the context of punishment. Instead, it may be the case that in making punishment decisions, rather than integrate information over short temporal windows to make causal judgements between events, we engage in an instantaneous moment-by-moment construction. Important to note, however, is that Study 2 found that causation ratings in the long after crime condition were significantly

smaller than in the control condition. This result in particular may suggest that participants interpreted the causation measure too literally. That is, when asked "to what extent negative life events" in the defendant's life caused him to commit the crime, participants may have interpreted "negative life events" to mean the abuse events explicitly mentioned in the vignette. With respect to the two post-crime childhood abuse conditions, wording of the causation measure may not have gauged invoked imaginations that the abuse also could have happened before the crime. Instead, the line of thinking amongst participants could have been, "Of course negative life events didn't cause the defendant to commit the crime; they happened after the crime!"

Unlike measures of retributive punishment and causation, only empathy was a significant predictor of sentencing in each condition. Such a result is not surprising given past research that has shown empathy diminishes punitiveness (Unnever & Cullen, 2009; Unnever et al., 2005). It is also worthy to note that ratings of empathy as well as retributive punishment and causation tended to be higher in the pre-crime condition than in all other conditions. Compared to post-crime mitigating factors, pre-crime mitigating factors may provide a more salient logical framework through which people contextualize the behavior of the offender. In other words, there may be an increased likelihood that people will actively try to understand why the offender transgressed. Taken together, these considerations only augment the need to understand why sentencing decisions that take into account post-crime mitigators do not differ from those that take into account pre-crime mitigators.

Limitations and Future Directions

The studies conducted here leave open a number of issues that future studies may wish to address. For one, in an effort to broaden psychologically-informed definitions of post-crime

mitigation, new research must investigate other potential post-crime mitigators beyond childhood abuse. Moreover, further explorations of post-crime mitigation should not be limited to negative life events and circumstances. Prior to delivering sentencing decisions, some American courts also consider a defendant's good deeds. Robinson, Jackowitz, and Bartels (2012) noted, for example, that Tennessee courts have recognized military service as a mitigating factor. The paper also documented that other states simply refer to a defendant's "character" as a possible consideration in sentencing. Thus, American legal systems incorporate post-crime mitigating factors of both negative and positive valence into judicial procedures. Accordingly, future work in psychology should examine how actors of the law evaluate both classes.

Limitations concerning the scope of the current paper also arise in Study 1. We used TDM merely as a theoretical framework by which to formulate Hypothesis 1. Specifically, we reasoned that the cognitive template for moral judgements offered by the theory embraces both pre-crime and post-crime negative life events. Past research, however, has employed empirical tests to more directly evaluate the predictive power of TDM. In a study on pre-crime mitigation Robins and Litton (2018) asked participants to rate the defendant's level of true self, free will, and moral blame, among other measures, in order to assess perceptions of moral agency and moral patiency. Future work on post-crime mitigation may wish to expound on TDM accounts with appropriate empirical tests.

Another limitation of our research was the simple survey flow used in all three studies. Participants first read that they were about to take part in a hypothetical sentencing phase of a criminal trial. They then read a short paragraph of details relevant to the crime and to the defendant's social history. Vidmar (2008), however, asserted that vital structures of jury research comprise the effects of the judge's preliminary statements, the attorneys' opening statements, the

examinations conducted by plaintiffs' and defendants' attorneys, the witness and expert testimony, the attorneys' closing arguments, as well as jury instructions. Mock jury research, Vidmar (2008) commented, often fails to account for the interaction of vital structural components of trials and how these interactions effect judicial outcomes. Accordingly, future studies may employ a survey flow more representative of criminal trial procedures.

One potential avenue of future research is to mimic a bifurcated trial in which mock jurors move through two phases of a trial. In the first, they read evidence and come to their own conclusions as to whether or not the defendant is guilty. In the second, those who reached a guilty verdict read a defense attorney's account of mitigating evidence and then recommend sentencing. While this methodology certainly captures one interaction of two judicial structures, we predict that results would not differ from the current study. Vignettes used in this study presented crimes as facts, rather than evidence, such that the defendant's implicit guilt was quite salient. In addition to investigating if our prediction is true, future studies might include additional structural elements, including closing statements and comprehensive jury instructions.

Study 2 left open another important issue. Results failed to profoundly answer whether or not the psychological mechanisms by which jurors evaluate post-crime mitigation differ from their evaluations of pre-crime mitigation. This study finds none. Moreover, R^2 values tended to be low, indicating that the models produced for each condition do not strongly explain the variability of sentencing data around its mean.

As discussed above, the retributive punishment and causation measures employed in this research may have been flawed. Rather than conclude that each have nothing to do with evaluations of post-crime mitigation, a new study might make adjustments to survey questions. In addition to the retributive justice measure used here, researchers could employ a set of

questions to separate respondents by the type of punishment theory they are inclined toward (e.g. just deserts *versus* deterrence *versus* revenge). It is possible that respondents inclined toward just deserts are more likely than others to view environmental harms as just punishment for crimes. Moreover, a new causation measure could reword the question used in Study 2 to test for postdictive processing in post-crime conditions. In all conditions participants might be asked instead, "To what extent do you think any negative external events in the defendant's life *before* the crime caused him to kill the clerk?" This new question may frame causation in a manner that avoids the literal interpretations in post-crime conditions previously discussed. Supplemental to these adjustments, new studies may investigate additional measures including responsibility and sympathy in an effort to compare evaluations of pre-crime and post-crime mitigation.

5. CONCLUSION

Considerations of mitigating evidence are ingrained in the U.S. criminal justice system. It is well documented that defendants who have experienced negative life events before the time of his or her crime often get reduced sentences. This paper begins to examine evaluations of post-crime harms and opens the door for future research to follow suit. We find one circumstance under which jurors do treat post-crime harms as mitigating, although additional research is needed to understand why. Empirical work in psychology offers law descriptive accounts of when and why jurors assign reduced sentences. A clearer understanding of post-crime mitigating evidence in the vein of human behavior could help lawmakers and courtroom actors update to new and psychologically credible definitions of mitigation.

AUTHOR CONTRIBUTIONS

Birney came up with the research topic. Birney conducted all background research in pertinent literature. Birney and Newman designed and implemented the two studies. Newman funded both studies. Birney collected and analyzed the data then produced the figure and table. Birney wrote a draft of the paper, received feedback from Newman, and then produced a final draft. All writing is Birney's.

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Appendix

Study 1 – Vignettes

Control Condition

Brian is 14 years old. He was recently arrested for murder. He got into an argument with a store clerk. The argument escalated and Brian assaulted the clerk. Brian repeatedly kicked the clerk in the head after he had fallen to the ground, which caused his death. A short time later, Brian was caught by the police.

Experimental Conditions (pre-crime/post-crime abuse)

Brian is 14 years old. He was recently arrested for murder. He got into an argument with a store clerk. The argument escalated and Brian assaulted the clerk. Brian repeatedly kicked the clerk in the head after he had fallen to the ground, which caused his death. A short time later, Brian was caught by the police.

During testimony, it is revealed that (**before**/**after**) the crime, Brian suffered severe physical and emotional abuse. His drug-addicted parents whipped him daily with a tree branch. They would lock him in his room for days at a time and then beat him for urinating on the floor. In order to survive, he ran away from home and learned to fend for himself on the streets.

Study 2 – Vignettes

Control Condition

Brian is 14 years old. He was recently arrested for murder. He got into an argument with a store clerk. The argument escalated and Brian assaulted the clerk. Brian repeatedly kicked the clerk in the head after he had fallen to the ground, which caused his death. After a lengthy investigation that took many years, Brian was caught by the police.

Experimental Conditions (pre-crime, shortly after crime, long after crime abuse)

Brian is 14 years old. He was recently arrested for murder. He got into an argument with a store clerk. The argument escalated and Brian assaulted the clerk. Brian repeatedly kicked the clerk in the head after he had fallen to the ground, which caused his death. After a lengthy investigation that took many years, Brian was caught by the police.

During testimony, it is revealed that (**before**/**shortly after**/**long after**) the crime, Brian suffered severe physical and emotional abuse. His drug-addicted parents whipped him daily with a tree branch. He was locked in his room for days at a time, and then they would beat him for urinating on the floor.

Study 1 – Dependent Variable Measure

Sentencing

How many years of prison does Brian deserve for killing the clerk?

[sliding scale 0-50 years]

Study 2 – Dependent Variable Measures

Sentencing

How many years of prison does Brian deserve for killing the clerk?

[sliding scale 0-50 years]

Retributive Punishment

To what extent have negative external events in Brian's life punished him for his crime?

[9-point scale (1 = not at all, 9 = to a very great extent)]

Causation

To what extent do you think negative external events in Brian's life caused him to kill the clerk?

[9-point scale (1 = not at all, 9 = to a very great extent)]

Empathy

How badly did you feel for Brian?

[9-point scale (1 = not at all, 9 = very much)]