

## ABSTRACT

MCKINSEY, EVA. Integrating Mindset Literature and Trauma Education: The Impact of Trauma Education on Criminal Justice-Related Attitudes and Beliefs. (Under the direction of Dr. Sarah L. Desmarais).

**Background:** Over recent years, there has been increasing recognition of the importance of creating trauma-informed justice systems. A core component of such efforts is the education of criminal justice professionals on trauma and its effects. Despite the growing presence of trauma education, there has been little research investigating the impacts of trauma education on knowledge, attitudes, and beliefs in this context. Further, trauma education sometimes fails to emphasize the potentially transient nature of trauma reactions, which may inadvertently foster a fixed mindset regarding justice-involved persons (i.e., that they cannot change) and contribute to more negative views regarding their likelihood of success.

**Objective:** I assessed the efficacy and impact of trauma education and trauma education enhanced with a growth mindset manipulation on criminal justice-related attitudes and beliefs. **Hypothesis:** I hypothesized that both forms of trauma education would lead to less punitive criminal justice-related attitudes and beliefs by fostering growth mindsets, and that mindset-enhanced trauma education would do so to a greater extent. **Method:** I conducted two experimental studies—one with a sample of 358 undergraduate students enrolled in an introductory psychology course at a large university in a southeastern state (Study 1) and one with a sample of 388 Amazon Mechanical Turk respondents (Study 2)—to test the efficacy and impact of both forms of trauma education on general punitiveness, expectation of recidivism, and support for alternatives to incarceration for violent and nonviolent crimes. In both studies, I randomly assigned participants to one of three conditions: 1) trauma education; 2) mindset-enhanced trauma education; or 3) control (no trauma education). I assessed intervention efficacy and impact, as well as covariates with pre- and post- intervention surveys. **Results:** In both studies, participants assigned to either trauma education condition exhibited greater trauma knowledge compared to the control condition, signaling intervention efficacy. Results also revealed differences as a function of the type of trauma education, as well as the specific beliefs and attitudes. Specifically, mindset-enhanced trauma education led to greater support for alternative sentencing for violent crimes [Study 2:  $B = .38$ ,  $t(3,398) = 3.67$ ,  $SE = .10$ ,  $p < .001$ ] and

indirectly resulted in less punitiveness [Study 1: indirect effect =  $-.24$ , 95% CI ( $-.395$ ,  $-.099$ ); Study 2: indirect effect =  $-.19$ , 95% CI ( $-.335$ ,  $-.060$ )] and greater support for alternative sentencing for nonviolent crimes [Study 1: indirect effect =  $.17$ , 95% CI ( $.078$ ,  $.281$ ); Study 2: indirect effect =  $.11$ , 95% CI ( $.050$ ,  $.184$ )] via growth mindsets. However, Study 2 results demonstrated that both trauma educations can lead to greater expectations of recidivism. **Conclusion:** Findings suggest that mindset-enhanced trauma education holds potential in shifting public attitudes regarding punitiveness and support for alternative sentencing— a shift that is needed to support policies that move our criminal justice system away from retributive and punitive justice.

Integrating Mindset Literature and Trauma Education: The Impact of Trauma Education on Criminal  
Justice-Related Attitudes and Beliefs

by  
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## **BIOGRAPHY**

Eva McKinsey grew up in Asheville, North Carolina. Following high school, she took one year off of school to explore her varied interests, work on a political campaign, and travel in Latin America. She then attended Colorado College where she received a Bachelor of Art in Political Science with a minor in Spanish. Following graduation in 2017, Eva spent two years working in various research-related positions, including with the Congressional Research Service and with the Ecological Determinants Lab at the University of Hawai'i at Mānoa, and again, traveling in Latin America. In Fall 2019, she joined the Applied Social and Community Psychology Ph.D. Program at North Carolina State University. Her research interests broadly revolve around transformation of the U.S. criminal justice system and specifically, trauma-informed practice in the criminal justice context.

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## TABLE OF CONTENTS

LIST OF TABLES.....	v
LIST OF FIGURES .....	iv
<b>Introduction.....</b>	<b>1</b>
Trauma Education in the Criminal Justice Context.....	2
Growth Mindsets .....	3
Criminal Justice-Related Attitudes and Beliefs.....	4
The Current Research .....	5
<b>Methods .....</b>	<b>7</b>
Participants .....	7
Interventions and Procedures.....	7
Measures .....	8
Data Analysis.....	10
<b>Results.....</b>	<b>12</b>
Study 1 .....	12
Study 2.....	17
<b>General Discussion.....</b>	<b>22</b>
<b>References.....</b>	<b>30</b>

## LIST OF TABLES

<b>Table 1.</b> Study 1 Sample Characteristics and Condition Comparisons.....	40
<b>Table 2.</b> Descriptive Statistics and Intercorrelations of Trauma Knowledge, Growth Mindsets, and Outcome Variables.....	41
<b>Table 3.</b> Pre-, Post-, and Adjusted Post-Intervention Trauma Knowledge Scores to Assess Intervention Efficacy.....	42
<b>Table 4.</b> Study 2 Sample Characteristics and Condition Comparisons.....	43

## LIST OF FIGURES

<b>Figure 1.</b> Generalized mediation models of the hypothesized effects of condition on criminal justice-related attitudes and beliefs .....	44
<b>Figure 2.</b> Study 1 mediation models of the effects of condition and mindsets on each criminal justice-related attitudes and beliefs.....	45
<b>Figure 3.</b> Study 2 mediation models of the effects of condition and mindsets on each criminal justice-related attitudes and beliefs.....	48



## Introduction

Decades of research demonstrates how trauma increases the risk of criminal justice involvement. Trauma is the psychological response to experiences that are physically or emotionally harmful or threatening, and that have lasting adverse effects on an individual's functioning and wellbeing (SAMHSA, 2013). Experiences that may result in a trauma response include racial discrimination (Carter et al., 2020), exposure to accidental or threatened death, injury, or violence (American Psychiatric Association, 2013), and childhood neglect, abuse, or household challenges (Felitti et al., 1998). Trauma can affect the brain in ways that lead to more impulsive behavior, emotional regulation challenges, trouble identifying threats, and other behaviors that contribute to a person's involvement in the criminal justice system, such as alcohol and drug use, housing instability, relationship problems, and difficulty maintaining employment, among others (Fox et al., 2015; Kar, 2018; Kim & Choi, 2020). Accordingly, research shows disproportionately high rates of trauma among offenders compared to the general population, with up to 90% of juvenile offenders and 75% of adult offenders in the United States reporting at least one traumatic event early in life (Dierkhising et al., 2013; Matheson, 2012). Over recent years, there has been increasing recognition of the importance of considering trauma in the criminal justice context, leading to a surge of efforts to create and implement trauma-informed justice systems (Marsh & Byer, 2013). Education on trauma and its sequelae are one of the most common components of such systems (Branson et al., 2017). Despite steps to incorporate trauma education into routine training for criminal justice professionals, there has been little research investigating the impact of trauma education on attitudes and beliefs.

Trauma education does not always emphasize the potentially transient nature of trauma reactions and the possibilities for recovery from trauma (Müller & Kenney, 2020). This circumstance may inadvertently foster a fixed mindset regarding justice-involved persons (i.e., that they cannot change) and contribute to more negative views regarding their likelihood of success and change. Beyond resilience, coping, and post-traumatic growth—which all act to counter or protect against the adverse effects of

trauma (Clements-Nolle & Waddington, 2019; Harmon & Venta, 2020)—both brain and behavior changes have also been shown to be possible through psychotherapy (Cozolino, 2017), social support (Brooks et al. 2018), and other intervention programs (Purewal Boparai et al., 2018). Information describing the potential for recovery and improvements in responses following traumatic events mirrors growth mindset interventions, which aim to increase belief in the malleable nature of human attributes over the belief they are static and genetically predetermined (Dweck & Yeager, 2019). Without describing the potential for recovery from the effects of trauma, trauma education risks presenting a deterministic, deficit-based view of justice-involved persons (Müller & Kenney, 2020). In this research, I examined the efficacy and impact of trauma education and trauma education enhanced with a growth mindset manipulation on criminal justice-related attitudes and beliefs. I tested the general hypothesis that both forms of trauma education would lead to less punitive criminal justice-related attitudes and beliefs by fostering growth mindsets, and that mindset-enhanced trauma education would do so to a greater extent.

### **Trauma Education in the Criminal Justice Context**

Education regarding trauma and its effects (i.e., trauma education), as well as strategies for interacting with those who have experienced trauma, are becoming increasingly more common components of training for criminal justice professionals (Marsh & Byer, 2013). A recent survey of 250 respondents who held a range of roles within judicial education, revealed that the vast majority (74.6%) viewed trauma education as an important topic in judicial education at-large (Marsh, 2019). Furthermore, a systematic review of literature on trauma-informed care in the juvenile justice system, specifically, found that staff training on trauma was a core element of trauma-informed care in the 10 publications reviewed and that the consequences of trauma on youth development and behavior was one of the most frequently recommended topics for training (Branson et al., 2017). While these efforts to incorporate and implement trauma-informed justice practices are laudable, little is known about the impact of these efforts. What empirical research does exist has focused on the effects of trauma-informed interventions on behavioral outcomes among justice-involved persons, such as their decreased substance use or perpetration of violent behavior (King, 2017; Baetz, 2019), or on psychoeducational outcomes among

organizational-level staff, such as increased knowledge of the correlates and consequences of trauma for justice-involved persons (see Purtle, 2018). There is no research, however, on trauma education's effectiveness in changing the criminal justice-related beliefs and attitudes (e.g., beliefs about criminal behavior or attitudes about different types of sentencing) held by the recipients of trauma education; thereby limiting our knowledge of trauma education's potential in ultimately improving criminal justice-related practices and case outcomes.

Research examining the outcomes of trauma education in other fields and domains, such as social work, medicine, and education, shows that trauma education can increase confidence of social work students in working with traumatized individuals (Strand et al., 2014), improve mental health care professionals' attitudes of people with severe mental illness and traumatic pasts (Pelletier, 2016), improve practitioner-client partnerships (Green et al., 2016), and expand relationship building capacity within the classroom (Brunzell et al., 2019). However, the extent to which such positive effects may be seen in the context of criminal justice, both within the system (i.e., change in attitudes and beliefs of criminal justice actors) and outside of the system (i.e., change in the public's attitudes and beliefs), is not clear. Furthermore, as introduced earlier, current trauma education curricula tend to focus on the negative effects that traumatic experience has on individuals' lives, brain development, and behavior patterns, failing to highlight potential for recovery, growth, and change (Müller & Kenney, 2020). As such, more research is needed to comprehensively understand the impacts of trauma education and its focus on consequences (rather than recovery).

### **Growth Mindsets**

Mindset theory (also referred to as implicit theories; see Dweck & Legget, 1988) differentiates between a belief in the malleable nature of specific human attributes or conditions (growth mindset or incremental theory) or a belief in the static nature determined largely by one's genetics (fixed mindset or entity theory). Beliefs about the stability of a given attribute have far-reaching consequences across a range of contexts, as mindsets influence the formation of judgments and stereotypes (Dweck & Leggett, 1988; Molden & Dweck, 2006). As such, in recent years, there has been considerable focus on growth

mindsets to understand—and change—behaviors, beliefs, and attitudes across diverse domains. Originally studied within the academic domain, mindsets have been shown to matter for health-related outcomes as well. For example, research shows that a growth mindset can prevent symptoms of depression (Miu & Yeager, 2015), reduce the risk for anxiety (Schleider & Weisz, 2016), increase the likelihood of seeking behavioral health treatment (Burnette et al., 2019), and foster more positive attitudes toward counseling (Angilella, 2005). Other research demonstrates that growth mindset interventions can improve attitudes and beliefs about others, including people involved in the justice system. For instance, Tam et al. (2013) found that those with a fixed mindset held more punitive attitudes toward criminal offenders compared to those with a growth mindset while Rade et al. (2017) found that growth mindsets were associated with more positive attitudes toward ex-offenders and greater support for their reintegration into the community.

### **Criminal Justice-Related Attitudes and Beliefs**

Criminal justice-related attitudes and beliefs have been the subject of much social science research for decades (e.g., Allen & Hough, 2007; Quinney, 1970). “Punitiveness” (i.e., the endorsement of harsh and retribution-oriented punishment toward criminal offenders; Tam et al., 2013) and related beliefs about offending behavior and justice-involved individuals, such as their likelihood of recidivism, have received particular attention given their relevance to criminal justice outcomes, practices, and policies. To demonstrate, the public’s support for being “tough on crime” is a significant determinant of U.S. incarceration rates and congressional attention to crime overtime (Enns, 2014). Attitudes and beliefs regarding retribution, crime, and justice-involved persons also affect the public’s interactions with previously incarcerated people (see Rade et al., 2016) and voting behavior, thereby influencing election outcomes and consequently, criminal justice-related policy (Mandracchia et al., 2013). Despite the widespread recognition of the limited effectiveness of a retributive and punitive criminal justice system (Andrews & Bonta, 2010), as well as the need to reduce mass incarceration in the United States (Wozniak, 2016), punitive attitudes and beliefs continue to be endorsed by people within and outside of the criminal justice system (Garrett et al., 2019; O’Hear & Wheelock, 2016).

While some researchers have examined associations between personal characteristics (e.g., race, sex, political party affiliation) and criminal justice-related attitudes (O’Hear & Wheelock, 2016), others have turned to theory to understand attitudes, as well as how to change them (Maruna & King, 2009; Rade et al., 2017, 2018; Tam et al., 2013; Templeton & Hartnagel, 2012). For instance, Rade et al. (2018) examined the relevance of mindset theory to public attitudes toward persons who were formerly incarcerated, and demonstrated how these attitudes could be changed as a result of participation in a mindset intervention. Still others have focused on education or training as a method for changing attitudes (Elffers et al., 2017; Mandracchia et al., 2013). Mandracchia et al. (2013), for example, found that participants who were educated about general forensic and criminal justice-related issues exhibited more favorable attitudes toward prison reform and less favorable attitudes toward the death penalty. Although this research advanced our knowledge of some methods for increasing support for less punitive and alternative sentencing, there remains gaps in knowledge regarding how current intervention efforts—and trauma education specifically—may do so.

### **The Current Research**

The present research aims to better understand the impact of trauma education on criminal justice-related public attitudes and beliefs. The investigation centers on the premise that trauma education and growth mindset manipulations are complementary; both emphasize the malleability of the brain and human attributes, suggesting that people and behavior can change. They also both emphasize situational and external influences on behavior. That said, growth mindset interventions also explain that such effects are not permanent, but rather there remain opportunities for continued change and improvement in brain functioning and behavior over time – a message that is not always comprehensively or explicitly communicated in trauma education (Müller & Kenney, 2020).

I conducted two experimental studies to examine the efficacy and impact of trauma education and trauma education enhanced with a growth mindset compared to an attention matched control on four criminal justice-related attitudes and beliefs: general punitiveness, expectation of recidivism, and support for alternatives to incarceration for violent and for nonviolent crimes. Overall, I hypothesized that both

forms of trauma education would lead to less punitive attitudes and beliefs (i.e., less general punitiveness, lower expectation of recidivism, and greater support for alternatives to incarceration for violent and nonviolent crimes), and that growth mindsets would act as a mediating factor (see Figure 1). More specifically, I postulated that mindset-enhanced trauma education would foster stronger growth mindsets, thus leading to even less punitive attitudes and beliefs. To these ends, I sought to answer the following research questions (RQs):

1. Does trauma education lead to greater trauma knowledge (efficacy and manipulation check)?

*Hypothesis 1: Participants assigned to both trauma educations would exhibit significantly greater increases in trauma knowledge compared to the control condition.*

2. Does trauma education foster stronger growth mindsets?

*Hypothesis 2: Participants in both trauma educations would exhibit stronger growth mindsets compared to the control condition, and those in the mindset-enhanced trauma education condition would exhibit the strongest growth mindsets (a paths; see Figure 1).*

3. Do stronger growth mindsets result in less punitive criminal justice-related attitudes and beliefs?

*Hypothesis 3: Stronger growth mindsets would result in less punitive attitudes and beliefs (b path; see Figure 1).*

4. Does trauma education have an indirect effect on criminal justice-related attitudes and beliefs via growth mindsets?

*Hypothesis 4: Both trauma educations would exhibit an indirect effect on attitudes and beliefs via growth mindsets, with mindset-enhanced trauma education exhibiting the larger indirect effect (ab).*

5. Overall, does trauma education result in less punitive criminal justice-related attitudes and beliefs?

*Hypothesis 5: There would be total effects of both trauma educations such that trauma education leads to less punitive attitudes and beliefs compared to the control condition (c paths; see Figure 1). Mindset-enhanced trauma education would exhibit a more pronounced total effect.*

## **Methods**

In Study 1, I piloted an experimental manipulation within an undergraduate study sample to answer the above questions, testing and comparing the efficacy and impact of a web-based trauma education intervention and one enhanced with a growth mindset manipulation. This study served as a proof-of-concept step to establish potential intervention effects. In Study 2, I replicated the study with participants recruited using Amazon Mechanical Turk (MTurk) to test the generalizability of the effects. Other than the recruitment and enrollment procedures, all methods remained the same across the two studies.

## **Participants**

For Study 1, I recruited 358 undergraduate college students enrolled in an introductory psychology course at a large university in a southeastern state. Students had to be over the age of 18 years old to participate. Potential participants accessed the study through an online experiment recruitment platform utilized by the university and received credit toward meeting a course research requirement upon completion of the study. I removed 17 respondents from the sample for completing less than 80% of the survey and identified and removed another six responses as potential outliers, resulting in a final sample of 335.

For Study 2, I recruited 422 adults through Amazon Mechanical Turk (MTurk). To be eligible, participants had to be over the age of 18, living in the United States, and not an employee of the researchers' home university. Participants were compensated 6 USD for full participation in the study. Three people were removed from the sample for being ineligible, seventeen were removed for completing less than 80% of the survey, and another 14 responses were identified as potential outliers and removed, resulting in a final sample size of 388.

## **Interventions and Procedures**

In both studies, participants received study materials via the respective online recruitment platforms. After providing informed consent, I randomly assigned participants to one of three conditions: 1) trauma education; 2) mindset-enhanced trauma education; or 3) control (no trauma education).

Education interventions were delivered using Qualtrics software as a computerized single-session intervention lasting no more than 15 minutes. The trauma education intervention was modeled after publicly available trauma trainings for criminal justice professionals (e.g., SAMHSA, n.d.). The material emphasized trauma as an individualized response to adverse experiences and the maladaptive coping behaviors that individuals often develop as a result of traumatic experiences, such as substance abuse and aggression. The curriculum underscored the importance of considering sequelae among people who likely have traumatic pasts on an individual basis. The mindset-enhanced trauma education intervention additionally included information on the biopsychological consequences of traumatic experiences, as well as information that emphasized the changeable rather than fixed nature of these responses, which I based upon growth mindset messaging used in prior research (e.g., Schleider et al., 2019). In this way, the enhanced training emphasized connections between the brain and behavior, the malleability of the brain, and the corresponding changeable nature of human behavior.

All participants received a pre-intervention survey to measure trauma knowledge and general person mindsets. Then, participants in the experimental conditions received the modular, computerized intervention. After each module, participants responded to comprehension questions to test attendance to and understanding of the material before moving on to the next module. Participants in the control condition reviewed a 10-minute, topic irrelevant (i.e., focused on the opioid epidemic) online presentation as an attention-matched filler task. The post-intervention survey included the impact measures, the potential covariates, and the pre-intervention survey items to assess change in knowledge and mindsets. The researcher's home university's IRB approved all study procedures prior to recruitment and data collection.

## **Measures**

### ***Efficacy Measure***

I assessed *trauma knowledge* pre- and post-intervention using four items on a 5-point scale (ranging from 1 = strongly disagree, to 5 = strongly agree) adapted from a previous study examining the impact of a trauma-informed care education package (Hall et al., 2016). Items were focused on the effects



of trauma on the brain and behavior, the correlation between traumatic experience and involvement in the criminal justice system, and the participant's self-reported ability to explain trauma and its effects. I reverse scored all items, summed all items' scores, and calculated mean scores, such that higher scores indicated greater trauma knowledge. This measure served as both an efficacy measure and a manipulation check.

### ***Explanatory Variable***

I assessed *general person mindsets* pre- and post-intervention using the domain-general Implicit Person Theory measure, which measures beliefs about the fixed vs. malleable nature of human attributes using a 6-point scale (ranging from 1 = strongly disagree, to 6 = strongly agree; Levy et al., 1998). I reverse scored four of the eight items, summed responses, and calculated mean scores, such that higher scores indicated stronger growth mindsets.

### ***Impact Measures***

I included four post-intervention measures to assess criminal justice-related attitudes and beliefs. I measured *general punitiveness* using a 6-point scale (ranging from 1 = strongly disagree, to 6 = strongly agree) that assessed how harshly one believes an offender should be punished (Maruna & King, 2009). I reverse scored four of the eight items, summed all items' scores, and calculated a mean score, such that a higher score indicated greater levels of punitiveness. I assessed *expectation of recidivism* for "most offenders" using four items on a 7-point scale (ranging from 1 = strongly agree, to 7 = strongly disagree; Tam et al. 2013). I reverse scored items, summed responses, and calculated mean scores, such that higher scores indicated greater expectation of recidivism. I assessed *support for alternatives to incarceration* for *violent crimes* and *nonviolent crimes* using three 4-point scale survey items (ranging from 1 = often, to 4 = never) from the National Center for State Courts Sentencing Attitudes Survey (NCSC, 2006). One item queried support for alternatives to incarceration for all violent crimes and two others queried support for alternatives to incarceration for non-violent drug crimes and non-violent property crimes (averaged to produce a mean support for alternatives to non-violent crime score). I reverse scored all responses such that higher scores represented greater support for alternatives to incarceration.

## ***Covariates***

Potential covariates included *interpersonal contact* with justice-involved persons (measured using a 14-item Level-of-Contact questionnaire with items summed; Rade et al., 2018), *previous trauma training* (0 = no, 1 = yes), and several participant characteristics. Participants characteristics included *age* (measured continuously), *gender* (12 response options collapsed to four for analysis: woman, man, other gender identity, prefer not to answer), *race/ethnicity* (nine response options collapsed to six for analysis: Asian; Black or African American; Hispanic, Latinx, or Spanish origin; White; multiracial; other or prefer not to answer), and *political orientation* (measured using an 11-point scale ranging from 1 = extremely liberal to 11 = extremely conservative; Kroh, 2007). I also included *education* as a potential covariate in Study 2 (nine response options collapsed to three for analysis: less than college degree, college degree or vocational training, more than college degree).

Previous research suggests that the above characteristics and measures may co-vary with criminal justice-related attitudes and beliefs and/or growth mindsets. For example, political conservatism and lower educational attainment has been found to positively correlate with punitiveness (Payne et al., 2004; Sidanius et al., 2006). Additionally, people with a more liberal political orientation, younger age, higher levels of interpersonal contact with people involved in the criminal justice system, as well as men and people of color tend to report more positive attitudes toward ex-offenders (Hirschfield & Piquero, 2010; Leverentz, 2011; Rade et al., 2016; Willis et al., 2013). Further, research has shown that white people are more likely to harbor violent beliefs in criminal justice system situations compared to Black people (DeLisi, 2001). As for mindsets, previous research has shown mixed findings on differences across demographic characteristics. For instance, whereas one study found that male students exhibited significantly more growth mindset strategies than female students (O'Rourke et al., 2015), another found that male and older students were less likely to pursue growth-oriented goals (Martin, 2015).

## **Data Analysis**

Data analysis involved five steps, the last two of which correspond to the main research questions. I first computed descriptive statistics for all variables (i.e., frequencies and percentages for

nominal data and means and standard deviations for continuous data) and compared sample characteristics across groups using one-way ANOVAs and Fisher's exact tests,<sup>1</sup> as appropriate, to ensure successful randomization. Second, I conducted bivariate correlations and one-way ANOVAs to test for associations between the covariates and outcome variables (i.e., post-intervention trauma knowledge, post-intervention growth mindset, punitiveness, expectation of recidivism, and support for alternatives to incarceration for violent and nonviolent crimes), identifying covariates to retain in the mediation models. Third, I conducted bivariate correlations to investigate the associations between the variables of interest.

Fourth, to assess the efficacy of the trauma educations (RQ 1), I conducted one-way ANCOVAs with Bonferroni correction to test and compare post-intervention trauma knowledge scores controlling for pre-intervention scores. I also re-ran results controlling for covariates. Efficacious training was indicated by greater change in trauma knowledge scores for the two trauma education conditions compared to the control condition.

Fifth and finally, I conducted four separate mediation analyses (one for each hypothesized criminal justice-related attitude or belief) using PROCESS model 4 (Preacher & Hayes, 2004; Hayes, 2013) adapted for multicategorical independent variables as described in Hayes and Preacher (2014). Due to the multicategorical nature of the independent variable, PROCESS created two dummy coded variables, with the control condition coded as zero; therefore, the mediation pathways were tested in two parts – control versus mindset-enhanced trauma education ( $X_1$ ), and control versus trauma education ( $X_2$ ; see Figure 1). These analyses tested research questions 2-5 by examining:

- the effects of both trauma educations on growth mindsets ( $a$  paths; RQ 2),
- the effects of growth mindsets on the four criminal justice-related attitudes and beliefs ( $b$  path; RQ 3),

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<sup>1</sup> Fisher's exact tests were used in place of chi-squared analyses because all but one comparison of nominal data contained expected cell sizes less than  $n < 5$ .

- the indirect effects of both trauma educations on the four attitudes and beliefs via growth mindsets (*ab*; RQ 4), and
- the total effects of both trauma educations on the four criminal justice-related attitudes and beliefs (*c* paths; RQ 5).

I used the post-intervention mindset score controlling for the pre-intervention score as the growth mindset measure included in the mediation models. I also re-ran all models controlling for covariates to assess whether the pattern of findings remained the same. I used bootstrapping procedures (10,000 bootstrap resamples) to create an approximation of the sampling distribution and to generate 95% bias-corrected confidence intervals for the effects in the mediation analyses (Hayes, 2013; Preacher & Hayes, 2004). I conducted all analyses using SPSS v.27 (IBM, Armonk, NY). I used the SPSS PROCESS macro for the mediation analyses (Hayes, 2013; Preacher & Hayes, 2004).

I conducted an a priori power analysis using the Monte Carlo Power Analysis for Indirect Effects app (Schoemann et al., 2016) and found that a minimum sample size of  $N = 250$  would result in power of .90 to detect small effects ( $r_s = .20 - .25$ ). Prior research on mindsets suggests that effect sizes in that range can be reasonably expected between growth mindset manipulations and growth mindset strength (pathway *a*), as well as between growth mindsets and criminal justice-related attitudes (pathway *b*; see Burnette et al., 2013; Tam et al., 2013).

## **Results**

### **Study 1**

#### ***Descriptive Statistics and Randomization***

Table 1 shows the descriptive statistics for sample characteristics and covariates. A majority of participants in Study 1 were white and women. All participants were currently enrolled in an undergraduate Introduction to Psychology course at a large public university in the southeastern region of the United States. On average, their age was 19.90 ( $SD = 1.47$ , range = 18 - 31). The majority had never participated in trauma education training (see Table 1). The mean political orientation score was 5.46 ( $SD = 2.48$ , range = 1 - 11), falling between leaning liberal and moderate. On average, participants reported

just over five forms of contact with or exposure to someone (including themselves) who had been previously incarcerated (range = 0 - 13). One-way ANOVAs and chi-square analyses revealed no significant differences between conditions on all variables, indicating successful randomization of participants across conditions (see Table 1).

### ***Bivariate Analyses***

**Covariates.** Bivariate analyses revealed significant associations between five covariates and outcome variables. Specifically, as participants' interpersonal contact with formerly incarcerated people increased, so did their support for alternatives to incarceration for nonviolent crimes ( $r = .13, p = .016$ ). As conservativeness increased, so did levels of punitiveness ( $r = .50, p < .001$ ) and expectations that a person will recidivate ( $r = .27, p < .001$ ), while support for alternatives to incarceration for both violent crimes ( $r = -.12, p < .001$ ) and nonviolent crimes ( $r = -.30, p < .001$ ) decreased. Conversely, as participant age increased, their support for alternatives to incarceration for violent crimes increased as well ( $r = .17, p = .002$ ). Additionally, participants who identified as white ( $p = .04$ ) and multi-racial ( $p = .012$ ) exhibited higher post-intervention trauma knowledge scores compared to those in the "other or prefer not to answer" race category, as did participants who identified as women ( $p = .007$ ) and men ( $p = .05$ ) compared to those in the "other gender identity" category.

**Associations Between Outcomes.** Results showed significant associations between trauma knowledge scores (pre- and post-intervention) and three outcome measures (see Table 2). Specifically, greater trauma knowledge was associated with less punitiveness, greater support for alternatives to incarceration for nonviolent crimes, and, unexpectedly, greater expectation of recidivism ( $ps \leq .017$ ). Post-intervention trauma knowledge was also positively correlated with post-intervention growth mindsets ( $p < .001$ ). Growth mindsets also were associated with outcomes measures, all in the expected pattern of a stronger growth mindset being correlated with less punitive attitudes and beliefs ( $ps \leq .025$ ); however, the negative association between growth mindsets and expectation of recidivism was no longer significant post-intervention ( $p = .075$ ). As for the associations between the attitudes and beliefs of interest, general punitiveness was associated with all other outcomes also in the expected direction—

higher punitiveness correlated with greater expectation of recidivism and lesser support for alternatives to incarceration for violent and nonviolent crimes ( $ps < .001$ ). Support for alternatives for violent and nonviolent crimes were also positively correlated ( $p < .001$ ).

### ***Intervention Efficacy***

Table 3 presents the pre- and post-intervention mean trauma knowledge scores for each condition, as well as the adjusted post-intervention trauma knowledge scores controlling for the pre-intervention scores. The table also shows results for the one-way ANCOVA testing for differences between post-intervention trauma knowledge scores controlling for pre-intervention scores to determine whether participation in the trauma education interventions increased knowledge of trauma and its sequelae. Results showed that participants in the trauma education ( $AdjM = 4.56$ ) and the mindset-enhanced trauma education ( $AdjM = 4.48$ ) conditions exhibited greater trauma knowledge post-intervention compared to those in the control condition [ $AdjM = 4.15$ ;  $F(2,330) = 30.34$ ,  $p < .001$ ,  $\eta_p^2 = .16$ ], indicating that the interventions were efficacious. The two trauma education conditions did not differ from each other in regard to change in trauma knowledge ( $p = .328$ ). I re-ran results including covariates and the pattern of findings remained the same.

### ***Intervention Impact***

To test for intervention impact and investigate a potential pathway of change, I conducted mediation analyses predicting the four criminal justice-related outcome variables. While the effects of trauma education condition on growth mindsets ( $a$  paths; RQ 2) remained constant across all four models, the effect of growth mindsets on outcome variables ( $b$  paths; RQ 3), the indirect effects of condition on outcome variables ( $ab$ ; RQ 4), and the total effects of condition on outcome variables ( $c$  paths; RQ 5) differed across each outcome (see Figure 2). Below I present the findings first for RQ 2, then for RQ 3 through 5 in relation to each outcome.

**Effects of Trauma Education on Mindsets.** For all models, results showed that participants in both the mindset-enhanced trauma education ( $B_{a1} = .78$ ,  $t(3,337) = 9.63$ ,  $SE = .08$ ,  $p < .001$ ) and the trauma education ( $B_{a2} = .24$ ,  $t(3,337) = 2.95$ ,  $SE = .08$ ,  $p < .001$ ) conditions exhibited a stronger growth

mindset compared to participants in the control condition [ $F(3,337) = 148.42, p < .001, R^2 = .57$ ]. The pattern of results remained the same after including covariates in the model.

**General Punitiveness.** Results showed that a stronger growth mindset was associated with lower levels of punitiveness [ $B_b = -.31, t(4,336) = -3.48, SE = .09, p < .001$ ; see Figure 2a]. Bootstrap confidence intervals for the indirect effects of mindset-enhanced trauma education [indirect effect $_{ab1} = -.24, 95\% \text{ CI } (-.395, -.099)$ ] and trauma education [indirect effect $_{ab2} = -.08, 95\% \text{ CI } (-.138, -.026)$ ] conditions did not include zero, indicating a significant indirect effect. To illustrate, for the mindset-enhanced trauma education condition, the association between condition and punitiveness went from positive (direct effect $_l = .23$ ; i.e, more punitive) to negative (total effect $_l = -.01$ ; i.e., less punitive) after incorporating the effects of growth mindsets. That said, the total effect of either condition on punitiveness was not significant ( $p_1 = .915; p_2 = .394$ ). In other words, participants in neither trauma education condition exhibited significantly less overall punitiveness compared to those in the control condition. I re-ran the model controlling for covariates and the pattern of results remained the same.

**Expectation of Recidivism.** The path from growth mindsets to expectation of recidivism was not significant ( $p = .911$ ; see Figure 2b), and there were no indirect effects of mindset-enhanced trauma education [indirect effect $_{ab1} = .01, 95\% \text{ CI } (-.138, .153)$ ] or of trauma education [indirect effect $_{ab2} = .002, 95\% \text{ CI } (-.043, .052)$ ] on expectation of recidivism via growth mindsets. The total effects of condition on expectation of recidivism were not significant either ( $p_1 = .271; p_2 = .843$ ). I re-ran the model controlling for covariates and the pattern of results remained the same.

**Support for Alternatives to Incarceration for Violent Crimes.** The path from growth mindsets to support for alternatives to incarceration for violent crimes was not significant ( $p = .767$ ; see Figure 2c). There also were no indirect effects of mindset-enhanced trauma education [indirect effect $_{ab1} = .02, 95\% \text{ CI } (-.115, .149)$ ] and trauma education [indirect effect $_{ab2} = .01, 95\% \text{ CI } (-.039, .047)$ ] on support for alternatives to incarceration for violent crimes via growth mindsets. The total effects of condition on support for alternatives for violent crimes were not significant, as well ( $p_1 = .849; p_2 = .588$ ). I re-ran the model controlling for covariates and the pattern of results remained the same.

**Support for Alternatives to Incarceration for Nonviolent Crimes.** Stronger growth mindsets were associated with greater support for alternatives to incarceration for nonviolent crimes [ $B_b = .23$ ,  $t(4,336) = 4.04$ ,  $SE = .06$ ,  $p < .001$ ; see Figure 2d]. As with general punitiveness, bootstrap confidence intervals for the indirect effects of mindset-enhanced trauma education [indirect effect $_{ab1} = .17$ , 95% CI (.078, .281)] and trauma education [indirect effect $_{ab2} = .05$ , 95% CI (.020, .098)] did not include zero, indicating significant indirect effects. For the mindset-enhanced trauma education condition, the effect of condition on support for alternatives to incarceration for nonviolent crimes substantially increased after incorporating the effects of growth mindsets (direct effect $_t = .03 \rightarrow$  total effect = .21), making the total effect of condition on outcome significant [ $t(3,337) = 2.45$ ,  $SE = .09$ ,  $p = .015$ ]. However, there was still no significant total effect of trauma education on support for alternatives to incarceration for nonviolent crimes ( $p_2 = .075$ ). So, whereas those in the mindset-enhanced trauma education condition exhibited overall greater support for alternatives to incarceration for nonviolent crimes compared to the control condition, those in the trauma education condition did not. I re-ran the model controlling for covariates and the pattern of results remained the same.

### **Summary**

Participants in both trauma education conditions exhibited greater trauma knowledge compared to the control condition, indicating that the interventions were efficacious and supporting my first hypothesis. Regarding intervention impact, participants in both trauma education conditions also exhibited stronger growth mindsets compared to the control condition, with those in the mindset-enhanced trauma education condition exhibiting the stronger growth mindsets, confirming my second hypothesis. Results regarding the remaining research questions differed across each outcome of interest. In the model predicting general punitiveness, stronger growth mindsets resulted in less punitiveness, supporting my third hypothesis. Additionally, my fourth hypothesis was supported in that both trauma education conditions indirectly resulted in less punitiveness via growth mindsets, with the mindset-enhanced trauma education condition exhibiting a stronger indirect effect. My fifth hypothesis was not supported: punitiveness did not differ as a function of condition. My hypotheses 3, 4, and 5 were not



supported in regard to expectations of recidivism or support for alternatives to incarceration for violent crimes outcome. Lastly, the model predicting support for alternatives to incarceration for nonviolent crimes revealed that stronger growth mindsets resulted in greater support for alternatives, supporting my third hypothesis. Both trauma education conditions also indirectly resulted in greater support for alternatives to incarceration for nonviolent crimes via growth mindsets with the mindset-enhanced trauma education exhibiting the greater effect, supporting my fourth hypothesis. My fifth hypothesis was partially supported: only the mindset-enhanced trauma education condition led to greater support for alternatives to incarceration for nonviolent crimes compared to the control condition.

Taken together, results of Study 1 suggest that trauma education, particularly mindset-enhanced trauma education, has potential to indirectly lead to greater support for alternative sentencing and less punitiveness by way of growth mindsets. That said, the purpose of this study was to test our materials and establish potential effects of trauma education interventions within an accessible sample (i.e., undergraduate students). The second study aimed to increase external validity and test generalizability by assessing effects within a nationwide sample of MTurk workers.

## **Study 2**

### ***Descriptive Statistics and Randomization***

Table 4 shows descriptive statistics for sample characteristics and covariates. A majority of participants were white, women, and had at least a college degree or vocational training. The average age was 42.95 ( $SD = 11.64$ , range = 22 - 78). Similar to Study 1, the majority had never participated in trauma education training (see Table 4). On average, participants reported 5.83 ( $SD = 2.18$ , range = 0 - 13) forms of contact with or exposure to someone (including themselves) who had been previously incarcerated. The mean political orientation score was 4.76 ( $SD = 2.96$ , range = 1 - 11), falling between slightly liberal and leaning liberal. On average, participants reported nearly six forms of contact with or exposure to someone (including themselves) who had been previously incarcerated (range = 0 - 13). One-way ANOVAs and chi-square analyses revealed no significant differences between conditions on all variables

except political orientation [ $F(2,285) = 5.46, p = .005$ ], which I included as a covariate in later analyses (see Table 4).

### ***Bivariate Analyses***

**Covariates.** Bivariate analyses revealed significant associations between four covariates and outcome and explanatory variables. Specifically, as participants' interpersonal contact with formerly incarcerated people increased, so did their post-intervention trauma knowledge ( $r = .16, p = .002$ ), expectation of recidivism ( $r = .10, p = .045$ ), and support for alternatives to incarceration for nonviolent crimes ( $r = .11, p = .025$ ). As conservatism increased, levels of punitiveness ( $r = .60, p < .001$ ) and expectation of recidivism ( $r = .36, p < .001$ ) also increased, while post-intervention trauma knowledge ( $r = -.19, p < .001$ ), post-intervention growth mindset ( $r = -.29, p < .001$ ), and support for alternatives to incarceration for violent ( $r = -.33, p < .001$ ) and nonviolent crimes ( $r = -.38, p < .001$ ) all decreased. Additionally, participants who identified as women exhibited greater post-intervention trauma knowledge compared to men ( $p = .015$ ), and participants who had participated in previous trauma training exhibited greater support for alternatives to incarceration for violent crimes compared to those who had no previous trauma education training ( $p = .026$ ).

**Associations Between Outcomes.** Results showed significant associations between trauma knowledge (pre- and post-intervention) and three outcome measures (see Table 2). Specifically, greater trauma knowledge was associated with less punitiveness, greater support for alternatives to incarceration for nonviolent crimes, and greater pre- and post-intervention growth mindsets ( $ps \leq .001$ ). Pre- and post-intervention growth mindsets were also associated with outcomes measures, all in the expected pattern of stronger growth mindsets being correlated with less punitive attitudes and beliefs ( $ps < .001$ ). As for associations between attitudes and beliefs of interest, general punitiveness was associated with all other outcomes also in the expected direction— higher punitiveness was correlated with greater expectation of recidivism and lesser support for alternatives to incarceration for violent and nonviolent crimes ( $ps < .001$ ). Expectation of recidivism was negatively correlated with support for alternatives to incarceration

for violent and nonviolent crimes, and support for alternatives for violent and nonviolent crimes were positively correlated ( $p < .001$ ).

### ***Intervention Efficacy***

As shown in Table 3, participants in the trauma education ( $AdjM = 4.59$ ) and the mindset-enhanced trauma education ( $AdjM = 4.58$ ) conditions exhibited greater trauma knowledge post-intervention compared to those in the control condition [ $AdjM = 4.08$ ;  $F(2,384) = 88.56$ ,  $p < .001$ ,  $\eta_p^2 = .32$ ], indicating that the interventions were efficacious. The two trauma education conditions did not differ from each other in regard to change in trauma knowledge ( $p > .999$ ). I re-ran results including covariates and the pattern of findings remained the same.

### ***Intervention Impact***

To test intervention efficacy, I conducted mediation analyses predicting the four criminal justice-related outcomes (see Figure 3). Below I present the findings for RQ 2, then for RQ 3 through 5 in relation to each outcome.

**Effects of Trauma Education on Mindsets.** For all models, results showed that participants in the mindset-enhanced trauma education condition [ $B_{a1} = .74$ ,  $t(3,398) = 8.99$ ,  $SE = .08$ ,  $p < .001$ ] exhibited a stronger growth mindset compared to participants in the control condition [ $F(3,398) = 382.37$ ,  $p < .001$ ,  $R^2 = .74$ ]. Those in the trauma education condition did not exhibit significantly stronger growth mindsets compared to those in the control condition ( $B_{a2} = .05$ ,  $p = .504$ ). The pattern of results remained the same after including covariates in the model.

**General Punitiveness.** Results showed that stronger growth mindsets were associated with lower levels of punitiveness [ $B_b = -.26$ ,  $t(4,397) = -2.83$ ,  $SE = .09$ ,  $p = .005$ ; see Figure 3a]. A bootstrap confidence interval for the indirect effect of the mindset-enhanced trauma education condition [indirect effect $_{ab1} = -.19$ , 95% CI (-.335, -.060)] did not include zero, indicating a significant indirect effect. After incorporating the effects of growth mindsets, the association between the mindset-enhanced trauma education condition and punitiveness shifted from nearly zero (direct effect = .006) to negative (total effect = -.19; i.e., less punitive). The total effect was not significant ( $p_t = .222$ ), indicating that overall,

the mindset-enhanced trauma education condition did not exhibit significantly less punitiveness compared to the control condition. As for the trauma education condition, there was no significant mediation [95% CI (-.053, .020)] nor total effect ( $p = .682$ ). I re-ran the model controlling for covariates and the pattern of results remained the same.

**Expectation of Recidivism.** Growth mindsets did not significantly predict expectation of recidivism ( $p = .216$ ), and there were no indirect effects of mindset-enhanced trauma education [95% CI (-.198, .051)] or of trauma education [95% CI (-.006, .011)] on expectation of recidivism via growth mindsets (see Figure 3b). The total effect of mindset-enhanced trauma education condition was also not significant ( $p_I = .100$ ). Conversely, there was a significant total effect of the trauma education condition on expectation of recidivism [ $B_{c2} = .31$ ,  $t(3,398) = 2.17$ ,  $SE = .14$ ,  $p = .031$ ], such that participants in the trauma education condition exhibited higher expectations that a person will recidivate. This pattern of results shifted when incorporating covariates (i.e., political orientation and interpersonal contact scores) into the model. Controlling for these covariates, the total effect of mindset-enhanced trauma education on expectation of recidivism became significant [ $B_{cI} = .33$ ,  $t(5,382) = 2.35$ ,  $SE = .14$ ,  $p = .019$ ], and the total effect of trauma education became insignificant, though it was close [ $B_{c2} = .26$ ,  $t(5,382) = 1.91$ ,  $SE = .14$ ,  $p = .056$ ; see Figure 3c].

**Support for Alternatives to Incarceration for Violent Crimes.** Growth mindsets did not significantly predict support for alternatives to incarceration for violent crimes ( $p = .336$ ), and there were no indirect effects of the mindset-enhanced trauma education [95% CI (-.055, .134)] or the trauma education [95% CI (-.005, .025)] on support for alternatives to incarceration for violent crimes via growth mindsets (see Figure 3d). The total effect of trauma education on support for alternatives for violent crimes was also not significant ( $p_I = .311$ ); however, there was a total effect of mindset-enhanced trauma education [ $B_{cI} = .38$ ,  $t(3,398) = 3.67$ ,  $SE = .10$ ,  $p < .001$ ]. That is, those in the mindset-enhanced trauma education condition exhibited significantly greater support for alternatives to incarceration for violent crimes compared to the control condition, though growth mindsets did not mediate this relationship. I re-ran the model controlling for covariates and the pattern of results remained the same.

**Support for Alternatives to Incarceration for Nonviolent Crimes.** Stronger growth mindsets were associated with significantly greater support for alternatives to incarceration for nonviolent crimes [ $B_b = .15, t(4,397) = 3.42, SE = .05, p < .001$ ; see Figure 3e]. As with general punitiveness, a bootstrap confidence interval for the indirect effect of mindset-enhanced trauma education did not include zero, indicating a significant indirect effect [indirect effect<sub>abl</sub> = .11, 95% CI (.050, .184)]. However, the mindset-enhanced trauma education condition had no significant total effect on support for alternatives to incarceration for nonviolent crimes ( $p = .253$ ). As for the trauma education condition, there was no indirect effect [95% CI (-.011, .029)] nor total effect ( $p = .818$ ) on support for alternatives for nonviolent crimes. I re-ran the model controlling for covariates and the pattern of results remained the same.

### **Summary**

Results showed that both trauma educations were efficacious (i.e., led to greater trauma knowledge), supporting my first hypothesis. Regarding intervention impact, only participants in the mindset-enhanced trauma education condition exhibited stronger growth mindsets compared to the control condition, partially confirming my second hypothesis. In respect to general punitiveness, stronger growth mindsets resulted in less punitiveness, supporting my third hypothesis. I found partial support for my fourth hypothesis – only the mindset-enhanced trauma education indirectly resulted in less punitiveness via a growth mindset – and no support for my fifth hypothesis – participants in neither trauma education conditions exhibited significantly less punitiveness overall compared to the control condition. Regarding the expectation of recidivism outcome, my third and fourth hypotheses were not supported. My fifth hypothesis was partially supported in that, when covariates were not included in the mediation model, trauma education predicted a higher expectation of recidivism and, when covariates were included in the model, mindset-enhanced trauma education predicted a higher expectation of recidivism. Similarly, while results did not support my third and fourth hypotheses in regard to the support for alternatives to incarceration for violent crimes outcome, I did find partial support for my fifth hypothesis. Specifically, those in the mindset-enhanced trauma education exhibited significantly greater support for alternatives to incarceration for violent crimes. Lastly, the model predicting support for

alternatives to incarceration for nonviolent crimes revealed that a stronger growth mindset resulted in greater support for alternatives, supporting my third hypothesis. However, only the mindset-enhanced trauma education condition indirectly resulted in greater support for alternatives to incarceration for nonviolent crimes via a growth mindset, partially supporting my fourth hypothesis, and neither condition led to greater overall support for alternatives to incarceration for nonviolent crimes compared to the control condition, failing to support my fifth hypothesis.

Overall, these results corroborate the Study 1 findings that mindset-enhanced trauma education has the potential to indirectly lead to greater support for alternative sentencing and less punitiveness via growth mindsets. In contrast to Study 1, results suggest that, without incorporation of the growth mindset manipulation, trauma education does not produce such effects. Findings also revealed a couple interesting total effects (i.e., on expectation of recidivism and support for alternatives to incarceration for violent crimes) that growth mindsets did not mediate, suggesting that other factors and mechanisms of change are likely influential in the relationship between trauma education and criminal justice-related attitudes and beliefs.

### **General Discussion**

The incorporation of trauma education into routine training for criminal justice professionals is an essential part of growing efforts to develop trauma-informed justice systems (Branson et al., 2017; Marsh, 2019). Despite these efforts, no previous research – to my knowledge – has investigated the impact of such education on criminal justice-related attitudes and beliefs. Further, some education on early and/or severe trauma depicts trauma as an experience that results in irreversible damage to a person’s development and consequently, their social behavior (Mansfield & Guthman, 2015; Müller & Kenney, 2020). However, research shows this not to be the case – the brain is malleable (Otterson, 2010), people can recover from trauma (Di Lemma et al., 2019), and people’s behavior can change (Baetz et al., 2019). These messages are the foundation of growth mindset interventions (Dweck & Yeager, 2019). As such, with this research, I sought to better understand the impact of both trauma education and trauma education enhanced with a growth mindset manipulation. I conducted two experimental studies testing the

general hypothesis that both forms of trauma education lead to less punitive criminal justice-related attitudes and beliefs by way of growth mindsets, and that mindset-enhanced trauma education does so to a greater extent.

Whereas the first study served to establish potential intervention effects within an accessible sample (i.e., undergraduate students), the second served to demonstrate the effects of trauma education within a more representative sample (i.e., a nation-wide MTurk sample). Therefore, I focus my below discussion on Study 2 findings, recognizing that they likely better represent how trauma education impacts the attitudes and beliefs of the average adult in the United States. Understanding the impacts of trauma education on the public's attitudes and beliefs is crucial considering their influence on the adoption and maintenance of criminal justice-related policy and practice (Enns, 2014; Mandracchia et al., 2013), as well as the importance of such attitudes and beliefs on how people interact with and treat previously justice-involved persons (Rade et al., 2016). Further, understanding trauma education's impacts are critical given the increasing efforts to incorporate trauma-informed practices into a range of contexts and settings, including schools, health care systems, military, and child welfare (Becker-Blease, 2017; Ko et al., 2008). In the sections that follow, I review the findings and discuss their implications and connections to the existing literature.

### **Summary of Findings**

Findings from the second study showed that mindset-enhanced trauma education had some effect, either indirect or total, on all of the criminal justice-related attitudes and beliefs examined: general punitiveness, expectation of recidivism, and support for alternatives to incarceration for violent and nonviolent crimes. I will begin by discussing the presence of indirect effects of trauma education with growth mindsets as the intervening factor and then turn my attention to the total effects of trauma education on the criminal justice-related outcomes of interest.

I found that mindset-enhanced trauma education resulted in stronger growth mindsets, that stronger growth mindsets led to less general punitiveness and greater support for alternatives to incarceration for nonviolent crimes, and taken together, that mindset-enhanced trauma education

exhibited an indirect effect on said outcomes via stronger growth mindsets. These findings align with previous research suggesting that growth mindsets can lead to generally less punitive attitudes and beliefs (e.g., Tam et al., 2013; Rade et al., 2017). The present studies, however, also examined the relationship between different forms of trauma education and mindsets; thereby, being the first to integrate the rich literature on growth mindsets with trauma education. In Study 2, only those in the mindset-enhanced trauma education condition exhibited stronger growth mindsets in relation to those in the control condition, highlighting the added value and impact of incorporating a growth mindset manipulation into trauma education interventions. This finding supports broader calls from researchers, advocates, and trauma survivors alike to reframe trauma trainings in ways that avoid perpetuating a deterministic, deficit-based understanding of traumatic experience (Ginwright, 2018; Müller & Kenney, 2020; Stokes et al., 2017; Tseris, 2013). The incorporation of growth mindsets into trauma education may be one strategy to respond to these calls by shifting the content of trauma education from being deficit-focused to change- and growth-focused.

Furthermore, the finding that mindset-enhanced trauma education strengthens a person's growth mindset has implications beyond the outcomes directly examined in these studies. Prior research investigating mindsets in the criminal justice context has indicated that growth mindsets in general are associated with a range of criminal justice-related outcomes – less punitive goals of sentencing, less support for the death penalty (Tam et al., 2013), more positive views toward ex-offenders, greater support for ex-offender re-entry (Rade et al., 2017), and jury verdict decision-making (Gervey et al., 1999). As such, because mindset-enhanced trauma education strengthens a person's growth mindset, it can be assumed that this intervention may have the potential to impact the attitudes and beliefs examined in these previous studies as well; thereby, suggesting the even more expansive potential that mindset-enhanced trauma education may have on decreasing the retributive and punitive nature of people's attitudes and beliefs.

While these findings regarding the indirect effects of mindset-enhanced trauma education via growth mindsets are of theoretical importance and present possibilities for real-world effectiveness



(Rucker et al., 2011), I did not find total effects of either trauma education intervention on these outcomes. In other words, those who received either form of trauma education did not overall exhibit significantly different levels of general punitiveness or support for alternatives to incarceration for nonviolent crimes from those in the control condition. The simultaneous presence of indirect effects and absence of total effects can be understood by considering the complexity of influences that contribute to an overall effect, such as differential power between pathways and suppression effects (Hayes, 2009; Rucker et al., 2011). For instance, as Hayes (2009) explains, a total effect is the sum of numerous paths of influence, direct and indirect, not all of which are likely incorporated into the analytical model. Therefore, one intervening variable not included in a model may account for an indirect path of influence in the opposite direction of an intervening variable that is included in the model, thereby, canceling each other out and resulting in a nonsignificant total effect. In the case of the current research, it is likely that other factors linked to both trauma education and criminal justice-related attitudes were not included in the model, yet were responsible for suppressing, or canceling out, the influence of growth mindsets.

The influence of intervening factors not included in the model also may help us understand the presence of total effects that were not mediated by growth mindsets. For instance, the finding that mindset-enhanced trauma education resulted in increased support for alternatives to incarceration for violent crimes, but that growth mindsets did not explain this outcome, presents several questions, including: What was the mechanism of change? What intervening variable(s) did produce this shift in attitudes? This total effect is of particular interest given prior research indicating the public's tendency to oppose alternative sentencing for violent offenses (Thielo et al., 2016). This specific shift in attitudes, however, is key to effectively transforming our criminal justice system and addressing mass incarceration given the majority of incarcerated people are convicted of violent offenses (Wozniak, 2016). Results of Study 2 suggest that mindset-enhanced trauma education may be one strategy to begin to change public attitudes that may act as a barrier to alternative sentencing for violent offenses.

Lastly, I found that both trauma educations (trauma education in the model without covariates and mindset-enhanced trauma education in the model including covariates) led to a greater expectation

that a person will recidivate, and that growth mindsets did not play a significant role in this relationship. These findings contradict previous research showing that people with a growth mindset exhibited lower expectations of recidivism, which in turn led to less punitive attitudes (indicated by less support for the death penalty and retributive sentencing goals; Tam et al., 2013). On the surface, these results appear to reveal an adverse effect of trauma education and to contradict logic; that is, it seems as though those with a greater belief in the malleable nature of human behavior would also believe that a person has the capability to change their criminal behavior and to not reoffend. However, this is where other factors may be at play. For instance, trauma education, and particularly mindset-enhanced trauma education, also teaches about the immense effects of trauma on the brain. As such, even with the incorporation of a growth mindset manipulation, participants may have still developed the belief that change after trauma is extremely difficult to achieve; therefore, people are likely to reoffend if not provided with the services and supports they need to change and grow. Perhaps a stronger growth mindset messaging is needed to counter this belief. Alternatively, information about trauma and its sequelae may activate other attitudes and beliefs that counter and/or supersede the impacts of growth mindsets. For instance, factors such as blame, stigma (Hoyt & Burnette, 2020), deficit thinking (Valencia, 2010), “redeemability” (Maruna & King, 2009), racist beliefs, and trust in our criminal justice system (Unnever & Cullen, 2010) have been shown to be associated with growth mindsets and/or punitiveness, therefore, may be playing a significant role in these models. Further research is needed to explore and identify other potential intervening factors.

### **Limitations**

Results must be considered in light of several limitations. First, both the study samples and the interventions lack external validity. Both study samples were convenience samples and therefore, no efforts were made to ensure their representativeness of the targeted populations (i.e., population of students and the general public) and neither study sample captured the true population of interest in regard to trauma education in the criminal justice context – criminal justice actors. However, as previously noted, because trauma education is becoming more widespread in a range of settings (e.g., schools, healthcare; see Purtle, 2018), study results provide meaningful insight into its impact within contexts

outside of criminal justice. Furthermore, understanding the public's criminal justice-related attitudes and beliefs is important in and of itself given their influence on criminal justice policy and practice (Mandracchia et al., 2013), and how they may influence treatment of formerly incarcerated persons (e.g., stigma and prejudice; Rade et al., 2016). The second study's sample of U.S. adults also likely reflects, to a certain degree, the patterns that would be found within a criminal justice actor sample. Additionally, for the purposes of this investigation, I created the trauma education interventions to be 10-15 minute single-session interventions; however, trauma education is typically integrated into broader trauma trainings lasting at least several hours. To demonstrate, SAMHSA's trauma training for criminal justice professionals lasts around four hours (SAMHSA, n.d.). That said, because study effects were present in response to only 10-15 minutes of intervention exposure, such effects likely would be replicated, or even magnified, following a full-length trauma education program. This point is related to the second study limitation – attitudes and beliefs were measured directly following participation in the interventions, calling to question the extent to which the attitude and belief changes would hold over time. Some prior research has shown that single-session intervention effects may wane over time (Schleider & Weisz, 2017), highlighting the need for future research to include follow-ups. Third, and finally, I tested attitudes and beliefs, not behaviors. While attitudes and beliefs may be related to behaviors, this is not always the case (Fazio & Zanna, 1981). Therefore, I am limited in my ability to claim that the results showing the association between mindset-enhanced trauma education and generally less punitive attitudes would translate to real-world behaviors, actions, or decision-making (e.g., voting).

### **Future Directions**

Further research is needed to address the above limitations and to better understand study results. First, future research should test the effects of both trauma education interventions within a criminal justice actor sample. Successful replication of study results would support the need for incorporating growth mindset information into trauma education interventions for criminal justice professionals. In doing so, we could address existing concerns that some trauma education interventions' lack attention to the potential for growth post-trauma (Müller & Kenney, 2020), as well as offering a pathway for change

toward less punitive attitudes. Further investigation is also needed to identify the other intervening factors that are significant in the relationship between different forms of trauma education and criminal justice-related attitudes and beliefs. Specifically, future research should attempt to identify mediating variables that may be canceling out the effects of growth mindsets or producing adverse effects in the models predicting general punitiveness, support for alternatives to incarceration for nonviolent crimes, and expectation of recidivism. Identification of and attention to these factors in future intervention development could make mindset-enhanced trauma education an effective intervention for shifting criminal justice attitudes and beliefs and increasing support for alternative sentencing. Finally, more research is needed to understand the potential for different forms of trauma education to impact behavior and decision-making, not just attitudes and beliefs, particularly among criminal justice actors. While the current research was novel in its investigation of how different forms of trauma education impact criminal justice-related attitudes and beliefs, I did not investigate how the observed changes in these attitudes and beliefs may translate to changes in behavior and decision-making. Future research should consider the findings from the present research alongside prior research examining the associations between attitudes and behaviors of criminal justice professionals (e.g., Kaiser & Spohn, 2018; O'Neil et al., 2004) to better understand the potential for trauma education interventions to influence sentencing decisions and outcomes for people who come into contact with the criminal justice system.

## **Conclusion**

The present research investigated the understudied topic of trauma education in the criminal justice context and provided the first evidence regarding its impact on criminal justice-related attitudes and beliefs. Such evidence is crucial given the increasing presence of trauma training in the criminal justice context (Marsh & Byer, 2013). Additionally, the study was the first, to my knowledge, to integrate the rich literature on growth mindsets with trauma education. Taken together, the findings show that mindset-enhanced trauma education results in greater support for alternative sentencing for violent crimes and indirectly results in less punitiveness and greater support for alternative sentencing for nonviolent crimes via growth mindsets. These findings signal the potential role that mindset-enhanced trauma

education holds in shifting our criminal justice system away from retributive and punitive justice – a shift that is critical to implementing policies and practices that can successfully address mass incarceration (Wozniak, 2016) and improve the effectiveness of criminal justice interventions in reducing recidivism and increasing successful community reintegration among justice-involved persons (Andrews & Bonta, 2010).

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**Table 1.** Study 1 Sample Characteristics and Condition Comparisons.

	Overall ( <i>n</i> = 335)	Conditions			Comparison <i>p</i>
		GM Trauma Ed ( <i>n</i> = 109)	Trauma Ed ( <i>n</i> = 111)	Control ( <i>n</i> = 112)	
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	
<b>Categorical Variables</b>					
Race/ethnicity					.60
Asian	47 (14.0)	15 (13.8)	14(12.5)	18 (15.8)	
Black or African American	23 (6.9)	5 (4.6)	11 (9.8)	7 (6.1)	
Hispanic, Latinx, or Spanish Origin	8 (2.4)	0 (0.0)	3 (2.7)	5 (4.4)	
White	202 (60.3)	71 (65.1)	66 (58.9)	65 (57.0)	
Other or prefer not to answer	20 (6.0)	7 (6.4)	6 (5.4)	7 (6.1)	
Multiracial	35 (10.4)	11 (10.1)	12 (10.7)	12 (10.5)	
Gender					.76
Woman (cis & trans)	186 (55.5)	61 (56.0)	63 (56.3)	62 (54.4)	
Man (cis & trans)	130 (38.8)	43 (39.4)	42 (37.5)	45 (39.5)	
Other gender identity	6 (1.8)	0 (0.0)	3 (2.7)	3 (2.6)	
Prefer not to answer	13 (3.8)	5 (4.6)	4 (3.6)	4 (3.5)	
Previous Trauma Training					.46
Yes	14 (4.2)	4 (3.7)	3 (2.7)	7 (6.1)	
No	321 (95.8)	105 (96.3)	109 (97.3)	107 (93.9)	
<b>Continuous Variables</b>					
	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>F</i>
Age	19.90 (1.48)	20.10 (1.56)	19.70 (1.55)	19.89 (1.31)	2.02
Political Orientation	5.46 (2.48)	5.67 (2.64)	5.41 (2.37)	5.32 (2.45)	0.60
Contact	5.30 (2.04)	5.20 (2.39)	5.47 (1.58)	5.21 (2.07)	0.64

*Notes.* GM Trauma Ed = mindset-enhanced trauma education condition, Trauma Ed = trauma education alone condition; *p* values refer to the significance level of the fisher’s exact tests, which were used in place of chi-square analyses because all comparisons contained expected cell counts less than *n* = 5.



**Table 2.** Descriptive Statistics and Intercorrelations of Trauma Knowledge, Growth Mindsets, and Outcome Variables.

Measures	<i>M (SD)</i>	$\alpha$	1	2	3	4	5	6	7	8
Study 1										
1. Pre- Trauma Knowledge	4.12 (0.49)	.53	1.00							
2. Pre- Growth Mindset	3.66 (0.90)	.90	-.07	1.00						
3. Post- Trauma Knowledge	4.40 (0.55)	.72	.56***	-.001	1.00					
4. Post- Growth Mindset	3.93 (0.93)	.91	.02	.67***	.22***	1.00				
5. General Punitiveness	3.60 (1.06)	.81	-.12*	-.25***	-.16**	-.28***	1.00			
6. Expectation of Recidivism	4.94 (0.97)	.89	.15**	-.14**	.16**	-.07	.27***	1.00		
7. Support for Alt. – Violent	1.83 (0.90)	--	-.01	.14**	-.05	.11*	-.28***	-.05	1.00	
8. Support for Alt. – Nonviolent	3.14 (0.65)	.63	.16**	.13*	.23***	.27***	-.47***	-.05	.29***	1.00
Study 2										
1. Pre- Trauma Knowledge	4.02 (0.53)	.58	1.00							
2. Pre- Growth Mindset	3.80 (1.32)	.98	.09	1.00						
3. Post- Trauma Knowledge	4.41 (.52)	.71	.59***	.16**	1.00					
4. Post- Growth Mindset	4.99 (1.32)	.98	.07	.93***	.23***	1.00				
5. General Punitiveness	3.43 (1.36)	.89	-.26***	-.40***	-.28***	-.45***	1.00			
6. Expectation of Recidivism	4.80 (1.27)	.96	-.01	-.37***	.09	-.36***	.52***	1.00		
7. Support for Alt. – Violent	1.98 (0.89)	--	.04	.27***	.04	.30***	-.48***	-.29***	1.00	
8. Support for Alt. – Nonviolent	3.30 (0.63)	.65	.23***	.27***	.27***	.31***	-.54***	-.24***	.37***	1.00

Notes. Pre- = pre-intervention, Post- = post-intervention, Support for Alt. = support for alternatives to incarceration; \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

**Table 3.** Pre-, Post-, and Adjusted Post-Intervention Trauma Knowledge Scores to Assess Intervention Efficacy.

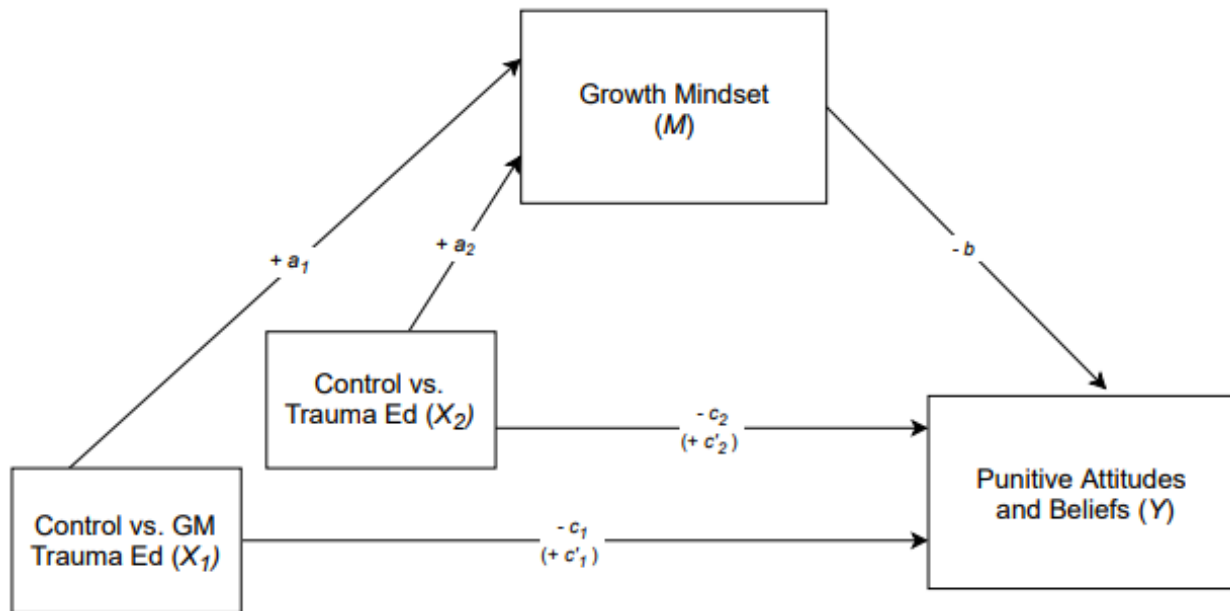
<b>Intervention Efficacy Measures</b>	<b>Conditions</b>			<b>Comparison</b> <i>F</i>
	<b>GM Trauma Ed</b> <i>M (SD/SE)</i>	<b>Trauma Ed</b> <i>M (SD/SE)</i>	<b>Control</b> <i>M (SD/SE)</i>	
<b>Study 1</b>				
Pre- Trauma Knowledge	4.15 (0.49)	4.18 (0.45)	4.04 (0.51)	
Post- Trauma Knowledge	4.50 (0.49)	4.59 (0.50)	4.10 (0.52)	
Adj. Post- Trauma Knowledge	4.48 (0.04) <sub>a</sub>	4.56 (0.04) <sub>a</sub>	4.15 (0.04) <sub>b</sub>	30.34***
<b>Study 2</b>				
Pre-Trauma Knowledge	3.96 (0.52)	3.99 (0.54)	4.10 (0.52)	
Post-Trauma Knowledge	4.54 (0.45)	4.57 (0.47)	4.13 (0.52)	
Adj. Post- Trauma Knowledge	4.58 (0.03) <sub>a</sub>	4.59 (0.03) <sub>a</sub>	4.08 (0.03) <sub>b</sub>	88.56***

*Notes:* GM Trauma Ed = mindset-enhanced trauma education condition, Trauma Ed = trauma education alone condition; Adj. Post- Trauma Knowledge = post-intervention trauma knowledge score controlling for pre-intervention trauma knowledge score; \*\*\* $p < .001$ ; Subscript letters denote which conditions differ from each other at the  $p = .05$  level.

**Table 4.** Study 2 Sample Characteristics and Condition Comparisons.

	Overall ( <i>n</i> = 388)	Conditions			Comparison <i>p</i>
		GM Trauma Ed ( <i>n</i> = 124)	Trauma Ed ( <i>n</i> = 130)	Control ( <i>n</i> = 134)	
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	
<b>Categorical Variables</b>					
Race					.69
Asian	22 (5.7)	10 (8.1)	7 (5.4)	5 (3.7)	
Black or African American	27 (7.0)	6 (4.8)	11 (8.5)	10 (7.5)	
Hispanic, Latino, or Spanish Origin	12 (3.1)	4 (3.2)	4 (3.1)	4 (3.0)	
White	304 (78.4)	94 (75.8)	101 (77.7)	109 (81.3)	
Other or prefer not to answer	4 (1.0)	3 (2.4)	0 (0.0)	1 (0.7)	
Multiracial	19 (4.9)	7 (5.6)	7 (5.4)	5 (3.7)	
Gender					.12
Woman (cis & trans)	196 (50.5)	67 (54.0)	63 (48.5)	66 (49.3)	
Man (cis & trans)	181 (46.6)	55 (44.4)	65 (50.0)	61 (45.5)	
Other gender identity	5 (1.3)	2 (1.6)	0 (0.0)	5 (3.7)	
Prefer not to answer	6 (1.5)	0 (0.0)	2 (1.5)	2 (1.5)	
Education					.66
Less than college degree	144 (37.1)	48 (38.7)	43 (33.1)	53 (39.6)	
College degree or vocational training	185 (47.7)	57 (46.0)	69 (53.1)	59 (44.0)	
More than college degree	59 (15.2)	19 (15.3)	18 (13.8)	22 (16.4)	
Previous Trauma Training					.80
Yes	7 (1.8)	3 (2.4)	2 (1.5)	2 (1.5)	
No	381 (98.2)	121 (97.6)	128 (98.5)	132 (98.5)	
<b>Continuous Variables</b>					
	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>F</i>
Age	42.95 (11.64)	42.16 (11.66)	43.41 (11.75)	43.22 (11.56)	0.42
Political Orientation	4.76 (2.96)	4.06 (2.80)	5.24 (2.91)	4.93 (3.06)	5.46**
Contact	5.83 (2.18)	5.58 (2.21)	6.04 (2.30)	5.86 (2.03)	0.24

*Notes.* GM Trauma Ed = mindset-enhanced trauma education condition, Trauma Ed = trauma education alone condition; *p* values refer to the significance level of the fisher’s exact tests, which were used in place of chi-square analyses because all but one comparison (education) contained expected cell counts less than *n* = 5; \*\**p* < 0.01.



**Figure 1.** Generalized mediation models of the hypothesized direct and total effects of condition on criminal justice-related attitudes and beliefs; GM Trauma Ed = mindset-enhanced trauma education condition, Trauma Ed = trauma education condition, Growth Mindset = post-intervention mindset score controlling for pre-intervention mindset score;  $c'$  = direct effects.

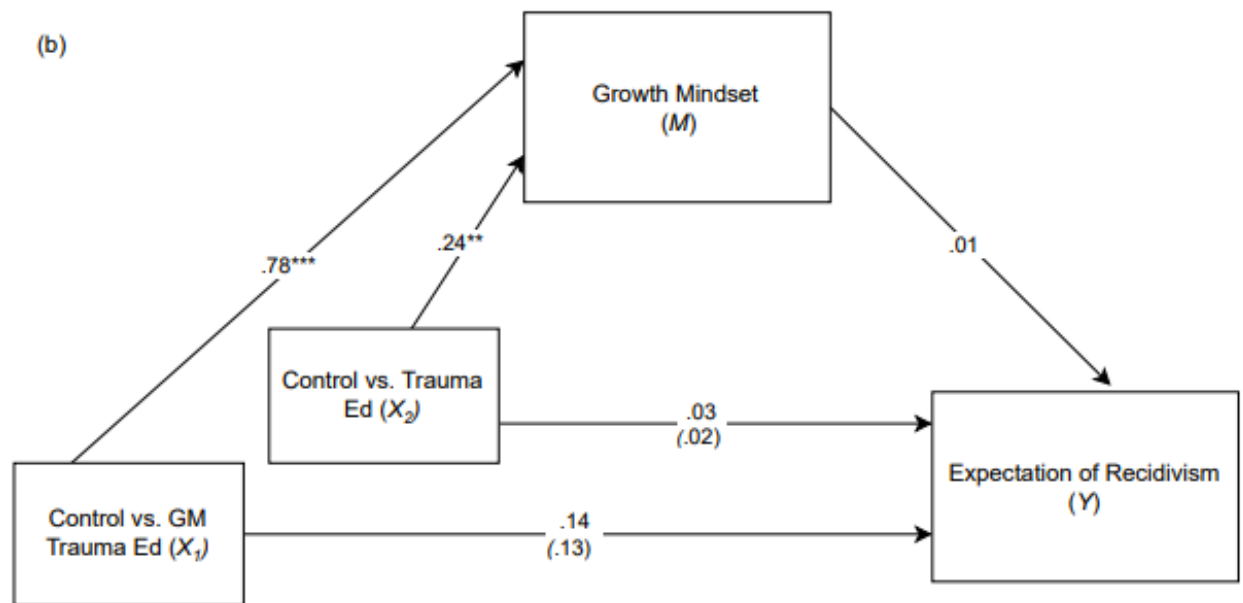
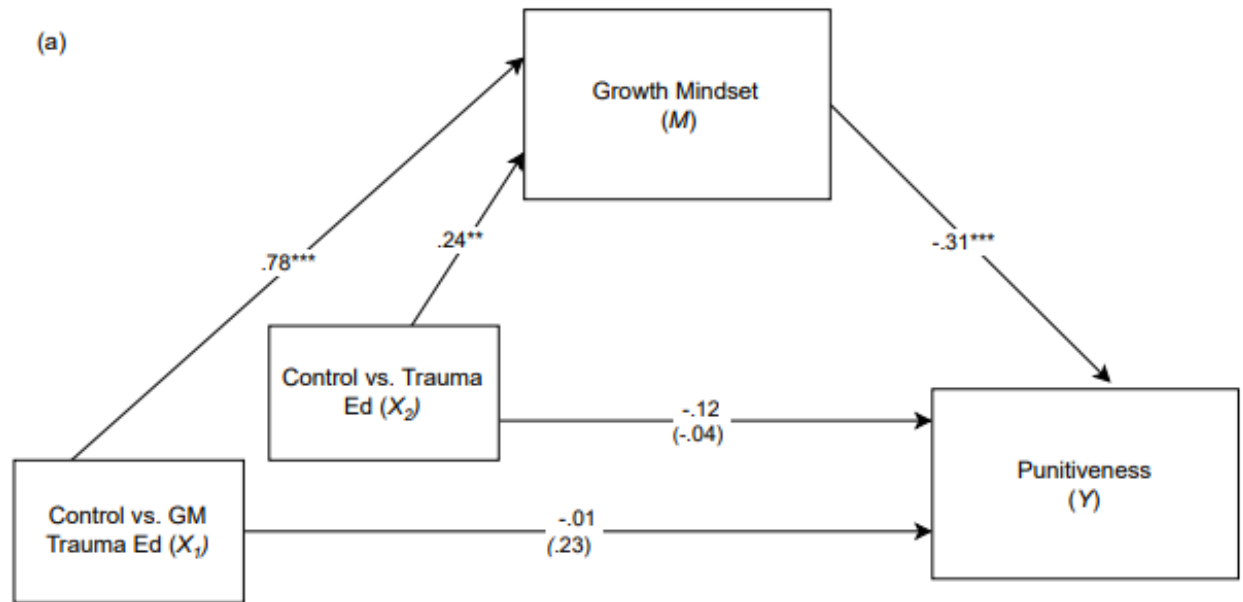
**Figure 2.** Study 1 mediation models of the effects of condition and mindsets on each criminal justice-related attitudes and beliefs; no covariates are included in models; GM Trauma Ed = mindset enhanced-trauma education condition, Trauma Ed = trauma education condition, Growth Mindset = post-intervention mindset score controlling for pre-intervention mindset score; values in parentheses = direct effects; \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

Figure 2a. Mediation model predicting general punitiveness.

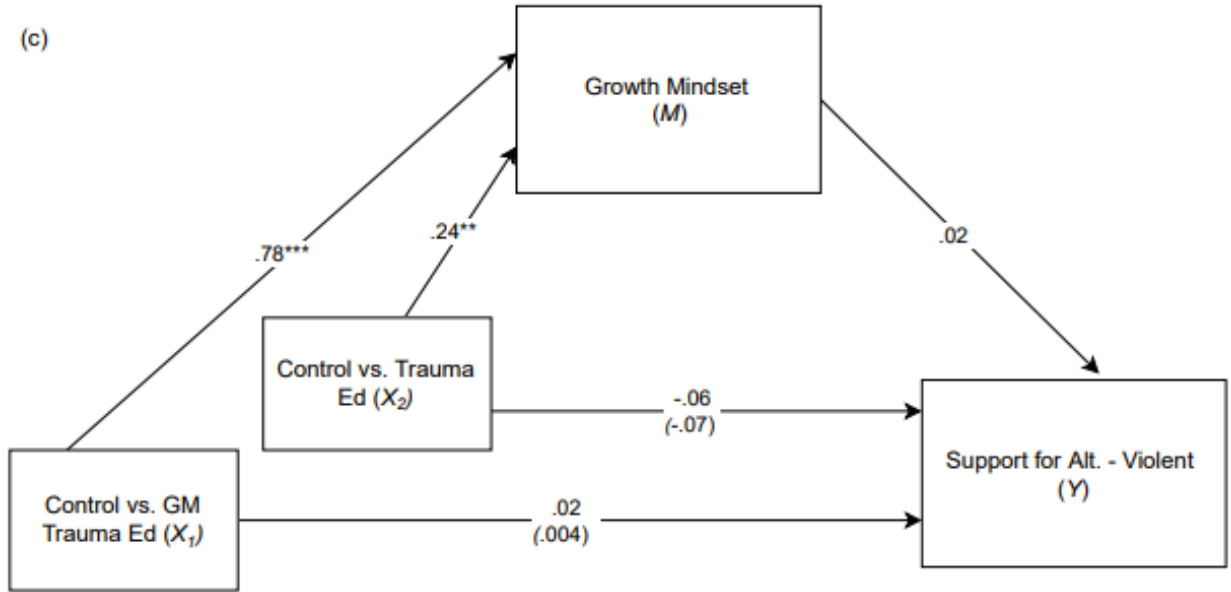
Figure 2b. Mediation model predicting expectation of recidivism.

Figure 2c. Mediation model predicting support for alternatives to incarceration for violent crimes.

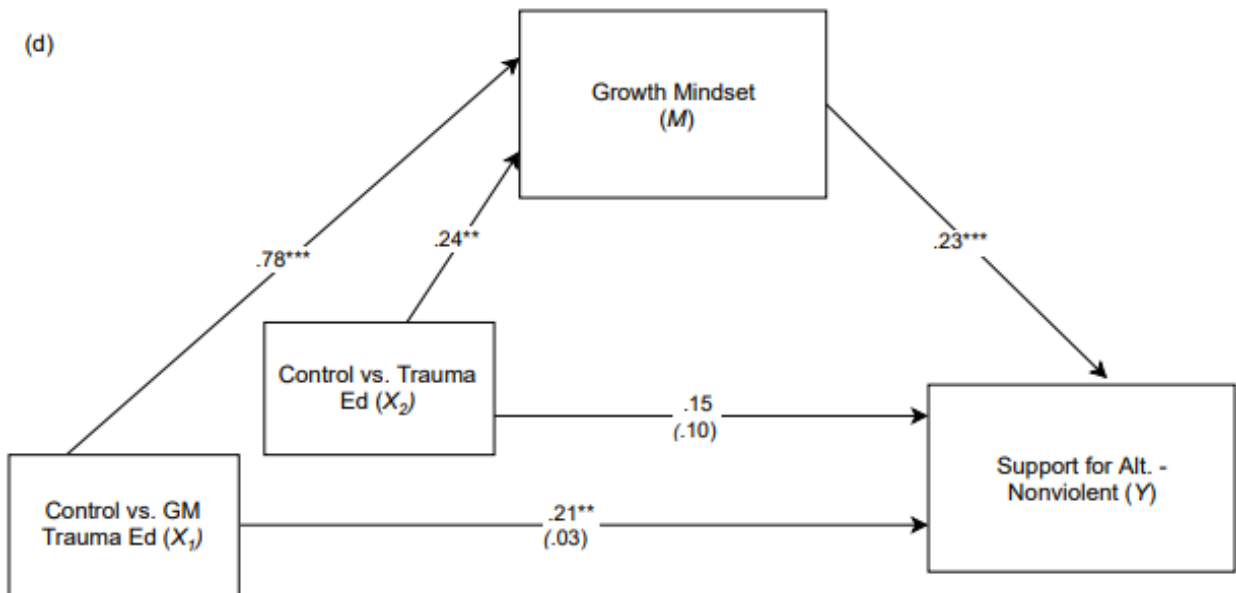
Figure 2d. Mediation model predicting support for alternatives to incarceration for nonviolent crimes.



(c)



(d)



**Figure 3.** Study 2 mediation models of the effects of condition and mindsets on each criminal justice-related attitudes and beliefs; Covariates are not included in the models, except for 3c. GM Trauma Ed = mindset enhanced-trauma education condition, Trauma Ed = trauma education condition, Growth Mindset = post-intervention mindset score controlling for pre-intervention mindset score; values in parentheses = direct effects; \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

Figure 3a. Mediation model predicting general punitiveness.

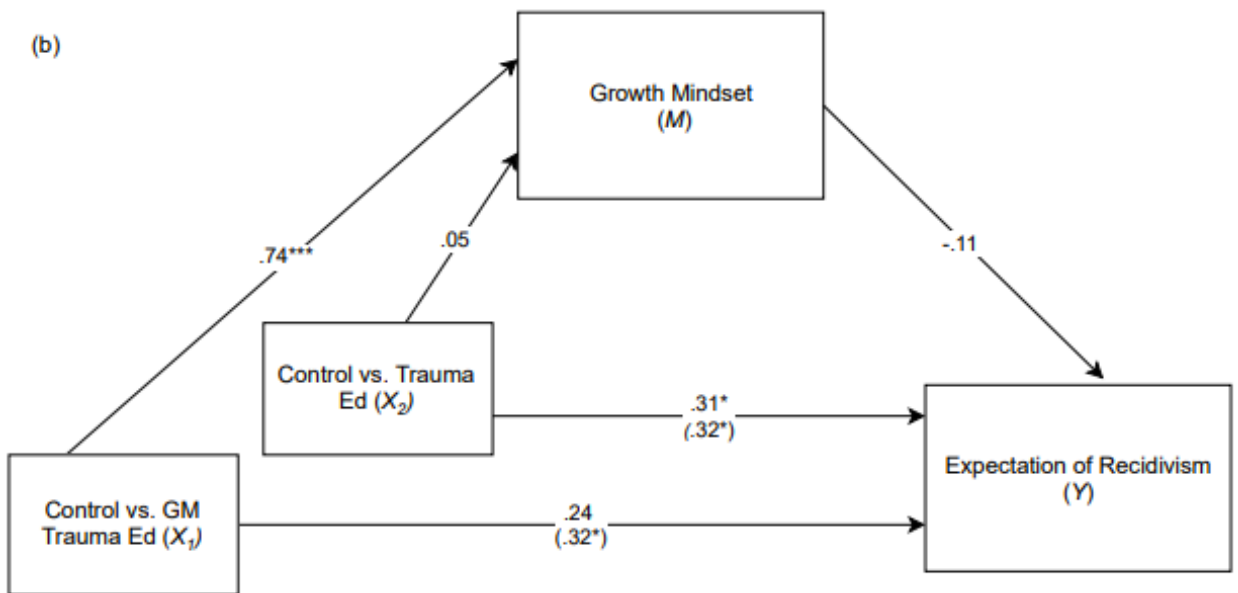
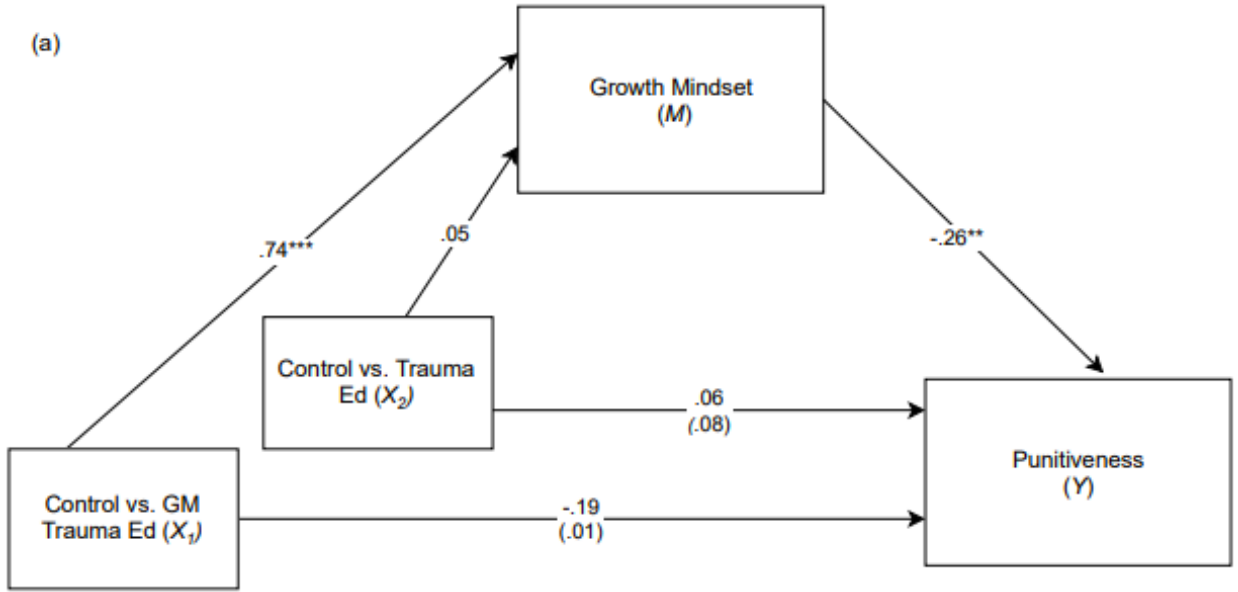
Figure 3b. Mediation model predicting expectation of recidivism.

Figure 3c. Mediation model predicting expectation of recidivism, includes covariates.

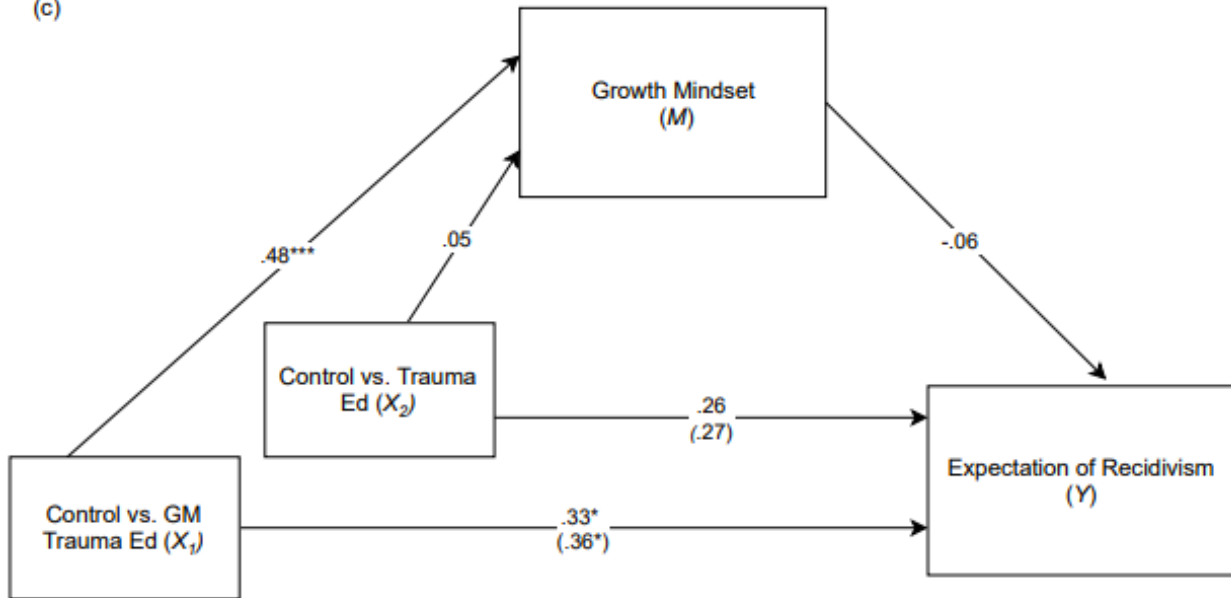
Figure 3d. Mediation model predicting support for alternatives to incarceration for violent crimes.

Figure 3e. Mediation model predicting support for alternatives to incarceration for nonviolent crimes.

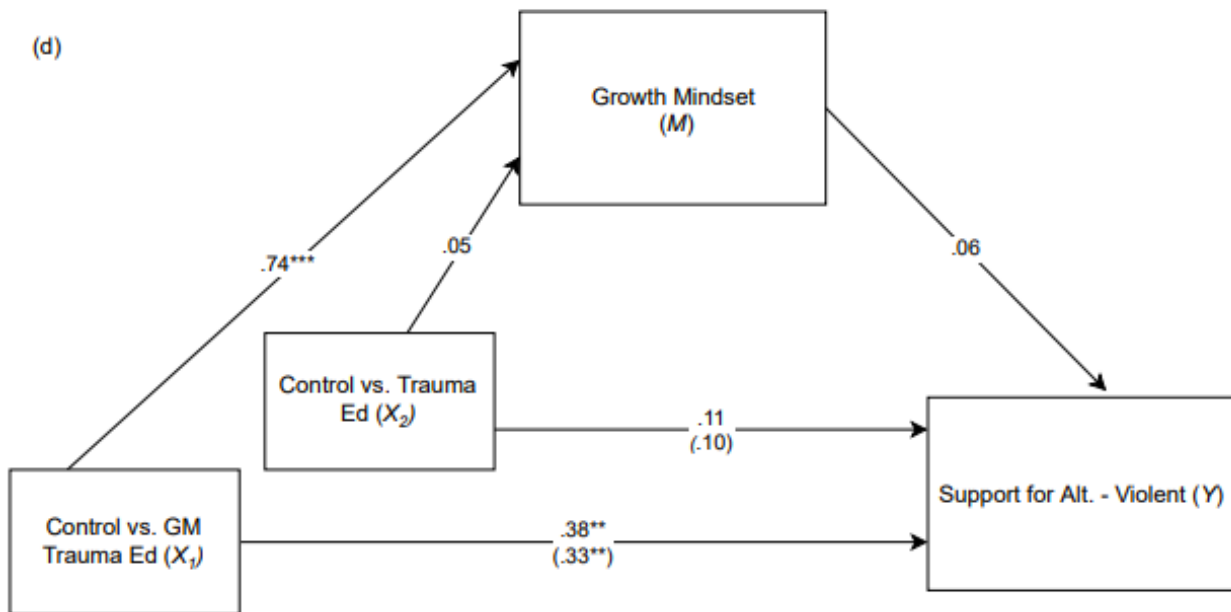




(c)



(d)



(e)

