



The Role of Exposure to Violence and Psychopathy on Violent Crime Perpetration

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Abstract

Exposure to violence strongly predicts violent behavior. However, not all individuals who are exposed to violence engage in violent behavior. Personality is one factor that influences the translation from exposure to violence to engagement in violent behavior. Previous research in adolescents showed that psychopathy (a personality disorder) mediated the relationship between exposure to violence and violent behavior. However, this research has not: been conducted in adults, despite evidence of instability in exposure to violence and psychopathy across the lifespan; examined the specificity of this relationship to different expressions of psychopathy, such as subcomponent Factors and primary/secondary subtypes; and, considered other environmental experiences that may impact this relationship. In two samples of adults (community [$N=232$] and prison [$N=313$]), psychopathy affected the relationship between exposure to violence and violence (community indirect effect = 0.03, $SE=0.02$, 95% $CI=0.004, 0.07$; prison indirect effect = 0.14, $SE=0.05$, 95% $CI=0.05, 0.25$). These effects appeared to be related more strongly to the impulsive-antisocial traits of psychopathy and the secondary (high-anxious) subtype of psychopathy. Results were robust against demographic and other environmental experiences. Ultimately, our findings indicate that psychopathy is an important factor affecting the link between exposure to violence and violent behavior.

Keywords Exposure to violence · Psychopathy · Psychopathy Factors · Secondary psychopathy · Violence

In the United States, approximately 30% of all individuals witness, learn about, or are the victims of violent acts in their community (Finkelhor et al. 2011). For those who live in poor, urban communities, rates of exposure to community violence (ETV) are elevated, with about 80–100% of residents reporting exposure (Bender and Roberts 2009; Gorman-Smith and Tolan 1998; Stein et al. 2003) and Black youth in

low-income Chicago neighborhoods reporting exposure to at least one violent event per day (Richards et al. 2015).¹ ETV is strongly associated with a host of adverse outcomes, such as physical and mental health issues, poor academic achievement, and neuropsychological dysfunction (Borofsky et al. 2013; Cooley-Quille et al. 2001; Fowler et al. 2009; Henrich et al. 2004; Sharkey et al. 2012; Wright et al. 2004). Additionally, ETV is one of the most robust predictors of engagement in violent behavior (Baskin and Sommers 2014; Durant et al. 1994; Gaylord-Harden et al. 2011; Hawkins et al. 2000; Spano et al. 2006). However, not all individuals who are exposed to violence engage in violent behavior. Therefore, it is necessary to identify other factors that promote the translation from ETV to violent behavior.

The impact of ETV on engagement in violent behavior is undeniable. Individuals who have more chronic and direct exposure to violence are more likely to chronically engage in violent criminal behavior themselves (Baskin and

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¹ In the United States Black individuals disproportionately live in communities with the greatest disadvantage and highest rates of ETV (McNulty and Bellair 2003; Williams and Jackson 2005; Adelman 2004; Friedson and Sharkey 2015).

Sommers 2014; Mulford et al. 2018). Several theories identify possible mechanisms to explain this relationship between ETV and violent behavior. For example, social modeling theory posits that those who are exposed to violence learn from what they see and reenact this violence in their own lives (Bandura 1978; Huesmann and Kirwil 2007). Additionally, network-based theories suggest that ETV, particularly within one's social network, increases the risk of individual victimization and perpetration of violence, spreading like a "contagious" disease through the network (Bond and Bushman 2017; Tracy et al. 2016). Finally, some theories use a basic learning model to propose that individuals exposed to violence either fail to habituate to violence, resulting in over-detection of threat and difficulty inhibiting responses to threat (Estrada et al. 2020; Gaylord-Harden et al. 2017), or become desensitized to repeated ETV, lowering inhibitory mechanisms against violence and increasing engagement in violent behavior (Guerra et al. 2003; Ng-Mak et al. 2002, 2004). But, even among those who experience ETV, there appears to be significant variation in terms of the quantity and quality of exposure, the impact of risk and protective factors, and how these factors relate to outcomes, particularly violent crime (Baskin-Sommers et al. 2013; Haynie et al. 2009; Kimonis et al. 2008; Patchin et al. 2006).

Individual difference factors, such as personality traits, may influence how people interpret and use the information they see in their environments, resulting in individual variability in behaviors like violent offending (Calder et al. 2011; Canli et al. 2001; Kaspar and König 2012; Paunonen 2003; Paunonen and Ashton 2001; Wu et al. 2014). Psychopathy represents one set of personality traits associated with interpersonal manipulation, callousness, shallow affective experiences, impulsivity, and chronic antisocial behavior (Hare 2003). Psychopathy is associated with higher levels of ETV (Kimonis et al. 2008; Schraft et al. 2013) and increased engagement in violent behavior (Asscher et al. 2011; Hare 1999; Salekin et al. 1996). Further, psychopathy accounts for some of the relationship between several types of environmental experiences (e.g., child abuse, poor neighborhood conditions, parenting practices) and engagement in antisocial behaviors such as violence, substance use, and theft (Goulter et al. 2019; Mosteiro et al. 2016; Weiler and Widom 1996). For example, in a sample of adjudicated adolescents, psychopathy mediated the relationship between ETV and future violent offending (Baskin-Sommers and Baskin 2016). Taken together, these findings suggest that psychopathy as a personality construct may explain, in part, the translation of environmental experiences into violent behavior.

While we have a sense of the importance of psychopathy in explaining how environmental experiences shape behavior, several gaps in our understanding remain. First, the majority of previous research has been conducted in juveniles (Baskin-Sommers and Baskin 2016; Goulter et al. 2019; Mosteiro et al.

2016). As a result, it is unclear if psychopathy influences the relationship between ETV and violence in adults. ETV (Baskin and Sommers 2015, 2014), psychopathy (Fontaine et al. 2010; Hawes et al. 2014; Lynam et al. 2008), and violent offending (Moffitt 1993) are not static over time. Some individuals show stable, high levels of each of these factors across developmental stages (Baskin and Sommers 2014; Farrington et al. 2009; Moffitt et al. 2002; van Baardewijk et al. 2011). However, other individuals show decreases in antisocial behavior over time, and some individuals only start their antisocial behavior in adulthood (Gomez-Smith and Piquero 2005). Therefore, extending the examination of ETV, psychopathy, and violence to include later developmental stages (i.e., adulthood) is necessary for capturing the varied cumulative and/or recent experiences of these factors.

Second, there is a long tradition of subdividing psychopathy into subcomponent traits and phenotypically similar subtypes, but little research examines these subdivisions in relation to ETV. According to dual-process models of psychopathy (Patrick 2007), the interpersonal and affective traits of psychopathy (Factor1 traits) correspond to a fundamental emotion deficit that reduces reactions to threat, whereas the impulsive and antisocial traits (Factor2 traits) correspond to a deficit in executive control that interferes with the processing of threat and undermines inhibition of behavior. Consistent with the idea that Factor2 traits result in aberrant reactions to threatening information (e.g., violence) and a dysregulated response to that information, there is evidence that Factor2 traits positively correlate with ETV (Schraft et al. 2013).² Similarly, psychopathy is sometimes conceptualized in terms of primary and secondary subtypes (Lykken 1995). Primary psychopathy is presumed to be a consequence of some intrinsic deficit that hampers self-regulation, whereas secondary psychopathy is believed to stem from social disadvantage, excessive neurotic anxiety, and/or some other form of psychopathology. Relative to primary psychopathy, individuals with secondary psychopathy show comparable levels of antisocial behavior, but greater levels of emotional reactivity (Skeem et al. 2007), which purportedly accounts for the stronger association between secondary psychopathy and ETV (Docherty et al. 2016). Further examination into the association between ETV and psychopathic traits/subtypes is warranted given that each expression is associated with distinct causes and could impact the internalization of violence.

Finally, previous research inconsistently considers the impact of demographic factors (i.e., sex, age, race; Cale and

² Some research in youth samples show a positive correlation between callous-unemotional traits (a developmental precursor to Factor1 traits of psychopathy) and ETV (Kimonis et al. 2008; Howard et al. 2012). However, these traits and their relationship to ETV were not considered in the context of impulsive-antisocial traits (Factor2) nor was a full measure of psychopathy used in these studies. Therefore, the strength of the relationship between "Factor1" traits and ETV is unclear.

Lilienfeld 2002; Eitle and Turner 2002; Flannery et al. 2004; McCabe et al. 2005) on the relationships among ETV, psychopathy, and violent behavior. From a statistical standpoint, this is an issue because the relationship among these factors may be partially accounted for by demographic factors that unequally characterize individuals living in communities with high rates of ETV. Additionally, no previous study considered other environmental factors, specifically childhood maltreatment, in the context of the relationships among ETV, psychopathy, and violence. Childhood maltreatment (i.e., physical, emotional, and sexual abuse and neglect; Bernstein et al. 2003) associates with both psychopathy, particularly the secondary subtype, and violent behavior (Dargis and Koenigs 2017; Forth and Tobin 1995; Ireland et al. 2002; Kolla et al. 2013; Krischer and Sevecke 2008; Salzinger et al. 2007; Thornberry et al. 2001). Further, individuals exposed to violence are likely to experience childhood maltreatment (Cecil et al. 2014; Finkelhor et al. 2011) given that ETV and childhood maltreatment share risk factors (e.g., poor neighborhood conditions; Salzinger et al. 2002) and that rates of victimization to more than one type of adverse environmental experience are relatively high (Finkelhor et al. 2009). Thus, much like with demographic factors, the influence of childhood maltreatment on relationships among ETV, psychopathy, and violent behavior remains unclear. Ultimately, these limitations hinder our ability to understand the generalizability of the ETV-psychopathy-violence relationship and consequently reduce our ability to precisely specify how psychopathy may affect the relationship between ETV and violent behavior.

To address these gaps in the research, we examined the effect of psychopathy on the relationship between ETV and violent behavior in two independent samples of adults. In a sample of community members and a sample of currently incarcerated males, we measured ETV, psychopathy, and violent behavior. The use of two samples provides an opportunity to replicate any observed effects. Additional demographic (e.g., sex, age, race) and environmental experiences (e.g., childhood maltreatment) were considered in follow-up robustness analyses. Based on previous work, it was hypothesized that psychopathy would indirectly affect the relationship between ETV and violent behavior. Moreover, the indirect effect of psychopathy on the relationship between ETV and violent behavior would be stronger for Factor2 traits and the secondary subtype.

Method

Participants

Community Sample A targeted recruitment approach in a high-crime area was used to identify potential participants for our sample for violent behavior. We posted recruitment

flyers that called for individuals who engage in risk-taking behavior (e.g., crime, substance use, gambling, impulsive behavior, bullying) in New Haven County, Connecticut, a high-crime region. New Haven ranks in the 95th percentile for crime; on average, 343 crimes are committed per square mile, as compared to the national median of 31.1 (Note: Data accessed from <https://www.neighborhoodscout.com/ct/new-haven/crime> on 05/22/2019). The rate of violent crime is 5.70 (per 1000 residents), compared to a statewide rate of 2.28 and a national median of 2.49. This community feature combined with our targeted recruitment of self-identified “risk-takers” resulted in a sample that was enhanced for clinically significant violent behavior.

A prescreen phone interview and in-person assessment materials were used to determine eligibility. Individuals were included for the study if they were between 18 and 75 years old on the date of the first contact, performed at the fourth-grade level or above on a standardized measure of reading (Wilkinson 1993), scored 70 or above on a brief measure of IQ (Zachary 1986), did not have diagnoses of schizophrenia, bipolar disorder, or psychosis not otherwise specified (First et al. 2015), and did not have a history of certain medical problems (e.g., uncorrectable auditory or visual deficits; head injury with loss of consciousness greater than 30 min) that may impact their comprehension of the materials or performance on the task. A HIPAA waiver was obtained for the prescreen phone interview and all participants provided written informed consent during their in-person session. Participants earned \$10/h for their completion of the self-report measures. All procedures were followed based on the protocols set forth by the Yale University Institutional Review Board.

Incarcerated Sample Before recruitment, study personnel received an institutional roster of inmates. This roster was used to review institutional files and exclude individuals who did not meet eligibility criteria. Then, individuals were selected randomly from the list of eligible inmates and invited to participate. Invited individuals were provided with information about study procedures and informed that any information collected during the study would not go into their institutional files and would not affect any pending legal status or sentencing they might be facing. In keeping with the Connecticut Department of Correction regulations, participants did not receive monetary compensation. Participants were informed that they could withdraw from the study at any time. All participants provided written informed consent according to the procedures set forth by the Yale University Institutional Review Board. After providing consent, participants completed an initial session that involved a life history assessment, including questions about engagement in violent crime. Then, participants completed a questionnaire assessing exposure to violence. Sessions took place in a private testing space within the prison.

The prescreen of institutional files and assessment materials were used to determine eligibility. Eligible individuals were under 75 years old and did not have: a history of psychosis or bipolar disorder, current mood/anxiety disorders, current psychotropic medication, a family history of psychosis, certain medical problems that could impede comprehension of or performance on the experimental task (e.g., uncorrectable auditory or visual deficits, 3 or more serious head injuries), IQ below 70, or reading level below fourth grade.

Measures³

Exposure to Violence ETV was measured using a scale that assesses lifetime exposure to violent events (Selner-O'Hagan et al. 1998). The questionnaire consisted of 13 items, documenting the types of both experienced and observed violence (e.g., "Have you been hit, slapped, punched, or beaten up?" and "Have you seen someone else get attacked with a weapon, like a knife or bat?"). Participants were asked to respond to each item based on a dichotomous choice (yes/no). If yes was selected, participants indicated the number of times they experienced this situation in their lifetime and the age they first experienced this event. A total ETV score was calculated using a sum of all 13 items. The reliability for the ETV scale was good in both the community and prison samples (Cronbach's alpha for community sample = .847; Cronbach's alpha for prison sample = .860).

Violent Crime In the community sample, all participants were asked an open-ended question about if they ever committed a violent crime. Additionally, we looked up all participants in the Connecticut Department of Correction inmate database, which logs adult (18 or older) charges. If participants denied committing a violent crime and none were found linked to the participant in the Department of Correction database, they were given a 0 on this item. If participants self-reported committing a violent crime and/or a violent crime was listed in the database, they were given a 1 on this item. Binary coding for committing a violent crime was the only information entered into the dataset for this sample.

In the incarcerated sample, a life-history interview (see below) was used to obtain self-reported engagement in criminal activity. Then, study personnel reviewed State records to corroborate the self-report. A total count of the number of

violent crimes charged as an adult (18 or older) was generated for this sample.

Psychopathy In the community sample, psychopathy was measured using the Self-Report Psychopathy-III (SRP-III) scale (Paulhus et al. *in press*). The SRP-III is a 64-item measure and participants were asked to rate the degree to which they agree with each statement using a 5-point Likert scale (1 = Disagree Strongly and 5 = Agree Strongly). Total scores range from 64 to 320. Additionally, the SRP-III total score can be decomposed into two reliable factors, reflecting Factor1 and Factor2 of psychopathy, respectively. The reliability for the SRP-III total score and Factors was good (Cronbach's alpha for total score = .847; Cronbach's alpha for Factor1 = .871; Cronbach's alpha for Factor2 = .838).

In the incarcerated sample, psychopathy was measured using the Psychopathy Checklist-Revised (PCL-R; Hare 2003). This measure used information gleaned from a life-history interview and a review of institutional files to score the participant on the presence of 20 different items (e.g., callousness, manipulation, impulsivity). A score of 0, 1, or 2, was given for each item according to the degree to which a characteristic was present. Thus, PCL-R total scores ranged from 0 to 40. Additionally, the PCL-R items can be reliably examined based on factor scores, reflecting interpersonal-affective traits (Factor1) and impulsive-antisocial traits (Factor2). For 15% of the sample, inter-rater reliability for the PCL-R total score and Factors was good (ICC for total score = .809; Cronbach's alpha for Factor1 = .831; Cronbach's alpha for Factor2 = .801).

Anxiety Previous research has shown that individuals with high levels of psychopathic traits can be separated into two subtypes based on levels of anxiety, with primary psychopathy associating with low levels of anxiety and secondary psychopathy associating with high levels of anxiety (Brinkley et al. 2004; Newman et al. 2005). In the community sample, anxiety was measured using the Spielberger State-Trait Anxiety Inventory (Spielberger et al. 1983). This is a 40-item self-report measure that assesses anxiety in terms of state- and trait-based levels of stress. For the present study, the trait-based subscale was used, which included 20 questions rated on a 4-point Likert scale, from 0 to 3 (0 = Almost Never; 1 = Sometimes; 2 = Often; 3 = Almost Always). The reliability for the Trait Anxiety Inventory (TAI) was good (Cronbach's alpha = .943).

In the prison sample, anxiety was measured using the Welsh Anxiety Index (Welsh 1956), a 39-item self-report measure designed to assess anxiety and negative affect. Participants were asked to report whether they experienced different anxiety-related behaviors by responding to each True (1)/False (0) item. Scores were determined by summing all responses, with total scores ranging from 0 to 39. The reliability for the Welsh Anxiety Index (WAI) was good (Cronbach's alpha = .909).

³ In the community and prison samples, the measures of psychopathy and anxiety were different. At each site, a large battery of measures was administered. These batteries were used for a number of different studies and had to be standardized across those studies. Measures selected within each site were based on the goals of the individual studies that that site, the use of certain measures in previous work with similar samples, and the feasibility of administration at the site. The measures used have been shown to tap the same core constructs of interest and the slight variation in measures provided an opportunity to conduct a systematic replication.

Covariates Following the basic mediation models, we conducted robustness analyses. In these analyses we included chronological age, participant identified race, biological sex (community sample only since the incarcerated sample was all biologically male), and childhood maltreatment as measured by the Childhood Trauma Questionnaire-Short Form (CTQ; Bernstein et al. 2003), a 28-item retrospective inventory of maltreatment experiences prior to age 18 (total scores range from 25 to 125), as possible covariates. The reliability for the CTQ was adequate in both the community and prison samples (Cronbach's alpha for community sample = .743; Cronbach's alpha for prison sample = .750).

Data Analysis

We applied a mediation analysis using the PROCESS macros (model 4) for SPSS (Hayes 2018) that allowed us to determine whether the relationship between ETV and violence was indirectly affected by psychopathy and its Factors. This analytic approach provides estimates for the direct relationship between ETV and violent behavior, as well as, whether psychopathy is a link between ETV and violent behavior. For the analysis examining the impact of primary/secondary subtypes of psychopathy on the ETV-violence relationship, a moderated mediation analysis (model 14) was used, where anxiety score moderated the relationship between psychopathy and violence. Conditional effects were estimated at the 16th, 50th, and 84th percentiles of the moderator (anxiety score). This model allowed us to examine whether the indirect effect of psychopathy was stronger for individuals higher or lower on anxiety, essentially modeling the indirect effect at estimates of the primary (higher psychopathy, lower anxiety) and secondary (higher psychopathy, higher anxiety) subtypes. For all analyses, the indirect effect was tested using a bootstrap estimation approach with 5000 samples. Additionally, listwise deletion for each model was used if data were missing (see Tables 1 and 2 for counts).

Though the traditional conceptualization of mediation emphasizes temporal order, there are numerous examples of mediation using cross-sectional designs. These approaches provide an atemporal account of the statistical relationship between variables but are limited in their ability to provide an account for how causality occurs (Winer et al. 2016). Of note, there is reason to believe that ETV establishes an environmental context that shapes learning development. For communities with higher rates of ETV, there often is little upward mobility and opportunities to move out of the community (Sharkey and Sampson 2010). For many people in these communities there is residential stability that spans generations, making it quite likely that people are born into and stay in communities with disproportionate opportunities for ETV. Therefore, the environmental context seems to be established at a very early developmental stage, perhaps even prior to

birth. Additionally, psychopathy is considered a disorder where the evidence for higher scores accumulates across childhood and adulthood. Finally, the violent crime variables used in this study only included adult crimes.

Results

Descriptive Statistics

In the community sample, participants were 155 male (66.81%) and 77 female (33.19%) adults aged 18 to 70 ($M = 40.49$, $SD = 13.79$). The majority of participants self-identified as Black/African American (49.14%) or as White (45.69%), with the remainder of the sample identifying as Asian (3.02%), mixed racial identity (1.72%), or American Indian (0.43%). Almost half of participants in the sample (41.99%) were unemployed, while the remainder were employed either full-time or part-time (39.83%), full-time students (6.93%), retired (1.30%), or on disability (9.95%). Educational attainment was as follows: 51.95% high school diploma, GED, or less; 42.86% some college or bachelor's degree; and 5.19% graduate work or degree. (Note: One participant was missing data for employment status and educational attainment.) Approximately 85% of the sample reported experiencing at least one exposure to violence in their lifetime, 43% of the sample reported experiencing over four (the median) different exposures to violence in their lifetime, and the average age of first exposure was around 12 years old. In this sample, 38.36% of the sample committed a violent crime. Finally, the average psychopathy score was 156.34 ($SD = 28.18$; see Table 1 for sample characteristics and zero-order correlations).

In the incarcerated sample, participants were 313 male offenders from a high-security correctional institution who ranged in age from 19 to 67 ($M = 32.58$, $SD = 10.14$). The majority of participants self-identified as Black/African American (53.35%) or as White (43.13%), with the remainder of the sample identifying as Asian (0.32%), mixed racial identity (0.64%), American Indian (1.92%), or Pacific Islander (0.64%). Educational attainment was as follows: 92.97% high school diploma, GED, or less; 6.39% vocational school, some college or bachelor's degree; and 0.64% graduate work or degree. Approximately 99% of the sample reported experiencing at least one exposure to violence in their lifetime, 49% of the sample reported experiencing over nine (the median) different exposures to violence in their lifetime, and the average age of first exposure was around 6 years old. In this sample, 93.30% of participants had been charged with a violent crime in their lifetime, and on average participants had 5.24 ($SD = 5.35$) violent crime charges. Finally, the average psychopathy score was 23.56 ($SD = 6.60$; see Table 2 for sample characteristics and zero-order correlations).

Table 1 Community sample characteristics and zero-order correlations

Variable	n	Mean	Std. Dev.	Min	Max	Correlations										
						1	2	3	4	5	6	7 [†]	8 [†]	9	10 [†]	
1. ETV Total	232	4.44	3.56	0.00	13.00	—										
2. SRP-III Total	232	156.34	28.18	80.00	234.00	.32**	—									
3. SRP-III Factor 1	232	75.23	14.09	38.00	112.00	.07	.83**	—								
4. SRP-III Factor 2	232	81.11	17.98	34.00	133.00	.44**	.86**	.51**	—							
5. TAI	232	17.78	10.85	0.00	54.00	.10	.34**	.32**	.30**	—						
6. Age	232	40.49	13.79	18.00	70.00	.16*	-.01	-.15*	.13	.01	—					
7. Biological Sex [†]	232			0.00	1.00	-.16*	-.37*	-.32**	-.33**	-.05	-.00	—				
Male	155															
Female	77															
8. Race [†]	232			0.00	1.00	.01	.15*	.14*	.13*	.19**	-.04	-.05	—			
White	106															
Non-white	126															
9. CTQ Total	231	45.45	17.20	25.00	106.00	.19**	.28**	.20**	.28**	.51**	.02	-.05	.07	—		
10. Violent Crime [†]	232	.38	.49	0.00	1.00	.36**	.25**	.05	.34**	.04	.26**	-.24**	-.14*	.08	—	

* $p < .05$; ** $p < .001$

[†] Spearman correlations were used to examine relationships with Biological Sex (dummy-coded, male vs. female); Race (dummy-coded, white vs. non-white); and Violent Crime (dummy-coded, no/yes)

Community Sample: Exposure to Violence, Psychopathy, and Violence

Total Score.⁴ Results indicated that ETV was significantly related to psychopathy (a path = 2.56, SE = 0.49, $p < .0001$) and psychopathy was significantly related to committing a violent crime (b path = 0.01, SE = 0.01, $p = .03$). There was a significant indirect effect of psychopathy on the relationship between ETV and committing a violent crime (indirect effect = 0.03, SE = 0.02, 95% CI = 0.004, 0.07), and ETV remained significantly related to violent crime after psychopathy was accounted for (direct effect = 0.19, SE = 0.04, $p < .0001$).

In order to examine the robustness of the above analyses, we included several covariates. The mediation results largely remained the same after inclusion of sex (indirect effect = 0.02, SE = 0.01, 95% CI = -0.009, 0.05), age (indirect effect = 0.04, SE = 0.02, 95% CI = 0.01, 0.08), race (indirect effect = 0.04, SE = 0.02, 95% CI = 0.01, 0.07), CTQ score (indirect effect = 0.03, SE = 0.01, 95% CI = 0.004, 0.06), or all of these covariates simultaneously (indirect effect = 0.02, SE = 0.01, 95% CI = -0.001, 0.05).

Factor Scores. Results indicated that ETV was significantly related to Factor2 (a path = 2.25, SE = 0.30, $p < .0001$), but not Factor 1 (a path = .30, SE = 0.25, $p = .24$). Factor2, but not

Factor1, was significantly related to committing a violent crime (Factor1 b path = -0.02, SE = 0.13 $p = .07$; Factor2 b path = 0.04, SE = 0.01, $p < .001$). There was a significant indirect effect of Factor2 on the relationship between ETV and committing a violent crime (indirect effect = 0.10, SE = 0.03, 95% CI = 0.047, 0.166), but not of Factor1 (indirect effect = -.01, SE = 0.01, 95% CI = -0.026, 0.005). ETV remained significantly related to violent crime after the psychopathy Factors were accounted for (direct effect = 0.14, SE = 0.05, $p = .03$). The indirect effect of Factor2 remained when considering several covariates (indirect effect with sex = 0.08, SE = 0.03, 95% CI = 0.035, 0.142; indirect effect with age = 0.09, SE = 0.03, 95% CI = 0.041, 0.156; indirect effect with race = 0.11, SE = 0.03, 95% CI = 0.058, 0.182; indirect effect with CTQ = 0.09, SE = 0.03, 95% CI = 0.045, 0.158; indirect effect with all covariates = 0.07, SE = 0.03, 95% CI = 0.028, 0.132).

Primary/Secondary Variants. There was evidence of significant moderated mediation (index = .002, SE = .002, 95% CI = .001, .005). The indirect effect of psychopathy on ETV and violent crime commission was conditional on the level of anxiety, such that as anxiety increased the indirect effect of psychopathy was significant (TAI = 6.08: indirect effect = .025, SE = 0.02, 95% CI = -0.184, 0.074; TAI = 16.00: indirect effect = .039, SE = 0.02, 95% CI = 0.006, 0.083; TAI = 28.00: indirect effect = .057, SE = 0.029, 95% CI = 0.009, 0.121). The indirect effect related to higher psychopathy and higher anxiety (at 28.00) largely remained when considering several covariates (indirect effect with sex = 0.03, SE = 0.02, 95% CI = -0.009, 0.086; indirect effect with age = 0.05, SE =

⁴ Given that we cannot ensure temporal order between ETV and psychopathy, mediation models were conducted using psychopathy as the independent variable and ETV as the mediator. The indirect effect was not significant in this model (indirect effect = 0.01, SE = 0.002, 95% CI = 0.00, 0.011).

Table 2 Prison sample characteristics and zero-order correlations

Variable	n	Mean	Std. Dev.	Min	Max	Correlations									
						1	2	3	4	5	6	7 [†]	8	9	
1. ETV Total	313	8.25	3.33	0.00	13.00	—									
2. PCL-R Total	313	23.56	6.60	5.30	38.00	.47**	—								
3. PCL-R Factor 1	313	8.31	3.39	1.00	16.00	.25**	.81**	—							
4. PCL-R Factor 2	295	12.93	3.83	1.10	20.00	.49**	.84**	.41**	—						
5. WAI	313	12.46	7.89	0.00	38.00	.09	.05	-.05	.16**	—					
6. Age	313	32.58	10.14	19.00	67.00	-.03	.047	.16**	-.10		—				
7. Race [†]	313			0.00	1.00	-.28**	-.12*	-.10	-.05	-.04	-.01	—			
White	135												—		
Non-white	178													—	
8. CTQ Total	313	44.04	16.55	25.00	109.00	.28**	.23**	.10	.27**	.16**	.02	-.03	—		
9. Violent Crime Count	313	5.24	5.35	0.00	34.00	.22**	.24**	.17**	.22**	.09	.22**	-.08	.21**	—	

* $p < .05$; ** $p < .001$

[†] Spearman correlations were used to examine relationships with Race (dummy-coded, white vs. non-white)

0.02, 95% CI = 0.013, 0.137; indirect effect with race = 0.07, SE = 0.03, 95% CI = 0.019, 0.139; indirect effect with CTQ = 0.05, SE = 0.03, 95% CI = 0.009, 0.112; indirect effect with all covariates = 0.03, SE = 0.02, 95% CI = -0.001, 0.094).

Prison Sample: Exposure to Violence, Psychopathy, and Violence

*Total Score.*⁵ Results indicated that ETV was significantly related to psychopathy (a path = 0.93, SE = 0.01, $p < .0001$) and psychopathy was significantly related to the number of violent crime charges (b path = 0.15, SE = 0.05, $p = .004$). The indirect effect of psychopathy on ETV and violent crime charges was a significant (indirect effect = 0.14, SE = 0.05, 95% CI = 0.05, 0.25), and ETV remained significantly related to the number of violent crime charges after psychopathy was accounted for (direct effect = 0.21, SE = 0.10, $p = .034$).

In order to examine the robustness of the above analyses, we included several covariates. The mediation results remained the same after inclusion of age (indirect effect = 0.12, SE = 0.05, 95% CI = 0.04, 0.23), race (indirect effect = 0.13, SE = 0.05, 95% CI = 0.05, 0.24), CTQ score (indirect effect = 0.12, SE = 0.04, 95% CI = 0.04, 0.21), or all of these covariates simultaneously (indirect effect = 0.10, SE = 0.04, 95% CI = 0.03, 0.20).

Factor Scores. Results indicated that ETV was significantly related to Factor1 and Factor2 (Factor 1 a path = .26, SE = 0.06, $p < .0001$; Factor 2 a path = .56, SE = 0.06, $p < .0001$).

Neither Factor1 nor Factor2 were related to the number of violent crime charges (Factor1 b path = 0.11, SE = 0.09, $p = .24$; Factor2 b path = 0.15, SE = 0.09, $p = .11$). There was a significant indirect effect of Factor2 on the relationship between ETV and the number of violent crime charges (indirect effect = 0.10, SE = 0.04, 95% CI = 0.004, 0.169), but not of Factor1 (indirect effect = .03, SE = 0.03, 95% CI = -0.024, 0.095). ETV remained significantly related to the number of violent crime charges after the psychopathy Factors were accounted for (direct effect = 0.24, SE = 0.10, $p = .02$). The indirect effect of Factor2 largely remained when considering several covariates (indirect effect with age = 0.12, SE = 0.04, 95% CI = 0.037, 0.204; indirect effect with race = 0.09, SE = 0.05, 95% CI = -0.002, 0.177; indirect effect with CTQ = 0.06, SE = 0.04, 95% CI = -0.018, 0.150; indirect effect with all covariates = 0.10, SE = 0.05, 95% CI = 0.016, 0.189).

Primary/Secondary Variants. There was evidence of significant moderated mediation (index = .02, SE = .01, 95% CI = .001, .03). The indirect effect of psychopathy on ETV and the number of violent crimes was conditional on the level of anxiety, such that as anxiety increased the indirect effect of psychopathy was significant (WAI = 4.32: indirect effect = .003, SE = 0.07, 95% CI = -0.135, 0.133; WAI = 11.00: indirect effect = .107, SE = 0.04, 95% CI = 0.022, 0.198; WAI = 20.00: indirect effect = .246, SE = 0.09, 95% CI = 0.100, 0.433). The indirect effect related to higher psychopathy and higher anxiety score (at 20.00) remained when considering several covariates (indirect effect with age = 0.23, SE = 0.07, 95% CI = 0.112, 0.392; indirect effect with race = 0.25, SE = 0.08, 95% CI = 0.109, 0.417; indirect effect with CTQ = 0.21, SE = 0.07, 95% CI = 0.096, 0.369; indirect effect with all covariates = 0.21, SE = 0.07, 95% CI = 0.10, 0.361).

⁵ Given that we cannot ensure temporal order between ETV and psychopathy, mediation models were conducted using psychopathy as the independent variable and ETV as the mediator. The indirect effect was not significant in this model (indirect effect = 0.04, SE = 0.02, 95% CI = 0.00, 0.09).

Discussion

A large number of individuals witness or are the victim of acts such as assaults, shootings, and stabbings in their communities. Exposure to these violent crimes increases risk for violence perpetration. However, individual differences, such as personality, play a role in the translation of ETV to violent behavior. In the present study, we found that, in two independent samples, psychopathy had an indirect effect on the relationships between ETV and violence. Moreover, this effect was stronger for the impulsive-antisocial traits of psychopathy and the secondary subtype of psychopathy. These results were robust against demographic features (i.e., sex, age, race) and other early environmental experiences (i.e., childhood maltreatment). These findings emphasize the importance of examining environmental experiences *and* personality factors when considering what promotes engagement in violent behavior.

The results of the current study reinforce a wealth of empirical literature that demonstrates the crucial role that one's environment plays in shaping engagement in violent behavior (e.g., direct effects in the present study; Baskin and Sommers 2014; Durant et al. 1994; Gaylord-Harden et al. 2011; Hawkins et al. 2000; Mulford et al. 2018; Spano et al. 2006). Despite this clear link, personality traits, such as psychopathy, affect the relationship between ETV and violent behavior. Psychopathy may influence the way that environmental information is interpreted and used to guide future behavior (Baskin-Sommers and Baskin 2016; Blair and Mitchell 2009; Walters and DeLisi 2015). Broadly speaking, psychopathy is associated with difficulties processing and integrating contextual information, such as emotion-laden information, and using that information to inform behavior (Baskin-Sommers and Newman 2012; Baskin-Sommers et al. 2016; Levenston et al. 2000). This failure to fully integrate contextual information may lead to a fractionated view of information that minimizes the emotional impact and consequences of a situation, and results in a normalized view of violence (Porter and Woodworth 2006) and callous use of violence to quickly obtain goals (Flight and Forth 2007; Glenn and Raine 2009). Thus, it is likely that to completely understand why some people engage in violent behavior, it is necessary to consider how personality impacts the way environmental information is viewed and interpreted and how this promotes violent behavior.

As an example of specifying the types of personality traits that affect the connection between ETV and violent behavior, both the impulsive-antisocial traits and secondary psychopathy subtype appear to more strongly impact the ETV-violent crime relationship than the interpersonal-affective traits and primary psychopathy subtype. Impulsive-antisocial traits and secondary psychopathy are related to affective dysregulation and difficulty engaging in controlled behavior (Newman et al.

2005; Patrick 2007). Individuals with these traits and subtype display the behavioral characteristics typically associated with psychopathy, but these individuals do not seem limited in their arousal response to emotional experiences. While the primary traits and subtype are associated with a genetic predisposition to low affective arousal, reduced empathy, and concern for others, the secondary traits and subtype reflect the influence of alternative mechanistic processes, such as highly atypical early environments, and is accompanied by excessive emotionality. It is theorized that in constant adaptation to maximize control and survival in a dangerous environment, behavioral responses become unpredictable and under-controlled in the face of emotionally arousing stimuli and situations (Glenn et al. 2011; Kimonis et al. 2012). In the context of violence, individuals higher on impulsive-antisocial traits and secondary psychopathy may have difficulty managing arousal in response to observing violence and processing inhibitory inputs, such as pain (Garfinkel and Critchley 2016), resulting in hyper-awareness of threatening information, the failure to mitigate the consequence of that information, and increased violence perpetration. In general, increased arousal and poor regulation associated with these traits and subtype of psychopathy may be important features through which environmental experiences result in disruptive behavior.

Before concluding, several limitations should be noted. First, due to the nature of data collection, we were unable to establish the temporal order of ETV, psychopathy, and engagement in violent behavior. However, the average age of first exposure to a violent event was around 12 years old in the community sample and around 6 years old in the incarcerated sample, both of which are before the age of evaluation for psychopathy using the SRP-III and PCL-R. Additionally, when mediation models were conducted using psychopathy as the independent variable and ETV as the mediator, the results did not consistently demonstrate mediation (but see Howard et al. 2012). Thus, though our findings suggest that ETV may precede psychopathy, limitations in our cross-sectional design and use of retrospective self-report measures (Naicker et al. 2017) result in an inability to establish causality. Second, the use of a cross-sectional design limited our ability to understand how changes in ETV, psychopathy, and violent behavior over time alter the nature of the relationships among these three factors. Membership in trajectories of ETV (Baskin and Sommers 2014) and psychopathy (Fontaine et al. 2010) that decreased from adolescence to early adulthood were associated with enhanced functioning compared to those on trajectories that increased or stayed high over time. Given the impact of changes in ETV and psychopathy over time, one's trajectory of ETV and psychopathy may relate in unique ways that alter engagement in violent behavior across the lifespan. To address both of these limitations, future work should use longitudinal designs to examine the relationships among ETV, psychopathy, and violence. Third, different

measures of psychopathy, and anxiety, were used across the two samples. Though these measures were well-validated tools for assessment of these constructs in the community and prison settings, respectively, and provide an opportunity for systematic replication, the use of different measures precludes direct comparison of the effects across samples. Lastly, there is evidence that psychopathy in women is expressed in different ways than men (Sprague et al. 2012) and that women compared to men with psychopathy are exposed to higher rates of sexual violence (Colins et al. 2017). Future research would benefit from examining the effects of gender or subtypes of trauma, beyond just ETV, on the relationship between psychopathy and violent behavior.

In conclusion, the present study adds to a growing body of literature that reinforces the need for comprehensive consideration of the multiple factors that result in violent behavior. Both environment and personality play a role in the translation of violence exposure to violent behavior. Future work is needed to specify the precise mechanisms through which ETV and psychopathy synergize to promote this type of behavior. Based on the findings related to the impulsive-antisocial traits of psychopathy and the secondary subtype of psychopathy, a focus on affective arousal and poor behavioral control may be candidate features that are important to consider as cognitive-affective mechanisms promoting violence perpetration. Ultimately, understanding how one's environmental context is processed in light of their personality is important for conceptualizing the roots of their behavior.

Compliance with Ethical Standards

Conflict of Interest Suzanne Estrada declares that she has no conflict of interest.

Michelle Cinguina declares that she has no conflict of interest.

Arielle Baskin-Sommers declares that she has no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee, Yale University Institutional Review Board, and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Experiment Participants Informed consent was obtained from all individual participants included in the study.

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