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Predicting Antisocial Personality Features among Justice-Involved Males and Females: The Effects of Violence Exposure in Childhood and Adolescence

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Abstract: The high rate of antisocial personality disorder (ASPD) among individuals involved in the justice system represents a significant public health concern, as individuals with ASPD are more likely to reoffend after incarceration and to engage in longer-term offending behavior patterns over the lifespan. Research suggests that traumatic event exposure in childhood and adolescence may be one factor that contributes to the heightened risk for ASPD in adulthood, though findings are mixed depending on the operationalization of trauma exposure and demographics of study samples. The present study examined the impact of early and varied exposure to violence on the development of ASPD features in young adulthood. In addition, given evidence for gender differences in how youth respond to trauma, as well as disparate prevalence rates of ASPD among males and females, a secondary aim was to assess the impact of gender on the relationship between early trauma and antisocial personality outcomes. The study sample consisted of 1354 adolescents (86% male) who participated in a longitudinal research study of serious juvenile offenders. A series of linear regression analyses revealed that the magnitude of violence exposure participants endorsed at baseline significantly predicted antisocial personality features at six-year follow-up. Participants' gender was not found to moderate the relationship between violence exposure and antisocial outcomes. Results suggest that targeting maladaptive cognitions and behaviors resulting from chronic exposure to early trauma may be a crucial component of treatment for justice-involved individuals exhibiting ASPD features.

Keywords: antisocial personality; violence exposure; juvenile justice; gender differences; trauma

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1. Introduction

Antisocial personality features refer to patterns of thinking, feeling, and behaving that are characterized by a lack of social responsibility and disregard for others [1]. There are multiple diagnoses that may be applied to individuals who display antisocial personality features, but the majority of research has focused on antisocial personality disorder (ASPD) as defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) [2]. Individuals can only be diagnosed with ASPD in adulthood, although features of the diagnosis can be present during childhood and adolescence. The diagnosis is characterized primarily by a tendency to engage in reckless, aggressive, impulsive, or deceitful actions, as well as consistent irresponsibility.

The prevalence of ASPD is far higher among individuals involved with the justice system than among those in the general population [2–7]. Some studies estimate that up to half of incarcerated adults meet criteria for ASPD, whereas lifetime prevalence ranges from 3% to 5% in the community [4,6]. Rotter and colleagues [5] found that ASPD prevalence among justice-involved adults may reach as high as 78%. An ASPD diagnosis is associated with a higher likelihood of justice system involvement, in addition to greater risk of reoffending after incarceration and of engaging in long-term patterns of offending [8].

For example, McCabe et al. [9] found that men in the community with ASPD were 2 to 5 times more likely to engage in serious violent or nonviolent crimes compared to those without ASPD. The diagnosis is also associated with significant psychiatric comorbidity, substance abuse, and psychological distress [10].

It is important to note the limitations of DSM-5 diagnostic criteria for ASPD, which overlap significantly with system-involvement, thus inflating rates of ASPD among incarcerated populations. For example, Criterion A1, defined as "failure to conform to social norms with respect to lawful behavior", [2] (p. 659) refers directly to contact with the criminal justice system. Other ASPD symptoms are problematic in that rather than reflecting features of personality, they may better capture social context. For example, aspects of prison adjustment and difficulties with reintegration are represented in the ASPD criteria, including irritability, lack of remorse, and failure to sustain consistent work [6,11,12]. To this end, Schnittker et al. [6] suggested that ASPD prevalence estimates are highly sensitive to DSM-5 criteria. The authors found that by eliminating only Criterion A1, ASPD prevalence was reduced by more than 50% among formerly incarcerated adults.

Limitations notwithstanding, determining the factors that contribute to the development of antisocial personality features and/or ASPD diagnoses may be a crucial step to mitigating the individual and public health consequences that the disorder carries.

1.1. Developmental Risk for Antisocial Personality Outcomes

According to a meta-analytic review of 38 studies examining genetic contributions to antisocial behavior, ASPD is approximately 50% heritable [13], leaving significant variance to be accounted for by environmental and social factors. An individual's family environment (e.g., parental rearing practices and level of parental supervision) has been shown to contribute to the development of ASPD, with studies indicating that lower levels of parental involvement/supervision are associated with greater ASPD characteristics in adolescence and young adulthood [14,15]. Neighborhood conditions such as high unemployment and instability (e.g., number of vacant households) have also been shown to predict antisocial behavior and ASPD symptoms in late adolescence [16,17]. Finally, researchers have found that adolescents who report early exposure to trauma (e.g., directly experienced or witnessed physical or sexual violence prior to age 16) may be at increased risk for ASPD in young adulthood [18]. Taken together, the extant literature suggests that certain developmental risk factors may be implicated in ASPD.

1.2. Traumatic Event Exposure among Justice-Involved Adolescents

Adolescents involved with the juvenile justice system (ages 10 to 18) report high rates of exposure to varied traumatic events, with 90% or more of justice-involved samples reporting exposure to at least one traumatic event in their lifetime [19–24]. In contrast, one study found that 67.8% of adolescents in the community reported exposure to at least one traumatic event [25]. Across studies, adolescents report exposure to multiple different types of traumatic events [19,21]. In one nationwide study using data from the National Child Traumatic Stress Network, justice-involved adolescents endorsed an average of 4.9 different trauma types (SD = 2.9) [21]. Researchers have also found gender differences in traumatic event exposure among justice-involved adolescents, with more boys reporting exposure to community violence and more girls endorsing exposure to interpersonal victimization [19]. Further, a dose–response relationship has been established, such that a higher total count of traumatic event exposures increases the odds of negative justice-related outcomes (e.g., arrest, incarceration, recidivism) [26–30].

1.3. Effects of Traumatic Event Exposure

Early exposure to traumatic events has been found to have a deleterious impact on brain development, leading to adverse effects on cognitive, emotional, and behavioral functioning [31,32]. Such consequences, also referred to as trauma reactions (TRs), include dysregulation in thoughts, mood, and behavior such as impaired impulse control, negative affectivity, low perceived control, self-destructiveness, impaired risk-recognition, and challenges with self-protection capacities [32–35]. These TRs have been linked to self-regulation deficits, increasing the risk of maladaptive behaviors commonly observed among justice-involved adolescents, such as substance use and aggression [33,34,36–40]. Therefore, following traumatic event exposure, adolescents may begin to engage in patterns of risk-seeking, impulsivity, and delinquent behaviors, all of which are necessary prerequisites for the diagnosis of ASPD in adulthood [2].

1.4. Traumatic Event Exposure and Antisocial Personality Features

Findings have been mixed regarding the effects of exposure to traumatic events in childhood and adolescence on the development of antisocial personality traits in adulthood. For example, among 863 adult offenders, DeLisi, Drury, and Elbert [41] found that the number of adverse childhood experiences (i.e., traumatic events, as well as less severe adversities, including parental divorce/separation) individuals reported being exposed to was predictive of an adulthood ASPD diagnosis, but not of greater ASPD symptoms. Among 320, mostly male (82.5%) offenders, Guntner and colleagues [42] found that participants with a history of traumatic event exposures (coded dichotomously) were more likely to meet criteria for ASPD than those with no reported trauma history. By contrast, Zlotnick [43] found that a history of childhood physical and/or sexual abuse was *not* associated with an increased likelihood of having an ASPD diagnosis within a sample of 85 incarcerated women. Such findings indicate the need for further research to elucidate the nature of the relationship between traumatic event exposure in childhood and adolescence and antisocial personality outcomes in adulthood. In addition, the extant research suggests a possible differential impact of traumatic event exposure on antisocial personality outcomes depending on an individual's gender.

1.5. Gender Differences in Response to Trauma

There is evidence to suggest that males and females (and, in particular, justice-involved adolescents) tend to react differently in the aftermath of traumatic event exposure [22]. Research indicates that girls demonstrate higher levels of TRs overall compared to boys [44], though there are conflicting findings regarding gender differences in specific types of TRs that might show greater linkage to antisocial personality outcomes, such as post-traumatic risk-seeking behaviors [45,46]. For example, Modrowski and Kerig [46] found that female gender was associated with heightened posttraumatic risk-seeking behavior among justice-involved adolescents, while Bennett and colleagues [47], found that girls experienced greater trauma-related internalizing symptoms (e.g., depression and anxiety) and boys experienced more externalizing symptoms secondary to trauma (e.g., anger and irritability). Though the nature of the differences is unclear, there is consistent evidence that developmental differences exist in how males and females respond to trauma.

1.6. Gender Differences in Antisocial Personality Outcomes

Many studies have also demonstrated gender differences in the prevalence rates of ASPD diagnoses and symptoms, both in the general and justice-involved populations [48,49]. For example, approximately 50% of incarcerated men versus 20% of incarcerated women are estimated to have an ASPD diagnosis [3]. Differences in the developmental pathways to ASPD may also differ by gender. In one study comparing 323 individuals (253 men, 70 women) with an ASPD diagnosis, Sher and colleagues [50] found that women with ASPD had a significantly greater history of childhood trauma exposure (i.e., more varied types of exposures) compared to males, suggesting that repeated trauma exposure may play a more influential role in the development of ASPD for women than for men. Other studies provide little support for the role of trauma exposure in antisocial personality outcomes among females [43] compared to males [42]. However, given the developmental differences in how males and females respond to trauma, additional research is needed to examine whether the effects of early traumatic event exposure on antisocial personality outcomes differ by gender.

1.7. The Current Study

The aim of the present study was to assess the impact of early and varied exposure to traumatic events, specifically violence exposure, on antisocial personality outcomes in young adulthood among individuals involved in the justice system. As an exploratory aim, we sought to determine whether the effects of trauma exposure on antisocial outcomes varied depending on participants' gender. To accurately approximate the independent effect of violence exposure on antisocial personality outcomes, variables significantly associated with antisocial outcomes (e.g., parental supervision, neighborhood characteristics, and early onset behavioral problems) [15], were controlled for in the analyses. Given the near ubiquitous experience of traumatic event exposure among justice-involved adolescents [19], the magnitude of traumatic events reported, rather than the presence or absence of prior trauma, was examined. It was hypothesized that a greater number of traumatic event exposures in childhood/adolescence would predict heightened antisocial personality characteristics in young adulthood, independent of the effects of covariates. Given the lack of prior research on gender differences in the relationship between early exposure to trauma and antisocial personality outcomes, there was no specific directional hypothesis regarding the differential impact of trauma exposure on antisocial personality features in males versus females.

2. Methods

2.1. Study Design

In the present study, data were derived from the Pathways to Desistance project ("Pathways"), a seven-year, multi-site longitudinal study of juvenile offenders [51]. Participants (N = 1354) were between the ages of 14 and 17 when their offense was committed and had been adjudicated delinquent or found guilty of a serious offense (primarily felonies) in Philadelphia, PA (N = 700) or Phoenix, AZ (N = 654). All youth provided informed assent or consent. Parent or guardian consent was obtained for all youth under the age of 18 at the time of enrollment. Data were collected between the years 2000 and 2010 and primarily consisted of self-report measures completed by youth in a number of settings (e.g., juvenile detention facilities, participants' homes, libraries). Participants were interviewed every six months for the first three years of the study post-baseline and then annually for the final four years of the study [52]. In the present study, only baseline interview data and six-year follow-up data were utilized. This decision was made because antisocial features were only assessed at the six-year follow-up.

2.2. Participants

At baseline, participants ranged in age from 14 to 17 (M = 15.87, SD = 1.02). Males accounted for 86.45% (n = 1170) of the sample, and females accounted for 13.6% (n = 184). The sample was racially and ethnically diverse, with participants identifying as African American (n = 561, 41.4%), Hispanic/Latinx (n = 454, 33.5%), non-Hispanic White (n = 274, 20.2%), and "other" (n = 65, 4.8%). All participants who had valid outcome data on the antisocial personality features measures (n = 1196; 88.3%) were included in the present analyses. This included 1022 males (85.5%) and 175 (14.5%) females.

2.3. Measures

2.3.1. Violence Exposure

A modified version of the Exposure to Violence Inventory (ETV) [53] was administered at baseline in the Pathways study and was used to account for participants' exposure to traumatic events throughout childhood and adolescence. The scale contains 13 items prompting the respondent to answer "yes" (a score of 1) or "no" (0) as to whether they have ever directly experienced six types of violent events (e.g., "Have you ever been chased when you thought you might be seriously hurt?") or witnessed seven types of violence (e.g., "Have you ever seen someone else being raped, an attempt made to rape someone or any other type of sexual attack?"). The total scale score (range = 0 to 13) was used in the present study, with higher scores indicating exposure to a wider array of violent events. The original ETV has demonstrated excellent test–retest reliability (rs = 0.75 to 0.94) among a sample of 80 children and young adults (ages 9 through 24) [53]. Internal consistency information for the ETV victimization, witnessing, and total scales was not made available by the Pathways authors [54].

2.3.2. Antisocial Features

The 24 items that make up the Antisocial Features (ANT) scale of the Personality Assessment Inventory (PAI) [55] were administered at the six-year follow-up interview in the Pathways study, when participants were between the ages of 20 to 25 (M = 22.03, SD = 1.15). The ANT total scale consists of three subscales including the egocentricity (ANT-E) subscale, the stimulus-seeking (ANT-S) subscale, and the antisocial behaviors (ANT-A) subscale. Each subscale is made up of eight items answered on a 4-point Likert scale with answers indicating whether the statement is "false, not at all true" (0), "slightly true" (1), "mainly true" (2), or "very true" (3), and higher scores on each scale representing greater antisocial features. Items on the egocentricity subscale are meant to tap into an individual's sense of empathy and regard for others and society as a whole (e.g., "I will take advantage of others if they leave themselves open to it"). The stimulus-seeking subscale is designed to assess an individual's level of impulsivity, tendency to seek excitement, and proclivity for reckless activities (e.g., "I do a lot of wild things just for the thrill of it"). The antisocial behaviors subscale assesses an individual's history of rule- or law-breaking actions (e.g., "I've deliberately damaged someone's property;") [55].

The total antisocial features scale score is calculated by summing the raw subscale scores and then converting the raw total score to a T-score. The T-score represents a linear transformation of the raw score such that the mean scale score is 50 with a standard deviation of 10. Scores above 59T signify a clinically significant elevation (i.e., one standard deviation above the mean). While average scores (59T or below) reflect an individual with relatively intact impulse control and an average amount of warmth and empathy in their relationships, scores above 59T represent someone who is impulsive or a risk-taker, who may be self-centered, skeptical of others' intentions, and unsympathetic in interpersonal relationships.

Using a census-matched sample (n = 1000) to calculate reliability and validity estimates for each of the PAI scales, Morey [55] reported internal consistency coefficients (Cronbach's alpha) for each of the three antisocial features subscales including 0.63 for the ANT-E scale, 0.69 for the ANT-S scale, and 0.73 for the ANT-A scale. Internal consistency measures of the ANT scales were not reported by the Pathways authors and were unable to be calculated in the present study given the absence of item-level data for each participant.

Concerning validity, Morey [55] found that the PAI ANT scale was significantly correlated with the Minnesota Multiphasic Personality Inventory, Second Edition (MMPI-2) [56] antisocial scale (r = 0.77), as were the ANT-E (r = 0.63), ANT-S (r = 0.57) and ANT-A subscales (r = 0.77). The psychometric properties of the ANT scale appear to be particularly robust among justice-involved populations. In a meta-analytic review, Gardner and colleagues [57] found that ANT scores were significant predictors of multiple forms of antisocial behavior among justice-involved participants, including institutional misconduct (d = 0.44), recidivism (d = 0.33), and violent behavior (d = 0.29).

2.3.3. Early Onset Behavioral Problems

A count score indicating the number of childhood behavior problems participants endorsed at baseline was used to account for the potential influence of early conduct issues on later development of antisocial personality features [54]. Participants were asked five yes/no questions indicating whether they had ever been in trouble for various disruptive behaviors before the age of 11 (i.e., fighting, cheating, disturbing the class, stealing, being "drunk/stoned"), with possible scores ranging from 0 to 5 [54]. Internal consistency for the 5-item scale was 0.56. The majority of participants (75.8%; n = 1026) endorsed at least one early behavior problem, with an average of 1.52 (SD = 1.19) early problems reported.

2.3.4. Neighborhood Conditions

The Neighborhood Conditions Measure was adapted specifically for the Pathways study and was used to account for the influence of participants' environmental conditions [54]. The Neighborhood Conditions Measure and consists of 21 self-report items designed to assess for social and physical disorder within youth's home neighborhood (if youth were detained at the time of administration, they were prompted to answer the questions in reference to the neighborhood they lived in prior to detention). Questions were rated on a 4-point Likert scale ranging from 1 = *never* to 4 = *often*, which indicated the frequency that youth were exposed to certain conditions in their neighborhood (e.g., "graffiti or tags," or "people using needles or syringes to take drugs"). Internal consistency at baseline for the total score was high (α = 0.94).

2.3.5. Parental Monitoring

Parental monitoring (i.e., the extent to which primary caregivers are aware of and set limits on youth's behavior) was assessed with an adapted version of the Parental Monitoring Inventory [58]. Four items of the total scale identify the level of supervision that youth receive from their primary caretaker (e.g., "How often do you have a set time to be home on weekend nights?"). Questions are answered on a 4-point Likert scale ranging from 1 = *never* to 4 = *always*. The internal consistency was found to be moderate (α = 0.73) at baseline [54,59]. The Pathways data included each participant's mean score for the 4-item measure. The average parental monitoring score was 2.80 (SD = 0.86), indicating that youth received a moderate level of supervision on average.

2.3.6. Procedures and Data Analyses

Data were downloaded from the ICPSR website [54] and saved in SPSS, Version 25 (IBM Corp.; Armonk, NY, USA) [60]. Four multiple linear regression models were estimated to examine the effect of baseline violence exposure on antisocial outcomes at six-year follow-up. In each model, the predictors remained the same and included baseline violence exposure as well as baseline "controls" or covariates (i.e., gender, early behavior problems, neighborhood conditions, parental monitoring). The only difference between models was the outcome variable, which included the antisocial features total T-score (Model 1), the egocentricity subscale (Model 2), stimulus-seeking subscale (Model 3), and antisocial behaviors subscale raw scores (Model 4). We used the PROCESS macro [61] to examine whether participants' gender moderated the effects of violence exposure on each of the four antisocial features outcomes. Regardless of whether interaction effects were found to be significant, results of the moderation analyses were probed to examine the effect of violence exposure on antisocial outcomes at differing levels of the moderator (i.e., among males compared to females). For all statistical tests, significance criteria were set to $p < 0.05$. Tests for effect sizes were also conducted when appropriate. Due to unequal sample sizes between males and females, Hedges' g was calculated for the t-tests. For the multiple linear regression models, the standardized (B) and unstandardized (b) coefficients, in addition to variance (R^2), were evaluated to determine magnitude of the effects.

3. Results

Prior to conducting analyses, the continuous variables were assessed for normality of distribution through histograms and Q-Q plots. Deviation from normality was assessed using standard guidelines for skewness and kurtosis. All variables followed a normal distribution and had skewness and kurtosis < 2. Therefore, all variables were appropriate for inclusion in the analyses.

The antisocial features total scale and subscale scores are reported in Table 1 along with comparisons by participants' gender. The average T-score for the antisocial features total scale was 60.93 (*SD* = 11.28), indicating that the average score within the sample was clinically elevated (i.e., above 59T). Males scored significantly higher on the total antisocial features scale ($M = 61.68$, $SD = 11.20$) compared to females ($M = 56.48$, $SD = 10.71$), $t_{(1, 1194)} = 32.53$, $p < 0.001$, $g = 0.47$. Similarly, males reported significantly more antisocial features on the egocentricity, stimulus-seeking, and antisocial behaviors subscales when compared to females, *g*s = 0.19 to 0.51 (see Table 1).

Table 1. Antisocial Personality Disorder Features by Gender.

Outcome	Total ($n = 1196$) *M* (*SD*)	Male ($n = 1022$) *M* (*SD*)	Female ($n = 174$) *M* (*SD*)	*t*	*p*	*g*
ANT Total	60.93 (11.28)	61.68 (11.20)	56.48 (10.71)	32.53	<0.001	0.47
ANT-E	3.81 (3.58)	3.91 (3.57)	3.22 (3.61)	5.61	0.010	0.19
ANT-S	7.45 (4.44)	7.78 (4.43)	5.54 (4.04)	38.10	<0.001	0.51
ANT-A	11.84 (4.01)	12.10 (3.97)	10.30 (3.91)	30.90	<0.001	0.45

Note: ANT = antisocial features scale (T-score), ANT-E = egocentricity subscale (raw score), ANT-S = stimulus-seeking subscale (raw score), ANT-A = antisocial behaviors subscale (raw score).

At baseline assessment, participants reported exposure to approximately five types of traumatic events throughout their lifetime ($M = 5.34$, $SD = 2.99$). On average, males reported a greater number of traumatic event exposures ($M = 5.49$, $SD = 2.99$) than females ($M = 4.40$, $SD = 2.87$), $p < 0.001$, $g = 0.53$.

Correlations between continuous variables were calculated to determine the bivariate relationship between violence exposure and each of the antisocial features outcomes as well as to determine whether proposed covariates were significantly correlated with antisocial outcomes and should thus be retained in the final regression models. As seen in Table 2, violence exposure was significantly correlated with all antisocial scale outcomes (*r*s = 0.16 to 0.29, *p*s < 0.01), indicating a positive linear relationship between greater exposure to violence in childhood/adolescence and greater antisocial features in young adulthood. Early behavior problems and neighborhood conditions were each positively correlated with antisocial outcomes as well. As expected, parental monitoring was negatively correlated with antisocial outcomes, indicating that greater parental supervision was associated with fewer antisocial features in young adulthood.

Table 2. Correlations Between Continuous Variables.

Measure	1	2	3	4	5
1. Violence Exposure	-				
2. ANT Total	0.26 *	-			
3. ANT-E	0.16 *	0.85 *	-		
4. ANT-S	0.21 *	0.89 *	0.68 *	-	
5. ANT-A	0.29 *	0.82 *	0.54 *	0.58 *	-
6. Early Behavior Problems	0.30 *	0.25 *	0.15 *	0.20 *	0.28 *
7. Neighborhood Conditions	0.31 *	0.09 *	0.10 *	0.07 *	0.08 *
8. Parental Monitoring	−0.25 *	−0.16*	−0.12 *	−0.13 *	−0.16 *

Note: ANT = antisocial features scale (t-score), ANT-E = egocentricity subscale (raw score), ANT-S = stimulus-seeking subscale (raw score), ANT-A = antisocial behaviors subscale (raw score). * $p < 0.01$

3.1. Overall Effect of Violence Exposure on Antisocial Features

In each of the four linear regression models, violence exposure was a significant predictor of antisocial features, even after controlling for the proposed covariates (see Table 3). The effect of violence exposure on the total antisocial features T-score was 0.70 ($p < 0.001$), indicating that with each additional exposure to violence in childhood/adolescence, participants' antisocial T-scores were expected to increase by 0.70 points. The effects of violence exposure were notably smaller on the antisocial features subscale scores (b = 0.14 to 0.29). This difference was likely a result of the fact that the subscales were recorded as raw scores, with much less variability (i.e., ranges from 0 to 24) than the T-score total (range = 33 to 97). As such, smaller effects were to be expected.

Table 3. Multiple Linear Regression Models Estimating the Effect of Violence Exposure on Antisocial Features.

Predictor	*b*	*SE*	*B*	*t*	*p*
			Model 1: Violence Exposure → ANT Total		
Violence Exposure	0.70	0.13	0.18	5.60	<0.001
Gender (Male vs. Female)	−3.05	0.95	−0.10	−3.20	0.001
Early Behavior Problems	1.61	0.30	0.17	5.40	<0.001
Neighborhood Conditions	−0.14	0.48	−0.01	−0.30	0.768
Parental Monitoring	−1.11	0.40	−0.08	−2.77	0.006
			Model 2: Violence Exposure → ANT-E		
Violence Exposure	0.14	0.04	0.12	3.51	<0.001
Gender (Male vs. Female)	−0.15	0.31	−0.02	−0.48	0.629
Early Behavior Problems	0.31	0.10	0.10	3.18	0.001
Neighborhood Conditions	0.13	0.16	0.03	0.85	0.395
Parental Monitoring	−0.32	0.13	−0.08	−2.45	0.014
			Model 3: Violence Exposure → ANT-S		
Violence Exposure	0.21	0.05	0.14	4.09	<0.001
Gender (Male vs. Female)	−1.56	0.38	−0.12	−4.08	<0.001
Early Behavior Problems	0.49	0.12	0.13	4.06	<0.001
Neighborhood Conditions	−0.08	0.19	−0.01	−0.42	0.673
Parental Monitoring	−0.34	0.16	−0.07	−2.13	0.034
			Model 4: Violence Exposure → ANT-A		
Violence Exposure	0.29	0.04	0.21	5.70	<0.001
Gender (Male vs. Female)	−1.05	0.33	−0.09	−3.18	0.001
Early Behavior Problems	0.70	0.10	0.20	6.49	<0.001
Neighborhood Conditions	−0.20	0.17	−0.04	−1.18	0.239
Parental Monitoring	−0.34	0.14	−0.07	2.47	0.014

Note: b = unstandardized effects, B = standardized effects, ANT = antisocial features scale (t-score), ANT-E = egocentricity subscale (raw score), ANT-S = stimulus-seeking subscale (raw score), ANT-A = antisocial behaviors subscale (raw score).

In Model 1, the included predictors accounted for approximately 12% of the variance in participants' antisocial features total T-scores (see Model 1 in Table 3), $R^2 = 0.12$, $F(5, 1048) = 27.87$, $p < 0.001$. Model 2 accounted for only about 5% of the variance in egocentricity outcomes, $R^2 = 0.05$, $F(5, 1048) = 10.86$, $p < 0.001$, while Model 3 accounted for roughly 8% of the variance in antisocial stimulus-seeking raw scores, $R^2 = 0.08$, $F(5, 1048) = 18.43$, $p < 0.001$. Finally, the included predictors accounted for approximately 14% of the variance in the antisocial behaviors subscale raw score, $R^2 = 0.14$, $F(5, 1048) = 13.74$, $p < 0.001$.

3.2. Effect of Violence Exposure on ASPD Features by Gender

Next, a series of linear regression models in which the interaction of violence exposure at baseline and participants' gender on antisocial features at six-year follow-up were tested. In each of the four moderation models, there was no evidence to support gender as a moderator of the violence exposure/antisocial features relationship. In Table 4, the relationship between violence exposure and antisocial features is shown for males as well as females, and the interaction effects (i.e., the test of moderation) for violence exposure by gender are presented. Interestingly, the effect of violence exposure on antisocial features was quite different among males versus females in each of the four models. For example, the effect of violence exposure on egocentricity scores (see Table 4, Model 2) was 0.20 ($p < 0.001$) for males, while the effect was 0.11 ($p = 0.227$) for females. Though the effect was significant in males and not females, the interaction effect remained nonsignificant ($b = -0.09$, $p = 0.391$), providing no evidence for moderation.

Table 4. Effect of Violence Exposure on Antisocial Features for Males and Females and Interactions between Gender and Violence Exposure.

	b	*SE*	95% CI	*p*
	Model 1: Violence Exposure → ANT Total			
Males	0.97	0.11	0.75, 1.19	<0.001
Females	0.57	0.29	0.01, 1.14	0.045
Violence exposure × gender	−0.40	0.31	−1.00, 0.21	0.196
	Model 2: Violence Exposure → ANT-E			
Males	0.20	0.04	0.13, 0.27	<0.001
Females	0.11	0.09	−0.07, 0.30	0.227
Violence exposure × gender	−0.09	0.10	−0.28, 0.11	0.391
	Model 3: Violence Exposure → ANT-S			
Males	0.30	0.05	0.22, 0.39	<0.001
Females	0.12	0.11	−0.11, 0.34	0.300
Violence exposure × gender	−0.19	0.12	−0.43, 0.06	0.131
	Model 4: Violence Exposure → ANT-A			
Males	0.38	0.04	0.31, 0.46	<0.001
Females	0.29	0.19	0.09, 0.49	0.004
Violence exposure × gender	−0.09	0.11	−0.30, 0.12	0.404

Note: ANT = antisocial features scale (T-score), ANT-E = egocentricity subscale (raw score), ANT-S = stimulus-seeking subscale (raw score), ANT-A = antisocial behaviors subscale (raw score), Violence exposure × gender = interaction effect between violence exposure and gender.

4. Discussion

Prevalence rates of traumatic event exposure [19] and ASPD [5] are disproportionately higher among individuals involved in the justice system than those in in the community. Research consistently demonstrates that childhood trauma is a risk factor for antisocial and violent behavior in adulthood [62,63]; however, extant research investigating the relationship between early traumatic event exposure and antisocial personality features among individuals in the justice system has resulted in varied findings [41,43]. As such, we sought to examine the impact of early violence exposure on antisocial personality features in justice-involved young adults. It was hypothesized that a greater number of childhood/adolescent traumatic event exposures would predict increased antisocial personality characteristics. Given the evidence for disparate trauma-related sequelae in males versus females involved in the justice system [22], it was further examined whether the effect of traumatic events in childhood/adolescence on antisocial personality outcomes in young adulthood would vary by gender.

As hypothesized, exposure to violence significantly predicted all antisocial personality outcomes, including the antisocial features total score as well as individual facets of antisocial personality (i.e., egocentricity, stimulus-seeking, and antisocial behaviors). The magnitude of violence exposure was independently associated with all antisocial personality outcomes, even after accounting for known risk factors for ASPD such as neighborhood disorganization, early onset behavioral problems, biological gender, and parental monitoring. These results explicate the unique role of exposure to lifetime trauma on the development of antisocial personality characteristics, above and beyond dispositional and environmental covariates.

Consistent with DeLisi and colleagues [41], who found that trauma exposure in childhood (specifically adverse childhood experiences; ACEs) predicted an adulthood ASPD diagnosis, the current study provides additional support for the longitudinal effects of trauma on the development of antisocial personality. While past research [41,43] used exposure to trauma and ASPD diagnosis as dichotomous variables (yes/no), the present study utilized continuous variables to assess the effect of trauma exposure (number of traumatic events experiences) on antisocial personality features. Thus, the present analyses allowed for increased sensitivity in the detection of the relationship between traumatic event exposure and antisocial personality outcomes.

This is the first known study to evaluate the differential predictive effects of trauma exposure on the three antisocial features subscales among justice-involved individuals. The findings suggest that not only does lifetime traumatic event exposure predict antisocial personality in young adulthood, but these effects are both cognitive (i.e., egocentricity) and behavioral (i.e., stimulus-seeking) in nature. It has been established that early exposure to trauma increases posttraumatic risk-seeing behaviors associated with aggression, antisocial personality and conduct disorders [32,39,64]. These findings warrant additional research to elucidate the cognitive factors (e.g., moral disengagement, posttraumatic dissociation, etc.) that may account for this relationship between childhood violence exposure and antisocial traits in early adulthood.

4.1. Effect of Violence Exposure on Antisocial Personality Features by Gender

While previous research has indicated differences in the presentation of ASPD among males versus females [50], prior studies have not examined whether the effects of traumatic event exposure on antisocial personality outcomes differ by gender. In the present study, there were differential effects of violence exposure on facets of antisocial personality features for males compared to females; however, there was no evidence for a significant interaction between gender and violence exposure, suggesting that participants' gender did not moderate the relationship between violence exposure and antisocial personality outcomes.

The differences found for the effects of violence exposure on antisocial personality features between males and females may, in part, reflect the substantially greater number of males (n = 1022) in the sample compared to females (n = 174). Across all models, the effects of violence exposure on antisocial personality features were smaller among females when compared to males. It is possible that the effects for females would have reached a similar magnitude to those found among males if a greater number of female participants were included in the sample.

Alternatively, with greater statistical power to detect differences between males and females, it is possible that the moderating effects of gender may have reached statistical significance. In particular, the finding that violence exposure significantly predicted the antisocial features of egocentricity and stimulus-seeking among males, but not among females, is suggestive of gender differences in how violence exposure exerts its effects on personality outcomes. Additional research is necessary to better understand the differences in development of antisocial personality features among men versus women, particularly given the greater frequency of ASPD among men compared to women, and the increased frequency of PTSD among women versus men [3,21,65].

4.2. Strengths

Notable strengths of the present study include the longitudinal design and the representative nature of the sample. Data for the Pathways study were collected across multiple time points over a six-year span, allowing us to predict long-term personality outcomes based on violence exposure in childhood/adolescence, without having to rely on young adults' retrospective reporting of early trauma exposure. In addition, the sample demographics (41.4% Black, 33.5% Latinx) are representative of national statistics, as Black adolescents are overrepresented in the juvenile justice system, and Latinx adolescents represent a significant portion of juvenile justice cases [66].

Most significantly, the current study examined gender differences in outcomes among justice-involved adolescents. Given the over-representation of males in the juvenile justice system, it is rare that researchers are able to compare outcomes between male and female participants. Despite the differences in the percentage of males versus females in the current study sample, the absolute number of females (n = 174) allowed for examination of unique pathways to antisocial personality outcomes among females, adding to the scant literature on outcomes among justice-involved females in general [67].

4.3. Limitations and Future Directions

One limitation of the current study was the use of self-report questionnaires in assessing both violence exposure and antisocial personality outcomes. Memory of violence exposure may have been incomplete if participants experienced violence at a young age, or if the traumatic nature of their experiences prompted repression or reticence. Corroboration by caretakers, or if applicable, Child Protective Services case files, could have supplemented this self-report to improve measurement precision. In addition, the covariates we included (e.g., early onset of behavior problems, parental monitoring) were all based on self-report measures, making it difficult to ensure response accuracy across participants. For example, regarding early behavior problems, some participants may be more likely to report times when they got in trouble as a child, and some participants may be more aware of disorganization in their neighborhood than others. Again, additional reports or more objective measures of these covariates could have increased accuracy of responses.

Although the Exposure to Violence Inventory [53] included questions about direct victimization and witnessed violence, we were unable to distinguish these forms of violence exposure in our analyses. Direct victimization appears to more closely related than witnessed violence to the association between violence exposure and delinquency [68], so aggregating these different kinds of violence exposure may have minimized important differences.

The current study was also limited by its use of convenience sampling from only two geographic regions in the United States: Philadelphia, PA and Phoenix, AZ. While the Pathways study detailed inclusion criteria (e.g., 14–17 years old and guilty of a serious offense), individuals had the option of declining to participate in the study, thus suggesting that self-selection bias may have emerged. Further, the results may not generalize to other justice-involved populations given the geographic restrictions. The current results are robust; however, future studies are necessary to replicate longitudinal research with justice-involved individuals.

The longitudinal design of this study was a key methodological strength, but it was impossible to determine when antisocial personality features developed in relation to trauma exposure. Future studies should assess whether traumatic events can contribute to the development of ASPD while considering the following: the role of acute vs. chronic exposure, single traumatic event type vs. polyvictimization, latency period between trauma exposure and TRs, latency period between TRs and development of antisocial personality traits [69]. Such considerations may provide insight as to sensitive developmental periods wherein long-term personality change is more likely to be triggered. Understanding the impact of different types and durations of traumatic event exposure may also have implications for clinical intervention. Further, examining specific TRs or PTSD symptom clusters [36,39] may provide insight into how violence exposure manifests certain pathological changes that may contribute to long-term personality change.

4.4. Implications

The current findings have implications for future clinical and policy work. Analyses indicated that even when controlling for broad environmental risk factors and trait-level indicators (e.g., early onset behavior problems), exposure to violence impacts changes in personality. This emphasizes the role of the environment in shaping personality, suggesting that even stable attributes implicated in personality functioning can be amenable to intervention.

The current findings also offer guidance for future longitudinal studies to explore the covariates examined, as well as differences in traumatic event exposure and latency periods. Finally, the present findings are important for understanding delinquency, and the unique predictive role of traumatic event exposures. Ultimately, it is important to make clinical interventions in the juvenile justice system more trauma-informed [70]. Specifically, trauma-informed interventions target the sequelae of traumatic event exposures and TRs, including the deficits in self-regulation that may overlap with ASPD features [70–74]. Creating trauma-informed justice systems requires an understanding of the impact of trauma in all programs, policies, and interactions, at both the individual and system levels [72]. Addressing the trauma-related self-regulation difficulties implicated in aggression and impulsivity [33,34,75] may help interrupt the development of ASPD and its associated deleterious consequences.

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Data Availability Statement: Publicly available datasets were analyzed in this study. This data can be found here: https://www.pathwaysstudy.pitt.edu/ (accessed on 4 December 2019).

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