

Relationship between adverse childhood experiences and psychopathy: A systematic review

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ABSTRACT

Psychopathy can be defined as a constellation of traits that comprises affective characteristics, interpersonal characteristics, as well as impulsive and antisocial behavior. This review aims to demonstrate that psychopathic subtypes differ in terms of adverse childhood experiences (ACEs). Studies focusing on the relationship between ACEs and psychopathy were obtained through multiple databases, following PRISMA procedures. Of the 77 documents collected, 12 were retained for further analysis and considered eligible for inclusion, with seven studies from manual search being additionally included, leading to a total of 19 studies. The results provide support for the theoretical conceptions of psychopathic subtypes (primary psychopathy vs. secondary psychopathy), suggesting that individuals with psychopathy and high levels of negative affect (secondary psychopathy) experience a greater degree of abuse in childhood than individuals with psychopathy and low levels of negative affect (primary psychopathy). Childhood is a critical developmental period that sets the stage for health and wellness outcomes in adulthood; thus, precise and consistent assessments of ACEs are imperative to help improving the clinical evaluation of personality disorders, and also of psychopathy.

The usual ways in which an individual regulates their emotions and behaviors (i.e., temperament) and their interaction with others have been used as a conceptual framework the study of behavioral functioning over time. A general theory of antisocial behavior and criminal justice system involvement argues that individuals who have behavioral problems manifest three fundamental problems: (a) difficulty inhibiting instinctive or emotional responses in favor of socially appropriate behavioral responses; (b) experience high levels of negative affect, particularly of emotions such as anger and hostility, as well as irritability toward emotions such as anxiety and depression; (c) strenuous control and negative affect often interact in a dynamic manner. Thus, individuals whose behavioral repertoires are dominated by both low control and high negative affect are not only at significant risk for behavioral problems, but also at significant risk of provoking negative reactions in others (DeLisi & Vaughn, 2014, 2015), and these repertoires tend to be particularly visible in individuals with high psychopathy.

Psychopathy is a personality structure comprising interpersonal (e.g., deceitfulness and manipulation), affective (e.g., lack of empathy,

remorse, or guilt), and behavioral (e.g., social deviance, criminality) characteristics (Hare, 2003; Hare & Neumann, 2008). It is typically expressed through deception, manipulation, lack of empathy, lack of insight, inflated and arrogant self-appraisal, and other antisocial traits (Cleckley, 1941; Hare, 1996, 2003). Although infrequent in the general population (1–2%) (Hare, 1996; Neumann & Hare, 2008), 15 to 25% of criminals meet the diagnostic criteria for psychopathy (Hare, 1996). Psychopathic traits are also among the strongest predictors of chronic violent offending (Blair, Peschardt, Budhani, Mitchell, & Pine, 2006; Hare, 2003; Raine, 2002). High-psychopathy individuals (and callous-unemotional traits, a potential component of psychopathy) are more prone to adverse childhood experiences (ACEs), including exposure to violence and violent offenses (Baskin-Sommers & Baskin, 2016; Blair & Lee, 2013; Skeem, Polaschek, Patrick, & Lilienfeld, 2011). Moreover, psychopathy has emerged as a significant correlate of antisocial, impulsive, and violent behavior (Camp, Skeem, Barchard, Lilienfeld, & Poythress, 2013), as well as recidivism and failure in rehabilitation (Costa & Babcock, 2008; Hemphill, Hare, & Wong, 1998; Rock, Sellbom, Ben-Porath, & Salekin, 2013).

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Although disputable, antisocial behavior is commonly considered a relevant component of the definition of psychopathy (Moreira, Almeida, Pinto, & Fávero, 2014; Moreira, Azeredo, & Barbosa, 2019). This may include crimes or breaking laws, but it is not limited to that. It covers exploitation behavior in interpersonal relationships that are not considered criminal offenses. In fact, despite a long debate, most conceptions of psychopathy still consider essential to put the interpersonal and affective dimensions of Psychopathy together with the personality characteristics that underlie antisocial behavior, as represented in the Factors 1 and 2 of the Psychopathy Checklist-Revised (PCL-R; Hare, 2006; Hare & Neumann, 2008).

Although psychopathy has long been recognized in clinical practice, up until the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association [APA], 2006) it was somehow entangled within the antisocial personality disorder (ASPD; Santana, 2016). The present edition of the manual (DSM-5; APA, 2013) integrates psychopathy in section III (Emerging Measures and Models), even though it still is a specifier for the diagnosis of ASPD (Miller, Lamkin, Maples-Keller, Sleep, & Lynam, 2017). Moreover, special attention must be paid to limited prosocial emotions when diagnosing conduct disorder in children and adolescents (Rijo, Brazão, Ribeiro da Silva, & Vagos, 2017), leading to the inclusion of the specifier “With limited prosocial emotions” (Colins & Andershed, 2015) in the DSM-5 (APA, 2013). In order for this specifier to be used, children and adolescents must meet at least two of the following criteria for a duration of at least 12 months and within various relational and situational contexts: (a) lack of remorse or guilt; (b) lack of empathy; (c) unconcern about performance; and (d) shallow or deficient affect (APA, 2013; Colins & Andershed, 2015; Edens, Mowle, Clark, & Magyar, 2017). An optimal evaluation of the criteria for this specifier should include not only the testimony of the individual, but it should also triangulate different sources of information, including people from the individual's social circle, such as parents and other relatives, teachers and peers (Rijo et al., 2017). Children and adolescents, from ages 5 to 17, who are diagnosed with conduct disorder and fulfil the criteria of the “With limited prosocial emotions” specifier, typically exhibit more aggression and cruelty, as well as symptoms for attention deficit hyperactivity disorder and oppositional defiant disorder (Colins & Andershed, 2015). These children and adolescents are also more likely to resort to aggression in order to achieve instrumental gains (APA, 2013). It is worth noting that the features of this specifier correspond to some characteristics found in adult psychopathy (Edens et al., 2017). Summing-up, oppositional defiant disorder may develop into conduct disorder and both may be associated with adult manifestations of psychopathy (Kazdin, 1997; Robbins, 1978; Searight, Rottnek, & Abby, 2001).

Many studies have reported a strong correlation between ACE exposure and later mental health issues including ASPD (Anda et al., 2006; Douglas et al., 2011; Gorey & Leslie, 1997; Moylan et al., 2010; Schilling, Aseltine, & Gore, 2007; Vaughn et al., 2017). For example, Vaughn et al. (2017) analyzed a sample of both native-born Americans and first- and second-generation immigrants to the United States, and found that those with greater ACE exposure had a higher likelihood of being diagnosed with a personality disorder.

Theoretical conceptualizations of psychopathic subtypes propose that a primary variant (PP) largely stems from impoverished affect, whereas a secondary variant (SP) is hypothesized as developing subsequently to adverse environmental experiences, including ACEs (Falkenbach, Poythress, & Creevy, 2008; Hiatt, Lorenz & Newman, 2002; Hicks, Markon, Patrick, Krueger, & Newman, 2004; Kahn et al., 2013; Kimonis, Skeem, Cauffman, & Dmitrieva, 2011; Lorenz & Newman, 2002; Poythress et al., 2010; Skeem, Johansson, Andershed, Kerr, & Loudon, 2007; Sutton, Vitale, & Newman, 2002; Swogger & Kosson, 2007; Vassileva, Kosson, Abramowitz, & Conrod, 2005). The PP “are born” with the main interpersonal and affective characteristics of this personality structure (Karpman, 1941, 1949). Conversely, SP

develop similar characteristics to PP as a result of adverse environmental experiences, for example, rejection and abuse from parents (Karpman, 1941, 1949), but not as much as a consequence of constitutional factors. In other words, the structure of PP seems to be a reflection, essentially, of the genetic configuration, while the structure of SP appears to be heavily determined by experience and affective reactions (depression, anxiety, guilt and hostility) (Karpman, 1948). This distinction between PP and SP was broadened by the work of Blackburn (1996, 1998). PP manifest reduced anxiety, which is related to a predisposition for social dominance and overconfidence. Contrarily, SP exhibit characteristics of borderline personality disorder (BPD), including pronounced dysphoria, impulsivity, hostility, and reactive aggression (Blackburn, 1996, 1998).

Both types (PP and SP) exhibit high levels of heterogeneity within the group: the emotional deficit that is dominant in PP may result in a variety of life strategies – some criminal, others more controlled and manipulative, and others more socialized and adjusted to society (Gao & Raine, 2010; Yildirim, 2016; Yildirim & Derksen, 2015).

There is strong empirical support for such distinctions between the primary and secondary variants of psychopathy (Arnett, Smith, & Newman, 1997; Falkenbach et al., 2008; Lorenz et al., 2002; Hicks et al., 2004; Kahn et al., 2013; Kimonis et al., 2011; Lorenz & Newman, 2002; Newman & Schmitt, 1998; Newman, Schmitt, & Voss, 1997; Poythress et al., 2010; Skeem et al., 2007; Swogger & Kosson, 2007).

Genetic and environmental factors are associated with psychopathic traits (Forsman, Lichtenstein, Larsson, & Andershed, 2008). Common genetic influences explain between 43% and 56% of the variance in three psychopathy dimensions proposed by Larsson, Lichtenstein, and Andershed (2006) – grandiose/manipulative, callous/unemotional, and impulsive/irresponsible – and this finding is consistent with reports from other studies (Blonigen, Carlson, Krueger, & Patrick, 2003; Taylor, Loney, Bobadilla, Iacono, & McGue, 2003). On the other hand, non-shared environmental factors (e.g., different attachment to parents, different ACEs) may explain 37% of the variance in psychopathic traits, whereas shared environmental influences (e.g., quality of attachment to parents, ACEs – sexual, emotional, physical abuse, negligence, violence – or interaction with peers) do not seem to contribute to the variance in psychopathic traits (Larsson et al., 2006). Despite the shared genetics between ASPD and psychopathy (Larsson et al., 2006), it appears that environmental factors are mostly involved in the development of ASPD, which may be a feature of behavioral adaptations, whereas psychopathy may be largely innate (Freedman & Verdun-Jones, 2010).

Twin studies suggest that personality traits that are at the core of psychopathy (e.g., impulsivity, aggressiveness, irresponsibility, absence of remorse) are more strongly inherited when compared to other personality disorders (Viding, 2004). Genetic factors may explain between 0.37 and 0.44 of the variance in psychopathy measurements (Beaver, Barnes, May, & Schwartz, 2011). Regardless of these findings, a substantial part of the variance remains unexplained, and it is not sufficiently clear the role of environmental factors in the two variants of psychopathy.

As psychopathy becomes increasingly discussed, there is growing recognition of the need for better data on the relationship between ACEs and different typologies of psychopathy. The study of etiological mechanisms underlying the said typologies is a fundamental step in the development of more effective methods to prevent impulsive behavior and cold-heartedness that often characterize psychopathic individuals. Theoretical conceptualizations of psychopathic subtypes suggest that PP is largely associated with impoverished affect, while it is hypothesized that SP may be secondary to ACEs (e.g., childhood maltreatment). Important questions are being raised concerning the role of ACEs in psychopathy, especially whether ACEs are differently associated with PP and SP or not. We reviewed research providing evidence on the link between psychopathy and early experiences of maltreatment, aiming to examine whether the available evidence supports the distinction of psychopathic subtypes in terms of ACEs.

1. Method

The review exclusively focuses on empirical research and was conducted in accordance with PRISMA guidelines (Moher, D., Liberati, A., Tetzlaff, J., & Altman, 2009). Although it was initially intended to conduct a systematic review with meta-analysis, the reduced number of studies, their heterogeneity, and measurement variance precluded the production of reliable effect sizes of ACE factors relative to psychopathy.

1.1. Evidence acquisition and inclusion criteria

Studies were identified through a search in multiple databases of EBSCOhost, including Academic Search Ultimate, PsycARTICLES, PsycINFO, and Sociology Source Ultimate. In order to avoid publication bias, these searches were supplemented with a manual search. Retrospective and prospective searches were also conducted by examining bibliographies and locating studies citing each of the identified articles. An analysis of the keywords used in the articles was conducted in order to define the search expressions and to collect the largest number of terms.

1.1.1. Inclusion criteria

To assess the eligibility of studies, the following inclusion criteria were used: (1) empirical study – the study had to report empirical findings; (2) relationship between ACEs and psychopathy – the study had to include the relationship between the two constructs; and having a (3) antisocial group – the study had to include clinical or subclinical samples assessed for psychopathy or antisocial personality disorder.

1.1.2. Exclusion criteria

The reviewers considered, as exclusion criteria, case studies, theoretical studies, narrative reviews, systematic reviews, and meta-analysis. Outside these criteria, no specific exclusion criteria were applied.

The search results were analyzed independently by two researchers (DM and DSM), and discrepancies were solved by another researcher (FB), in order to reduce the probability of missing any study or as a way to minimize errors in the classification process (Moher et al., 2009). The agreement index was assessed using Cohen's kappa and revealed a nearly perfect agreement; $K = 0.980$, $p < .001$ (Landis & Koch, 1977).

1.2. Search strategy and data abstraction

The keywords for the search, all limited to the abstracts, were: (Callous* OR unemotional OR psychopath* OR sociopath* OR antisocial) AND (traumatic events in childhood OR negative events in childhood OR adverse childhood experiences) NOT psychopathol*.

The search was not limited by any geographical, temporal, or linguistic factors.

A total of 77 studies, published between 1995 and 2019, were identified from all databases and search methods. Twenty-eight duplicate studies were excluded. The abstracts of the remaining 56 studies were assessed, 12 of which were included: $n = 7$ from Academic Search Ultimate, $n = 4$ from PsycINFO, and $n = 1$ from PsycARTICLES. In addition, seven studies were included from manual search. In total, this systematic review comprised 19 articles.

The objectives, methodological aspects (sample/instruments), and main conclusions were extracted from each study (Fig. 1).

2. Results

Comparing the prevalence rates of various psychiatric disorders in individuals who experienced a potentially traumatic event (PTE) in childhood, individuals who had experienced a PTE in adulthood, and individuals with no history of PTE, in a representative sample of Chileans, it was possible to associate exposure to a PTE with greater

probability of developing a psychiatric condition. Specifically, inter-personal trauma in childhood (rape or physical aggression) vs. inter-personal trauma only in adulthood predicted a higher risk of alcohol or other drug use disorders (these addictions are frequently associated with psychopathy), $OR = 3.3$, $CI\ 95\% 1.2-9.7$, and other disorders, including antisocial personality disorder, $OR = 5.7$, $CI\ 95\% 2.4-13.3$ (Zlotnick et al., 2008).

In fact, different types of childhood abuse have been associated with different personality disorders in adulthood (Lobbestael, Arntz, & Bernstein, 2010). Sexual abuse has shown a weak positive correlation with schizoid disorder, $r(409) = 0.21$, $p < .001$ (for a more in-depth explanation of the relationship between schizotypy and psychopathy see Ragsdale & Bedwell, 2013), while physical abuse was associated both with antisocial personality disorder, $r(409) = 0.28$, $p < .001$, and schizoid disorder, $r(409) = 0.21$, $p < .001$ (Lobbestael et al., 2010). On the other hand, emotional abuse was related with the expression of symptoms of schizoid disorder, $r(409) = 0.24$, $p < .001$ (Lobbestael et al., 2010).

With specific regard to adult women who exhibit violent behavior, they report more ACEs compared to non-offending women (physical abuse, $\chi^2(2, N = 91) = 6.03$, $p < .05$, substance abuse: $\chi^2(2, N = 91) = 43.78$, $p < .001$; suicide attempts: $\chi^2(2, N = 91) = 38.34$, $p < .001$) (Weizmann-Henelius, Viemerö, & Eronen, 2004).

It was explored whether dysfunctional interpersonal behavior is associated with ACEs in a sample of patients detained in a high security care (McCartney, Duggan, Collins, & Larkin, 2001). Regarding parental attachment, the group diagnosed with psychopathy had significantly lower parental care scores concerning the mother ($M = 20.9$, $SD = 11.1$) and father ($M = 17.8$, $SD = 10.1$) when compared to the non-psychopathy group concerning the mother ($M = 26.0$, $SD = 8.3$) and father ($M = 25.1$, $SD = 9.0$) (McCartney et al., 2001).

A study sought to compare the characteristics of the childhood with high vs. low scores of psychopathy in a sample of women (Forouzan & Nicholls, 2015). Negative childhood characteristics were evaluated, including ACEs in four developmental periods (early childhood, late childhood, early adolescence, late adolescence) in order to understand whether it was possible to distinguish women with high and low scores on the PCL-R in young adulthood (Forouzan & Nicholls, 2015). The results suggest that women with high psychopathy scores, compared to those with low-psychopathy, were more likely to exhibit psychological, cognitive and behavioral dysfunction in early childhood (half of the women were highly psychopathic, compared to only 6% of women with low psychopathy, $p < .001$) and less likely to have been exposed to various forms of victimization (73% of women with low psychopathy experienced at least one form of abuse compared to 57% of women with psychopathy; in late childhood, the rate was 79%) and revealed a background marked by problematic relationships between parents and children (none of the problematic characteristics of women's relationships with their maternal figures distinguished those with high vs. low scores on PCL-R during early childhood (0–5 years), late childhood (6–12 years) and early adolescence (13–15 years) by maternal figures were found to be more common between women with high scores on the PCL-R than among women with low scores on the PCL-R) (Forouzan & Nicholls, 2015). In addition, the presence of negligence during childhood and the mental and personality problems of the mother, which led to foster care, PCL-R scores were negatively associated with conflictual, $\Phi = 0.350$, $p < .01$, whereas evidence of childhood impulsivity was positively associated with higher scores of psychological abuse, $\Phi = 0.538$, $p < .01$, and verbal abuse, $\Phi = 0.589$, $p < .01$ (Forouzan & Nicholls, 2015).

Psychopathic-like adolescents were identified among a larger group of community-based adolescents and adolescents referred for institutional correctional treatment (Ručević & Ajduković, 2016). Compared with the community group, referred adolescents exhibited higher levels of: *impulsive and irresponsible behavioral style*, with this being the case both in male, $F(248) = 12.9$, $p < .001$ and female adolescents, F

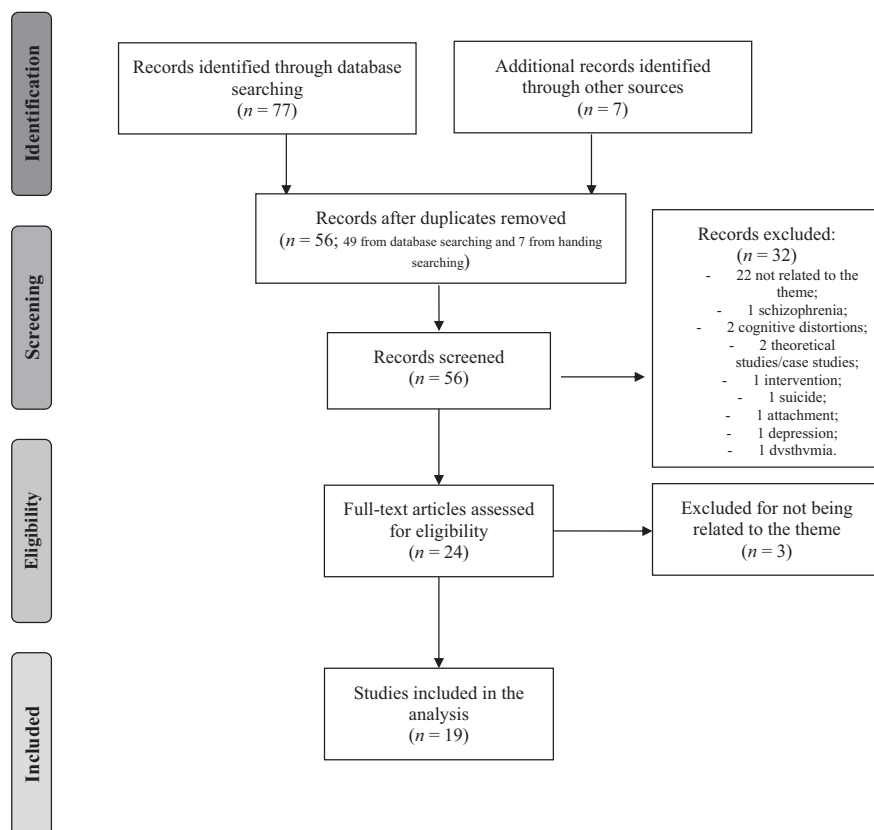


Fig. 1. Flowchart of literature search.

(131) = 23.3, $p < .001$; *delinquent versatility*, both in male, $F(248) = 36.7$, $p < .001$ and female adolescents, $F(131) = 25.7$, $p < .001$; *childhood physical victimization* in male, $F(248) = 9.13$, $p < .01$, and female adolescents, $F(131) = 18.4$, $p < .001$; *parental conflict* in male, $F(248) = 9.11$, $p < .01$, and female adolescents, $F(131) = 12.6$, $p < .01$. Referred adolescents, compared with the community group, exhibited lower levels of quality of mother attachment, and this result was found both in the case of male, $F(248) = 21.64$, $p < .001$ and female adolescents, $F(131) = 6.90$, $p < .05$; and quality of parent- father attachment in male, $F(248) = 8.67$, $p < .01$, and female adolescents, $F(131) = 14.1$, $p < .001$ (Ručević & Ajduković, 2016).

One study compared childhood experiences of psychopathic criminals ($n = 50$) with the experiences of non-psychopathic criminals ($n = 55$), in order to understand the impact of ACEs. In terms of parental dynamics, it were found significant differences between groups in parental discipline, $t(104) = 7.90$, $p < .001$, parental antipathy, $t(104) = 5.00$, $p < .001$, parental indifference/negligence, $t(104) = 4.55$, $p < .001$, parental supervision, $t(104) = 6.21$, $p < .001$, psychological abuse, $t(104) = 2.24$, $p < .01$, negative institutional experience, $t(104) = 2.82$, $p < .01$, negative school experience, $t(104) = 4.70$, $p < .001$, negative school performance, $t(104) = 4.77$, $p < .001$, negative social experience, $t(104) = 2.53$, $p < .01$, and antipathy toward parents, $t(104) = 3.00$, $p < .01$, with psychopathic group showing the highest impact of ACEs (Marshall & Cooke, 1999).

Individuals with high psychopathy and high levels of negative affect score significantly higher on childhood abuse measures than individuals with high psychopathy and low levels of negative affect, namely in the total score of the Childhood Trauma Questionnaire, $t(109) = 3.23$, $p = .001$, emotional abuse, $t(109) = 4.02$, $p < .001$, physical abuse, $t(109) = 2.48$, $p = .01$, and emotional negligence, $t(209) = 3.10$, $p = .002$. Individuals with high psychopathy, either with high or low

levels of negative affect, do not differ in terms of physical neglect and sexual abuse (Dargis & Koenigs, 2017b).

A study was conducted with a sample of 4733 adjudicated young people (Zettler, Wolff, Baglivio, Craig, & Epps, 2017) in order to examine the relationship between ACEs and youth residential placement. The cross-sectional results for the entire sample, regardless of sex or ethnicity, were that ACEs significantly increased the chances of residential placement at age 17, $t(4732) = 6.73$, $p < .001$. For men, ACEs significantly increased the chances of residential placement in black men, $OR = 1.39$, $p < .001$, and hispanic men, $OR = 1.69$, $p < .001$, but had a null effect on anglo-americans (Zettler et al., 2017).

In addition, it is worth mentioning that temperament features such as core self-regulation capacity and negative emotionality, have been more strongly associated with violent and non-violent delinquency, $b = 0.050$, $z = 5.78$, $p < .001$, than psychopathic traits, $b = 0.001$, $z = 3.56$, $p < .001$, and traumatic events in childhood, $b = 0.309$, $z = 2.75$, $p < .01$ (DeLisi, Fox, Fully, & Vaughn, 2018). Temperament and psychopathy have similar predictive capacity, but do not surpass previous history of violence and delinquency as a predictor of future offenses (DeLisi et al., 2018). Overall, the results corroborate the temperament-based theory by DeLisi and Vaughn (2014) and suggest that the abovementioned temperament features can play an important role as a risk factor for violent and non-violent delinquency (DeLisi et al., 2018).

Two independent samples of twins and siblings from the United States – the Midlife Development in the United States (MIDUS; $N = 862$) and the National Longitudinal Study of Adolescent to Adult Health (Add Health; $N = 3112$) – were studied regarding ACEs (Schwartz, Wright, & Valgardson, 2019). Specifically, for the MIDUS sample, twins exposed to higher levels of ACEs were more likely to engage in antisocial behavior, $b = 1.29$, $p = .001$, compared to their co-twins. The results of both samples indicate that factors other than

those captured in the measures of ACEs employed (e.g., genetic influences or unmeasured family-level influences) are implicated in the associations observed in the baseline models (Schwartz et al., 2019). In addition, increased exposure to ACEs was associated with increased prevalence of alcohol problems and higher levels of antisocial behavior: for the MIDUS sample, increased exposure to ACEs resulted in a higher prevalence of alcohol problems, $b = 0.61$, $p = .038$, and higher overall levels of antisocial behavior, $b = 1.08$, $p < .001$, in adulthood. For the Add Health sample, increased exposure to ACEs was associated with increased levels of antisocial behavior in adulthood, $b = 0.46$, $p < .001$ (Schwartz et al., 2019).

It has been demonstrated that young people exposed to ACEs are more likely to offend and relapse (for a relationship between psychopathy and recidivism see, for example, Långström & Grann, 2002). In fact, ACEs have a direct and indirect effect on recidivism, with almost half of the total effect of ACEs on recidivism occurring through negative emotions (Wolff & Baglivio, 2016). Specifically, the results indicate that ACEs have a modest but significant direct effect on juvenile recidivism, $b = 0.014$, CI 95% 0.006, 0.024, $p < .01$, as well as an indirect effect through negative emotions, $b = 0.014$, CI 95% 0.010, 0.019, $p < .01$, with a total effect of 0.028, CI 95% 0.016, 0.035, $p < .01$ (Wolff & Baglivio, 2016).

So far, evidence has indicated that physical abuse during childhood is associated with psychopathic traits in juvenile and adult offenders, but there is considerably less research on whether exposure to domestic violence as a witness, rather than as a direct victim, influences the subsequent presentation of psychopathic traits in adulthood. What the results of a study by Dargis and Koenigs (2017a) reveal is that witnessing domestic violence is significantly associated with the overall level of psychopathy, $t(116) = 3.45$, $p < .001$, $\eta_p^2 = 0.09$, with a particularly strong relationship with Factor 1 scores, i.e. the interpersonal/affective characteristics of psychopathy, $t(116) = 3.50$, $p < .001$, $\eta_p^2 = 0.10$, but a significant relation was also found with scores of Factor 2, $t(114) = 2.77$, $p < .001$, $\eta_p^2 = 0.06$ (Dargis & Koenigs, 2017a). It is worth noting that this relationship was maintained when the experience of domestic violence as a direct victim was controlled, for the total score, $t(100) = 2.90$, $p < .001$, $\eta_p^2 = 0.08$, Factor 1, $t(100) = 2.66$, $p < .001$, $\eta_p^2 = 0.07$, and Factor 2, $t(98) = 2.25$, $p = .03$, $\eta_p^2 = 0.05$ (Dargis & Koenigs, 2017a).

The lifestyle features of psychopathy were significantly more highly correlated with abuse scores (total score of the Child Abuse and Trauma Scale) than both the affective, $t(612) = 4.52$, $p < .001$, or interpersonal, $t(612) = 4.26$, $p < .001$, features of psychopathy (Poythress, Skeem, & Lilienfeld, 2006). Parallel tests revealed that the lifestyle features of psychopathy were significantly more highly correlated with total scores on the Dissociative Experiences Scale than the interpersonal features, $t(612) = 2.88$, $p < .01$, but not in the case of the affective features of psychopathy (Poythress et al., 2006).

With the goal of examining the cross-sectional relationship between maternal and paternal bonding, childhood physical abuse and psychopathic personality at age 28, a study used a community sample of 333 participants (Gao, Raine, Chan, Venables, & Mednick, 2010). The study also prospectively assessed whether children separated from their parents in the first 3 years of life are more likely to have a psychopathic-like personality 25 years later (Gao et al., 2010). Hierarchical regression analyses indicated that: psychopathic personality is explained by parental bonding (lack of maternal care), $\beta = -0.38$, $t = -7.30$, $p < .001$, paternal overprotection, $\beta = -0.12$, $t = -2.28$, $p < .05$, and childhood physical abuse, $\beta = 0.156$, $t = 2.712$, $p = .007$. Psychopathic personality is explained by parental bonding after taking into account sex, social adversity, ethnicity, and abuse, $\beta = 0.26$, $t = 4.10$, $p < .001$, and those separated from parents in the first 3 years of life were particularly characterized by low parental bonding and a psychopathic personality in adulthood (Gao et al., 2010).

Another study investigated childhood relational trauma in a group of violent offenders from Italy (Craparo, Schimmenti, & Caretti, 2013).

A higher prevalence of physical abuse and emotional abuse was observed in the group of convicted offenders (Craparo et al., 2013). Specifically, the risk for psychopathy increases when trauma occurs early in life (Craparo et al., 2013). Results showed that a subgroup with high-risk for psychopathy (HRP) tended to have experienced a relational traumatic event earlier in life compared to the rest of the participants ($Mage = 5.6$, $SD = 2.85$ vs. $Mage = 11.5$, $SD = 8.86$), $t(20) = 2.18$, $p = .05$ (Craparo et al., 2013). Data also showed that seven out of eight participants (87.5%) in the HRP group experienced a relational trauma before the age of 10 (Craparo et al., 2013). The Chi-square test showed that people in the HRP group were more likely to experience traumatic events before this age, compared to other participants, $\chi^2(1, N = 22) = 4.20$, $p = .04$ (Craparo et al., 2013). These were mostly related to abuse and neglect in family environments (6 out of 7) (Craparo et al., 2013). Although such findings do not imply a direct cause-effect relation between early experiences of relational trauma and psychopathy, results suggest a relationship between ACEs and the development of psychopathic traits (Craparo et al., 2013).

The experience of at least one type of abuse in childhood was more frequent among younger inmates, $t(76) = 2.80$, $p = .006$. These results were explained by a higher prevalence of physical abuse among younger participants, $r = -0.31$, $p = .005$ (Schimmenti, Di Carlo, Passanisi, & Caretti, 2015). Emotional abuse resulted in the only significant predictor for PCL-R total scores, $\beta = 0.36$, CI 95% 1.85, 9.25, $p = .004$, adjusted $R^2 = 0.12$, $F(3,74) = 4.45$, $p = .006$. Emotional abuse contribute to Factor 1 scores, $\beta = 0.33$, CI 95% 0.73, 4.58, $p = .008$, adjusted $R^2 = 0.09$, $F(3,74) = 2.77$, $p = .048$, and to Factor 2 scores, $\beta = 0.28$, CI 95% 0.47, 4.80, $p = .018$, adjusted $R^2 = 0.15$, $F(3,74) = 5.59$, $p = .002$. In detail, emotional abuse was a specific predictor of the affective facet, $\beta = 0.35$, CI 95% 0.50, 2.79, $p = .005$, adjusted $R^2 = 0.07$, $F(3,74) = 3.02$, $p = .035$, and lifestyle facet, $\beta = 0.32$, CI 95% 0.47, 3.20, $p = .009$, adjusted $R^2 = 0.12$, $F(3,74) = 4.45$, $p = .006$, of the PCL-R (Schimmenti et al., 2015).

Using a sample of incarcerated adult male criminal offenders ($N = 183$), it was possible to confirm that the severity of child abuse was linked to the severity of psychopathy, $t(183) = 3.67$, $p = .001$, $\eta_p^2 = 0.07$ (Dargis, Newman, & Koenigs, 2016). Analyses of the Childhood Trauma Questionnaire subscales revealed that this relationship held for physical abuse history, $t(183) = 4.70$, $p = .0001$, $\eta_p^2 = 0.11$, physical neglect history, $t(183) = 2.93$, $p = .01$, $\eta_p^2 = 0.04$, emotional abuse, $t(183) = 2.15$, $p = .01$, $\eta_p^2 = 0.02$, and emotional neglect history, $t(183) = 2.95$, $p = .01$, $\eta_p^2 = 0.05$ (Dargis et al., 2016). Furthermore, this relationship was particularly strong for physical abuse, $t(172) = 4.49$, $p = .001$, $\eta_p^2 = 0.10$, and the antisocial facet of psychopathy, $t(172) = 3.27$, $p = .01$, $\eta_p^2 = 0.06$ (Dargis et al., 2016).

Additionally, one study used two datasets: 253 adolescents in a residential facility for juvenile offenders in Pennsylvania, and 723 institutionalized delinquents in Missouri (Farina, Holzer, DeLisi, & Vaughn, 2018). It was found that trauma, measured by the Childhood Trauma Questionnaire (CTQ), significantly predicted psychopathy personality scores for both boys, $\beta = 4.25$, $p < .001$ and girls, $\beta = 4.24$, $p < .001$ (Farina et al., 2018). These results suggest that nuanced understanding of the traumatic history of these adolescents may not only be a pathway to psychopathy, but also a critical part of their overall assessment and treatment plan (Farina et al., 2018) (Table 1).

3. Discussion

Important questions are being raised concerning ACEs that contribute to the development of psychopathy, especially how ACE contribute in a different way to PP and SP, although few studies have looked at the relationship between ACEs and the different subtypes of psychopathy. This review intended to examine evidence on whether psychopathic subtypes differ in terms of ACEs. In order to gather more knowledge on this issue, a systematic literature review was conducted

Table 1
Summary of the studies' characteristics.

Study ID	Objectives	Sample		Country of origin of the studies	Language	Instruments	Results and main conclusions
		Age	% male				
Craparo et al. (2013)	To investigate childhood relational trauma in a group of violent offenders.	M = 38.1 (SD = 11.8)	100	Italy	English	<ul style="list-style-type: none"> - Traumatic Experience Checklist; - Hare Psychopathy Checklist-Revised (PCL-R). 	There was a high prevalence of childhood experiences of neglect and abuse among the offenders. Higher levels of ACEs were found among participants who obtained high scores on the PCL-R.
Dargis and Koenigs (2017a)	To examine the relationship between witnessing domestic violence during childhood (i.e., witnessing, hearing, or intervening in abuse against a parent/sibling) and psychopathic traits.	M = 31.7 (SD = 7.67)	100	United States of America (USA)	English	<ul style="list-style-type: none"> - PCL-R; - Maltreatment and Chronology of Exposure; - Self-report parental education obtained during interviews; - Wechsler Adult Intelligence Scale-Revised. 	Witnessing domestic violence was significantly associated with overall level of psychopathy, with a particularly strong relationship to the interpersonal/affective features of psychopathy.
Dargis and Koenigs (2017b)	To demonstrate that psychopathic subtypes differ in terms of experienced childhood maltreatment in an adult offender population.	Ages between 18 and 55	100	USA	English	<ul style="list-style-type: none"> - PCL-R; - Multidimensional Personality Questionnaire-Brief Form; - Childhood Trauma Questionnaire (CTQ). 	These results provide support for theoretical conceptualizations of psychopathic subtypes, suggesting that psychopathic offenders with high levels of negative affect experience a greater degree of childhood maltreatment.
Dargis et al. (2016)	To confirm that severity of overall childhood maltreatment was linked to severity of both psychopathy and antisocial personality disorder in adulthood.	M = 32.6 (SD = 7.74)	100	USA	English	<ul style="list-style-type: none"> - PCL-R; - ASPD symptoms in adulthood and CD symptoms in childhood were assessed based on criteria set forth by the Diagnostic and Statistical Manual of Mental Disorders, fourth edition, text revision (DSM-IV-TR); - CTQ; - Wechsler Adult Intelligence Scale-Revised; - Parent's education level. 	Severity of childhood maltreatment was linked to severity of both psychopathy and antisocial personality disorder in adulthood. This relationship was particularly strong for physical abuse and the antisocial facet of psychopathy.
DeLisi et al. (2018)	To test the relative effects of these temperamental features along with psychopathic traits and trauma in their association with violent and non-violent delinquency.	M = 16.0 (SD = 1.42)	60	USA	English	<ul style="list-style-type: none"> - A 15-item temperament scale was created based on items derived from Tarter's research on neurobehavioral disinhibition; - Youth Psychopathic Traits Inventory (YPT); - CTQ. 	Temperament was uniformly more strongly associated with violent and non-violent delinquency than psychopathic traits and childhood traumatic events.
Farina et al. (2018)	To examine the relationship between childhood trauma and psychopathy.	Ages between 13 and 19 years	55	USA	English	<ul style="list-style-type: none"> - Massachusetts Youth Screening Instrument Version 2; - Traumatic Experiences Scale; - CTQ; - YPT; - Psychopathic Personality Inventory-Short Form. 	Psychopathy is significantly correlated with childhood trauma. For the Missouri data, trauma significantly predicted psychopathy scores for both boys and girls.

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Table 1 (continued)

Study ID	Objectives	Sample	Type of sample	Country of origin of the studies	Language	Instruments	Results and main conclusions
		Age	% male				
		TI	100	USA	English	<ul style="list-style-type: none"> - Checklist about abuse characteristics; - Negative self-schemas; - Children's Attributional Style Questionnaire; - Attributional Style Questionnaire; - Dissociation subscale of the Trauma Symptom Inventory; - Self Perception Profile for Adolescents and Young Adults. 	Abuse-specific indicators of stigmatization, in particular the combination of shame and self-blame more than general self-blame attributions for everyday events, explained why youth with CSA histories experienced more dissociative symptoms and clinically significant levels of dissociation.
Forouzan and Nicholls (2015)	Potential pathways from childhood sexual abuse (CSA) to negative self-schemas to subsequent dissociative symptoms and low global self-esteem were examined in a prospective longitudinal study of 160 ethnically diverse youth with confirmed CSA histories.	55% of the sample were children ages 8 to 11 years ($M = 9.60, SD = 1.10$), and 45% were adolescents ages 12 to 15 years ($M = 13.5, SD = 1.10$)	TI: 160 from child protective services T2: 147 youth (institutionalized)	USA	English	<ul style="list-style-type: none"> - Childhood and adolescent characteristics; - PCL-R. 	Compared to women with low psychopathy scores, women high on psychopathic traits in young adulthood were more likely to manifest psychological, cognitive, and behavioral dysfunction in early childhood and to have been exposed to diverse forms of victimization.
Gao et al. (2010)	To examine the cross-sectional relationship between maternal and paternal bonding, childhood physical abuse and psychopathic personality at age 28. It also prospectively assesses whether children separated from their parents in the first 3 years of life are more likely to have a psychopathic-like personality 25 years later.	At least 18 years	0	Canada	English	<ul style="list-style-type: none"> - Parental bonding; - Modification of the Conflict Tactics Scale; - Hare's Self-Report Psychopathy scale. 	(1) poor parental bonding (lack of maternal care and low paternal overprotection) and childhood physical abuse were both associated with a psychopathic personality; (2) parental bonding was significantly associated with psychopathic personality after taking into account sex, social adversity, ethnicity and abuse; and (3) those separated from parents in the first 3 years of life were particularly characterized by low parental bonding and a psychopathic personality in adulthood.
Lobbestael et al. (2010)	To investigate the relationship between five forms of childhood maltreatment (sexual, physical and emotional abuse, emotional and physical neglect) and 10 personality disorders (PDs).	$M = 33.5 (SD = 10.7)$	36	The Netherlands	English	<ul style="list-style-type: none"> - Structured Clinical Interview for DSM-IV axis I and axis II disorders; - Interview for Traumatic Events in Childhood. 	Sexual abuse was associated with symptoms of schizoid and borderline PD; physical abuse with antisocial PD; emotional abuse with schizotypal and borderline PD; and emotional neglect with borderline PD.
Marshall and Cooke (1999)	To compare the childhood experiences of criminal psychopaths with those of criminal non-psychopaths and to examine whether differences in either the type or intensity of	$M = 32.2 (SD = 8.03)$	100	United Kingdom (UK)	English	<ul style="list-style-type: none"> - PCL-R; - Childhood Experience of Care and Abuse. 	Factor analysis of the childhood experience variables revealed two distinct factors, familial and societal, both of which were highly correlated with adult psychopathy scores. These findings suggest that the

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Table 1 (continued)

Study ID	Objectives	Sample		Country of origin of the studies	Language	Instruments	Results and main conclusions
		Age	% male				
McCartney et al. (2001)	adverse experience in childhood could be identified. To explore the widely-held assumption that dysfunctional interpersonal behavior, a key characteristic of personality disorder, is associated with adverse experiences in childhood in a sample of patients detained in high secure care.	M = 38.2 (SD = 9.70) and M = 39.1 (SD = 11.8) for the PD and MI groups	PD sample: 85 MI sample: 81	UK	English	<ul style="list-style-type: none"> - Parental Bonding Inventory (PBI); - Chart of Interpersonal Relations in Closed Living Environment (CIRCLE). 	experiences psychopaths have in childhood influence adult outcome. On the PBI, the PD group had significantly lower care scores and increased protection scores compared to the MI group; the latter reported care and protection scores similar to those from published norms. The CIRCLE scores also demonstrated significantly different interpersonal functioning between the PD and MI groups, with each group typically plotted in opposing halves of the interpersonal circle (IPC).
Poythress et al. (2006)	Theorists have postulated that some variants of psychopathy result from childhood abuse and neglect. Dissociative symptoms are also thought to arise from abuse. To date, the conjoint associations among abuse, dissociation, and psychopathy have not been examined systematically. Some have hypothesized that abuse relates primarily to the affective symptoms of psychopathy, with dissociative experiences mediating this relationship. Others have suggested that abuse more directly affects the impulsive lifestyle features of psychopathy. The authors used structural equation modeling to examine these hypotheses. To compare differences between community-based psychopathic-like adolescents and referred psychopathic-like adolescents in means, variances, and covariation between problem behaviors, adverse childhood experiences, parental conflict, physical and sexual victimization, and perceived parent-adolescent attachment quality.	M = 30.5 (SD = 6.20)	100	USA	English	<ul style="list-style-type: none"> - Retrospective self-report measure of childhood abuse; - Dissociative Experiences Scale; - Hare's Self-Report Psychopathy scale. 	Abuse exerted no direct or indirect effect on the core interpersonal and affective features of psychopathy but was directly related to the facet of psychopathy associated with an impulsive and irresponsible lifestyle.
Ručević and Ajduković (2016)		Community sample: M = 16.2 (SD = 1.42) The community adolescents were about the same age as the delinquent adolescents t(1,725) = 1.67, p > .05.	Community-based psychopathic-like adolescents: 72 Referred psychopathic-like adolescents: 70	Croatia	English	<ul style="list-style-type: none"> - Basis demographic information and socioeconomic status; - YPI; - Perceived Parent-Child Attachment Quality; - Adverse Childhood Experiences (ten yes/no questions); - Childhood Victimization Inventory; - Self-Report of Delinquency; - Risky Sexual Behavior. 	Relative to the community group, referred adolescents presented with a distinct profile exhibiting higher levels of impulsive and irresponsible behavioral style, higher rates of problem behaviors and childhood victimization, and lower perceived parent-adolescent attachment quality.
		M = 43.3 (SD = 10.9)	100	Italy	English		(continued on next page)

Table 1 (continued)

Study ID	Objectives	Sample	Country of origin of the studies	Language	Instruments	Results and main conclusions
Schimmmenti, Di Carlo, Passamisi, & Caretti, 2015	To explore the relationship between childhood experiences of abuse and psychopathic traits in a group of violent offenders.	Age N = 78 inmates who were convicted of violent crimes (forensic)	USA	English	<ul style="list-style-type: none"> - Traumatic Experience Checklist; - PCL-R. 	Emotional abuse resulted in a positive predictor of PCL-R total scores and its Interpersonal-Affective and Lifestyle-Antisocial factors. This suggests that emotional abuse in childhood, in combination with neurobiological and temperamental vulnerabilities, can foster the development of psychopathic traits. Siblings that experienced more adversity were no more likely to experience deleterious outcomes than their co-siblings. The similarity between siblings from the same family stemmed from latent sources of within-family environmental influences not captured by traditional ACEs measures.
Schwartz et al. (2019)	To properly control for latent sources of genetic and within-family environmental influences and isolate the association between ACEs and the following outcomes in adulthood: physical health, depressive symptoms, educational attainment, income attainment, alcohol problems, and antisocial behavior.	MIDUS: M = 54.2 (SD = 11.7) Add Health: M = 16.1 (SD = 1.73)	USA	English	<ul style="list-style-type: none"> - Physical health problems; - Screening Version of the World Health Organization Composite International Diagnostic Interview; - Educational attainment; - Income attainment; - Six-item version of the Alcohol Screening Test; - Aggression scale of the Multidimensional Personality Questionnaire; - Adverse childhood experiences. 	Two independent samples of twins and siblings from the United States: the Midlife Development in the United States (MIDUS) study (N = 862) and the National Longitudinal Study of Adolescent to Adult Health (Add Health; N = 3112) (community)
Weizmann-Henelius, Viemerö, & Eronen, 2004	To identify psychological risk markers for violent female offenders.	Offenders: M = 34.9 (SD = 10.4), Non-offenders: M = 37.0 (SD = 13.5)	Finland	English	<ul style="list-style-type: none"> - Demographic data and data on violent and nonviolent criminality; - Structured interview comprising variables based on empirically demonstrated risk factors in female violence; - The Structured Clinical Interview II for DSM-IV; - PCL-R; - Wechsler Adult Intelligence Scale-Revised. 	Offenders had more adverse experiences in childhood and adulthood than non-offenders, and reported partner related difficulties prior to the index offense. Cluster B personality disorders and more limited cognitive functioning characterized offenders who indulge in substance abuse and had received psychiatric treatment more often than non-offenders. Antisocial personality disorder, psychopathic traits, substance abuse and non-violent criminality also proved to be more frequent among the recidivists. ACEs have both a direct and indirect effect on recidivism, with nearly half of the total effect of ACEs on re-offending operating through negative emotionality.
Wolff and Baglivio (2016)	To examine the pathways by which ACEs affect juvenile delinquency	-	USA	English	<ul style="list-style-type: none"> - Official offending; - ACE Score; - Negative Emotionality; - Age at first offense; - Worst prior offense; - Self-report measure of the young person's friendship network; 	ACEs have both a direct and indirect effect on recidivism, with nearly half of the total effect of ACEs on re-offending operating through negative emotionality.

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Table 1 (continued)

Study ID	Objectives	Sample	Country of origin of the studies	Language	Instruments	Results and main conclusions
Zettler, Wolff, Baglivio, Craig, & Epps, 2017	To examine the relationship between ACEs and juvenile residential placement.	Age - % male	USA	English	<ul style="list-style-type: none"> - Self-report measure of the young person's friendship network; - Substance abuse; - Attention deficit hyperactivity disorder (ADHD) diagnosis; - Mental health problems; - Residential placement history; - Community-based placement type. - Residential Placement; - ACEs Score; - Seriousness category of first offense; - Against-person Felony; - Sexual felony; - School status; - Mental health problem history; - Child welfare placement history; - Antisocial peers; - Current substance use; - Anger/Irritability history; - Sexual aggression indications; - Violent behavior indications; - Demographics; - Region. 	<p>N = 4733 adjudicated juveniles (institutionalized)</p> <p>Consistent predictors of residential placement across demographic groups included the presence of antisocial peers, substance abuse issues, and anger problems.</p>
Zlotnick et al. (2008)	To compare the prevalence rates of various psychiatric disorders in individuals with first onset of a potentially traumatic event (PTE) in childhood, individuals with first onset of a PTE in adulthood and those with no history of a PTE	Age - % male	Chile	English	<ul style="list-style-type: none"> - Diagnostic of Statistical Manual of Mental Disorders, Revised Third Edition (DSM-III-R); - Posttraumatic stress disorder; - Antisocial personality disorder modules from the Diagnostic Interview Schedule and modules for a range of DSM-III-R diagnoses from the Composite International Diagnostic Interview. 	<p>N = 2390 Chileans (community)</p> <p>No PTE: 42 First PTE in adulthood: 57 First PTE in childhood: 54</p> <p>Exposure to a lifetime PTE was associated with a higher probability of psychiatric morbidity than no PTE exposure. PTE with childhood onset relative to adult onset was related to lifetime panic disorder, independent of the number of lifetime and demographic differences between the two groups.</p>

following the PRISMA guidelines, including the use of two independent researchers in the selection of the studies for review.

The heritability of psychopathy, as aforementioned, seems to be substantial and precedes any effects of ACEs. Also, heritability estimates among psychopathic persons are higher for the most antisocial of them, which means these features likely evoke aversive/abusive experiences (an evocative gene-environment correlation) (e.g., Blonigen, Hicks, Krueger, Patrick, & Iacono, 2005). Furthermore, it is assumed that problematic behavior in childhood influences antisocial behavior in adolescence and adulthood (Goodnight et al., 2016). Thus, antisocial behavior is strongly influenced by genetics, with heritability accounts ranging from 0.397 to 0.495, according to Baker, Jacobson, Raine, Lozano, and Bezdjian (2007). There are few or no effects of shared environmental factors for twins, with heritability ranging from 0.021 to 0.484 (reported by teachers) (Baker et al., 2007). Although previous results show that influences of shared environmental influences are not significant and that antisocial behaviors are mostly influenced by heritability, it is also known that non-shared environmental factors play a relevant role here (Tuvblad, Grann, & Lichtenstein, 2006).

Theory and empirical research maintain that psychopathy may be linked to a history of ACEs. Among the studies addressing the heterogeneity of psychopathy, Porter (1996), following Karpman's (1941) distinction, proposed that primary psychopathy mainly reflects a congenital affective deficit, while secondary psychopathy reflects a distancing of emotions resulting from negative experiences in childhood and of acquired affective disorders. These subtypes have been shown to be associated with a history of ACEs. Therefore, analyzing the relationship between the symptoms of ACEs and the various subtypes of psychopathy is of particular relevance in terms of clinical assessment and treatment.

The growing body of literature relates adverse and traumatic events during childhood with psychopathic traits later in adulthood (Anda et al., 2006; Dargis & Koenigs, 2017a; Dargis & Koenigs, 2017b; DeLisi et al., 2018; Forouzan & Nicholls, 2015; Marshall & Cooke, 1999; McCartney et al., 2001; Schwartz et al., 2019; Weizmann-Henelius et al., 2004; Wolff & Baglivio, 2016; Zlotnick et al., 2008; Zettler et al., 2017). However, it is known that exposure to domestic violence may also be a contributing factor to the manipulative and interpersonal style exhibited by individuals with high psychopathic traits (Dargis & Koenigs, 2017b).

Specifically, sexual abuse predicts borderline and paranoid personalities; physical abuse predicts borderline and antisocial personalities; emotional abuse and physical neglect predicts borderline personalities (Lobbestael et al., 2010). Additionally, similarities in the covariance between problematic behaviors, victimization, and attachment suggest that comparable processes connect family factors to problematic behavior in adolescents with psychopathy who have avoided contact with the juvenile justice system and were referred as psychopathic adolescents (Ručević & Ajduković, 2016).

The results indirectly support the theoretical conceptions of psychopathic subtypes (PP vs. SP, explain the relationship of levels of negative affect with PP and SP; Dargis & Koenigs, 2017b), suggesting that individuals with psychopathy and high levels of negative affect experience a greater degree of abuse in childhood than individuals with psychopathy and low levels of negative affect (Dargis & Koenigs, 2017a). In addition, the ACEs measures that are currently being applied may not adequately capture the full range of sources of environmental influence at the family level (Schwartz et al., 2019).

This systematic review is not without limitations. Although a thorough and systematic search was attempted, using rigorous criteria, there is a possibility that some relevant studies, due to their unavailability or inaccessibility, were not included. In addition, it is also possible that studies without significant findings were not included in this review, due to the difficulty that exists in publishing these types of results. For these reasons, publication bias is difficult to overcome.

Children and adolescents who have been exposed to adverse

experiences in childhood (e.g., physical, sexual, emotional violence) are more likely to engage in higher rates of substance use, violence, and other delinquent behaviors, than children who were less exposed, or not at all exposed, to any type of violence, particularly of a psychopathic type (Dube, Anda, Felitti, Edwards, & Croft, 2002; Dube et al., 2003; Fettes, Aarons, & Green, 2013; Thornberry, Krohn, Lizotte, Smith, & Tobin, 2003). However, the mechanisms underlying the trajectory from childhood adversity to behavioral problems are not well understood (Grant et al., 2003). Adolescence is a critical period of development that sets the stage for health and well-being outcomes in young adulthood (Schulenberg, Sameroff, & Cicchetti, 2004). Therefore, it is urgent that an accurate and consistent assessment of ACEs be made, in order to help improve the clinical evaluation of multiple psychiatric populations and, specifically, of psychopathy.

3.1. Future directions

Individuals with psychopathy, particularly in forensic samples, clearly experience ACEs at heightened rates, compared to non-psychopathy samples. Specialists are disfavoring these individuals if they neglect to screen for, provide or refer to services to address, the multiple exposures experienced.

Future research should further examine whether risk or protective factors of ACE exposure differ by psychopathy subtypes, as existing evidence on this matter is still very scarce. This evidence is critical for the development of better prevention strategies. Although this study adds to the literature on the prevalence of ACE exposure in individuals with high level of psychopathy, few ACE studies have done much in the realm of examining what can be done to mitigate the effects of ACE exposure once they have occurred. More thorough examination of the risk factors for higher ACE exposure and the resiliency factors that can mitigate those effects through intervention programs is clearly needed. Therefore, the intervention programs would tend to be more personalized: (a) the diagnosis of primary and secondary psychopathy makes the type of intervention differ; (b) preventive interventions could start to be developed.

Efforts need to begin in the preschool years. As the large genetic component to psychopathic antisocial behavior is likely to reflect not only the direct effects of genes, but also gene*environment interaction, preventative efforts for psychopathy will benefit from developmental investigations of this interaction (Viding, Blair, Moffitt, & Plomin, 2005). Findings regarding shared and non-shared environmental influences on children with early onset antisocial behavior, but no psychopathic tendencies, suggest that this subgroup of children is probably amenable to traditional interventions aimed at improving family, school and neighborhood conditions (Viding et al., 2005). Consideration of the aetiological differences between children with early onset antisocial behavior will assist in evaluation of the effectiveness of prevention and treatment programs, as well as raise evidence to the steps needed for devising more effective and targeted future prevention and treatment efforts (Blonigen et al., 2005; Douglas et al., 2011; Viding et al., 2005). It is also important to make early intervention strategies more suited to precursors of PP and SP features in childhood, increasing the impact of early intervention in preventing more serious consequences of psychopathic traits, thus reducing the social and economic impact that psychopathic individuals, as teens and adults, bring to societies.

Also, it is known that ACEs are differently associated with commitment offenses. Youth with more ACEs are generally less likely to be convicted for homicide or serious person/property offending, and more likely to be committed for sexual offenses (e.g., DeLisi et al., 2017; Drury et al., 2017). The effects of ACEs on sexual offending are robust (DeLisi et al., 2017), but considering the heterogeneity of these offenders, it would be important to further investigate the impact of the ACEs on the different types of sexual offenders (DeLisi & Beauregard, 2018) namely of psychopathic type.

Summing-up, further research on the relationship between ACEs the manifestation of specific psychopathic traits in adults and adolescents is needed. This research should also consider other potential mediators of the ACEs-psychopathy relationship, such as peer influences and social bonds.

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