



# Adverse childhood experiences and coping strategies: do they make a difference in psychopathic traits and altruism for young adults?

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## Abstract

Adverse Childhood Experiences (ACEs) have been frequently associated with the presence of psychopathic traits and low levels of altruism. However, there are psychological factors such as coping strategies and demographic variables (sex and socioeconomic status) that can also influence psychopathic and altruistic traits. This study explored the impact of ACEs on psychopathic and altruistic traits, considering participants' coping strategies, in an underexplored population. A total of 420 young Spanish adults (18–20 years old,  $M=18.92$ ;  $SD=0.77$ ) completed the Adverse Childhood Experiences Questionnaire, the Youth Psychopathic Inventory, the Altruistic Scale, and the Brief Coping Scale. Linear regression and comparative qualitative (fsQCA models) analyses indicated that total ACEs and avoidant emotion-focused coping (especially among males) were associated with higher psychopathic traits. Conversely, total ACEs and problem-focused coping (particularly among females) were linked to altruism. FsQCA models extended these findings, incorporating high SES to these previous profiles when predicting psychopathy and altruism. Thus, it is crucial to promote secure environments in childhood that facilitate the development of adaptive coping strategies. These strategies can mitigate the long-term effects of ACEs, reducing the likelihood of developing psychopathic traits while simultaneously increasing altruism.

**Keywords** Adverse childhood experiences · Psychopathic traits · Altruism · Coping strategies · Emerging adulthood

## Introduction

Adverse childhood experiences (ACEs) refer to potentially traumatic events or chronic stressors that take place during childhood and adolescence. They can encompass physical, emotional, and sexual abuse; physical and emotional neglect; and household dysfunction (e.g., substance abuse, parental divorce, incarcerated relatives, and household mental illness) (Felitti et al., 1998). In a recent cross-cultural study by Basto-Pereira et al. (2022), the average range of ACEs was between 1.15 and 3.92, with an average prevalence of 1.35 ( $SD=1.61$ ) ACEs in Spain. However, these data may be underestimated because it is usually collected retrospectively, implying that participants may forget or misreport past events (Gomes et al., 2019).

ACEs predispose individuals to a broad spectrum of behavioral and personality issues, as well as physical and mental health challenges, which can lead to early morbidity and mortality (Felitti et al., 1998). One of the negative outcomes that can emerge from ACEs is the manifestation of dissociative symptoms, which in turn is associated with

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the presence of psychopathy (Smith et al., 2020). Psychopathy is identified by behaviors that are antisocial, impulsive, manipulative, coercive, insensitive, callous, and grandiose, collectively forming a distinctive syndrome (De Brito et al., 2021). Although it shares traits with antisocial personality disorder, psychopathy additionally includes elements of narcissistic, borderline, and histrionic personality traits (Sarkar et al., 2011). Based on the theoretical model of attachment styles in adulthood of Bartholomew and Horowitz (1991), the desynchronization between caregiver and child creates insecure self and world models, which have been significantly associated with high psychopathy in adults (Zara et al., 2024). In this context, experiences of childhood maltreatment appear to elicit a dissociative response to stress, which is a critical element in the affective deficits present in psychopathy (Grabow & Becker-Blease, 2023). This mechanism may also be adaptive in the early stages, as it enables survival in the face of chronic adversity and adaptation despite having a dangerous attachment figure (Snyder et al., 2024). But long-term exposure to dissociative symptoms has not only been linked to negative emotional and behavioral health outcomes, but also to maladaptive personality traits including psychopathic and antisocial personality traits (Smith et al., 2020). Additionally, according to social information processing theories, based on the hostility attribution bias, in the face of adversity, people who have experienced ACEs tend to perceive their environment as an unpredictable threat, and they have a diminished sense of empowerment regarding their ability to change their environment (Nusslock & Miller, 2016).

As a result of the desynchronization between the reference attachment figure and the hostile attribution bias, the development of emotion regulation is hindered, and in turn, the person will be more likely to use emotion-focused coping strategies, such as avoidant emotion-focused (AEF) coping rather than problem-focused (PF) coping strategies (Sheffler et al., 2019). The literature indicates that psychological adjustment in adulthood is related to the ability to use different coping strategies depending on the situation. However, within them, AEF coping is linked to worse physical and emotional health outcomes (Lacomba-Trejo et al., 2022).

Conversely, it is relevant to point out that the research on ACEs has focused almost exclusively on risk factors and negative outcomes (i.e., a deficit model), while failing to include positive aspects such as protective factors. This may be because of the prevailing perspective that emotional, behavioral, and personality problems, including psychopathy, arise from adverse experiences (Ulloa et al., 2016). Despite this general approach, there is an increasing body of research on possible protective and post-traumatic growth effects following adverse experiences (Bethell et al.,

2016). However, the relationship between childhood traumatic events and positive aspects of personality (e.g., altruism) has not been explored in depth (Prior et al., 2021; Ulloa et al., 2016).

Altruism is a type of prosocial behavior in which the person behaves in a way that enhances the well-being of others at a personal cost and without expecting anything in return. There is little and conflicting literature on the relationship between altruism and ACEs, although there are two opposing strands of research. The first argues that altruism can arise from the suffering experienced from ACEs. This would increase empathy and compassion towards others in the form of post-traumatic growth (Greenberg et al., 2018). Some previous research pointed out that trauma can change the way a person sees themselves, others, and the world (Janoff-Bulman, 2011). Posttraumatic growth implies a reappraisal and adaptation to a new reality that could lead to a higher predisposition towards helping other people (Canevello et al., 2022). On the other hand, the second strand argues that exposure to ACEs may weaken the social bond between the caregiver and the child, jeopardizing the process of self-construction, and consequently contributing to problems with other selves. That is, a child who has never been loved or cared for does not really have an adequate model to love or care about others (Carvalho et al., 2020; Gomis-Pomares & Villanueva, 2020).

Additionally, sociodemographic factors, such as sex and socioeconomic status (SES), may have an impact on the link between ACEs and detrimental outcomes. Thus, it has been theorized that sex may be a variable of interest in exposure to ACEs (Prior et al., 2021), given that some of these events (e.g., sexual abuse, gender-based violence, and mental illness in the household) are more predominantly reported by women than men.

In relation to altruistic behavior, it has been consistently observed that women are more altruistic than men across different cultures (Gomis-Pomares & Villanueva, 2020), possibly due to differences in gender-role socialization (Eagly et al., 2020), that is to say, the process by which individuals, from an early age, learn and internalize the norms, roles, behaviors, and expectations associated with their gender within a specific society (Adshead, 2022). In contrast, it seems that psychopathic traits are more prevalent in men than in women (Muris et al., 2017), but it is also possible that psychopathy is expressed differently by sex. For instance, women with psychopathic traits may more frequently resort to manipulation or coercion than men; however, men with psychopathy tend to rely more on physical force. When it comes to criminal activities, patterns also differ. Women often engage in fewer sexual offenses and more instances of arson than men, for example (Nicholls & Petrila, 2005).

Furthermore, the variable SES has also been frequently connected with ACEs, mediating their associations with negative outcomes. In fact, previous research has highlighted the importance of SES in the prediction of physical and mental health outcomes (Kivimäki et al., 2020) and even its relationship with some positive behavioral tendencies such as pro-sociality (Piff et al., 2010). Traditionally, low SES has been related to negative and criminal behavior, or psychopathic symptoms (Bégin et al., 2023), however, these negative results have also been found in high-SES participants (e.g., university students), indicating that SES may have non-monotonic effects on certain outcomes (i.e., high levels of a positive variable may yield negative effects; Gomis-Pomares & Villanueva, 2023), and therefore it is a variable worth further studying.

Although ACEs are common across different contexts and cultures, there is a general overrepresentation of research conducted in English-speaking countries, and the same applies to the other variables in this study. For instance, there is evidence for lower ACEs scores in Spanish populations, indicating the possible existence of specific protective and buffering factors (Basto-Pereira et al., 2022). Therefore, there is an urgent need for additional research in countries with different cultures, such as this study. Also, the underrepresentation of female participants in psychopathy research is well-known (Verona & Vitale, 2018). Fortunately, there is an increasing body of work on psychopathy in non-English speaking countries (Moltó et al., 2000), and with non-incarcerated samples (Wilson et al., 2014). Nevertheless, we found a lack of studies on ACEs in the Spanish context. The context can influence the perception and prevalence of ACEs, as well as the way in which individuals cope with traumatic situations. Similarly, the context can be crucial in understanding altruistic behavior. In this sense, Spanish culture emphasizes social support and community and may rely more on family and close social networks for emotional support during stressful times whereas on Anglo-American cultures, individualism is more pronounced. In addition, more emotion-focused coping strategies could be employed in Spain, and more problem-focused coping strategies in American cultures (Oyserman et al., 2002). Altruism is also driven by social and familial bonds in collectivist and interdependent societies whereas in Anglo-American countries, it is often motivated by individual principles, personal responsibility, and community involvement (Hofstede, 1994; Parmar et al., 2023). Therefore, studies are needed in our country to specifically understand how the variables under study behave in our context.

Most of the previous studies that addressed these issues used only linear analyses to capture these phenomena, for example, regression models (mainly logistic regression), excluding other types of statistical methodologies that

account for non-linear relationships, like fuzzy-set qualitative comparative analysis (fsQCA). Therefore, the present study attempted to combine the use of linear and non-linear prediction methods such as fsQCA, which offered the possibility of finding multiple explanations for the same result (Ragin, 2008), therefore presenting a broader vision of reality. Thus, unlike linear regressions which do not account for the interaction between independent variables, fsQCA models contemplate Boolean logic, explaining the possible interactions between the independent variables on specific outcomes (Ragin, 2008).

Therefore, the main aim of this research was to analyze the influence of ACEs on both psychopathic and altruistic traits in young Spanish adults, considering the coping strategies they adopt and some socioeconomic variables (sex and SES). We hypothesized that the total effect of ACEs would elevate the probability of presenting high psychopathic traits and low altruism (H1); the use of negative coping strategies (high use of AEF and low use of PF strategies) would contribute to the emergence of psychopathic traits and the absence of altruism (H2); and the male sex and low SES would increase the likelihood of psychopathic traits and reduce the likelihood of altruism (H3).

## Method

### Participants

This research included 420 emerging adults ranging from 18 to 20 years old ( $M = 18.92$ ,  $SD = 0.77$ ). All the participants were from the Valencian community in Spain, and 63.3% were women.

### Instruments

The Adverse Childhood Experiences Questionnaire (Felitti et al., 1998) was used to specifically assess ten categories of adverse experiences: sexual abuse, physical abuse, emotional abuse, physical neglect, emotional neglect, parental separation or divorce, substance abuse in the household, mental illness in the household, witnessing domestic violence, and household member incarceration. Most areas of ACEs were scored dichotomously (Yes/No), except for the areas of physical abuse, emotional abuse, neglect, and witnessing domestic violence, which included a Likert scale from 0 to 4. It is worth noting that each dimension of the questionnaire was dichotomized according to the original authors' instructions (Felitti et al., 1998). This questionnaire had shown strong psychometric properties in prior research ( $\alpha = 0.88$ ) (Murphy et al., 2014). The Spanish version of the

questionnaire is currently undergoing verification of its psychometric properties.

The short version of the Youth Psychopathic Inventory (YPI-Short) (Orue & Andershed, 2015) was included to assess participants' psychopathic traits and consists of 18 self-report items. The dimensions measured in this questionnaire include grandiosity-manipulation, or the interpersonal dimension, callous-unemotional, or the affective dimension, and impulsive-irresponsible, or the behavioral future dimension. The 18 items in the questionnaire were scored on a 4-point Likert scale (Not applicable/Strongly applicable). The questionnaire has demonstrated adequate psychometric properties, both in other studies ( $\alpha \geq 0.68$ ) (Orue & Andershed, 2015) and in the present study ( $\alpha = 0.80$ ).

The Altruistic Scale (AAS) (Loureiro & Lima, 2009) assesses participants' ability to contribute to the well-being of others without expecting any rewards in return. It is divided into three sections, with four items each (twelve items in total). The cognitive dimension is scored based on the level of agreement or disagreement with the presented statements. The affective component dimension evaluates how participants would feel about the described actions. The behavioral component focusses on different types of behaviors. Each item on the scale was rated using a 5-point Likert scale, which ranged from 1, indicating "Strongly disagree" to 5, indicating "Strongly agree". The scale has shown good psychometric properties ( $\alpha = 0.79$ ) (Loureiro & Lima, 2009). In our study, we obtained  $\alpha$  values of 0.57.

The Brief Coping Scale (BCS) developed by Carver et al. (1997) and Perczek et al. (2000) evaluates coping responses in adults that may be adaptive and functional or suspected of being maladaptive. It consists of fourteen dimensions that should be analyzed separately, as there is no global score. Nevertheless, in this research, a classification of coping strategies formulated by Sheffler et al. (2019) was utilized: Problem-Focused Coping (PF) and Avoidant Emotion-Focused Coping (AEF). PF coping was formed by three "adaptive" strategies: positive reinterpretation and growth, active coping, and planning. Meanwhile, AEF coping comprised the following three subscales: emotional venting, denial, and behavioral disengagement. Responses were assessed on a Likert scale ranging from 1 to 4, where a score of 4 indicates a higher use of coping strategies and 1 indicates a lower use of coping strategies. The questionnaire had previously shown strong psychometric characteristics. Specifically, for PF,  $\alpha = 0.84$ , and for AEF,  $\alpha = 0.77$  (Perczek et al., 2000). In our study, we obtained adequate  $\alpha$  values for the PF scale ( $\alpha = 0.70$ ), but lower values for the AEF scale ( $\alpha = 0.42$ ).

## Procedure

The collected data stemmed from the SOCIALDEVIANCE1820 Research Project (Basto-Pereira et al., 2020). After obtaining consent from the university ethics committee (22/2018), the data from the participants was gathered. The researchers explained the study's objectives onsite, emphasizing that all questionnaires presented were completely anonymous and confidential. Using convenience and snowball sampling methods, participants were enrolled from different workplaces, sports organizations, universities, high schools, and adult schools. Subsequently, with participants' consent, the different questionnaires were administered. Participants could take part in a voucher draw if they completed all the questionnaires. All participation was entirely voluntary.

Sociodemographic questions were asked, namely concerning the age, sex, and SES of each participant. The factors considered to assess SES included education, profession, and whether the participants were financially independent or dependent on their parents. SES was split into three categories: high, medium, and low. If participants were financially independent, their SES was considered; if not, their parents were considered. A high level corresponded to individuals who worked in large companies, held managerial positions, or had jobs that required a university degree. The medium level corresponded to individuals with occupations that required professional skills, or they held jobs that required a high school diploma. Finally, the low level corresponded to individuals who had routine or semi-routine jobs, among others.

## Data analysis

Statistical analyses were conducted with the SPSS software (Version 29; IBM Corporation, Armonk, NY, USA) and fsQCA 2.5 (Claude & Christopher, 2014). First, descriptive analyses were carried out, then the predictive capacity of sex, SES, the total ACEs score, PF, and AEF on psychopathic traits and altruism were tested by hierarchical regression models (HRMs) and fsQCAs.

To conduct the fsQCA, raw data responses were converted into fuzzy-set responses. Initially, missing data were removed, resulting in a final sample of 398 individuals. Second, values were recalibrated between 0 and 1. Direct calibration was applied to variables such as sex (0 = men, 1 = women), SES (low = 0, medium = 0.49, high = 1), ACEs (low = 0, medium = 0.49, high = 1), and so forth. Subsequently, automatic calibration was performed, considering reference values (Woodside, 2013): 0 for values completely outside the 10th percentile set, 0.5 for intermediate values (50th percentile), and 1 for values entirely within

the 90th percentile set. According to previous literature, a condition is considered necessary when its consistency is  $\geq 0.90$  (Ragin, 2008). Sufficient conditions are those that, although not always present for an outcome to occur, can lead to it. In this sense, a model is informative when the overall consistency is around or above 0.75. The models offer three possible solutions (parsimonious, complex, and intermediate). This study considered the combination between the intermediate and the parsimonious solution, as suggested by Pappas and Woodside (2021).

Statistical significance was determined at a level of 0.5 for all tests conducted. Whether the data followed a normal distribution was verified through the Kolmogorov-Smirnov and Shapiro-Wilk normality tests. Both tests yielded statistically significant results for all variables ( $p < .001$ ), indicating that the data were not normally distributed. However, collinearity among the independent variables in the two regression models was assessed, and it was found that there was no issue, indicated by a Variance Inflation Factor (VIF) value of 1 in all cases. Additionally, autocorrelation among the regression model residuals using the Durbin-Watson coefficient was tested, concluding that there was none, as the values in both cases were close to 2.

## Results

### Descriptive analysis

In terms of the sample's origin, 92.7% were of Spanish nationality. Furthermore, 4.3% of the participants had achieved primary education, 42.7% had finished secondary school, and 53% were enrolled at the university. Of the participants, 29.2% had a low SES level, 54.7% a medium SES level, and 16.1% a high SES level.

### Hierarchical regression models

Two hierarchical regression models were performed, one to predict altruism and another to predict psychopathy. In the initial step, sex and SES were incorporated. In the subsequent step, the overall ACEs score was added. Lastly, in the third step, PF and AEF coping strategies were included. Regarding the prediction of psychopathy, in the final step, being male ( $\beta = -0.24$ ,  $p < .05$ ), experiencing ACEs ( $\beta = 0.13$ ,  $p < .05$ ), and using AEF coping ( $\beta = 0.27$ ,  $p < .05$ ) predicted 12% of psychopathy. Conversely, concerning the linear regression model predicting altruism, in the final step, being female ( $\beta = 0.28$ ,  $p < .05$ ) and presenting PF coping ( $\beta = 0.18$ ,  $p < .05$ ) emerged as significant predictors, accounting for 9% of the variance in altruism (Table 1).

### Fuzzy-set Qualitative Comparative Analysis (fsQCA)

#### Analysis of necessary conditions

Table 2 shows the descriptive analyses and calibration values of the fsQCA. No necessary condition was obtained.

#### Analysis of sufficiency conditions

All the models presented were informative (Ragin, 2008) (Table 3). Regarding the prediction of psychopathic traits, for high levels, three combinations of causal conditions explaining 23% of the cases were found. The first path combined the interaction between being male with high levels of AEF and low levels of PF coping. The second pathway resulted from being male with high SES, and high levels of AEF, and the third pathway combined being male with high levels of ACEs and AEF coping. Likewise, in predicting low levels of psychopathic traits, a pathway was obtained that explained 29% of the variance resulting from the interaction

**Table 1** Hierarchical regression model of psychopathic traits and altruism

| Predictor     | Total psychopathic traits |            |          |       |      | Total altruism |            |         |       |      |
|---------------|---------------------------|------------|----------|-------|------|----------------|------------|---------|-------|------|
|               | $\Delta R^2$              | $\Delta F$ | $\beta$  | $t$   | VIF  | $\Delta R^2$   | $\Delta F$ | $\beta$ | $t$   | VIF  |
| <b>Step 1</b> | 0.05***                   | 10.05      |          |       |      | 0.07***        | 14.43      |         |       |      |
| Women         |                           |            | -0.24*** | -5.26 | 1.02 |                |            | 0.28*   | 5.74  | 1.03 |
| High SES      |                           |            | 0.05     | 0.97  | 1.03 |                |            | -0.01   | -0.21 | 1.03 |
| <b>Step 2</b> | 0.02**                    | 8.66       |          |       |      | 0.004          | 1.70       |         |       |      |
| ACEs total    |                           |            | 0.13**   | 2.74  | 1.03 |                |            | -0.05   | -1.03 | 1.03 |
| <b>Step 3</b> | 0.07***                   | 15.76      |          |       |      | 0.03**         | 7.39       |         |       |      |
| PF            |                           |            | -0.03    | -0.71 | 1.04 |                |            | 0.18*** | 3.65  | 1.04 |
| AEF           |                           |            | 0.27***  | 5.61  | 1.04 |                |            | -0.09   | -1.80 | 1.04 |
| Durbin-Watson | 1.93                      |            |          |       |      | 1.98           |            |         |       |      |
| $R^2_{adj}$   | 0.12***                   |            |          |       |      | 0.09**         |            |         |       |      |

ACEs Adverse childhood experiences, PF problem-focused coping, AEF avoidant emotion-focused coping,  $R^2_{adj}$  denotes the adjusted  $R^2$  value,  $\Delta R^2$  change in  $R^2$ ,  $\Delta F$  change in F,  $\beta$  regression coefficient,  $t$   $t$ -value, VIF Variance Inflation Factor; \*\* $p \leq .01$ , \*\*\* $p \leq .001$

**Table 2** Descriptive analyses and calibration values of the fsQCA

|             | SES  | ACEs | AEF   | PF   | Psychopathic traits | Altruism |
|-------------|------|------|-------|------|---------------------|----------|
| <i>M</i>    | 1.87 | 0.76 | 3.10  | 5.18 | 1.81                | 2.95     |
| <i>SD</i>   | 0.67 | 0.63 | 1.85  | 1.94 | 0.41                | 0.43     |
| <i>Min.</i> | 1.00 | 0.00 | 0.00  | 0.00 | 1.00                | 1.25     |
| <i>Max.</i> | 3.00 | 2.00 | 18.00 | 9.00 | 3.17                | 5.25     |
| P10         | 1.00 | 0.00 | 1.00  | 2.50 | 1.33                | 2.42     |
| P50         | 2.00 | 1.00 | 3.00  | 5.50 | 1.78                | 3.00     |
| P90         | 3.00 | 2.00 | 4.00  | 5.00 | 2.40                | 3.50     |

*M*Mean, *SD*Standard deviation, *Min.* Minimum, *Max.* Maximum, P10 10th percentile, P50 50th percentile, P90 90th percentile, *SES* Socioeconomic status, *ACEs* adverse childhood experiences, *AEF* avoidant emotion-focused coping, *PF* problem-focused coping

**Table 3** Sufficiency analysis for high and low levels of psychopathic traits and altruism

| Frequency cut-off 1        | High levels of psychopathic traits<br>Consistency cut-off 0.86 |      |             | Low levels of psychopathic traits<br>Consistency cut-off 0.86 | High levels of altruism<br>Consistency cut-off 0.91 |             | Low levels of altruism<br>Consistency cut-off 0.91 |      |             |
|----------------------------|----------------------------------------------------------------|------|-------------|---------------------------------------------------------------|-----------------------------------------------------|-------------|----------------------------------------------------|------|-------------|
|                            | 1                                                              | 2    | 3           | 1                                                             | 1                                                   | 2           | 1                                                  | 2    | 3           |
| Women                      | ○                                                              | ○    | ○           | ●                                                             | ●                                                   | ●           | ○                                                  | ○    | ○           |
| High SES                   |                                                                | ●    |             |                                                               | ●                                                   |             | ○                                                  | ○    |             |
| ACEs                       |                                                                |      | ●           |                                                               | ●                                                   | ●           |                                                    | ●    | ●           |
| PF                         | ○                                                              |      |             | ●                                                             | ●                                                   | ●           | ○                                                  | ○    | ○           |
| AEF                        | ●                                                              | ●    | ●           | ○                                                             |                                                     | ○           | ●                                                  |      | ●           |
| Raw coverage               | 0.18                                                           | 0.16 | 0.15        | 0.29                                                          | 0.21                                                | 0.19        | 0.13                                               | 0.13 | 0.11        |
| Unique coverage            | 0.02                                                           | 0.02 | 0.01        | 0.29                                                          | 0.06                                                | 0.04        | 0.04                                               | 0.04 | 0.02        |
| Consistency                | 0.86                                                           | 0.83 | 0.86        | 0.85                                                          | 0.84                                                | 0.87        | 0.91                                               | 0.91 | 0.92        |
| <b>Overall consistency</b> |                                                                |      | <b>0.81</b> | <b>0.85</b>                                                   |                                                     | <b>0.84</b> |                                                    |      | <b>0.89</b> |
| <b>Overall coverage</b>    |                                                                |      | <b>0.23</b> | <b>0.29</b>                                                   |                                                     | <b>0.25</b> |                                                    |      | <b>0.19</b> |

Socioeconomic status (SES); adverse childhood experiences (ACEs); Avoidant emotion-focused (AEF) coping; problem-focused (PF) coping; expected vector according to Fiss nomenclature (2021). For high levels of psychopathic traits: 0, 0, 1, 0, 1; for low levels of psychopathic traits: 1, 1, 0, 1; for high levels of altruism: 1, 0, 1, 0, 1; for low levels of altruism: 0, 1, 0, 1, 0; ● indicates presence of core conditions; ○ indicates absence of core conditions; ○ indicates presence of peripheral conditions; ● indicates absence of peripheral conditions

between being female and reporting high levels of PF and low levels of AEF coping.

Regarding high levels of altruism, two pathways explained 25% of the cases. The first path considered being female, having high levels of SES, reporting a high number of ACEs, and using PF coping. The second pathway considered the interaction between being female, having ACEs, and reporting high levels of PF and low levels of AEF coping. Consistent with this, three pathways accounted for 19% of the cases of low levels of altruism. The first path considered the interaction between being male, having low SES, and using infrequent PF and frequent AEF coping. The second pathway resulted from the combination between being male, having low SES, using infrequent PF coping, and experiencing a high number of ACEs. Finally, the third pathway considered being male and reporting a high number of ACEs, frequent AEF coping, and infrequent PF coping.

## Discussion

The main objective of this study was to analyze the influence of ACEs on both psychopathic traits and altruism behavior in young Spanish adults, considering the coping strategies they adopt. In this line, the first hypothesis was that the total score of ACEs would increase the risk of presenting high psychopathic traits and low altruism. Our results did not fully support this hypothesis. Both linear and non-linear models associated ACEs with psychopathic traits (alongside being male and using AEF coping). However, only the non-linear models emphasized the contribution of ACEs to altruism, and in the opposite direction than expected: increasing altruism in the case of women using an adaptive PF coping strategy. These findings support a group of studies that found the suffering experienced from ACEs increases empathy and compassion towards others (Greenberg et al., 2018). Overall, these results prompted us to reflect, on the one hand, that experiencing a greater number of ACEs does not necessarily lead to negative outcomes (e.g., psychopathic traits), as the suffering of disruptive life events can be buffered by other variables. Our results contribute to the

discussion of recent studies where two possible outcomes in response to ACEs are established: the development of psychopathic traits generally linked to being male, or the development of altruism linked to being female. It is possible that future studies (e.g., examining the contribution of each ACE; Carvalho et al., 2020) may lead to the conclusion that not only is the cumulative effect of ACEs relevant (Chandrasekar et al., 2023), but also that certain ACEs on their own (differential impact) may be capable of influencing future negative outcomes. In this line, the differential effect of ACEs may vary depending on sex. For instance, in the case of women, sexual abuse seems to be a stronger risk factor for the development of psychopathy compared to men (Farrington & Bergström, 2023).

Our second hypothesis was that the use of maladaptive coping strategies (i.e., AEF coping) would contribute to the emergence of psychopathic traits and the absence of altruism, which was mainly supported by the results. Thus, being a male with ACEs and using an AEF coping strategy was the main combination associated with a higher risk of presenting psychopathic traits. These findings correspond with research that emphasized the significance of early interactions with primary caregivers in the development of attachment bonds and their subsequent consequences for emotion regulation and establishment of adaptive PF coping strategies (Sheffler et al., 2019; Snyder et al., 2024). Furthermore, low levels of emotion regulation can enhance emotion-centered coping strategies through emotional avoidance. For example, individuals with psychopathy often exhibit a pattern of emotional avoidance linked to difficulties in experiencing and understanding emotions, as well as a limited capacity to emotionally adapt to different contexts (Smith et al., 2020). The use of AEF strategies linked to psychopathic traits has been regarded as an involuntary and primitive reaction (e.g., denial or venting) versus other more elaborated coping strategies viewed as tactics (e.g., planning) (Perczek et al., 2000), a characteristic that can fit with the impulsivity or disinhibition included in the psychopathic traits (De Brito et al., 2021).

Conversely, our results underscore the importance of positive PF coping strategies. Being a woman and using a PF coping strategy were the variables related to a higher presence of altruism. This result supports previous studies suggesting that individuals who more frequently employ PF strategies tend to exhibit higher levels of altruism (Neophytou et al., 2023). Moreover, this tendency promotes emotional connections with others, acting as a protective factor against risky behaviors and potentially mitigating psychopathic tendencies (Jia et al., 2024). Similarly, it was observed that despite the challenges, when challenges are present with a positive PF coping strategy, the impact of these challenges is diminished.

The last hypothesis posited that the male sex and low SES would predict a higher likelihood of psychopathic traits and a lower likelihood of altruism. Both types of methodologies indicated that being male was relevant in predicting psychopathy, as noted in other studies (Adshead, 2022). Some of the evidence indicates that psychopathic traits appear differently in men compared to women, with different associated risk factors, but overall, psychopathy was less prevalent in our female participants. Thus, factors related to socialization and emotional connections seem to be more critical for predicting psychopathy in women (Farrington & Bergström, 2023). These differences might be attributed to gender socialization issues. Gender socialization theory (Carter, 2014) charts how cultural expectations and norms associated with gender roles influence the formation of identity and behavior from an early age. These socialization processes shape attitudes, values, and behaviors that society deem appropriate for each gender. In this regard, gender socialization influences how aggression, violence, and psychopathic traits are expressed (Adshead, 2022).

In the case of altruism, both methodologies also revealed that women were more altruistic than men, regardless of the presence of ACEs. In fact, only in the case of women did we observe how the expression of the caregiving role through altruism can emerge as an adaptive response to ACEs, demonstrating greater empathy and a predisposition to help others in adversity, again possibly to overcome their own difficulties (Greenberg et al., 2018). Moreover, some previous studies had also shown that sex differences in altruistic behavior may manifest in the type of altruistic actions. For instance, men might exhibit a helping role related to heroism or chivalry exercised in the short term and in public settings, whereas women may display a more protective and affectionate behavior exercised over time and in private settings (Eagly et al., 2020). Exploring the contribution of sex to different types of altruistic acts in the future, could offer a more comprehensive understanding of the phenomenon.

Regarding SES, our results supported our hypothesis only in the non-linear models, adding a new variable to the higher likelihood of developing psychopathic traits, but in the unexpected direction: high SES. That is, being male, using AEF coping, and reporting high SES was related to higher psychopathic traits. Unexpectedly, it was not low SES that was associated with psychopathy, as some studies had found (Bégin et al., 2023). At the same time, another important feature of this new combination including high SES for psychopathic traits was that no ACEs were present. In this sense, this group of psychopathic traits may be related not to maladaptive processes, such as previously described (e.g., lack of emotional regulation, dissociation), but to a “successful psychopathy” observed in individuals with psychopathic traits who have achieved a high social

status. Supporting this difference between types of psychopathy, some studies have also found low scores on emotion dysregulation in “successful psychopathy” (Guo et al., 2023), thus emphasizing the apparently adaptive nature of this type of psychopathy with stable SES, leadership roles, and professional achievement.

Finally, it was also observed that high SES was also linked with the presence of altruism in women. This result supports previous studies showing that having economic leverage was associated with high levels of altruism, versus limited economic resources being associated with low levels of altruism (Prior et al., 2021). Nevertheless, further research is needed to expand our comprehension of SES and its non-monotonic effects.

## Limitations

Despite the contributions of this study, it is important to highlight some limitations. First, data collection relied exclusively on self-report measures, which are susceptible to bias. Although retrospective studies of ACEs have shown good reliability (e.g., Pinto et al., 2014), future studies should consider incorporating social desirability scales, multiple informants, and objective methods. Second, the retrospective design of the study might have influenced the results. In this sense, the collected data could be underestimated or overestimated, as they rely on the participants’ memory. Retrospective reporting can be influenced by recall bias, where participants may forget or misreport past events (Gomes et al., 2019). These factors need to be considered when interpreting the findings and their generalizability. In addition to the above, it is important to note that one subscale of the instruments used, specifically the AEF subscale, demonstrated low internal consistency. Therefore, it would be advisable for future research to conduct a thorough analysis of the psychometric properties of the instrument within our sample. Nevertheless, the age range analyzed in this study (emerging adulthood) presents better conditions for ACE recalling than other age ranges (Ho et al., 2019). Therefore, future research should develop longitudinal studies that allow for more accurate predictions.

Moreover, our results should be considered within the cultural context in which they were obtained. The strong emphasis on family and community support in Spanish culture may provide protective factors against ACEs that might not be as prevalent in more individualistic societies (Parmar et al., 2023). For example, the buffering effect of PF coping could be explained by the higher frequency of seeking help and emotional support in our society compared to others. Given all the above, the generalizability of our findings to other cultural settings should be approached with caution.

In addition, our regression models demonstrated small  $R^2$  values, indicating modest predictive power and suggesting that other unmeasured variables may play a significant role. On the contrary, our QCA models provided higher coverage values. These results imply that while the regression models identified significant predictors, QCA offered a more nuanced understanding of the conditions leading to different levels of psychopathy and altruism. Therefore, employing a mixed-methods approach could better capture the complexity of these constructs and provide valuable insights for future research. In consequence, there are other variables that could be of interest but were not considered here. For example, it could be relevant to consider the role of attachment bonds and resilience as mediating variables between exposure to ACEs and psychopathic traits/altruism (Snyder et al., 2024). Multiple mediation models could be tested where the development of attachment bonds influences resilience and coping styles, which in turn impact subsequent personal outcomes (altruism and psychopathic traits).

## Conclusion

Despite its limitations, this study makes significant contributions. On one hand, it addressed gaps in the literature regarding the association of ACEs, the use of coping strategies, and two different outcomes, one from a deficit model (psychopathic traits), and one from a positive point of view (altruism). Additionally, the study was conducted with a Spanish sample of emerging adults, an age period particularly relevant for predicting future development, and in a scarcely analyzed cultural context. Furthermore, the study led us to conclude that sociodemographic variables (sex and SES), along with coping strategies, are crucial in predicting adaptive outcomes in adulthood, regardless of the presence of ACEs. Similarly, the use of two types of prediction analyses was of great assistance in obtaining a better understanding of the variables related to the prediction of psychopathy and altruism.

In conclusion, this study examined the influence of ACEs on psychopathic traits and altruistic behavior in young Spanish adults, considering the coping strategies they adopt. The findings indicate that a higher number of ACEs does not necessarily lead to negative outcomes such as psychopathic traits, as other variables like gender and coping strategies play a significant role. Specifically, males with ACEs who use maladaptive coping strategies (AEF) are more likely to exhibit psychopathic traits, whereas females using adaptive coping strategies (PF) tend to show increased altruism. Additionally, high SES was unexpectedly linked to higher psychopathic traits in the absence of ACEs, suggesting a potential “successful psychopathy” characterized by high

social status and professional achievement. These findings highlight the complexity of interactions between ACEs, coping strategies, gender, and SES in predicting psychopathic traits and altruistic behavior, and underscore the importance of incorporating comprehensive approach when evaluating the impact of ACEs, including factors like coping strategies, gender, and SES. This holistic view can better inform assessments and interventions, aiming for more nuanced and effective support for young adults.

## Practical and theoretical implications

The results of this work also suggest significant theoretical and practical implications. First, the theoretical implications of this study are crucial for understanding how ACEs influence the development of psychopathic and altruistic traits in adulthood. Based on the theoretical model of adult attachment styles by Bartholomew and Horowitz (1991), we observe that desynchronization between caregiver and child can lead to insecure internal models, contributing to psychopathy. Additionally, social information processing theories (Nusslock & Miller, 2016) explain how individuals with ACEs develop a hostile attribution bias, which hinders emotional regulation and fosters avoidant emotion-focused coping strategies. Lastly, gender socialization theory (Carter, 2014) helps to understand how gender differences influence the manifestation of psychopathic and altruistic behaviors. Our results support the relevant role of the cited theoretical contributions. For instance, mental health professionals should evidently consider the contribution of ACEs to the development of mal/adaptive personality traits and coping strategies. Additionally, the use of intervention programs that enhance PF strategies can help individuals who have experienced ACEs to mitigate their effects. Finally, from a public policy point of view, childhood prevention and support programs could emphasize the importance of promoting safe environments in childhood that foster secure attachment bonds and help children regulate their emotions through adopting PF strategies.

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**Data availability** The datasets produced and/or analyzed during this study are available from the corresponding author upon reasonable request.

**Code availability** N/A.

## Declarations

**Ethics statement** This study received approval from the ethics committee (22/2018).

**Consent to participate** All participants signed the informed consent form and were informed of the purpose of the study.

**Consent for publication** N/A.

**Adverse childhood experiences and coping strategies** Do they make a difference in psychopathic traits and altruism for young adults?

**Conflict of interest** The authors declare no conflicts of interest.

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