

## ORIGINAL ARTICLE



# Adverse childhood experiences: Pathways to internalising and externalising problems in young adulthood

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## Abstract

Although adverse childhood experiences have been closely linked to a variety of adjustment difficulties in adulthood, less is known about which specific adverse experience or combinations of experiences are differentially predictive of internalising and externalising problems. This would undoubtedly enhance early adverse childhood experiences prevention and intervention programmes. Therefore, this research aims to explore the impact of adverse childhood experiences (abuse and neglect) on deviant behaviour, as well as depressive, anxious and stress symptoms in a community sample of Spanish young adults aged 18–20 years old ( $N = 270$ ). All participants were recruited using convenience and snowball sampling methods as part of the International Study SOCIALDEVIANCE1820. All answered self-report questionnaires about sociodemographic issues, adverse childhood experiences as well as current deviant behaviour and current internalising symptoms. Regression and fuzzy-set qualitative comparative analysis showed that experiencing either physical abuse or a combination of emotional abuse and emotional neglect may lead to externalising problems in men. Internalising problems, however, were linked to the cumulative effect of multiple adverse experiences and were more frequent in women. These pathways to both externalising and internalising problems suggest a differential impact of adverse experiences.

## KEYWORDS

abuse, adverse childhood experiences, externalising problems, internalising problems, neglect

## Key Practitioner Messages

- Adverse childhood experiences (ACEs) are linked to internalising and externalising problems during the young adulthood.
- Either experiencing physical abuse or a combination of emotional neglect and emotional abuse can lead to externalising behaviours in men.
- Experiencing multiple ACEs is a risk factor for the expression of internalising problems.
- It is important to improve detection of the deleterious cumulative effects of ACEs on internalising problems, although this is difficult due to their “lack of specialisation”.

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## INTRODUCTION

Adverse Childhood Experiences (ACEs) are defined as traumatic events that occur in childhood such as experiencing violence, abuse and neglect, or witnessing violence at home (Centers for Disease Control and Prevention [CDC], 2021). Adolescents abused as children are more likely to experience depression and other internalising disorders, as well externalising behavioural problems such as delinquency and violence perpetration (Finkelhor et al., 2013; Murphy et al., 2020; Thornberry et al., 2010). Moreover, these kinds of problems tend to be comorbid in individuals with a history of childhood adversity (Toth & Cicchetti, 2013). Parental hostility and lack of a protective environment have been shown to predict an increase in symptoms of depression and anxiety over time in adolescents (Bolger & Patterson, 2001; Lew & Xian, 2019), but the same negative environment has also been linked to externalising problems (Aguilar-Ruiz & Pereda, 2022; Farrington, 2020).

According to the General Strain Theory (GST), these strains or stressors increase the likelihood of negative emotions (such as anger and frustration) and at the same time, these emotions “create pressure for corrective action” (Agnew, 1992). To deal with the negative emotionality arising from adverse experiences, children and adolescents implement risk coping strategies, such as antisocial and delinquent behaviour (externalising behaviour problems), (Basto-Pereira et al., 2016; Felitti et al., 1998; Gomis-Pomares & Villanueva, 2020), or develop internalising problems related with mental health (depression, anxiety, etc.), (CDC, 2021). These problematic outcomes are either manifested in outward behaviour through acting out in the external environment (externalising) or by affecting the person’s internal psychological environment (internalising) (Muniz et al., 2019).

### Individual, cumulative and combined effect of ACEs

So far, studies of the long-term consequences of adverse childhood experiences have focused on the overall experience of adversity or on the individual contribution of each type of childhood adversity or form of maltreatment. While various studies highlight the cumulative effect of ACEs on outcomes (Felitti & Anda, 2010; Jia et al., 2020), a small number of studies analysing the link between particular ACEs and internalising and externalising behaviours in young people have produced varying results. For example, sexual abuse was the only significant predictor of internalising problems in youth involved in the juvenile justice system (Muniz et al., 2019) while also physical abuse (Gomis-Pomares & Villanueva, 2020) and emotional abuse have emerged as significant predictors of externalising problems (Muniz et al., 2019).

However, it is not only the cumulative or individual impact but also the specific combinations of ACEs that matter (Berzenski & Yates, 2011, p. 257). Accordingly, some researchers have used person-centred models to identify variations in how variables are associated within groups of individuals, most commonly latent class analyses. For example, emotional abuse, alone or in combination with other maltreatment types, has been found to be especially salient for psychopathology (e.g. anxiety, depression), while a combination of physical and emotional abuse was most strongly associated with conduct-related problems (Berzenski & Yates, 2011). However, previous studies have focused on children and adolescents (Hagan et al., 2016; Witt et al., 2016) and have not included young adults or the category of neglect (Berzenski & Yates, 2011). Given that the transition from adolescence to adulthood is a key a developmental phase (Arnett, 2000), ascertaining whether some types of ACEs are more closely related to externalising coping strategies or to internalising outcomes would undoubtedly enhance early ACE prevention and intervention programmes for this age group.

To date, most psychology studies have tended to only use regression models, mainly logistic regression (e.g. 73 per cent of the studies in a systematic review, from Basto-Pereira et al., 2015), focusing on the individual contribution of each variable. Interactions can be assessed using qualitative comparative analysis models (fsQCA) (Blackman et al., 2011), an analytical technique which allows more than two variable combinations and takes into account equifinality (Ragin, 2008); that is, different pathways that lead to the same result. Both linear regression and fsQCA methodologies are complementary and can be used to analyse the causal relationships between the variables (Eng & Woodside, 2012; Ragin, 2008), providing a novel method for analysing complex phenomena in social sciences.

### Gender differences

As well as complexity in the pathways between different ACEs and different outcomes, the literature also points to gender differences in the relationship between ACEs and outcomes. However, results are inconsistent. Some studies report no gender differences (Silver et al., 2010), or gender differences depending on the developmental phase, namely adolescence (e.g. Leban, 2021), others report that boys show more externalising problems than girls (Eschenbeck et al., 2007; Leban & Gibson, 2020; Sterba et al., 2007). When confronted with stressful situations, boys tend to express anger and

act out aggressively, even reaching the status of deviant behaviour or violations of criminal law (Godinet et al., 2014; Gomis-Pomares & Villanueva, 2020). A possible contributing factor to this response is that ACEs have been related to impulsivity for boys, but not for girls (Chapple et al., 2021). In contrast, girls are more likely to cope by internalising their response, in an attempt to preserve closeness with others and relationships (Maschi et al., 2008), and may exhibit maladaptive psychological or emotional problems (Eschenbeck et al., 2007). According to the General Strain Theory (Agnew, 1992; Broidy & Agnew, 1997), women are exposed to different strains compared to men, and they could differ in the way they react to them. In this sense, identifying how gender contributes to differing outcome trajectories in young adulthood could also help professionals design or modify assessment and intervention strategies that are more gender sensitive.

## Cultural context

Most of the research in the field of ACEs and their negative outcomes has been carried out in English-speaking countries (Cronholm et al., 2015) and there is a need for further studies in countries with different cultural backgrounds, such as Spain. Spain can be classified as collectivist culture. This kind of culture emphasises collective identity, emotional dependence, group solidarity and harmony, in contrast with individualistic cultures, which emphasise autonomy, emotional independence, individual initiative and primacy of personal goals over group goals (Hofstede, 1980). One of the key points of collectivist cultures is that free emotional expression is less frequent and less important compared to their interpersonal meaning. In this sense, negative emotions can threaten group cohesion, whereas positive emotions can unite the group. For this reason, in collectivistic cultures there is an attempt to show more positive emotions and less negative emotions, just the opposite of what happens in individualistic cultures (Matsumoto et al., 2008). This especially affects the way negative emotions are conveyed, which can provoke a differential response pattern to adversities (Hofstede, 1980; Matsumoto et al., 2008). Therefore, the subtle nuances culturally linked to the development of internalising or externalising problems and their relationship with childhood adversity requires further consideration.

Importantly, chronic anxiety and depression are two of the most prevalent mental illnesses in the non-institutionalised Spanish population, with 3.9 per cent of the total population reporting suffering from both, and 9.6 per cent reporting suffering from either chronic anxiety or depression (ENSE, 2017). Furthermore, the Spanish Statistical Institute (INE, 2020) state that, in 2020, 11,238 minors and 221,437 adults were convicted of criminal or violent conduct (representing 5.7 per cent per 1000 inhabitants in both cases). Victimisations during adolescence are also common, with nearly 50 per cent of Spanish adolescents reporting one to three victimisations (events such as physical or emotional abuse, dating violence, sexual abuse committed by an acquaintance or stranger or witnessing violence) and almost 20 per cent, four or more instances (Pereda et al., 2014). These data indicate the high prevalence of childhood adversity, psychological distress and externalising problems in this population.

## Present study

The main aim of this study is to explore how adverse childhood experiences, and different combinations of these experiences, affect the development of internalising and externalising problems in a sample of Spanish young adults. Uniquely, it will employ linear regression to examine the cumulative effect of ACEs and qualitative comparative analysis models (fsQCA) to search for different combinations of ACEs resulting in different outcomes.

The following is hypothesised:

1. the experience of adverse childhood situations will increase the number of internalising and externalising problems during young adulthood;
2. the relationship between ACEs and the future adjustment difficulties will be gender-sensitive as follows: males will be mainly linked to externalising problems whereas females will be linked to internalising problems during young adulthood.

## METHODS

### Study design

The cohort consisted of 270 young adults between 18 and 20 years of age, with a mean age of 18.96 (men = 31.1 per cent,  $n = 84$ ; women = 68.9 per cent,  $n = 186$ ). In terms of socioeconomic status, 31.5 per cent ( $n = 85$ ) were of low

socioeconomic status, 50.7 per cent ( $n = 137$ ) were of medium socioeconomic status and 17.8 per cent ( $n = 48$ ) were of high socioeconomic status. The largest proportion of participants had a Spanish cultural background (94 per cent). With regard to level of schooling, 4.3 per cent had completed only primary education, 42.7 per cent had completed up to secondary school, and 53 per cent were university students.

The cohort was recruited from high schools, schools for adults, universities, workplaces and sports organisations using convenience and snowball sampling methods. All subjects between the ages of 18 and 20, regardless of their employment or educational status, and who did not have an intellectual disability, mental illness or problems understanding Spanish, were selected. After being informed of the research goals, assured of confidentiality and the facility to withdraw at any time, the participants signed an informed consent, and the questionnaires were administered collectively in the presence of the researchers. The average response time was approximately 25–30 minutes, and the participation rate was 97 per cent. This study is part of the International Study of Pro/Antisocial Behavior in Young Adults (SOCIALDEVIANCE1820) – Spanish sample (Basto-Pereira et al., 2020). The Ethics Committee of the University approved this study (reference number 22/2018).

Because there was a low incidence of cases with abuse and neglect in the initial sample ( $N = 490$ ), the decision was made to create a counterbalanced sample. For that purpose, a variable that was the sum of adverse experiences of abuse and neglect was created. A first subsample of 135 young adults who had faced at least one experience of abuse or neglect was then obtained. A second subsample, with the same gender percentages (31.1 per cent men; 68.9 per cent women) and a similar average age as the first subsample, was then randomly selected. In this case, the subsample did not have any adverse experience of abuse or neglect ( $n = 135$ ) (control group), creating a total sample composed of 270 participants. For this purpose, from the list of participants who had not experienced abuse or neglect in childhood, one subject out of 5 was randomly selected, until the same number of subjects as in the ACEs group was obtained.

## Measures

### Sociodemographic questionnaire

This questionnaire was used to collect sociodemographic information such as gender, age, ethnicity, schooling and socioeconomic status (SES). Regarding the SES variable, the professions and educational levels of the parents were considered unless the youth was financially independent, in which case the youth SES was considered. Three levels of SES were established: high SES: managerial and professional occupations; medium SES: intermediate occupations, such as professions requiring a high school education or specialised professional skills; and low SES: routine or semi-routine work and all others. The inter-judge reliability (kappa coefficient) between two independent judges was considered high (0.85).

### Adverse childhood experiences

The ACE study questionnaire (Felitti et al., 1998; Spanish version translated by the authors of this study) is designed to evaluate the occurrence of ten categories of adverse experiences during the first 18 years of life. In this study, we only focused on abuse and neglect, namely, in terms of the following: emotional abuse, physical abuse, sexual abuse, physical neglect and emotional neglect. Each adverse experience (ACE dimension) was dichotomised according to the original author's instructions (see Felitti et al., 1998; Pinto et al., 2014); if the subject marked one or more items in a category, it was considered present; otherwise, it was considered absent.

### Deviant behaviour variety scale (DBVS)

This self-reported frequency scale measures adolescents' involvement in deviant behaviour, which includes illegal behaviour, such as stealing or driving without a licence, and rule-breaking behaviour that is not illegal, for example, lying to adults (Sanches et al., 2016). Respondents answered in a two-point response style (Yes/No) and indicated whether or not they had been involved in each of the 19 behaviours during the previous year. The total score for deviant behaviours was obtained by summing the number of positive answers. Previous studies as well as the Spanish validation have shown good psychometric properties for this scale, with an alpha ranging from 0.82 (Sanches et al., 2016) to 0.79 (Gomis Pomares et al., 2022).

## Depression anxiety and stress scale (DASS-21), (Daza et al., 2002)

This self-report is designed to evaluate symptoms associated with anxiety, depression and tension/stress. Using a Likert scale ranging from 0 (“Doesn’t apply to me”) to 3 (“Applies to me most of the time”), respondents indicated which of the symptoms they experienced during the previous week. It has shown adequate psychometric properties with values ranging from 0.81 to 0.97 and an acceptable fit to a three-factor model in Spanish-speaking samples (Daza et al., 2002).

## Data analysis

Data analysis was carried out using multiple linear regression and fuzzy-set qualitative comparative analysis (fsQCA). First, descriptive analyses and calibration values were presented. Second, multiple linear regression was performed to analyse the predictive capacity of each adverse experience with respect to the domains of deviant behaviour and depression, anxiety and stress scales. In this regard, to ensure the absence of multicollinearity in linear regression analyses, collinearity diagnostic tests were conducted. Tolerance values ranged from 0.76 to 0.98 and Variance Inflation Factors (VIFs) values ranged from 1.02 to 1.30, indicating that there were no multicollinearity concerns.

Finally, fsQCA, which examines entire combinations of conditions simultaneously, was carried out. It is assumed that the influence of an attribute on a specific outcome does not depend only on individual attributes but rather on a combination of attributes. In fsQCA, consistency represents the extent to which a causal combination leads to an outcome, whereas coverage represents how many cases with the outcome are represented by a particular causal condition. In the first step of the fsQCA analysis, values of variables were operationalised as membership scores within predefined sets and were obtained through calibration (Ragin, 2008). Recalibrated values were gender (0 = male; 1 = female) and experiences of abuse or neglect (0 = absent; 1 = present). The values of age, deviant behaviour, stress, anxiety and depression were recalibrated using three thresholds (Woodside, 2013): 10 per cent (low level or fully outside the set), 50 per cent (intermediate level, neither within nor outside the set) and 90 per cent (high level or fully within the set). After the responses had been transformed, necessary and sufficient condition tests were used to evaluate the effect of adverse childhood experiences (abuse and neglect) on deviant behaviour, as well as depressive, anxious and stress symptoms. Necessary conditions are the causes that must always be present to produce a specific result, whereas sufficient conditions are those which can produce a certain result, but their presence is not necessary. The IBM SPSS Statistics 24 software package (IBM Corporation) was used to generate the linear regression models, and fsQCA 3.0 software was used to perform fsQCA.

## RESULTS

The main descriptors and calibration values of dependent variables are presented in Table 1.

Multivariate linear regression models included sociodemographic variables (gender, age and socioeconomic status) in Step 1, and each maltreatment experience, namely, abuse (emotional, physical and sexual) and neglect (emotional and physical), in Step 2 (see Table 2). The B value (an unstandardised coefficient showing if the independent variable is significantly associated to the dependent variable), standard error (SE), the t-value, p-value and the confidence intervals (CIs) are included in Table 2.

Physical abuse, gender and SES were significantly associated with deviant behaviour. In other words, 19 per cent of deviant behaviour was explained by the presence of physical abuse, being male and having high socioeconomic status. Regarding the stress variable, the three types of abuse addressed in the study, along with emotional neglect, were significantly associated, and the general model explained 21 per cent of the total variance. On the other hand, with regard to anxiety, the statistically significant variables were physical abuse, sexual abuse, emotional neglect and physical neglect (20 per cent of the total variance). Finally, with regard to depression, the same abuse and neglect variables as for the anxiety dimension were found to be predictive (physical abuse, sexual abuse, emotional neglect and physical neglect). In addition, socioeconomic level was a significantly associated variable in this model. Thus, being physically and sexually abused, having experienced emotional and physical neglect, and having a low socioeconomic status were the variables which explained presenting depressive symptoms (37 per cent of the variance).

Second, fsQCA was carried out. The consistency threshold indicates which combinations exhibit high scores for the outcome (Ragin, 2008). A model in fsQCA is considered informative when the consistency is around or above 0.75 (Eng & Woodside, 2012). Therefore, the respective models for the presence and absence of each variable were calculated (Table 3).



**TABLE 1** Main descriptors and calibration values

	Total age		SES		DBVS		DASS stress		DASS anxiety		DASS depression							
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females						
<i>M</i>	18.96	18.91	1.86	1.77	1.90	1.90	0.23	0.33	0.19	0.90	0.77	0.97	0.58	0.54	0.59	0.51	0.46	0.53
<i>SD</i>	0.77	0.79	0.69	0.71	0.67	0.69	0.17	0.20	0.12	0.69	0.65	0.69	0.59	0.53	0.61	0.66	0.62	0.67
Min.	18	18	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Max	20	20	3	3	3	3	1	1	1	3	2	3	3	2	3	3	2	3
<i>Calibration values</i>																		
10th percentile	18		1			0.05				0.14			0			0		
50th percentile	19		2			0.21				0.71			0.43			0.14		
90th percentile	20		3			0.47				2			1.43			1.70		

*Note:* *M*: mean; *SD*: standard deviation; Min: minimum; Max: maximum; SES: socioeconomic status; DBVS: Deviant Behaviour Variety Scale; DASS: Depression, Anxiety and Stress Scales.

**TABLE 2** Multiple linear regression to predict domains of deviant behaviour and depression, anxiety and stress scales

Model	Variables	Deviant behaviour					Linear regression						
		B	SE	t	p	LL	UL	DASS stress					
								B	SE	t	p	LL	UL
1	Gender (1)	-0.15	0.02	-7.22	0.000*	-0.19	-0.11	0.21	0.09	2.33	0.020*	0.03	0.39
	Age	-0.01	0.01	-1.15	0.252	-0.04	0.01	-0.05	0.06	-0.82	0.415	-0.15	0.06
	SES	0.02	0.01	1.66	0.009*	-0.01	0.05	-0.13	0.06	-2.07	0.040*	-0.25	-0.01
	<b>R<sup>2</sup></b>				<b>0.16</b>						<b>0.02</b>		
2	Gender (1)	-0.15	0.02	-7.44	0.000*	-0.19	-0.11	0.14	0.08	1.71	0.087	-0.02	0.31
	Age	-0.01	0.01	-1.05	0.294	-0.04	0.01	-0.05	0.05	-1.06	0.292	-0.15	0.05
	SES	0.03	0.01	2.34	0.020*	0.01	0.06	-0.07	0.06	-1.14	0.257	-0.18	0.05
	Emotional Abuse	0.02	0.03	-0.07	0.459	-0.08	0.04	0.27	0.12	2.23	0.027*	0.03	0.51
	Physical Abuse	0.06	0.02	2.44	0.015*	0.01	0.11	0.33	0.10	3.40	0.001*	0.19	0.52
	Sexual Abuse	0.03	0.03	1.25	0.214	-0.02	0.08	0.42	0.11	3.94	0.000*	0.21	0.62
	Emotional Neglect	0.04	0.03	1.45	0.148	-0.01	0.09	0.33	0.11	2.94	0.004*	0.11	0.55
	Physical Neglect	0.04	0.03	1.24	0.216	-0.02	0.11	0.15	0.13	1.11	0.270	-0.11	0.41
<b>R<sup>2</sup></b>				<b>0.19</b>						<b>0.21</b>			

Note: B = Regression coefficient; SE = Standard error; R<sup>2</sup> adjusted; \*p ≤ 0.05; LL = Lower Limit; UL = Upper Limit; SES; socioeconomic status; DASS = Depression, Anxiety and Stress Scales.

TABLE 2 (Continued)

Model	Linear regression											
	DASS anxiety					DASS depression						
	B	SE	t	p	LL	UL	B	SE	t	p	LL	UL
1	0.07	0.08	0.96	0.337	-0.08	0.23	0.09	0.09	0.99	0.321	-0.08	0.25
	-0.02	0.05	-0.37	0.715	-0.11	0.08	-0.07	0.05	-1.39	0.166	-0.17	0.03
	-0.14	0.05	-2.64	0.009*	-0.24	-0.04	-0.19	0.06	-3.38	0.001*	-0.31	-0.08
				<b>0.02</b>						<b>0.04</b>		
2	0.02	0.07	0.24	0.808	-0.12	0.16	0.01	0.07	0.18	0.856	-0.13	0.15
	-0.02	0.04	-0.44	0.664	-0.10	0.07	-0.08	0.04	-1.81	0.071	-0.16	0.01
	-0.07	0.05	-1.50	0.135	-0.17	0.02	-0.10	0.05	-2.07	0.040*	-0.20	-0.01
	0.05	0.10	0.50	0.621	-0.15	0.26	0.18	0.10	1.75	0.081	-0.02	0.39
	0.35	0.08	4.31	0.000*	0.19	0.52	0.44	0.08	5.33	0.000*	0.28	0.60
	0.37	0.09	4.12	0.000*	0.19	0.55	0.48	0.09	5.35	0.000*	0.30	0.66
	0.24	0.10	2.50	0.014*	0.05	0.43	0.48	0.10	4.99	0.000*	0.29	0.66
	0.28	0.11	2.43	0.016*	0.05	0.50	0.33	0.11	2.89	0.004*	0.10	0.55
				<b>0.20</b>	-0.12	0.16				<b>0.37</b>	-0.13	0.15

Note: B = Regression coefficient; SE = Standard error;  $R^2$  adjusted; \* $p \leq 0.05$ ; LL = Lower Limit; UL = Upper Limit; SES: socioeconomic status; DASS = Depression, Anxiety and Stress Scales.



**TABLE 3** Summary of the main sufficient conditions for the intermediate solution of the study variables for fuzzy analysis

<i>n</i>	DBV Consistency cutoff:0.81			~DBV Consistency cutoff:0.82			DASS stress Consistency cutoff:0.80			~DASS stress Consistency cutoff:0.82			DASS anxiety Consistency cutoff:0.82			~DASS anxiety Consistency cutoff:0.85			DASS depression Consistency cutoff:0.81			~DASS depression Consistency cutoff:0.84					
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Male	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Old	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
High SES	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Emotional Abuse	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Physical Abuse	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Sexual Abuse	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Emotional Neglect	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Physical Neglect	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Raw coverage	0.17	0.08	0.01	0.30	0.21	0.03	0.12	0.12	0.12	0.39	0.41	0.25	0.09	0.07	0.07	0.66	0.09	0.15	0.15	0.15	0.14	0.69	0.69	0.69	0.69	0.69	0.69
Unique coverage	0.14	0.06	0.01	0.17	0.08	0.01	0.02	0.04	0.06	0.06	0.06	0.05	0.08	0.02	0.01	0.56	0.01	0.03	0.03	0.03	0.01	0.69	0.69	0.69	0.69	0.69	
Consistency	0.81	0.86	0.88	0.81	0.89	0.87	0.87	0.87	0.84	0.82	0.82	0.81	0.88	0.87	0.88	0.72	0.98	0.67	0.88	0.88	0.83	0.67	0.67	0.67	0.67	0.67	
<b>Overall solution consistency</b>	<b>0.82</b>			<b>0.79</b>	<b>0.83</b>	<b>0.83</b>	<b>0.74</b>	<b>0.87</b>	<b>0.87</b>	<b>0.72</b>	<b>0.72</b>	<b>0.87</b>	<b>0.72</b>	<b>0.72</b>	<b>0.72</b>	<b>0.80</b>	<b>0.80</b>	<b>0.80</b>	<b>0.80</b>	<b>0.80</b>	<b>0.80</b>	<b>0.67</b>	<b>0.67</b>	<b>0.67</b>	<b>0.67</b>	<b>0.67</b>	
<b>Overall solution coverage</b>	<b>0.31</b>			<b>0.46</b>	<b>0.31</b>	<b>0.31</b>	<b>0.60</b>	<b>0.25</b>	<b>0.25</b>	<b>0.67</b>	<b>0.67</b>	<b>0.67</b>	<b>0.67</b>	<b>0.67</b>	<b>0.67</b>	<b>0.46</b>	<b>0.46</b>	<b>0.46</b>	<b>0.46</b>	<b>0.46</b>	<b>0.46</b>	<b>0.69</b>	<b>0.69</b>	<b>0.69</b>	<b>0.69</b>	<b>0.69</b>	

*Note:* DBV: Deviant Behaviour; SES: Socioeconomic Status; DASS: Depression Anxiety Stress Scales; Expected vector (0; absent; 1; present); Expected vector for the presence of deviant behaviour: 0.0.0.1.1.1.1.1; Expected vector for the absence of deviant behaviour: 1.1.1.0.0.0.0.0; Expected vector for the presence of stress: 1.1.0.1.1.1.1; Expected vector for the absence of stress: 0.0.1.0.0.0.0.0; Expected vector for the presence of anxiety: 1.1.0.1.1.1.1.1; Expected vector for the absence of anxiety: 0.0.1.0.0.0.0.0; Expected vector for the presence of depression: 1.1.0.1.1.1.1.1; Expected vector for the absence of depression: 0.0.1.0.0.0.0.0.

## Deviant behaviour

In the case of deviant behaviour, the different interactions accounted for 31 per cent of the variance for the presence of the variable (DBV) and 46 per cent for the absence of the variable (~DBV). In the former case, three pathways appeared significantly associated with the presence of deviant behaviour. The first interaction was defined by male gender, a high socioeconomic level and absence of emotional abuse in childhood. This combination of variables explained 17 per cent of deviant behaviour cases. The second pathway included older age, high socioeconomic level, absence of emotional abuse and presence of physical abuse, explaining 8 per cent of deviant behaviour cases. The third pathway consisted of being male and young with a low socioeconomic status and having experienced emotional abuse and neglect. This combination accounted for 1 per cent of deviant behaviour cases. In contrast, for the prediction of the absence of deviant behaviour, the three combinations were as follows. First was being young and female and not having experienced emotional or physical abuse or emotional or physical neglect, which explained 30 per cent of the absence of deviant behaviour cases. The second pathway was the result of the interaction between being a young female with a low socioeconomic status and not having experienced abuse (physical, emotional or sexual) or physical neglect (accounting for 21 per cent of the absence of deviant behaviour cases). Finally, the combination of being a female with a low socioeconomic status, having faced emotional abuse and not having experienced sexual abuse or physical and emotional neglect accounted for 3 per cent of the cases.

## Stress

The presence of high levels of stress (DASS Stress) accounted for 31 per cent of the cases. The combination of being young with a high socioeconomic status explained 12 per cent of stress cases. The second pathway was explained by the interaction between being male with a high socioeconomic status and having experienced emotional abuse during the childhood. This combination explained 12 per cent of stress cases. The third pathway was the result of being a female who had not been emotionally or sexually abused but had been emotionally neglected (accounting for 9 per cent of the stress cases). By contrast, the absence of high levels of stress during young adulthood (~DASS Stress) was explained by three different pathways, accounting for 60 per cent of the cases. These pathways were as follows: having a low socioeconomic status and not having experienced abuse or neglect during childhood; being young and not having faced abuse nor negligence; and finally, being male and, as in the previous cases, not having faced experiences of maltreatment (neither abuse nor neglect). These three combinations explained 41, 39 and 25 per cent of the cases, respectively.

## Anxiety

The presence of high levels of anxiety (DASS Anxiety) was explained by two pathways accounting for 25 per cent of the cases. The first was the result of the interaction between being young with a high economic status and having experienced emotional abuse during childhood (accounting for 9 per cent of the cases). The second pathway (7 per cent of the anxiety cases) was the combination of being a female with a low economic status, not having experienced emotional or sexual abuse but having experienced emotional neglect. On the other hand, the absence of elevated anxiety levels (~DASS Anxiety) was explained by three combinations of variables (67 per cent of the anxiety cases). The first pathway was the result of the combination of being a female with a low economic status and not having experienced emotional abuse but having experienced emotional neglect. This combination explained 7 per cent of anxiety cases. The second pathway was the interaction with not having faced child abuse (neither neglect nor abuse), explaining 66 per cent of cases. The third pathway was being a young, wealthy male who had not experienced physical or sexual abuse or emotional or physical neglect (accounting for 9 per cent of anxiety cases).

## Depression

Finally, concerning depression (DASS Depression), higher levels were explained by three pathways accounting for 46 per cent of the cases. The pathways were as follows: being a female and not having experienced emotional abuse but having experienced physical abuse (15 per cent of cases); being a female with a high socioeconomic status and having faced physical abuse in childhood (15 per cent of cases) and being a young female and having faced physical abuse during childhood (14 per cent of cases). In contrast, low levels of depression (~DASS Depression) were explained by only one pathway (69 per cent of the depression cases). This pathway was the result of not having experienced abuse during childhood.

## DISCUSSION

This research aimed to explore the relationship between adverse experiences or combinations of adverse experiences during childhood and the subsequent development of internalising and externalising problems in Spanish young adults. The first hypothesis posited that adverse childhood experiences would lead to a greater manifestation of internalising and externalising problems during young adulthood. This hypothesis was fully supported by the results.

While physical abuse relates both to externalising (deviant) and to internalising symptoms (depression), the rest of the adverse childhood experiences appear to associate mainly with internalising problems. As supported by previous studies (Gomis-Pomares & Villanueva, 2020; Hildyard & Wolfe, 2002), externalising behavioural problems are mainly the result of physical assault by primary caregivers. Moreover, emotional abuse, in combination with emotional neglect, was especially salient for externalising problems. Therefore, there may be two pathways leading to deviant behaviour. The first is the classical pathway in which physical abuse potentially acts as a learning mechanism. Children are thought to internalise a mental pattern of violent behaviour and imitate it by expressing violence towards others (cycle of violence) (Hildyard & Wolfe, 2002; Margolin & Gordis, 2000).

The second pathway to externalising behaviour is a new path resulting from the combination of emotional abuse and emotional neglect. Other studies previously established the impact of emotional abuse on increasing the risk of externalising behaviours in youth involved in the juvenile justice system (Muniz et al., 2019); however, the results here also implicate emotional neglect. The analytic strategy used here (fsQCA) allowed for the study of combined effects of ACEs and it seems that both the omission of emotional needs and the commission of acts in opposition to these emotional needs may produce frustration that is ultimately expressed through externalising problems, as General Strain Theory defends (Agnew, 2009). It is worth emphasising that these two pathways for the presence of externalising problems are present only for males.

Internalising problems seem to have a broader multifactorial association with different types of ACEs, which may demonstrate that the cumulative effect of ACEs is a more salient risk factor for the expression of internalising problems. Pathways to internalising problems seem to be multifactorial, but, once present, they tend to be stable over time, even observed in people in their sixties (e.g. Ege et al., 2015). This finding is consistent with the fact that adverse childhood events seem to be linked with a poorer prognosis and treatment response among adults with these kinds of internalising problems (Liu et al., 2017). Therefore, it is extremely important to improve detection of the deleterious cumulative effects of ACEs on internalising problems, something especially difficult due to their “lack of specialisation”.

It was also hypothesised that the relationship between ACEs and the future adjustment difficulties would be gender-sensitive, with males being mainly linked to externalising problems and females to internalising problems during young adulthood.

This hypothesis was mainly supported and the most consistent result was that males with high socioeconomic status who experience physical abuse during childhood are more likely to show externalising problems later in life. This outcome is logical if we consider that physical abuse is more frequent in boys than girls (Leban & Gibson, 2020) and is in line with the assumption that males and females experience different types of strain, and possibly distinct responses to them (Broidy & Agnew, 1997). As stated before, the association between emotional abuse, emotional neglect and externalising problems was also present for male participants, who seem to respond with crime and delinquency to adversities more often than women (Agnew, 1992).

Meanwhile, being a female experiencing ACEs was associated with internalising problems, specifically stress and depression. This result also supports previous studies which found that women are more likely to internalise anger with self-directed coping strategies, such as drug use (Sharp et al., 2012). In this regard, drug use is an extreme strategy usually linked to extreme adversities, such as sexual abuse, which is also more prevalent in women (Pereda et al., 2014; Villanueva & Gomis-Pomares, 2021), and at the same time, closely linked to internalising problems (Muniz et al., 2019). According to previous studies (Fuchshuber & Unterrainer, 2020), feelings of anxiety and pain associated with early childhood trauma are often managed by the child ignoring his or her own feelings and self-esteem. In adulthood, this internalised coping strategy may predispose them to risky behaviours such as drug use. Therefore, we can say that the gender-dependent classical behavioural responses to stressful situations appear to remain very similar during young adulthood, although the male pattern is more consistent.

Finally, it is interesting to highlight that the best contribution of fuzzy analyses in this study is how the ability to analyse different combinations of ACEs leading to the same outcome presents a more realistic picture of the situation. For example, the combination of emotional abuse and emotional neglect related to externalising problems is comparable to the classical result of physical abuse being linked to externalising outcomes. Another valuable nuance that fuzzy analyses offer is the combination of sociodemographic variables (SES, gender) with specific ACEs to facilitate the identification patterns involving externalising and internalizing problems.

It is worth mentioning the role of the variable socioeconomic status (SES) as it relates to internalizing and externalizing problems. For instance, high-SES men experiencing physical abuse were more likely to present externalizing

problems, while high-SES participants suffering emotional abuse were more prone to show stress and anxiety. The more consistent result involving SES from both analytic methodologies has to do with deviant behaviour, with which SES presented a positive relationship. Although low SES has been traditionally linked to deviant or criminal behaviour (Connolly et al., 2017; Rutter et al., 1998), a body of opposing results can also be found in the literature. Some deviant or transgressive behaviours, such as addiction or high illegal substance use, can also be linked to recreational choices, coping with stress and peer norms in high-SES participants (Loudermilk et al., 2018; Martin, 2019). This second observation may be especially valid in the age range of this study (18–20 years old), in which 53 per cent of the participants were university students. It is necessary to widen the scope and consider not only low SES as a risk factor for the exacerbation of problems but also high SES in specific conditions, assuming that SES may have non-monotonic effects on analysed variables.

## LIMITATIONS

Despite these results, this study is not free of limitations. The age range of our sample was limited (18–20 years). Therefore, our findings cannot be generalized to other age groups. However, the use of this age group can be considered an advantage, since it is closest to the period during which the adverse childhood experiences occurred, and the events are more easily recalled. Furthermore, previous studies with young adults have already shown good reliability for retrospective reports of Adverse Childhood Experiences (Pinto, Correia, & Maia, 2014). Second, the use of self-report questionnaires could be considered another limitation of this study. For this reason, future studies should consider combining self-report questionnaires with other types of measures (such as child protective services reports and official criminal files), to provide more accurate data on the impact of adverse experiences. Finally, since this is a cross sectional design, it is not possible to establish a causal relationship between the variables studied.

## CONCLUSION

This study contributes to our knowledge of the psychological mechanisms and reactions of the individual to particular ACEs. It emphasises the importance of understanding what combinations of adverse experiences may lead to a particular problem in order to mitigate the negative outcomes that can occur in adult life. The results show new pathways to both externalising and internalising problems, including combinations of ACEs, as well as some sociodemographic characteristics, that suggest a differential impact of ACEs depending on an individual's background. The findings also highlight how future studies would benefit from analysing the co-occurrence of internalising and externalising problems (Leban, 2021), and not only the co-occurrence of ACEs.

## ETHICS STATEMENT

The Ethics Committee of the authors' University approved this study (reference number 22/2018).

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