Psicothema

The effect of adverse childhood experiences on deviant and altruistic behavior during emerging adulthood

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Abstract

Background: The experience of coping with negative events in early ages (childhood and adolescence) has consistently been linked to some specific deviant behaviors, such as juvenile justice involvement or persistence in crime. In contrast, very few studies have focused on the link between Adverse Childhood Experiences and altruistic behavior. The objective of this study is to examine the possible influence of Adverse Childhood Experiences on the social behavior exhibited in emerging adulthood (specifically deviant and altruistic behavior). **Method:** The study population consisted of 490 young adults between the ages of 18 and 20, with a mean of 18.90 years (SD = .77). All voluntarily completed the following self-report questionnaires: the Adverse Childhood Experiences questionnaire, the Deviant Behavior Scale, and the Altruistic Scale. **Results:** Linear regression models found that Adverse Childhood Experiences were strong, positive predictors of deviant behaviors. Moreover, specific Adverse Childhood Experiences (physical abuse for deviant behavior, and emotional neglect for altruistic behaviors) had notable, differential effects. **Conclusions:** The prevention or early detection of Adverse Childhood Experiences during childhood could contribute to reducing maladaptive patterns of behavior and to increasing altruistic patterns during emerging adulthood.

Keywords: Adverse childhood experiences, deviant behavior, altruism, emerging adulthood, different impact.

Resumen

La influencia de las experiencias adversas infantiles sobre la conducta antisocial y altruista en la adultez emergente. **Antecedentes:** sufrir experiencias negativas durante la infancia se ha relacionado con comportamientos antisociales, como la implicación en la justicia juvenil o la persistencia en el crimen. Sin embargo, en comparación con la conducta antisocial, muy pocos estudios se han enfocado en la relación entre las Experiencias Adversas Infantiles y la conducta altruista. Por ello, el objetivo de este estudio es examinar la posible influencia de dichas experiencias en el comportamiento social manifestado durante la adultez emergente (conducta antisocial y altruista concretamente). **Método:** la muestra estaba formada por 490 jóvenes con edades comprendidas entre 18 y 20 años, con una media de 18.90 años (DT = .77). Todos completaron voluntariamente los siguientes cuestionarios de autoinforme: Adverse Childhood Experiences questionnaire, Deviant Behavior Scale y Altruistic Scale. **Resultados:** los modelos de regresión lineal mostraron que las Experiencias Adversas Infantiles eran fuertes predictoras de las conductas antisociales. Además, había experiencias adversas específicas (abuso físico para la conducta antisocial y negligencia emocional para las conductas altruistas) que produjeron un efecto diferencial y destacable. **Conclusiones:** la prevención o detección temprana de las Experiencias Adversas durante la Infancia podría contribuir a reducir los patrones de conducta inadaptados y a aumentar los patrones altruistas durante la adultez emergente.

Palabras clave: experiencias adversas en la infancia, conducta antisocial, altruismo, adultez emergente, impacto diferencial.

Adverse Childhood Experiences (ACEs) are defined as traumatic experiences that may include sexual, physical or emotional abuse or emotional and physical neglect, as well as adverse family circumstances that occurred during childhood or adolescence. Studies show that adverse experiences tend to be frequent and co-occurring: two-thirds of the population suffered from at least one before the age of 18, and over 10% experienced 5 or more (Bellis, Lowey, Leckenby, & Hughes, 2014; Felitti et al.,

1998). In overall terms, adverse experiences are more common among children under 6 years of age than among older children (Thompson et al., 2015). The results obtained by Kerker et al. (2015) indicate that almost all children between 18 and 71 months of age (98.1%) have experienced at least one adverse event, and 50.5% have experienced 4 or more. On average, the first exposure to ACEs occurs at one and a half years of age (Dong et al., 2004). Once an adverse event occurs in a child's life, the likelihood of additional ACEs increases significantly, which is why a chain of early risks opens up.

For this reason, various studies have increasingly established the importance of early life experiences in people's health throughout the life course (Felitti et al., 1998; Hughes et al., 2017). Individuals who have adverse childhood experiences during childhood or adolescence tend to have more physical and mental

health problems as adults than those who do not have ACEs. All the advances made in this field lead to the theoretical assumption that childhood adversity is strongly linked to social, emotional and cognitive impairment, and to the adoption of health risk behaviors that promote a wide range of negative outcomes: early disease, disability, social problems, and even early death (Felitti et al., 1998; Hughes et al., 2017). These risk behaviors, such as alcohol and drug abuse, or deviant behaviors (either consciously or unconsciously) may act as effective coping devices in the extreme short term to reduce the stress levels caused by experiencing these adverse situations.

It is generally the cumulative impact of multiple ACEs that leads to risk behaviors and negative outcomes in later life (Felitti & Anda, 2010). However, the individual contributions of the specific ACEs must also be considered, as some studies claim they have differential impact (Agnew, 2001; Sharp, Peck, & Hartsfield, 2012). For example, Agnew (2001) argues that most cumulative measures have only a moderate impact on crime. Meanwhile, different types of experiences may have a strong impact on crime, whereas others have little or no impact. In this study, we analyse both the cumulative and individual impacts of childhood adverse experiences on the adoption of non-adaptive strategies by young adults.

Deviant and non-altruistic behaviors can be regarded as risk strategies leading to negative outcomes, such as social problems, judicial involvement, and imprisonment. Deviant behavior might be conceptualized as behavior that violates social norms and values, including a wide range of acts such as theft, lying and assault. The definition includes antisocial behaviors that are violations of criminal law, usually referred to as offences or crimes, as well as acts that are not subject to sanctions by the criminal justice system, such as externalizing or disruptive behaviour (Braga, Gonçalves, Basto-Pereira, & Maia, 2017). Meanwhile, altruistic behavior is a concept that involves human actions being taken for the benefit of others, i.e., living for others (Eisenberg, 2014). This concept is encompassed within the prosocial behavior that consists of a broad category of actions which are defined by society as generally beneficial to other people (Piliavin, Dovidio, Gaertner, & Clark, 1981).

According to the Integrated Cognitive Theory of Antisocial Potential (Farrington, 2017), experiences of child and adolescent maltreatment, such as problematic family environments, anti-social models, delinquent parents and/or peers or traumatic experiences, are factors that foster deviant behavior in the long run. Likewise, according to Sampson and Laub (2003) being exposed to adverse situations such as poverty, or toxic family environments, provides more favourable conditions for future criminal behavior. For example, a child who experiences a negligent family environment may receive little affection, limited family supervision, as well as carelessness on the part of their legal guardians. Due to negligent parenting practices, the probability of this young person establishing a weakened social bond is higher, which is the central aspect in delinquent behavior (Sampson & Laub, 2003). Involvement with the juvenile justice system or persistence in crime (Basto-Pereira, Miranda, Ribeiro, & Maia, 2016; Craig, 2019; Dierkhising et al., 2013), have consistently been found to be related to adverse childhood experiences. Moreover, ACEs not only increase the chances of problems with the juvenile justice system, but also increase the risk of re-offending (Baglivio et al., 2014).

However, besides the cumulative effect of ACEs, we can also focus on the differential contribution of each specific ACE to the adoption of risk behaviors. Widom and Maxfield (1996) conducted one of the first studies to address the relationship between child maltreatment and deviant behavior. The results showed that children who were victims of physical abuse and/or neglect were almost twice as likely to be arrested as a result of violent crime as adults. Same results were also reported by Piquero and Sealock (2000), in a young offending population that was also substance-abusing. Meanwhile, other studies found household members who had been physically abused and incarcerated in childhood/adolescence to be the most significant predictors of involvement with the juvenile justice system (Baglivio el al., 2014; Basto-Pereira et al., 2016). As is apparent, physical abuse is the most consistent predictor of deviant behavior, in both juveniles (Braga et al., 2017; Maas, Herrenkohl, & Sousa, 2008), and young adults (Braga, Cunha, & Maia, 2018). Nevertheless, the research on the differential impact of ACEs on deviant behaviour has been limited in comparison to their cumulative impact.

In comparison to deviant behavior, very few studies have focused on the link between ACEs and altruistic behavior (Music, 2011). These studies have highlighted empathy difficulties in physically abused children, during their middle childhood (Margolin & Gordis, 2000). Other studies have mainly focused on child maltreatment victims that do not show serious negative sequelae, and are therefore resilient. One of the multiple personal characteristics that may foster this resilience is altruism (Mrazek & Mrazek, 1987). Further exploration of the neglected relationship between ACEs and altruism is therefore extremely relevant. In overall terms, an early identification of adverse childhood experiences is crucial outstanding for preventing deviant behavior and fostering altruistic behavior, thereby preventing negative outcomes in the long-term.

Previous studies agree that this cumulative impact of ACEs on later developments is strong in the long term (Felitti et al., 1998). Accordingly, most of the studies examined the influence of adverse childhood experiences in later stages of adulthood, but not in the period of emerging adulthood, a new conception of development for the period from the late teens through the twenties, with a focus on ages 18-25 (Arnett, 2000). It is precisely in this emerging adulthood period that participation in illegal activities peaks, and tends to decline thereafter (Stolzenberg & D'Alessio, 2008). Moreover, due to this specific age range analyzed, this study does not present the weakness of retrospective designs, which present some difficulties with remembering the negative events. In fact, older people report less ACEs (Dube et al., 2003). Finally, there is limited research studying childhood adversity experiences in Spanish populations compared to English-speaking countries. As Cronholm et al., (2015) found, some ACEs might differentially impact specific demographic groups that are often neglected by most studies in the field, such as African Americans, Hispanics, and Asians. Cultural nuances and invariances in childhood adversity are worthy of analysis.

The purpose of this study is therefore to explore the overall and differential effect of childhood adversity experiences on the adoption of risk strategies (deviant behaviors), and on the possible lack of positive strategies (altruistic conducts), in a Spanish emerging adult population. It is also hypothesized that having experienced more ACEs during childhood will increase deviant behavior and reduce altruistic behavior during emerging

adulthood. Moreover, we expect to find a differential contribution of ACE subtypes to the adoption of both behavioral strategies.

Method

Participants

The total study population consisted of 490 young adults, with 37.6% males and 62.4% females. The ages ranged from 18 to 20 years, with a mean of 18.90 years (SD= .77). Only a small portion of the population belonged to an ethnic minority (7.3%) consisting of 2.3% Romanian (N= 11), 1.9% Latin-American (N= 9), 1% African origin (N= 5) and 2.1% belonging to other nationalities (N= 10), and the rest were of Spanish origin. As for the level of schooling of the participants, 4.3% presented primary school level, 38.7% high school studies and 57%, university studies".

Instrument

The *"Adverse Childhood Experiences" (*ACEs) questionnaire (Felitti et al., 1998; Spanish translation carried out by the authors of this study) evaluates adverse childhood and adolescent experiences: abuse, neglect and household dysfunction during the first 18 years of life. The following ten adverse experiences were assessed: sexual (4 items), physical (4 items) and emotional abuse (3 items); physical (5 items) and emotional neglect (3 items); living in a household with domestic violence (3 items), parental divorce (1 item), household substance abuse (2 items), mental illness in the household (2 items) and incarceration of a member of the household (1 item). For the areas of emotional and physical abuse, neglect and witnessing domestic violence, the frequency with which the person experienced them is measured from "0 = Never" to "4 = Too Often". For the remaining experiences, the classification is "Yes" or "No". Each adverse experience (ACE dimension) was dichotomized according to the original author's instructions (Felitti et al., 1998; Pinto, Correia, & Maia, 2014). If the subject scored one or more items as often or very often the category was considered present, and otherwise it was considered absent.

The *"Deviant Behavior Scale"* (DVB) by Sanches, Gouveia-Pereira, Marôco, Gomes, & Roncon (2016), includes both illegal behavior and rule-breaking behavior that is not illegal (e.g. lying to adults, or skipping school for several days without parental consent). The scale contains 19 items, answered in a two-point response style (No/Yes), regarding whether the participants have engaged in each of the 19 behaviors during the previous year (12-month DVB). The total score for deviant behaviors is obtained by the sum of positive answers. The participants were also asked to write the number of behaviors they had engaged in throughout their entire life (Lifelong DVB).

The *"Altruistic Scale* (A.A.S)*"* (Loureiro & Lima, 2009) is composed of 12 items, organized in three subscales: Cognition (4 items), Affection (4 items), and Behavior (4 items). For the assessment of the cognitive dimension, participants are asked to indicate their level of agreement with a series of statements (e.g., "I think that, in this world, all you have to do is take care of yourself"). The affective component is made up of issues about which the subject is asked to indicate how he or she would feel if the actions described were carried out (e.g., "Caring for someone, without expecting a reward"). In the behavioral component, the subject is asked about a series of behaviours (e.g., "Giving up your place in a queue to someone who needs it" in the supermarket, bank, etc.). All the subscales are answered on a five-point scale (where 1 corresponds to "totally disagree" and 5 to "totally agree").

Procedure

The collected data is part of the *International study of pro/antisocial behavior in young adults SOCIALDEVIANCE1820 Research Project*. Data were collected in different contexts: 280 from universities (57.14%), 140 from technical and leisure centers (28.57%) and 70 from adult education centers (14.28%), after obtaining consent from the University Ethics Committee and the participants. The researchers visited these centers and explained the objective of the study. All participants took part voluntarily, and they were entitled to enter in a voucher draw. They were informed that the questionnaire was anonymous, and the data was strictly confidential. The questionnaires were administered collectively, in the presence of the researchers.

Data analysis

First, frequencies and Chi-Square (χ^2) tests were conducted to examine whether the males and females differed in their reported ACEs. Second, ANOVA analysis for independent samples and post-hoc tests were carried out to compare if there were any differences between the subjects who did not have any ACE, those who had from 1 to 3 ACEs, and those who had more than 4 ACEs. Subsequently, bivariate correlations were carried out between the variables under study of Adverse Childhood Experiences (ACE), Deviant Behavior (DVB) and Altruism (AAS). Finally, a series of linear regressions were also performed to determine whether the total and the different components of the ACE were predictors of deviant and altruistic behaviors.

Results

Descriptive results

Table 1 shows the prevalence of each specific ACE in the total sample and depending on gender. All ACE percentages were higher for women than men, except for emotional neglect and household substance abuse. However, significant differences were only found in physical and sexual abuse, and mental illness or suicide, with a higher incidence in women. In the case of women, 64.5% of respondents reported at least 1 of the 10 ACEs, and 33.4% reported 2 or more. The percentages for men were 57.3% and 20.8%, respectively.

When the subjects were grouped into 3 groups according to the number of ACEs they presented (0 ACEs, 37.6%; 1-3 ACEs, 52.8% and 4 or more ACEs, 8.2%), the results of the ANOVA analysis for independent samples indicated significant differences in the variables of deviant behavior over the last year ($p = .021*$), and lifelong deviant behavior ($p = .002*$). No difference between groups was found for the altruism variable ($p = .742$). Tukey's post-hoc tests indicated that these differences in the two deviant behavior variables (lifelong and last year) were between the group of subjects that presented no ACE and the group of subjects with 1 to 3 ACEs, compared to the group with 4 or more ACEs.

Table 1
Prevalence of each category of ACE and ACE score by gender

Category of ACE	Prevalence (%)			
	Women (N = 301)	Men (N = 181)	Total (N = 490)	p
Abuse				
Emotional	9.3	7.2	8.8	.419
Physical	18.9	11.6	16.4	.039*
Sexual	13.3	4.4	10.0	.002*
Neglect				
Emotional	1.7	4.4	2.7	.073
Physical	.00	.00	.00	-
Household dysfunction				
Parental Separation or Divorce	25.6	24.3	26.1	.755
Domestic violence	7.6	6.1	7.6	.516
Household Substance Abuse	17.9	18.2	18.4	.936
Mental illness or Suicide	31.6	21.0	28.0	.012*
Incarcerated household member	5.0	4.4	4.7	.779
ACE score				
0	35.5	42.7	37.6	
1	31.1	36.5	32.0	
2	16.9	9.6	14.1	
3	7.4	5.6	6.8	
4	3.4	2.2	3.1	
≥5	5.7	3.4	5.1	

* p<.05

Bivariate correlations between the different variables in the study showed a positive association between total ACE and lifelong deviant behavior ($r = .14$; $p = .002*$), and last year ($r = .09$; $p = .003*$), and a negative correlation between total ACE and altruism ($r = -.04$; $p = .361$).

Predictive analysis of the total ACE score

A linear regression was carried out with the different dependent variables of DVB overlife, 12-month DVB, and altruism and the independent variables of gender, age and total ACE score. As seen in Table 2, where the variable lifelong DVB was considered, gender and total ACE were significant variables, explaining 12.5% of the variance. In Table 3, in which the dependent variable was DVB over the last year, gender and total ACE also appeared as the two significant variables in the model, explaining the 15.8%. This means that being a man and having experienced adverse situations in childhood are predictive variables of deviant behaviors in the first 18 years of life and during the last year. Table 4 shows that the only predictor variable of altruism was gender, i.e. being a woman was a good predictor of altruistic behaviors. This model only explained 5.5% of the total variance.

Table 2
Linear regression of the total ACE variable on Lifelong DVB

	B	SE	t	p	LL	UL
Woman (1)	-2.48	.33	-7.45	.000*	-3.13	-1.82
Age	.29	.21	1.41	.159	-.17	.71
Total ACE	.36	.11	3.18	.002*	.14	.58
Constant	.72	3.99	.18	.856	-7.12	8.57

$N = 490$; $R^2= .130$; R^2 adjusted $=.125$; * p<.05

Table 3
Linear regression of the total ACE variable on 12-month DVB

	B	SE	t	p	LL	UL
Woman (1)	-.14	.02	-9.36	.000*	-.17	-.11
Age	-.01	.01	-1.09	.274	-.03	.01
Total ACE	.01	.01	2.44	.015*	.00	.02
Constant	.50	.18	2.87	.004	.16	.85

$N = 490$; $R^2= .164$; R^2 adjusted $=.158$; * p<.05

Table 4
Linear regression of the total ACE variable on Altruism

	B	SE	t	p	LL	UL
Woman (1)	.23	.04	5.37	.000*	.14	.31
Age	.02	.03	.80	.424	-.03	.07
Total ACE	-.02	.01	-1.40	.164	-.05	.01
Constant	2.42	.50	4.85	.000	1.44	3.41

$N = 490$; $R^2= .061$; R^2 adjusted$= .055$; * p<.05

Predictive analysis of the scales of the ACE

An analysis of the linear regression of the different components of the ACE and the demographic variables of gender and age, highlighted the following results. In Table 5, the variables that predicted the presence of deviant behaviors throughout life were gender, physical abuse and household substance abuse. This indicates that being a man, having suffered from physical abuse in childhood and someone in the home having abused substances are significant predictors of deviant behaviors throughout the course of life. This first model was statistically significant, explaining 15% of the variance.

The prediction of the different categories of ACE on DVB during last year is presented in Table 6. Gender and physical abuse were the two variables that predicted deviant behaviors during the previous year. This means that, to a certain extent as in the previous model, being a man and having suffered from physical abuse during childhood is significantly linked to the probability of deviant behaviors during the previous year. This model explained the 16% of the total variance.

Finally, Table 7 shows how the different dimensions of ACE and demographic variables predict altruism. In this case, gender and emotional neglect were the two variables that explained 6.4% of the total variance. Being a woman and not having suffered emotional neglect in childhood therefore increase the level of altruism.

Discussion

This study was conducted to assess the overall and differential effect of childhood adverse experiences on social behavior in a Spanish sample of emerging adults. The first hypothesis predicted that having suffered from ACEs during childhood will increase the adoption of deviant behaviors and the absence of altruism conducts. This hypothesis about the cumulative impact of ACEs was partly supported by the results. First, having experienced ACEs during childhood appeared to be a good predictor of deviant behavior not only during the previous year (12-month DVB), supporting previous studies (Basto-Pereira et al., 2016; Craig,

Table 5 Linear regression of Each Category of ACE on Lifelong DVB						
	B	SE	t	p	LL	UL
Woman (1)	-2.55	.34	.31	.000*	-3.21	-1.89
Age	.27	.21	1.27	.205	-.15	.68
Emotional Abuse	-.42	.49	-.86	.393	-1.39	.55
Physical Abuse	1.15	.39	2.95	.003*	.38	1.92
Sexual Abuse	.12	.19	.58	.564	-.28	.51
Emotional Neglect	.09	.05	1.91	.057	-.01	.19
Physical Neglect	-.32	.10	-.32	.749	-.23	.17
Parental Separation or Divorce	-.24	.38	-.65	.519	-.99	.50
Domestic Violence	-.32	.31	-1.02	.308	-.94	.30
Household Substance Abuse	.79	.34	2.31	.002*	.12	1.47
Mental Illness or Suicide	-.30	.29	-.79	.428	-.80	.34
Incarcerated household member	.73	.84	.87	.385	-.92	2.39
Constant	1.24	3.97	.31	.756	-6.57	9.04

*N = 490; R²= .173; R² adjusted= .150; * p<.05*

Table 6 Linear regression of Each Category of ACE on 12-Month DVB						
	B	SE	t	p	LL	UL
Woman (1)	-.14	.02	-9.28	.000*	-.17	-.11
Age	-.01	.01	-1.09	.278	-.03	.01
Emotional Abuse	-.01	.02	-.39	.695	-.05	.04
Physical Abuse	.04	.02	2.17	.030*	.01	.07
Sexual Abuse	.01	.01	.98	.327	-.01	.03
Emotional Neglect	.01	.01	1.67	.096	-.01	.01
Physical Neglect	.01	.01	.26	.797	-.01	.01
Parental Separation or Divorce	.01	.02	.78	.436	-.02	.05
Domestic Violence	-.02	.01	-1.14	.255	-.04	.01
Household Substance Abuse	.01	.02	.63	.529	-.02	.04
Mental Illness or Suicide	-.02	.01	-1.13	.259	-.04	.01
Incarcerated household member	.03	.04	.75	.453	-.05	.10
Constant	.49	.18	2.81	.005	.15	.84

*N = 490; R²= .188; R² adjusted =.166; * p<.05*

Table 7 Linear regression of Each Category of ACE on Altruism						
	B	SE	t	p	LL	UL
Woman (1)	.23	.04	5.28	.000*	.14	.31
Age	.02	.03	.71	.481	-.03	.07
Emotional Abuse	-.02	.06	-.32	.751	-.15	.10
Physical Abuse	-.07	.05	-1.43	.152	-.17	.03
Sexual Abuse	.01	.03	.17	.868	-.05	.06
Emotional Neglect	-.01	.01	-2.24	.026*	-.03	-.01
Physical Neglect	-.01	.01	-.07	.948	-.03	.03
Parental Separation or Divorce	-.03	.05	-.63	.526	-.13	.07
Domestic Violence	.06	.04	1.46	.144	-.02	.13
Household Substance Abuse	-.02	.05	-.41	.684	-.12	.07
Mental Illness or Suicide	.02	.04	.53	.595	-.05	.09
Incarcerated household member	.05	.11	.43	.668	-.16	.25
Constant	2.51	.50	4.99	.000	10.52	3.50

*N = 490; R² =.089; R² adjusted = .064; * p<.05*

2019), but also over the entire life (lifelong DVB). In specific terms, presenting 4 or more ACEs was a major turning point in the probability of exhibiting deviant behaviors. On the other hand, if we only focus on the cumulative impact of ACEs, these adverse experiences were not predictive of altruistic behaviors, as if an undifferentiated global experience of adverse situations was not related to the absence of positive actions for the benefit of others. Even the group with 4 or more ACEs presented the same mean for altruistic behaviors as the other groups (0 ACEs and 1-3 ACEs).

The second hypothesis on differential contributions of ACE subtypes to the adoption of deviant and altruistic behaviors provided the following results. Physical abuse was the main significant predictor of deviant behaviors, not only in the previous year of the young adult's life, but also for their entire life. In contrast, household substance abuse was only a significant predictor when deviant behaviors were assessed over their entire life. Apart from this, and contrary to the absence of an ACE cumulative effect on altruism, emotional neglect was the only differential ACE that predicted the lack of altruism. This result undoubtedly reinforces the need to study both types of impact of ACEs, cumulative and differential, to provide a more realistic overview of the situation, as suggested by Agnew (2001).

There therefore seems to be a differential effect depending on the type of adverse experience. Consistent with previous studies (Basto-Pereira et al., 2016; Braga et al., 2018), our data indicated that physical abuse appeared as the most consistent predictor of deviant behaviors. In fact, physically abused children have more externalizing problems in childhood compared to neglected children, including increased noncompliance and aggression towards adults and other children (Hildyard & Wolfe, 2002; Hoffman-Plotkin & Twentyman, 1984). These results could be due to learning mechanisms such as modelling and differential reinforcement. Children who have been victims of violence may imitate this behavior, particularly if they perceive that such violence results in rewards, such as compliance to one's wishes (Akers, 2009; Braga et al., 2017). Consequently, from a developmental point of view, it is logical and consistent to think that children who have experienced physical abuse and consequently present externalizing problems in middle childhood (Hildyard & Wolfe, 2002; Margolin & Gordis, 2000), continue to adopt the same type of risk strategies with deviant behaviors in emerging adulthood. This externalizing trajectory would also be consistent with the result, indicating that lifelong deviant behavior was also predicted by physical abuse. In this trajectory, the older the youth, the more severe type of transgressive acts that may be adopted, especially if they are not encouraged to abandon these maladaptive strategies and to adopt positive ones.

The differential predictive power of emotional neglect on altruistic behavior, is also intuitive, assuming that children who have never been loved by significant relatives, who have not ever felt special or important within a protective context, have also failed to learn the ability to love or care about others. According to the Integrated Cognitive Theory of Antisocial Potential mentioned above, being exposed to adverse situations during childhood or adolescence, may weaken the social bond that should be established under normal conditions (Farrington, 2017; Sampson & Laub, 2003). Similarly, some authors also consider these experiences of neglect as a threat to the overall development of children's self, as they do not receive any attention or care, meaning no valuable contributions to the process of self-construction (Toth, Cicchetti,

Macfie, & Emde, 1997). Problems with the self may consequently contribute to problems with other selves. In fact, neglected children have been shown to present more social withdrawal and limited peer interactions, and more internalizing problems than physically abused children (Hildyard & Wolfe, 2002; Hoffman-Plotkin & Twentyman, 1984).

As a summary, we can assume that different socio-emotional and cognitive impairments take place due to these adverse experiences. In physical abuse, the construction of a hostile mental scheme (deviant behavior) appears to be the key factor. Meanwhile, in children whose needs have been systematically ignored, the absence of a mental scheme of other's needs is the central point. Furthermore, although it was not an objective of this study, some comments are worth to be made about the variable gender in relation to early adverse situations. First, ACEs were more predominant in women than in men, which supports previous studies (Basto-Pereira, Miranda, Ribeiro, & Maia, 2016; Dube et al., 2003). Secondly, gender was a significant variable in all the predictive models analysed. However, while being a man suffering different ACEs was predictive of deviant behaviors, only being a woman was a good predictor of altruistic behaviors. These results are coherent with previous research showing the highest association of male gender to externalizing or disruptive behaviours as well as to violations of criminal law (Godinet, Li, & Berg, 2014; Kroneman, Loeber, & Hipwell, 2004).

Despite these results, this study is not without some limitations. All the variables in this study were measured by self-reported questionnaires, with a retrospective design. This method may involve some difficulties with remembering events that happened during childhood. However, unlike previous studies (Dube et al., 2013), the participants in this study are younger (18-20 years old), and consequently they can easily recall more recent events. Moreover, previous studies with young adults have already shown good reliability for retrospective reports of Adverse Childhood Experiences (Pinto et al., 2014). Second, the ACE questionnaire does not account for the intensity, frequency, duration or on some occasions, the specific perpetrator of each negative experience. Future studies must focus in depth on these parameters, which surely make a difference on the impact of the negative experience.

The cumulative effect and some specific dimensions of ACEs (even in the absence of this cumulative effect) had a relationship with the risk of presenting deviant behaviors and inhibiting the expression of altruistic behaviors. The results were highly predictive of deviant or violent behavior when the child had suffered from physical abuse, and a lack of altruistic behaviour when emotionally neglected. The results of this study therefore support the implementation of secondary and tertiary prevention strategies, as advocated by Felitti et al., (1998). Due to the age period chosen in this study, preventing the early adoption of deviant behaviors as chronic coping mechanisms is still possible. For those already using these maladaptive mechanisms, helping to promote change (desistance) may act as tertiary prevention. In both cases, networking and specialized training of all the agents involved in identifying ACEs and deviant behaviors (schools, public health services, the juvenile justice system), would be incredibly valuable. Likewise, implementing strategies for neglected children to be able to develop skills such as empathy or understanding the emotions of others would be very useful in fostering altruistic behaviors among children who have not learned how to do this earlier in life.

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