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## Early trauma and associations with altruistic attitudes and behaviours among young adults

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### ABSTRACT

**Background:** Childhood and adolescent traumas are exceptionally prevalent worldwide. Despite their high prevalence and substantial impact, little research has investigated the rates and specific types of early trauma by gender. It is also unknown whether the types of early trauma are differentially associated with heightened or hindered prosocial attitudes and behaviours.

**Objective:** To address this gap, this study aims to explore the rates of different types of early trauma (i.e., abuse: sexual, physical, and emotional; neglect: physical and emotional) among young Australian adults and investigate whether these differ according to participant gender (female, male and transgender/gender diverse). The study will also examine the associations between the different types of early trauma and current altruistic attitudes and behaviours (including the affective, behavioural and cognitive altruism domains), among a young adult Australian cohort.

**Methods:** Cross-sectional data was collected from 511 young Australians aged 18–20 years using an online self-report survey.

**Results:** Multiple regression analyses revealed that transgender/gender diverse individuals were over 3-times more likely to experience all types of maltreatment than females and over 3-times more likely to experience emotional and sexual abuse and emotional neglect than males. Experiencing one or more trauma types was negatively associated with the cognitive domain of altruism, experiencing physical neglect was associated with the affective domain, and having a family member involved in domestic violence was associated with the behavioural domain, after controlling for gender.

**Conclusions:** Findings show how early traumatic experiences can influence individuals' attitudes and behaviours during the pivotal developmental period of young adulthood.

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## 1. Introduction

Child and adolescent trauma is extremely common, with global estimates showing that 41–97 % of school-aged youth experience a traumatic experience during these early life stages (see systematic review by Carlson et al., 2019). Rates among nationally representative samples are somewhat lower, albeit, still concerningly high (39–41 %; Barrett et al., 2015; Kessler et al., 2010). Specifically, among Australian adults, 20 % report having experienced a childhood trauma prior to 9 years of age and 41 % before 17 years of age (Barrett et al., 2015). The most commonly reported early traumas are sexual assault, witnessing serious injury or death, and the unexpected death of a loved one (Barrett et al., 2015; Mills et al., 2011).

A consistent relationship has been found between child and adolescent trauma and a range of negative emotional, physical, cognitive, behavioural, and social factors such as psychiatric morbidity (e.g., post-traumatic stress disorder and depression), alcohol and drug use, poor academic and vocational performance, risky sexual behaviour, aggression, and criminal offending (Derzon, 2010; Lim & DeSteno, 2016). Most research on the impact of trauma has focused exclusively on these negative associations, which may be driven, in part, by the perspective that negative behavioural outcomes originate from negative experiences (Ulloa, Guzman, Salazar, & Cala, 2016). A relatively understudied area is the relationship between the experience of trauma and positive, prosocial outcomes including altruistic attitudes and behaviours (Stanton & Low, 2004; Ulloa et al., 2016).

Prosocial behaviours are voluntary actions that are intended to benefit others, and they indicate advanced social competence (Larson & Moses, 2017). Altruism is a form of prosocial behaviour and is defined as an individual's helping behavior that exhibits selfless concern for the wellbeing of others despite the consequences for themselves, and without expectation of reward (Batson & Powell, 2003). The relatively small amount of existing literature examining trauma and altruism has reported mixed findings. On the one hand, 'altruism born of suffering' (Vollhardt & Staub, 2011) is a concept which asserts that children and/or adolescents who have been victims of maltreatment are more likely to develop altruistic attitudes or behaviours as a result of an increased empathy for others in distress (Greenberg, Baron-Cohen, Rosenberg, Fonagy, & Rentfrow, 2018; Vollhardt & Staub, 2011; Wanner, Vitaro, Carbonneau, & Tremblay, 2009). The ability to achieve these heightened versions of 'moral sense' have been conceptualised as 'posttraumatic growth' (Puvimanasinghe, Denson, Augoustinos, & Somasundaram, 2014). Posttraumatic growth refers to the positive psychological change experienced after trauma, such as increased empathy and desire to help people (Boals, Steward, & Schuettler, 2010; Greenberg et al., 2018; Stanton & Low, 2004). The relationship between trauma and altruism has commonly been studied among samples who have experienced collective trauma. Studies conducted in countries who have experienced mass trauma, such as the war in Croatia, 9/11 or a natural disaster, have found that people are more likely to help others suffering the same trauma as they did, compared to individuals who have not experienced trauma (Bonanno, 2004; Frazier et al., 2013; Prino & Peyrot, 1994). This increase in altruistic tendencies has been attributed to the aforementioned increases in compassion associated with experiencing trauma (Puvimanasinghe et al., 2014). This ability to identify and empathise with others in distress drives individuals to engage in altruistic behaviour (Staub & Vollhardt, 2008).

On the contrary, other research has found that altruistic behaviour and helping others is inhibited following trauma exposure (Jirsaraie, Ranby, & Albeck, 2019; Keresteš, 2006). For example, a theory known as 'the cycle of violence' has been implicated in explaining these findings (Forsman & Långström, 2012; Wright, 2019). This theory proposes that exposure to violence will normalise that behaviour for those witnessing or experiencing it (Widom, 1989; Wright, 2019). According to this theory, it is for this reason that people who experience trauma behave in a less altruistic and more combative manner, reflecting what they have been exposed or victim to themselves (Maxfield & Widom, 1996; van der Merwe & Dawes, 2000). Adult samples of Vietnam War veterans who have been diagnosed with PTSD, for instance, have been found to exhibit increased inter-partner violence and overall physical aggression (Jakupcak et al., 2007; Teten et al., 2010). Similarly, Keresteš (2006) found a decrease in altruism in children exposed to war stressors in Croatia. Given these discrepant findings, it is possible that the extent to which people engage in altruistic behaviours following exposure to trauma may be related to the nature of the trauma itself. A more nuanced investigation into individual trauma types and relationships with altruistic attitudes and behaviours is warranted to better understand the relationship between various types of trauma and its associated consequences on altruism.

To our knowledge, only two existing studies have investigated the association between a range of individual trauma types and altruistic attitudes and behaviours (Carvalho, Maciel, & Basto-Pereira, 2019; Gomis-Pomares & Villanueva, 2020). These studies focused on a young adulthood age group, as emerging adulthood is a critical life stage wherein social roles inevitably change, potentially resulting in either desistance from or increased involvement in antisocial behaviour (Basto-Pereira, Queiroz-Garcia, Maciel, Leal, & Gouveia-Pereira, 2019; Stolzenberg & D'Alessio, 2008). Among their sample of 673 young Portuguese adults aged 18–20 years, Carvalho et al. (2019) examined whether there were any associations between the specific types of adverse childhood experiences (ACEs; abuse: sexual, physical, and emotional; neglect: physical and emotional) and altruism, as well as whether there were any associations between the types of ACEs and the domains of altruism (i.e., the 'affective' domain refers to an individual's emotional response; the 'behavioural' domain refers to an individual's behavioural responses; and the 'cognitive' domain refers to an individual's beliefs or perceptions). The authors found that abuse and neglect were negatively associated with global altruistic attitudes and behaviours, and in the more nuanced analyses, that emotional neglect was negatively associated with the affective altruism domain, and both physical abuse and emotional neglect were negatively associated with the behavioural altruism domain (Carvalho et al., 2019). These findings suggest that early maltreatment, particularly emotional neglect, inhibits normal acquisition of prosocial skills such as altruistic attitudes and behaviours. This is consistent with Music (2011) who proposed that a child who experiences lack of interpersonal affection will have less interest in helping others. Another study by Gomis-Pomares and Villanueva (2020) examined the associations between abuse (sexual, physical, and emotional), neglect (physical and emotional) and household dysfunction (parental divorce, domestic violence, household substance abuse, mental illness, and having an incarcerated household member) with altruistic

attitudes and behaviours among a sample of 490 young Spanish adults aged 18–20 years. While they found that the total number of ACEs was not significantly associated with global altruism scores, emotional neglect was negatively associated with global altruism; a finding that is consistent with the [Carvalho et al. \(2019\)](#) study. No examination of the association between each of the ten individual types of ACEs and the domains of altruism was conducted in this study.

Many studies have indicated that a person's sex—that is, being male or female—is related to the prevalence of early trauma and the types of traumas experienced ([Cavanaugh, Petras, & Martins, 2015](#); [Dierkhising et al., 2013](#); [Leban & Gibson, 2020](#); [Loxton et al., 2020](#)), as well as altruistic attitudes and behaviours ([Dreber, von Essen, & Raney, 2014](#); [Gomis-Pomares & Villanueva, 2020](#)). Some studies have shown that females are more likely to experience an early trauma, relative to males ([Cavanaugh et al., 2015](#); [Felitti et al., 1998](#); [Leban & Gibson, 2020](#)), in particular sexual abuse and assault ([Dierkhising et al., 2013](#)). On the contrary, other studies have found that males are more likely to experience an early trauma, as well as a greater number of traumas in their childhood, compared to females ([Axinn, Ghimire, Williams, & Scott, 2013](#); [Tolin & Foa, 2006](#)). There are also studies which highlight that the specific type of trauma experienced differs depending on an individual's biological sex. For instance, [Gomis-Pomares and Villanueva \(2020\)](#) examined the prevalence of ACEs according to participant sex in their sample and found that females were more likely than males to experience sexual abuse and have a household member with a mental illness, however, males were more likely to experience emotional neglect than females. Similarly, in Australia, epidemiological studies have indicated that females are significantly more likely to experience sexual abuse and domestic violence compared to males, while males are more likely to experience physical assault and disaster/accident-related traumas relative to females ([Mills et al., 2011](#); [Sunderland et al., 2016](#)).

More recent research has also sought to understand how gender—that is, a person's personal and social identity, which may or may not correspond to their sex assigned at birth—is associated with the experience of trauma ([Cantor et al., 2015](#); [Coulter et al., 2015](#); [Schnarrs et al., 2019](#)). Research on trauma and ACEs fairly consistently indicates that transgender individuals (i.e., people whose gender is different to what was presumed for them at birth) are at higher risk for trauma, particularly sexual assault, than their cisgender counterparts (i.e., individuals whose gender identity does match their sex assigned at birth; [Cantor et al., 2015](#); [Coulter et al., 2015](#)) and compared to the general population. ([Craig et al., 2020](#)). For instance, a recent study among 477 American sexual and gender minority individuals revealed that transgender individuals were more likely to experience emotional abuse, physical neglect, and emotional neglect than cisgender individuals (OR = 1.90, OR = 1.87, OR = 1.70, respectively; [Schnarrs et al., 2019](#)). Two recent systematic reviews have further highlighted the high risk of childhood abuse among transgender and gender non-conforming individuals, with prevalence estimates of up to 100 % ([Blondeel et al., 2018](#); [Tobin & Delaney, 2019](#)). Despite increasing knowledge regarding potential gender differences in the experience of trauma among international cohorts, the prevalence of trauma and types of traumatic experiences among people with diverse gender identities within the Australian context remains unknown. It is also important to take into account any possible sex and/or gender differences when trying to understand the relationship between early traumatic experiences and altruism; given that research has shown that females typically report more altruistic behaviours relative to males ([Dreber et al., 2014](#); [Gomis-Pomares & Villanueva, 2020](#)). Moreover, furthering our understanding of gender differences in the experience of early trauma can be used to inform relevant prevention and treatment approaches.

In sum, the literature appears mixed as to the associations between trauma and altruism, with some studies suggesting an increase in altruistic and helping behaviour as a result of earlier trauma (i.e. indicative of posttraumatic growth), while others show inhibited altruistic behaviours following trauma. These inconsistencies may in part be due to the focus on trauma as a collective factor, rather than considering the ways that different types of early traumatic experiences may impact later altruistic attitudes and behaviours. Research in this area has also been somewhat limited by a focus on the adult population and outside of Australia (i.e., predominantly Europe and the United States). The diversity of social and behavioural changes that take place during the critical life stage of young adulthood can have significant ramifications for an individual and have the potential to either become costly or beneficial to society ([Hawkins et al., 2012](#); [Hicks, Durbin, Blonigen, Iacono, & McGue, 2012](#)). Gaining an improved understanding of how young adults in this life stage are affected by early trauma exposure is critical. Two existing studies that have examined this relationship in a young adult age group were conducted in Europe ([Carvalho et al., 2019](#); [Gomis-Pomares & Villanueva, 2020](#)). Further investigation into these associations in an Australian context will supplement understanding in this neglected area. A deeper understanding of associations between the types of traumas and specific domains of altruism could be used to inform efforts to embed trauma informed care into services for young people in Australia and internationally. Additionally, improving our understanding of the relationship between the prevalence and types of ACEs experienced by people of different gender identities in the Australian context could inform intervention services to meet the needs of young people of a broader range of gender identities.

### 1.1. Aims and hypotheses

This study aims to explore the rates of different types of ACEs among young Australian adults and investigate whether this differs according to participant gender (female, male, TGD [i.e., identify as transgender or a different gender identity]). This study will also examine the associations between the different types of ACEs and altruistic attitudes and behaviours, among a young adult Australian cohort. Given the exploratory nature of this research due to mixed research findings to-date, no specific hypotheses will be generated.

## 2. Method

### 2.1. Participants

A total of 582 young adults were recruited and eligible to participate in the current study. Seventy-one participants were excluded

for incomplete data on variables of interest (i.e., ACEs and altruistic attitudes and behaviours), leaving a final analytic sample of 511 individuals (25.8 % male, 69.7 % female, 4.5 % TGD). No significant differences were evident in baseline sociodemographic characteristics between participants who had complete or incomplete data on these variables ( $p < .05$ ).

## 2.2. Procedure

Participants were recruited via social media advertisements (i.e., Twitter and Facebook), advertisements on professional websites, and existing professional networks between November 2018 and June 2019 as part of the Australian contingent of the *International study of pro/antisocial behaviour in young adults SOCIALDEVIANC1820* Research Project (Basto-Pereira et al., 2019). To be included in the study, participants were required to be 18–20 years of age, fluent in English and currently residing in Australia. After written consent was obtained, participants were given access to a confidential online baseline survey that took between 15 and 30 min to complete. All participants were volunteers and were given the option to enter into a draw to win a \$500 voucher for completing the survey. The current cross-sectional study utilises baseline data obtained as part of the Australian contingent of the *SOCIALDEVIANC1820* study.

### 2.2.1. Ethical approval

Ethical approval was granted by the University of Sydney's Human Research Ethics Committee (#2018/876). All participants were required to provide informed consent prior to completing the study.

## 2.3. Materials and measures

### 2.3.1. Demographics

Sociodemographic information was collected from the participants including gender (male, female, TGD [i.e., people who identified as transgender or a different gender identity]), age, years of schooling (dichotomised to indicate whether they had completed secondary school; yes, no), whether they were part of an ethnic minority (yes, no), and occupation (working, studying, working and studying, neither working or studying). Additionally, as per previous literature (Basto-Pereira et al., 2019), socioeconomic status (SES) was categorised as low, medium or high based on the participants occupation status and education history (if financially independent) or their parents/caretaker's occupation and education history (if not financially independent). SES was classified as 'low' for routine or semi-routine workers (e.g., factory worker), 'medium' for professions requiring high school education or specialised professional skills (e.g., electrician) or small employers, and 'high' for managerial and professional occupations requiring university education or large business owners.

### 2.3.2. Adverse Childhood Experiences questionnaire

The Adverse Childhood Experiences questionnaire (ACE; Dube et al., 2003; Felitti et al., 1998) is a self-report questionnaire that measures the types and frequency of specific childhood and adolescent traumas, categorised into three main groups: abuse, neglect and household dysfunction, during the first 18 years of life. Abuse and neglect are personal ACEs, while household dysfunction measures ACEs related to other family members. Ten adverse experiences are assessed within each of these three categories: *Abuse*: sexual (i.e., a child being witness or victim to any sexual processes beyond their understanding), physical (i.e., any act that is intentionally inflicted upon a child that causes harm) and emotional (i.e., any psychological act that results in the child suffering significant emotional deprivation or trauma); *Neglect*: physical (i.e., absence of provision of basic needs such as food or a safe home environment) and emotional (i.e., absence of provision of the psychological support that meets a child's emotional needs from a caregiver); *Household dysfunction*: living in a household with domestic violence, parental divorce, household substance abuse, mental illness or attempted suicide in the household, and incarceration of a member of the household. Responses for the abuse and neglect categories and domestic violence questions were scored on a 5-point Likert scale ranging from 1 'never' to 4 'very often'. Items were dichotomised to indicate whether or not each type of abuse and neglect had been experienced; if the item was scored as 'often' or 'very often', it was coded as 1 'Yes', and otherwise it was coded as 0 'No'. The remaining family dysfunction category required dichotomous responses of 0 'No' or 1 'Yes'. As per previous research, a total number of ACEs was obtained by summing the 10 dichotomous responses (range = 0–10), and the number of ACEs was categorised into 1, 2, 3, 4, 5 or more (Carvalho et al., 2019; Gomis-Pomares & Villanueva, 2020), as well as categorised into whether the participant had experienced at least one ACE (Dube et al., 2003; Hughes et al., 2019). The ACEs questionnaire has demonstrated acceptable internal consistency and test-retest reliability in a variety of samples including young adults (Ford et al., 2014; Mersky, Janczewski, & Topitzes, 2017; Zanotti et al., 2018).

### 2.3.3. Altruistic Attitudes and Behaviours Scale

The Altruistic Attitudes Scale (AAS; Loureiro & Lima, 2009) is a 12-item measure used to determine the extent of an individual's altruistic attitudes and behaviours. Items are categorised into three domains, including: cognitive (i.e., an individual's beliefs or perceptions, e.g., "I think that selfless people end up regretting"; 4-items), affective (i.e., an individual's emotional response, e.g., "Provide assistance to family and friends, without expecting anything in return"; 4-items) and behavioural (i.e., an individual's behavioural responses, e.g., "Giving your place in a waiting queue to someone else who needs it"; 4-items). The scale was originally in Portuguese but was translated, back-translated, and adapted for multiple languages including English as part of the International Study of Pro/Antisocial Behaviour in Young Adults (Basto-Pereira et al., 2019). Answers were recorded on a 5-point Likert scale, ranging from 1 'totally disagree' to 5 'totally agree'. Scores on each subscale range from 1 to 20, with higher scores indicating greater altruistic attitudes and

behaviours in the respective category. The AAS total scale has demonstrated acceptable reliability in the original study using an international sample (Cronbach's  $\alpha = 0.79$ ; Loureiro & Lima, 2009) and this was replicated in the current sample (Cronbach's  $\alpha = 0.72$ ).

## 2.4. Statistical analysis

Descriptive statistics were conducted on dependent and independent variables. Linear and logistic regressions were performed to investigate whether there were any gender differences in the experience of the 10 individual ACEs and ACE scores, and to examine the

**Table 1**  
Associations between individual ACEs and ACEs score by gender.

ACEs (DV)	Gender (IV)						
	Descriptive statistics				Inferential statistics (95 % CI) <sup>2</sup>		
	Total ( <i>n</i> = 511)	Male ( <i>n</i> = 132)	Female ( <i>n</i> = 356)	TGD ( <i>n</i> = 23)	Female vs male <sup>3</sup>	TGD vs male <sup>3</sup>	TGD vs female <sup>4</sup>
<b>Abuse<sup>a</sup></b>							
Emotional abuse, % ( <i>n</i> )	20.9 (107)	15.9 (21)	21.6 (77)	39.1 (9)	OR = 1.46 (0.86, 2.48)	<b>OR = 3.40*</b> <b>(1.3, 8.86)</b>	<b>OR = 2.56*</b> <b>(1.08, 6.08)</b>
Physical abuse, % ( <i>n</i> )	21.3 (109)	25.8 (34)	18.5 (66)	39.1 (9)	OR = 0.66 (0.41, 1.05)	OR = 1.85 (0.74, 4.67)	<b>OR = 2.49*</b> <b>(1.05, 5.93)</b>
Sexual abuse, % ( <i>n</i> ) <sup>1</sup>	17.0 (76)	16.1 (18)	16.0 (51)	38.9 (7)	OR = 1.00 (0.56, 1.79)	<b>OR = 3.32*</b> <b>(1.13, 9.72)</b>	<b>OR = 3.33*</b> <b>(1.25, 8.89)</b>
<b>Neglect</b>							
Emotional neglect, % ( <i>n</i> )	17.0 (87)	18.9 (25)	14.9 (53)	39.1 (9)	OR = 0.75 (0.44, 1.26)	<b>OR = 2.75*</b> <b>(1.07, 7.07)</b>	<b>OR = 3.68*</b> <b>(1.51, 8.92)</b>
Physical neglect, % ( <i>n</i> )	14.1 (72)	15.9 (21)	12.4 (44)	30.4 (7)	OR = 0.75 (0.42, 1.31)	OR = 2.31 (0.85, 6.31)	<b>OR = 3.10*</b> <b>(1.21, 7.96)</b>
<b>Household dysfunction</b>							
Parental separation or divorce, % ( <i>n</i> )	34.1 (174)	37.9 (50)	32.3 (115)	39.1 (9)	OR = 0.78 (0.52, 1.19)	OR = 1.05 (0.43, 2.62)	OR = 1.35 (0.57, 3.20)
Household domestic violence, % ( <i>n</i> )	11.9 (61)	7.6 (10)	13.8 (49)	8.7 (2)	OR = 1.95 (0.96, 3.97)	OR = 1.16 (0.24, 5.68)	OR = 0.60 (0.14, 2.63)
Household substance abuse, % ( <i>n</i> )	28.4 (145)	34.1 (45)	25.3 (90)	43.5 (10)	OR = 0.65 (0.43, 1.01)	OR = 1.49 (0.61, 3.66)	OR = 2.27 (0.96, 5.36)
Household mental illness or suicide, % ( <i>n</i> )	56.8 (290)	56.8 (75)	58.1 (207)	34.8 (8)	OR = 1.06 (0.71, 1.58)	OR = 0.41 (0.16, 1.02)	<b>OR = 0.38*</b> <b>(0.16, 0.93)</b>
Incarcerated household member, % ( <i>n</i> )	2.9 (15)	3.8 (5)	2.5 (9)	4.3 (1)	OR = 0.66 (0.22, 2.00)	OR = 1.16 (0.13, 10.36)	OR = 1.75 (0.21, 14.46)
<b>ACE score</b>							
0, % ( <i>n</i> )	12.1 (62)	11.4 (15)	12.1 (43)	17.4 (4)	OR = 1.07 (0.57, 2.00)	OR = 1.64 (0.49, 5.48)	OR = 1.53 (0.50, 4.72)
1, % ( <i>n</i> )	35.2 (180)	31.1 (41)	37.9 (135)	17.4 (4)	OR = 1.36 (0.89, 2.08)	OR = 0.47 (0.15, 1.46)	OR = 0.35 (0.12, 1.04)
2, % ( <i>n</i> )	20.9 (107)	22.7 (30)	21.1 (75)	8.7 (2)	OR = 0.91 (0.56, 1.47)	OR = 0.32 (0.07, 1.46)	OR = 0.36 (0.08, 1.56)
3, % ( <i>n</i> )	11.5 (59)	12.9 (17)	11.0 (39)	13.0 (3)	OR = 0.83 (0.45, 1.53)	OR = 1.02 (0.27, 3.78)	OR = 1.22 (0.35, 4.29)
4, % ( <i>n</i> )	7.1 (38)	9.1 (12)	6.5 (23)	13.0 (3)	OR = 0.69 (0.33, 1.43)	OR = 1.5 (0.39, 5.79)	OR = 2.17 (0.60, 7.85)
≥5, % ( <i>n</i> )	12.7 (65)	12.9 (17)	11.5 (41)	30.4 (7)	OR = 0.88 (0.48, 1.61)	<b>OR = 2.96*</b> <b>(1.06, 8.24)</b>	<b>OR = 3.36*</b> <b>(1.31, 8.66)</b>
≥1, % ( <i>n</i> )	87.9 (449)	88.6 (117)	87.9 (313)	82.6 (19)	OR = 0.93 (0.50, 1.74)	OR = 0.61 (0.18, 2.03)	OR = 0.65 (0.21, 2.01)

*Note.* ACEs: adverse childhood experiences; TGD: transgender or gender diverse; IV: independent variable; DV: dependent variable.

<sup>1</sup> The four items contained in the sexual abuse ACE were not mandatory. The resulting total sample size for this ACE category was  $n = 448$ , with  $n = 112$ ,  $n = 318$ , and  $n = 18$  for males, females, and TGD (i.e., identified as transgender or neither male, female or transgender) participants, respectively.

<sup>2</sup> For categorical variables, logistic regression analyses are presented as ORs with 95 % CIs. For continuous variables, linear regression analyses are presented as beta coefficients ( $\beta$ ) with 95 % CIs.

<sup>3</sup> Reference group is males.

<sup>4</sup> Reference group is females.

\* Significant at  $p < .05$ .

**Table 2**

Unique associations between individual ACEs and the cognitive, affective and behavioural domains of altruism, adjusted for participant gender.

		Altruistic attitudes and behaviours (DV)							
		Descriptive statistics, <i>M</i> ( <i>SD</i> )			Multiple regression models, $\beta$ (95 %CI)				
ACEs (IV)		Cognitive	Affective	Behavioural	Cognitive altruism (Model 1) <sup>1</sup>	Affective altruism (Model 2) <sup>1</sup>	Behavioural altruism (Model 3) <sup>1</sup>		
Abuse	Emotional abuse	No	3.52 (0.55)	4.29 (0.63)	3.55 (0.88)	[Ref]	[Ref]	[Ref]	
		Yes	3.44 (0.56)	4.24 (0.61)	3.68 (0.87)	$\beta = -0.04$ (-0.19, 0.12)	$\beta = 0.06$ (-0.12, 0.25)	$\beta = 0.26$ (-0.00, 0.51)	
		Physical abuse	No	3.52 (0.55)	4.29 (0.63)	3.58 (0.90)	[Ref]	[Ref]	[Ref]
		Yes	3.42 (0.54)	4.22 (0.62)	3.54 (0.81)	$\beta = -0.09$ (-0.23, 0.06)	$\beta = -0.00$ (-0.17, 0.17)	$\beta = -0.18$ (-0.41, 0.06)	
	Sexual abuse	No	3.51 (0.55)	4.31 (0.62)	3.58 (0.88)	[Ref]	[Ref]	[Ref]	
		Yes	3.53 (0.54)	4.26 (0.65)	3.62 (0.87)	$\beta = 0.04$ (-0.10, 0.18)	$\beta = -0.02$ (-0.19, 0.14)	$\beta = -0.02$ (-0.25, 0.22)	
		Neglect	Emotional neglect	No	3.51 (0.54)	4.30 (0.62)	3.55 (0.88)	[Ref]	[Ref]
	Yes			3.46 (0.60)	4.16 (0.63)	3.68 (0.85)	$\beta = 0.01$ (-0.16, 0.18)	$\beta = -0.06$ (-0.25, 0.15)	$\beta = 0.11$ (-0.17, 0.39)
	Physical neglect		No	3.51 (0.55)	4.31 (0.61)	3.54 (0.89)	[Ref]	[Ref]	[Ref]
	Yes	3.42 (0.57)	4.09 (0.66)	3.76 (0.79)	$\beta = 0.01$ (-0.17, 0.20)	$\beta = -0.22$ (-0.43, -0.01)*	$\beta = 0.16$ (-0.15, 0.46)		
Household dysfunction	Parental separation or divorce	No	3.51 (0.57)	4.30 (0.62)	3.57 (0.88)	[Ref]	[Ref]	[Ref]	
		Yes	3.48 (0.53)	4.23 (0.64)	3.58 (0.89)	$\beta = 0.02$ (-0.09, 0.13)	$\beta = -0.00$ (-0.14, 0.13)	$\beta = -0.00$ (-0.19, 0.18)	
	Exposure to domestic violence	No	3.51 (0.56)	4.29 (0.63)	3.60 (0.86)	[Ref]	[Ref]	[Ref]	
		Yes	3.42 (0.47)	4.16 (0.60)	3.36 (1.00)	$\beta = -0.11$ (-0.28, 0.07)	$\beta = -0.12$ (-0.32, 0.09)	$\beta = -0.38$ (-0.63, -0.49)*	
	Household substance abuse	No	3.53 (0.56)	4.29 (0.62)	3.57 (0.87)	[Ref]	[Ref]	[Ref]	
		Yes	3.44 (0.53)	4.25 (0.64)	3.58 (0.91)	$\beta = -0.08$ (-0.20, 0.05)	$\beta = 0.07$ (-0.08, 0.21)	$\beta = 0.02$ (-0.18, 0.23)	
	Mental illness or suicide	No	3.54 (0.52)	4.24 (0.61)	3.55 (0.88)	[Ref]	[Ref]	[Ref]	
		Yes	3.47 (0.58)	4.31 (0.64)	3.59 (0.88)	$\beta = -0.02$ (-0.12, 0.08)	$\beta = 0.09$ (-0.03, 0.21)	$\beta = 0.04$ (-0.13, 0.21)	
	Incarcerated household member	No	3.50 (0.55)	4.28 (0.62)	3.57 (0.88)	[Ref]	[Ref]	[Ref]	
		Yes	3.53 (0.58)	4.08 (0.81)	3.55 (0.75)	$\beta = 0.12$ (-0.20, 0.44)	$\beta = -0.03$ (-0.41, 0.35)	$\beta = 0.02$ (-0.51, 0.56)	

ACEs: adverse childhood experiences; TGD: transgender or gender diverse; IV: independent variable; DV: dependent variable.

<sup>1</sup> Results from multiple regression models 1, 2 and 3 were adjusted for participant gender.\* Significant at  $p < 0.05$ .

association between the experience of at least one ACE and altruism total scores, while controlling for participant gender. Three multiple regression models were subsequently conducted to analyse the unique associations between each of the 10 individual ACEs and the three domains of altruism (cognitive, affective, and behavioural), after adjusting for participant gender. Results for continuous variables are presented as beta coefficients ( $\beta$ ) with 95 % confidence intervals (95 %CI) and categorical variables are presented as odds ratios (ORs) with 95 %CI. Analyses were conducted using IBM SPSS version 25.

### 3. Results

#### 3.1. Participant characteristics

Over two-thirds of the sample were female (69.7 %; male = 25.8 %, TGD = 4.5 %), with a mean age of  $M = 18.90$  years ( $SD = 0.83$ ). The vast majority had completed secondary school (93.7 %). Almost half the sample reported that they were currently working and studying (47.4 %) while the remaining reported that they were currently studying only (34.4 %), working only (13.5 %), or neither working nor studying (4.7 %). The sample predominantly contained participants of medium and high SES (37.6 % and 49.1 %, respectively; low SES = 13.3 %), and approximately one-quarter (23.7 %) identified as being part of an ethnic minority.

#### 3.2. Adverse childhood experiences

The majority (87.9 %) of the sample reported experiencing at least one ACE before the age of 18, with over half (52.2 %) reporting exposure to two or more ACEs ( $M = 2.23$ ; Table 1). The median number of ACEs experienced was 2.00 (range = 0–8). The most commonly reported ACE among the whole sample were household mental illness or attempted suicide (56.8 %), followed by parental separation or divorce (34.1 %), household substance abuse (28.4 %) and physical abuse (21.3 %). The rates of individual ACEs and ACE scores by participant gender are shown in Table 1. No significant differences were found on any individual ACE or the number of ACEs between male and female participants. In contrast, significant differences were observed when comparing the experiences of TGD participants with male and female participants. Specifically, TGD participants were approximately 3 times more likely than male participants to have experienced emotional and sexual abuse (OR = 3.40 and OR = 3.32, respectively), emotional neglect (OR = 2.75) and five or more ACEs (OR = 2.96). Compared to female participants, TGD participants were significantly more likely to have experienced all types of abuse (emotional, physical and sexual) and neglect (emotional and physical), and were nearly 3 times more likely to have experienced five or more ACEs (OR's = 2.49–3.68). In contrast, TGD participants were significantly less likely than female participants to have a household member who had a mental illness or had attempted suicide (OR = 0.38).

#### 3.3. Relationships between ACEs and altruistic attitudes and behaviours

No significant relationship was detected between the experience of at least one ACE and altruism total scores ( $\beta = -0.56$ , 95 %CI =  $-0.18$ ; 0.07), five or more ACEs scores and altruism total scores ( $\beta = -0.07$ , 95 %CI =  $-0.20$ ; 0.05), or ACE total scores and altruism total scores ( $\beta = -0.01$ , 95 %CI =  $-0.03$ ; 0.01), when controlling for gender. When examining the relationship between ACEs and altruism domains, results showed that experiencing at least one ACE was significantly and negatively associated with the cognitive altruism dimension after controlling for gender ( $M = 3.48$ ,  $SD = 0.56$  vs  $M = 3.64$ ,  $SD = 0.51$ ;  $\beta = -0.14$ , 95 %CI =  $-0.29$ ;  $-0.00$ ). No significant differences were identified between participants who had experienced at least one ACE on the affective ( $M = 4.27$ ,  $SD = 0.63$  vs  $M = 4.31$ ,  $SD = 0.59$ ;  $\beta = -0.37$ , 95 %CI =  $-0.20$ ; 0.13) or behavioural domains of altruism ( $M = 3.57$ ,  $SD = 0.89$  vs  $M = 3.56$ ,  $SD = 0.84$ ;  $\beta = 0.01$ , 95 %CI =  $-0.22$ ; 0.25), compared to those who hadn't experienced any ACEs. Total ACE score was also significantly and negatively associated with the cognitive altruism domain ( $\beta = -0.03$ , 95 %CI =  $-0.05$ ;  $-0.02$ ).

The results of the three multiple regression models to examine the unique associations between the individual ACEs and the domains of altruism (cognitive, affective, and behavioural), after controlling for the effect of participant gender, are shown in Table 2. Two significant and negative associations were evident; physical neglect was significantly and negatively associated with the affective domain and household domestic violence was negatively associated with the behavioural domain.

### 4. Discussion

#### 4.1. Principal findings

The aims of this study were two-fold: to investigate the experience of ACEs by gender and to explore the relationships between the specific types of ACEs with altruistic attitudes and behaviours in a young adult sample. To our knowledge, this is the first study to investigate these relationships in a sample of young Australian adults. This study builds on existing research conducted in European countries, with a focus on young adults to provide insight into the way in which early traumatic experiences may influence individuals' attitudes and behaviours during this pivotal developmental period, wherein social roles are established (Hawkins et al., 2012; Hicks et al., 2012).

Results indicated high rates of traumatic experiences, with the majority of the sample (87.9 %) having experienced at least one ACE before the age of 18. These rates are higher than previously reported estimates of ACEs before 18 years of age among women in Australia (59 %; Loxton et al., 2020) and higher than the rates of trauma prior to the age of 17 years in the Australian general population (14 %; Barrett et al., 2015). Rather, they are more in line with the prevalence of trauma exposure among Australian adults, with

three-quarters (74.9 %) of people aged 18 and older having experienced at least one potentially traumatic event during their lifetime (Mills et al., 2011). The current study found no significant differences in rates of any individual ACE types, nor the total number of ACEs between male and female participants. While there is little to no research to which these findings can be compared, these results are inconsistent with previous research among international samples of young adults, which have reported sex/gender differences in rates of trauma, and the number and types of traumatic events experienced. Specifically, Gomis-Pomares and Villanueva (2020) found that female participants were significantly more likely than male participants to have experienced at least one ACE, a greater number of ACEs, and specific types of traumas such as physical and sexual abuse, as well as having a family member with a mental illness.

A significant difference emerged in the number and types of ACEs experienced between individuals who identified as TGD compared to both male and female participants. Specifically, TGD participants were more likely to experience five or more ACEs than both male and female participants. Additionally, compared to female participants, people who identified as TGD were more likely to have experienced all types of abuse and neglect. A slightly less pronounced pattern was evident when comparing the experiences of TGD to male participants, with TGD participants being significantly more likely to have experienced emotional and sexual abuse, and emotional neglect. These results lend support to the findings from Schnarrs et al. (2019), who found transgender participants were more likely to experience emotional abuse and both physical and emotional neglect than cisgender individuals. Albeit it is unknown in this paper whether these trauma types differed according to whether a person was a cisgender man or a cisgender woman, specifically. Abuse and/or neglect by a guardian may have been in reaction to the child's subtle or overt displays of gender non-compliance, to direct disclosure of gender diversity, or to the child's disruptive behaviour produced by their sense of difference/disconnect due to their gender non-conformity (Mizock & Lewis, 2008; Nuttbrock et al., 2010). However, for the TGD participants, it is unknown at what stage in their childhoods they experienced themselves to be different to the sex they were assigned at birth; as such, abuse and/or neglect may have occurred in a context where they had not explicitly self-identified themselves to be gender diverse. An additional finding in the current study was that TGD individuals were less likely to live with a household member who experienced a mental illness, compared to male and female participants. Overall, while these findings indicate that young people who currently identify as TGD may have a different experience of early trauma than cisgender individuals, we do not know whether the TGD participants identified as TGD at the time of their abuse/neglect, and therefore cannot conclude whether their experience of early trauma was, or was perceived to be, due to (or motivated by) their TGD gender identity. Similar conclusions have been drawn from previous systematic reviews investigating the prevalence of childhood trauma among sexual and gender minorities (Blondeel et al., 2018; Tobin & Delaney, 2019). Further research in this area is required to comprehensively tease out these nuanced relationships, and to better understand the experience of different types of trauma among people of different TGD identities.

The second aim of this study was to examine the associations between ACEs and altruistic attitudes and behaviours, after controlling for participant gender. Experiencing one or more ACEs, five or more ACEs, and having a high ACE total score was unrelated to global altruistic tendencies. These findings are consistent with those conducted by Carvalho et al. (2019) and Gomis-Pomares and Villanueva (2020) and indicate that the number of traumas an individual experiences in childhood or adolescence is unrelated to the experience of general altruistic attitudes or behaviours during young adulthood. On the contrary, several associations were identified between both the ACE total scores and the individual types of ACEs with the various domains of altruism. Specifically, experiencing at least one ACE was significantly and negatively associated with the cognitive domain of altruism, indicating that participants who reported experiencing one or more early traumas had significantly lower altruistic beliefs or perceptions than those who had not experienced any ACEs. These findings are consistent with Music (2011) who proposed that a child who experiences a deficit in interpersonal affects (such as any of the ACEs) is likely to have less interest in helping others, subsequently exhibiting inhibited altruistic tendencies – as is observed in the current study. Total ACE scores were also negatively associated with the cognitive altruism domain, suggesting that the more adverse experiences a person had during their childhood or adolescence, the weaker the altruistic beliefs or perceptions they held. It is possible that the experience of one or more ACEs (and a greater number of ACEs) may have diminished the likelihood of engagement in early everyday social routines, which are fundamental to the learning of social norms (Paulus, 2018), and hence the learning of prosocial beliefs (i.e., cognitive altruism, such as “*I think it is important to respect the feelings of others*”). In this way, the social environment may play an important function in the development of cognitive altruism. It is also possible that cognitive beliefs of altruism failed to be taught or transmitted to the child through interactions with their parents, particularly in cases where there were experiences of mental illness in the household or emotional abuse (Yu, Li, & Zhao, 2020).

On the contrary, no significant differences were found between participants who experienced at least one ACE, or a greater number of ACEs, on either the affective or behavioural altruism domain. It is possible that the associations between trauma exposure and the altruism domains may be somewhat dependent on the nature of the trauma itself (i.e., the specific type), rather than simply the experience of a/multiple trauma(s). Alternatively, there may be other factors influencing the relationship between ACEs and altruism. For instance, the age at which a person experienced an ACE (or multiple ACEs) may interact with the expression of altruistic beliefs, emotions, and behaviours later in life. It is also plausible that cognitive, affective, and behavioural altruism develop sequentially (in alignment with the various stages of a child's broader cognitive and affective development; Bar-Tal, 1982) or at separate timepoints, and this interacts with the age at which the ACE occurs, which differentially affects a person's ability to think, feel, and behave in an altruistic way in early adulthood. Further research is required to gain a deeper understanding into the complexities of these relationships.

When examining the associations between individual ACEs and the domains of altruism, results indicated that physical neglect was negatively associated with the affective domain, suggesting that participants who were physically neglected early in life exhibited lower emotional-related altruistic attitudes than those with no history of physical neglect. A negative relationship between physical neglect and affective altruism was similarly reported in a previous Portuguese study (Carvalho et al., 2019), whereby physical neglect had its strongest statistically significant negative correlation with the affective domain of altruism. However, it should be noted that

physical neglect was not a significant predictor of affective altruism in their regression model when including other types of abuse, neglect, and sociodemographic characteristics. It is possible that being a victim of early physical neglect may contribute to the formation of negative expectations of people and relationships based on past experiences, meaning these individuals are less able and willing to emotionally care for others. It has also been proposed that a lack of positive parenting practices (e.g., parental supervision) and structured daily routines, which are common characteristics of physical neglect, can negatively influence the acquisition of appropriate emotional self-regulation skills and can prohibit the ability and/or opportunity to model appropriate parental behaviour (Bater & Jordan, 2017). This may in turn affect one's capacity for empathy-related emotional responses, such as affective altruism. For instance, one study found that children who had experienced physical neglect were less able to understand negative emotions and had fewer adaptive emotional-regulation skills, compared to healthy controls who had not experienced such neglect (Shipman, Edwards, Brown, Swisher, & Jennings, 2005). These children also expected their caregivers to respond negatively to their displays of emotion (by providing less support and more conflict), and possibly as a result, they attempted to hold back their display of such emotions. Although this decreased level of emotional understanding and self-regulation may help physically neglected children cope with their home environment, it may also negatively influence their capacity to display or experience emotional altruistic responses.

Results also showed that household domestic violence was significantly and negatively associated with the behavioural altruism domain, with those who lived in a household with domestic and family violence demonstrating less altruistic behaviours than those who did not live in such a household. This finding can be understood through the concept of learned behaviour, for example, having been exposed to domestic violence, it is more likely that an individual's outward behaviour will be influenced by what they have witnessed growing up – tending away from altruistic behavioural tendencies (Music, 2011). Indeed, various studies have shown that children who witness violence or aggression, even in the context of a research experiment, later model this type of behaviour (see review by Pingley, 2017). It is suggested that when children observe family violence, they may internalise beliefs and patterns of behaviour and thus develop a greater propensity toward abusing others in the future (Abbassi & Aslinia, 2010). Exhibiting such aggressive antisocial behaviour can negatively influence trajectories of prosociality and instead predict decreases in altruistic, prosocial behaviour over time (Obsuth, Eisner, Malti, & Ribeaud, 2015). Furthermore, exposure to domestic violence in childhood has been linked to withdrawn social behaviours and social isolation (Hornor, 2005). It is possible that isolation and lack of social interaction leaves less room for the development of an intentional, unselfish interest in helping others. Additional research is warranted to expand our understanding of the associations between early exposure to domestic violence and later altruistic behaviours.

Interestingly, our study did not find a significant association between emotional neglect and any of the altruism domains, contrary to the previous European studies which found significant and negative associations between these variables (Carvalho et al., 2019; Gomis-Pomares & Villanueva, 2020). These contradictory findings may be partially explained by the substantial differences in the experience of emotional neglect in the current study (17.0 %) versus that of other studies of young adults (2.7 %; Gomis-Pomares & Villanueva, 2020). It is also possible that there were differences in the age at which the emotional neglect initially took place in these studies. Research suggests that younger onset of adversity, such as emotional neglect, has more of a negative impact on later altruistic tendencies (Dierkhising et al., 2013), however, it is unknown whether individuals in previous studies experienced emotional neglect earlier in life than the participants in the current study. Finally, it is plausible that there may have been differences in the level of emotional support provided by family, friends or peers during and/or following the period of emotional neglect, which may have impacted an individual's ability to demonstrate any form of prosocial behaviour. There may also be cross-cultural differences in attitudes towards interpersonal and intrafamilial early maltreatment, as well as differences in support systems available to aid an individual who endures adverse experiences during childhood or adolescence, which may impact the way in which an individual's altruistic attitudes and behaviours develop.

#### 4.2. Strengths and limitations

To our knowledge, this is the first Australian study to examine the associations between specific types of trauma and altruism (including the domains of altruism) in a young adult age group. This is particularly important as young adulthood is a pivotal life stage wherein social roles are explored as can be demonstrated through engagement in or desistance from prosocial behaviour. Understanding these relationships within an Australian context will allow for the development of culturally appropriate intervention or prevention strategies that specifically target individuals under 18 years of age who are experiencing the identified trauma most significantly associated with decreased altruistic behaviours. It is also one of the first studies internationally that sought to better understand the experience of various traumas by people of different gender identities.

The cross-sectional nature of the design does not allow for temporal comparison of how altruistic tendencies may change over time and the extent to which their early trauma experiences influence this behaviour. The study was also not nationally representative, which may explain some of the observed differences in rates of ACEs when compared to prevalence estimates among larger studies. Additionally, this study is part of a larger international project and the scale used to measure altruism (AAS) was the same across countries to allow for a direct comparison of findings. However, this measure was developed in Portugal (Loureiro & Lima, 2009), and it is possible that it may not reflect the full range of ways in which altruism can be expressed in an Australian context, and therefore may not provide a true indication of an individual's overall altruistic tendency in the current sample. Finally, this study sought to examine gender differences in the experience of ACEs during childhood and adolescence, however, that there may be limitations with regards to the way gender identity was assessed. Gender is a multifaceted and fluid construct, influenced in a temporal manner by social and cultural contexts and environments, which may not be accurately reflected in the three gender groups utilised in the present study. It was the study's intention to identify cisgender men, cisgender women, transgender people, and other gender diverse people. However, the survey asked only about gender, and a two-step question that asked about sex assigned at birth and current gender

identity may have been more effective, as recommended by ACON (one of Australia's leading health promotion organisations specialising in lesbian, gay, bisexual, transgender and intersex health; Stardust, Cook, Hopkins, Gray, & Olsen, 2017). It is plausible that some participants may have had transgender experiences in their lifetime, but do not currently identify as transgender (i.e., they may identify as male, female, transgender, or may see their gender as being fluid over time) and may have selected male or female rather than transgender or a different identity, thereby potentially mis-classifying their gender. Although we think this is unlikely and that participants will have understood the intent of the question, interpretation of the data needs to be undertaken with some caution. The constantly evolving nature of gender research and appropriate ways of ascertaining information about gender is regularly updated. More research is required to properly understand the nuanced relationship between gender and the experience of trauma, to inform future initiatives targeting the wellbeing of these individuals.

## 5. Conclusions and implications

Overall, this study has shown that there is a remarkably high rate of early trauma among young Australian adults and that TGD individuals are significantly more likely to experience a greater number of ACEs and a range of individual ACEs than either male or female participants. Furthermore, experiencing at least one ACE and a greater number of ACEs were both significantly and negatively associated with the cognitive domain of altruism, while physical neglect was negatively associated with the affective domain, and household domestic violence was negatively associated with the behavioural domain. Future research should continue to develop this line of research by examining the longer-term effects of early trauma on altruistic attitudes and behaviours using a longitudinal study design, to better understand whether the negative impact of trauma on these altruistic tendencies are maintained (or reversed) over the lifespan.

## Declaration of Competing Interest

The authors report no declarations of interest.

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