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Change in prosocial development following adversity exposure among U.S. Mexican youth

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Introduction: Altruistic prosocial behaviors (i.e., actions primarily intended to benefit others with little to no regard for self-benefit) are of special interest to researchers interested in growth in character strengths following exposure to adversity and trauma (referred to as the *altruism-born-of-suffering* hypothesis). The present study was designed to examine this hypothesis. Changes in prosocial behaviors following trauma exposure and whether problem-focused coping and familism facilitated prosocial behaviors were investigated in U.S. Mexican youth.

Methods: A total of 749 Mexican-origin students (initial *M* age = 10.42 years, *SD* = 0.55; 48.9% girls) from the U.S. Southwest completed surveys from 5th grade to early adulthood.

Results: U.S. Mexican girls who reported earlier trauma exhibited increases in altruistic behaviors into young adulthood but only when they reported relatively high levels of familism values in middle adolescence. A similar trend pattern was found for U.S. Mexican boys but only when they expressed relatively high levels of problem-focused coping in middle adolescence. There was other evidence of significant relations between both familism and problem focused coping and prosocial behaviors in these youth.

Discussion: Findings demonstrate the potential for prosocial development across adolescence to young adulthood among trauma-exposed youth from a U.S. ethnic/racial minority background.

KEYWORDS

altruism, U.S. Latino/a youth, prosocial behaviors, familism, coping, moral growth

Introduction

By 2065, the proportion of the U.S. population that is non-Latino/a/x White is expected to drop to 46% and the proportion of U.S. Latino/as is projected to rise to 24% (with U.S. Mexicans comprising the largest Latino/a subgroup; Pew Research Center, 2015). These projections emphasize the importance of high-quality research designed to understand positive development among ethnic and racial minoritized populations. Standing in sharp contrast to stereotypes that describe U.S. Mexicans as amoral criminals (Romero et al., 2015), researchers find that U.S. Mexicans display high character strengths (Whiting and Edwards, 1988), especially in the domains of relatedness, spirituality, and prosocial behaviors (Carlo and de Guzman, 2009; Knight and Carlo, 2012; Knight et al., 2014). These high character strengths exist within the context of racial-ethnic inequality and related exposures to a range of social and environmental adversities (e.g., Buka et al., 2001; Hussey et al., 2006; Roberts et al., 2011; Carlo et al., 2022), a pattern that portends resilience (Luthar et al., 2000; Masten and Narayan, 2012; Cicchetti, 2016). Given documented emphases on

pathology and deficit-based models of ethnic/racial minorities (Coll et al., 1996; Quintana et al., 2006; Cabrera et al., 2012), there is increased scholarly attention to strengths and assets of such groups in an effort to develop more holistic and balanced understanding of development. However, there are remaining gaps in our understanding of development including investigations of how U.S. Mexican youth can exhibit character strengths in spite of exposure to adversity, and the mechanisms that might support positive adaptation to adversity (Fuller and García Coll, 2010).

Infurna and Luthar (2018) and Infurna and Jayawickreme (2019) highlight numerous patterns of stability and change in character strengths that can result from exposure to adversity, including traumatic events. *Resilience* involves stable, healthy levels of character strengths before and after adversity. *Chronic low* refers to stable, low levels of character strengths before and after adversity. *Recovery* involves declines in character strengths following adversity, with gradual improvements to previous levels over time. *Growth*, sometimes called posttraumatic growth, involves character improvements following exposure to adversity (Tedeschi and Calhoun, 2004). Resilience, recovery, and growth, three positive adaptations to adversity, may be more likely in the context of intra- and inter-personal resources (e.g., social support, coping skills; Luthar and Eisenberg, 2017). Research focused on resilience has tended to rely on longitudinal designs and focus on single outcomes, whereas research on posttraumatic growth has tended to rely on retrospective and cross-sectional designs with recognition that reactions to adversity are multidimensional (Infurna and Jayawickreme, 2019). In the current study of U.S. Mexican adolescents to young adults, we examined variability in changes in prosocial behaviors, a multidimensional set of actions that benefit others (Carlo, 2014; Eisenberg et al., 2015), following exposure to adverse traumatic events. Additionally, we examined whether persons' problem-focused coping and endorsement of a culturally relevant value (i.e., familism) facilitated positive adaptations in the face of adversity.

Prosocial behaviors

Although there are various forms of prosocial behaviors, many such behaviors can be organized into actions that are exhibited in specific contexts or that are motivated by selfless or selfish desires (Eisenberg et al., 2015). Carlo and Randall (2001) presented several commonly studied forms of prosocial behaviors but two forms are particularly relevant to the present study. Altruistic prosocial behaviors are defined as helping others with little or no expectation for self-reward. Public prosocial behaviors, on the other hand, refer to helping in front of an audience. Conceptually, altruistic and public actions are expected to show a differentiated pattern of relations to other theoretically-relevant constructs and distinct developmental trajectories.

Altruistic prosocial behaviors have long been the focus of scholarly debate given the important implications regarding the relative benefit for others at the cost or expense to one's self and the nature of humans (Wilson, 1975; Batson, 1998). Altruistic prosocial behaviors are deemed to be primarily selflessly-motivated and predicted by strong moral principles and/or sympathy and often incur a (psychological or physical) risk to one's self (Staub, 2013; Eisenberg et al., 2015). Indeed, extreme examples of altruistic behaviors often draw much attention because they include acts of heroism and courage at the possible risk of one's life or health. Much of this work refers to moral or care exemplars—individuals who demonstrate committed acts of charity at great personal risk to themselves (Oliner and Oliner, 1988; Colby and Damon, 1992; Hart and Fegley, 1995). However, it is important to note that altruistic behaviors can also include somewhat less dramatic yet costly actions such as committed acts of charity, volunteerism, donations, and generosity (Staub, 2013; Carlo, 2014).

In contrast, scholars assert that public prosocial behaviors are primarily selfishly-motivated with an instrumental purpose (Carlo and Randall, 2001). These actions might be exhibited as a means to gain the approval of others or to elevate one's social status. Moreover, sometimes these actions can be a means to manipulate or harm others by gaining trust from others. Researchers have suggested that public prosocial behaviors, in contrast to most other forms of prosocial behaviors, can lead to subsequent aggressive and maladaptive behavioral outcomes (Carlo, 2014). On the other hand, it is possible that such actions might serve an immediate purpose to improve one's mood or to gain approval of others (e.g., parents, teachers) in appropriate social contexts.

Researchers have yielded substantive evidence that there are distinct correlates and developmental trajectories of altruistic and public prosocial behaviors (Carlo, 2014; see McGinley et al., 2014 and Xiao et al., 2019, for reviews). For example, as expected, high levels of prosocial moral reasoning and sympathy have been linked to altruistic prosocial behaviors but negatively linked to public prosocial behaviors among U.S. Latinx youth. Furthermore, social desirability is modestly, but significantly, positively related to public prosocial behaviors but not altruistic prosocial behaviors (Carlo and Randall, 2002). A recent study showed that public prosocial behaviors were associated with hoarding and stockpiling supplies during the COVID-19 pandemic (Dinić and Bodroža, 2020).

Prosocial behaviors and trauma exposure

Altruistic prosocial behaviors (i.e., actions primarily intended to benefit others with little to no regard for self-benefit) are of special interest to researchers interested in growth in character strengths following exposure to adversity and trauma. This interest is situated in a small, but growing, body of literature focused on the *altruism-born-of-suffering* hypothesis that trauma events can lead to reorganization and self-reflection on life's purpose and meaning, which can result in new schemas to reduce suffering, and improve the lives of others (Staub, 2013). Additionally, exposure to trauma could sensitize some individuals to the plight and suffering of others, which can move individuals to engage in actions intended to improve and assist others (Davis et al., 2016). There is suggestive evidence primarily based on cross-sectional or retrospective report study designs (see Staub and Vollhart, 2008, for a review), that some children and youth exposed to trauma (e.g., war, violence) exhibit high levels of altruistic behaviors (Eisenberg et al., 2015). Moreover, there is evidence of some adults' altruistic behaviors, even at risk to one's self, under extreme trauma circumstances (e.g., Holocaust,

war) or subsequent to traumatic events in childhood (Oliner and Oliner, 1988; Harel et al., 1993; Bonanno, 2004; Grossman et al., 2006). However, direct longitudinal evidence on this notion of change in altruistic behaviors as a result of earlier trauma exposure is lacking, especially in U.S. minoritized youth.

Thus, we sought to test the altruism born of suffering hypothesis by examining the patterns of developmental change in altruism following exposure to adversity. As a sensitivity test of the hypothesis, and because the nature of public prosocial behaviors is decidedly distinct from altruistic prosocial behaviors in terms of conceptual definition, developmental trends and antecedents (Carlo, 2014; see McGinley et al., 2014 and Xiao et al., 2019), we also examined associations between trauma exposure and developmental change in public prosocial behaviors.

Factors that may facilitate positive adaptation to trauma exposure

Despite the existing work on the *altruism-born-of-suffering* hypothesis and the speculation on how moral growth could occur, there are no direct studies of possible growth triggers mechanisms that could spur positive adaptations. Most models of prosocial and moral development have emphasized sociocognitive and socioemotive mechanisms (e.g., perspective taking, moral reasoning, empathy/sympathy) that predict prosocial behaviors (Eisenberg et al., 2015). Other scholars note the important influence of psychological (e.g., temperament, self-regulation) and socialization (e.g., parental practices and styles, peer affiliation, media exposure) mechanisms (Hoffman, 2000; Grusec, 2011; Eisenberg et al., 2015). In recent years, however, there has been increasing attention to integrative approaches that simultaneously consider the interplay of culture-group-specific mechanisms (e.g., cultural values, cultural stress) and non-culture-group-specific mechanisms (e.g., self-regulation or coping) to better account for individual and group differences in prosocial and moral developmental outcomes. Carlo and de Guzman (2009) posited, for example, that stressors (e.g., trauma), cultural values (e.g., familism), and coping at earlier ages could jointly account for prosocial behaviors at later ages. In their proposed ecocultural stress-based model, early life experiences (e.g., trauma exposure) are processed via moderating and mediating mechanisms (e.g., problem-focused coping behaviors, familism values) that subsequently predict individual and group differences in prosocial development among ethnic/racial minority youth.

In the context of understanding variability in the development of prosocial behaviors following trauma exposure, one might expect that trauma would result in distinct developmental trajectories based on individual differences in growth triggers such as problem-focused coping and/or the strength of their affinity to their family unit (i.e., familism). Researchers have suggested that trauma-exposed individuals who have well developed coping or self-regulation capacities might more effectively modulate their emotional and behavioral reactions to trauma, which can facilitate positive adaptation after trauma (Linley and Joseph, 2004). Indeed, problem-focused coping (i.e., attempts to reduce or eliminate stress source) have been linked to posttraumatic growth in adults (Linley and Joseph, 2004) and self-regulation and coping is also conceptually and empirically linked to higher levels of prosocial behaviors (Carlo et al., 2012; Eisenberg et al., 2015). For example, researchers have demonstrated that youth who exhibit relatively high levels of problem-focused coping also exhibit high levels of prosocial behaviors (Carlo et al., 2012). Although problem-focused coping is positively linked to prosocial behaviors, evidence on direct relations between problem-focused coping and specific forms of prosocial behaviors does not exist. However, individuals high in certain forms of problem-focused coping – in particular positive cognitive restructuring and seeking understanding – might be particularly prone to demonstrate growth following exposure to acute traumatic events (Linley and Joseph, 2004). Therefore, based primarily on theory (Carlo and de Guzman, 2009), we expected that trauma-exposed youth who are high (vs. low) on problem-focused coping might exhibit increases in altruistic prosocial behaviors and decreases (or no change) in public prosocial behaviors following trauma exposure.

An additional candidate variable that could empower positive adaptation to adversity is linked to relatively recent research on prosocial development in U.S. Latino/a youth (Carlo and de Guzman, 2009). Cultural researchers have identified familism (i.e., identity with, support, and obligation to kin) as a relatively common value strongly endorsed by many Latino/a families (Sabogal et al., 1987; Knight et al., 2010). Conceptually, familism embodies learning to be respectful and considerate of family members, to be socially responsible and responsive to the needs of family members, and to provide support to family members. These expectations and norms can provide important training grounds to apply prosocial attitudes and altruistic tendencies to others. Moreover, in general, familism beliefs might provide U.S. Mexican youth with psychological and social support needed to positively adapt to trauma exposure. Indeed, there is substantive, accumulated evidence that familism is positively related to several forms of prosocial behaviors in U.S. Latino/a youth (e.g., Armenta et al., 2011; Knight et al., 2014; Zhao et al., 2022; see Carlo, 2014).

Study hypotheses

The present study focused on late childhood through early adulthood based on known age-related changes in prosocial development (e.g., Van der Graaff et al., 2018; McGinley et al., 2021). We longitudinally examined whether earlier reported trauma exposure predicted changes in two distinct forms of prosocial behaviors. Specifically, we examined the association between youth exposure to traumatic events during late childhood to middle adolescence (grades 5, 7, and 10) and later development of altruistic and public prosocial behaviors from middle adolescence to early adulthood (grades 10, 12, and 5 years post high school) among U.S. Mexican youth. Problem-focused coping and familism values were examined as two growth-promoting mechanisms that might facilitate resilience, recovery, or growth following exposure to adverse

traumatic events. In addition, given gender socialization theory and prior reported gender differences in prosocial behaviors (Xiao et al., 2019), we then examined whether gender moderated these relations.

Given prior conceptual notions (Carlo and de Guzman, 2009; Staub, 2013) and the prior evidence on the relations between familism and prosocial behaviors, we hypothesized that trauma exposed U.S. Mexican youth who also endorsed higher levels of familism or problem-focused coping (relative to lower levels) might yield increases in altruistic prosocial behaviors and decreases (or no changes) in public prosocial behaviors across time. We did not have assessments of prosocial behaviors prior to trauma exposure. Our design, instead, compares developmental changes in prosocial behaviors among adolescent who were and were not exposed to trauma. This design incorporates the strengths from resilience *and* posttraumatic growth approaches (Infurna and Jayawickreme, 2019).

Method

Data were from a longitudinal study (2004–2018) of U.S. Mexican-origin families (Roosa et al., 2008). At Wave 1 (W1), we recruited Mexican origin students (48.9% girls), their mothers (required), and fathers (optional) from 5th grade rosters of schools in a large southwestern metropolitan area (N = 749 families). Eligible families met these criteria: they had a child in fifth grade at a sampled school; both biological parents were Mexican-origin; no stepfather/maternal boyfriend that was not the biological father lived in the household; the child did not have a learning disability; and the child and a co-residing biological mother agreed to participate. The average age of youth at wave 1 (5th grade) was 10.42 (SD = 0.55) years old. For subsequent waves, 710 families participated at grade 7 (95% retention rate), 637 at grade 10 (85% retention rate), 628 at grade 12 (84% retention rate), and 387 at 5 years post high school (52% retention rate).

At fifth-grade students in participating schools were sent home with recruitment materials. Interested families were screened; eligible families were scheduled for an in-home computer-assisted personal interview (CAPI). Children and their parents were given and read aloud assent and consent forms, respectively. All materials were available in both English and Spanish. Each family member received $45 after signing a consent or assent form. Complete information regarding recruitment and other study procedures can be found elsewhere (Roosa et al., 2008). At the three adolescent waves (W2–W4), CAPIs continued to take place in participants' homes in participants' language of choice (i.e., Spanish or English). Each family member received $50, $55, and $60 for participating in Waves 2–4, respectively. At the young adult wave (Wave 6), data were collected from the young adult participants only (i.e., those who were in 5th grade at Wave 1). Participants completed CAPIs in a location of their choosing (e.g., University campus, community location, participant home) and received $75 for participating. All procedures were reviewed and approved by the university's institutional review board (IRB protocol #0905004020) and conformed to American Psychological Association ethical standards. Data can be requested. This study was not preregistered.

Measures

Trauma exposure (W1–W3)

We assessed exposure to traumatic events using youth-report on items from the Diagnostic Interview Schedule for Children (C-DISC; Shaffer et al., 2000) and the multicultural events scale for adolescents (MESA; Gonzales et al., 2001). The C-DISC items came from the Post-traumatic Stress Disorder (PTSD) Module, which assessed past year exposure to traumatic events (e.g., being attacked, being threatened with a weapon, sexual or physical abuse). Additionally, given disparate rates of child and adolescent mortality among youth of color in the U.S. (Federal Interagency Forum on Child and Family Statistics, 1997; MacKay et al., 2000), we included one item from the MESA, which assessed whether a close friend had died during the past 3 months. Because each single event was rare at any given wave, we used all items at all waves to create a binary variable indicating exposure to traumatic events from late childhood to middle adolescence (i.e., 0 = no and 1 = yes).

Prosocial behaviors (W3–W6)

We used the Prosocial Tendencies Measure – Revised (PMT-R; Carlo et al., 2003) to asses two domains of prosocial behaviors. Using a 5-point Likert scale (1 = *Does not describe me at all* to 5 = *Describes me greatly*), participants were asked to rate the extent to which each of 7 statements described them. *Altruistic* prosocial behaviors involve helping others without the need for likely reward or acknowledgment (4 reverse coded items; e.g. "You feel that if you help someone, they should help you in the future"). *Public* prosocial behaviors consist of performing behaviors that benefit others in front of an audience (3 items; e.g. "You can help others best when people are watching you"). Psychometric work for this scale supports divergent and discriminate construct validity in multiple samples including U.S. Mexican youth (Carlo et al., 2010). Moreover, there is evidence of significant relations between the PTM-R and prosocial behavior tasks (e.g., Dictator games) and that prosocial behavior intervention programs show significant increases in scores on the PTM-R (Garbanzo-Rodríguez et al., 2017; Rodrigues et al., 2017; Sukys et al., 2017). For this study, Cronbach's coefficient alpha for the two subscales at all three waves were between 0.69 and 0.76.

Familism (W3)

To assess familism, mean scores were calculated based on youth reports on 24 items from four subscales of the Mexican American Cultural Values Scale (MACVS; Knight et al., 2010) using a 5-point Likert scale (1 = *Not at all* to 5 = *Completely*; α = 0.90). Subscales included family as referent (5 items, α = 0.71; e.g., "Children should be taught to always be good because they represent the family."), obligations (5 items, α = 0.65; e.g., "A person should share their home with relatives if they need a place to stay."), respect (8 items, α = 0.77; e.g., "Children should respect adult relatives as if they were parents."), and support and emotional closeness (6 items, α = 0.75; e.g., "Family provides a sense of security because they will always be there for you.").

Problem-focused coping (W3)

We calculated mean problem-focused coping scores based on youths' reports on eight items from the Children's Coping Strategies Checklist – Revision 2 (CCSC-R2; Ayers et al., 1996). Based on prior psychometric work with this scale (including factor analyses; e.g., Ayers et al., 1996; Prelow et al., 2002; Gaylord-Harden et al., 2008) and for practical reasons (i.e., need for psychometrically sound, relatively short scales in a large survey study), we selected the items from the Active Coping dimension of the measure. This included the positive cognitive restructuring dimension of the checklist, including positivity (2 items; e.g., "You tried to notice or think about only the good things in your life."), optimism (2 items; e.g., "You told yourself that things would get better."), and control (2 items; e.g., "You told yourself you could handle whatever happens."). We also selected all available items from the seeking understanding subscale (2 items; e.g., "You tried to understand it better by thinking more about it."). Participants responded to a 5-point Likert scale (1 = *Almost never or never* to 5 = *Almost always or always*) and were prompted to report "how often they did each thing to solve their problem or make yourself feel better." In the current study, $\alpha = 0.88$.

Gender

Parents reported whether the target child was a son or daughter at Wave 1.

Statistical analyses

Mplus 8.0 (Muthén and Muthén, 2017) was used to evaluate the study hypotheses. First, we used a series of growth curve models (GCMs) to assess gender equivalence for growth factors (intercept and linear slope) for each subscale of prosocial behaviors at Waves 3, 4, and 6 (coded as 0, 2, 6 in GCMs to capture the time that elapsed from 10th grade to young adulthood). The criterion for determining gender equivalence in growth patterns was a significant chi-square difference test (α level of 0.01) between the model constraining all paths to be equal for boys and girls and the model allowing the means of the growth factors to differ. If the chi-square difference test was not significant, the subsequent analyses were completed for the entire sample; otherwise, the subsequent steps were completed separately by gender. Next, two GCMs were conducted including childhood trauma (W1-W3) as a predictor of the trajectories of altruistic and public prosocial behaviors. This was accomplished by adding to the models in step 1 the binary trauma variable as a predictor of the growth factors (i.e., intercept and slope). Finally, we examined the potentially moderating roles of coping and familism on the relations between trauma exposure and the intercept and slope of the prosocial behavior subscales. Each moderator was tested separately by adding familism or coping and the interaction term to the models in step 2 as the predictors of the growth factors. Interaction terms were created between the trauma variable and each moderator (i.e., familism and coping), after the variable was centered. For significant interaction terms, simple slopes were examined for trauma on the growth factor at different levels of the moderator (i.e., higher and lower levels at +1 and −1 standard deviation from the mean, respectively). A probability level of < 0.05 was used to determine significant main and interaction effects.

Maximum Likelihood (ML) estimation was employed. Skew and kurtosis of the items were within the cutoffs provided by West et al. (1995) for use of ML estimation: skew ranged from −1.18 to 0.4 and kurtosis ranged from −0.68 to 1.32. To facilitate missing data strategy, auxiliary variables that were theoretically related to prosocial behaviors (e.g., consideration of others, social competence) were included in the models. To evaluate the goodness of fit of each model, root mean square error of approximation (RMSEA), comparative fit index (CFI), standardized root mean square residual (SRMR), and chi-square tests were used as fit indices. Adequate fit was based on the following cut-off scores: RMSEA < 0.08 and CFI > 0.95 (Hu and Bentler, 1999; Yu, 2002).

Missing data

Missing data were handled in all models with full information maximum likelihood estimation (FIML). Due to a large attrition rate at Wave 6, attrition analyses were completed for the following Wave 1 variables: demographics (age, gender, income, nativity, household structure), coping, familism, and trauma. Compared to those who completed Wave 6 assessment, children who did not participate in the assessment were more likely to be boys [52.7% vs. 41.8%; χ^2 (1) = 8.99, $p < 0.01$], older [$M_{attrited} = 10.91$ vs. $M_{retained} = 10.82$; t (1) = 7.88, $p < 0.01$], and have lower family income ($M_{attrited} = 5.96$ vs. $M_{retained} = 7.42$; $t = 20.51$, $p < 0.01$) at Wave 1, as well as more likely to report lower familism ($M_{attrited} = 4.50$ vs. $M_{retained} = 4.57$; $t = 4.07$, $p < 0.01$) and lower coping ($M_{attrited} = 3.75$ vs. $M_{retained} = 3.90$; $t = 7.94$, $p < 0.01$) at Wave 1. No differences were found for trauma, child nativity, or household structure at Wave 1. We were unable to explore differences in prosocial behaviors at Wave 1 or 2 because this construct was not administered then due to developmental considerations.

Results

Descriptive statistics for all study variables are presented in Table 1 and correlations in Table 2. Detailed descriptive statistics on trauma exposure and the individual trauma items are available in Supplementary Table S1. Significant gender differences for prosocial behaviors growth curve models were found for both subscales: altruistic [difference of chi-square: $\Delta\ x^2$ (2, 749) = 57.28, $p < 0.01$] and public [$\Delta\ x^2$ (2, 749) = 28.41, $p < 0.01$]. Table 3 presents slopes and intercepts for the growth curve models. For altruistic growth curve models, girls had a higher intercept than boys, and both groups demonstrated increases over time. Additionally, there was a negative correlation between intercept and slope for both groups, indicating that those with higher altruistic behaviors in 10th grade had shallower increases over time, and those with lower altruistic behaviors in 10th grade had steeper increases over time. For public growth curve models, boys had higher intercepts than girls and both genders demonstrated significant declines over time. There was a negative correlation between slope and intercept for both groups, indicating that those

TABLE 1 Descriptive statistics of the study variables.

	Full sample					Girls			Boys		
	N	*M*	*SD*	Min	Max	*N*	*M*	*SD*	*N*	*M*	*SD*
Familism W3	637	4.29	0.42	2.54	5.00	314	4.26	0.41	323	4.32	0.42
Coping W3	637	3.87	0.67	1.00	5.00	314	3.88	0.66	323	3.84	0.68
Altruistic W3	613	3.57	0.90	1.00	5.00	302	3.78	0.85	311	3.36	0.89
Altruistic W4	593	3.71	0.91	1.00	5.00	303	3.94	0.84	290	3.47	0.92
Altruistic W6	387	4.27	0.73	1.00	5.00	210	4.45	0.59	177	4.04	0.81
Public W3	613	2.88	0.89	1.00	5.00	302	2.73	0.93	311	3.02	0.82
Public W4	593	2.68	0.94	1.00	5.00	303	2.51	0.94	290	2.86	0.91
Public W6	387	2.31	0.93	1.00	5.00	210	2.16	0.85	177	2.49	0.99
	N	N yes	% yes			N	N yes	% yes	N	N yes	% yes
Trauma W1-W3	749	353	47.13			366	195	53.28	383	158	41.25

W1, wave 1; W2, wave 2; W3, wave 3; M, mean; SD, standard deviation.

TABLE 2 Correlations for study variables (females above diagonal/males below diagonal).

	Fam G10	Cop G10	Alt G10	Alt G12	Alt YA	Pub G10	Pub G12	Pub YA
Familism G10	-	0.30***	−0.17**	−0.06	−0.03	0.23***	0.21***	0.04
Coping G10	0.32***	-	0.01	0.07	0.02	0.13*	0.10	0.01
Altruistic G10	−0.23***	−0.06	-	0.63***	0.38***	−0.54***	−0.43***	−0.27***
Altruistic G12	−0.16*	0.05	0.58***	-	0.45***	−0.31***	−0.49***	−0.21**
Altruistic YA	−0.00	0.21**	0.48***	0.44***	-	−0.25***	−0.24***	−0.40***
Public G10	0.27***	0.22***	−0.48***	−0.27***	−0.22**	-	0.48***	0.22**
Public G12	0.20***	0.11	−0.27***	−0.46***	−0.23**	0.39***	-	0.28***
Public YA	−0.04	−0.11	−0.25***	−0.40***	−0.46***	0.26***	0.37***	-

Correlations were conducted on a subset of cases due to missing data. G10, grade 10; G12, grade 12; YA, young adult; Fam, familism; Cop, coping; Alt, altruistic; Pub, public. $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

with higher intercepts experienced steeper declines over time and those with lower intercepts experienced shallower declines over time.

Relations between trauma and altruistic and public prosocial behaviors

Structural equation models tested whether trauma exposure was related to the intercept (middle adolescence) and slope (change from middle adolescence to early adulthood) factors for each prosocial behavior model. Fit indices supported adequate model fit such that RMSEAs were between 0.04 and 0.07, CFIs were between 0.96 and 0.98, and SRMRs were between 0.9 and 0.12. Unstandardized path coefficients for models with trauma predicting growth factors are presented in Table 4 (i.e., Model 1).

Earlier trauma exposure predicted, on average, lower altruistic intercepts for girls but had no association with girls' altruistic slopes. These findings were in the direction of childhood trauma being costly, on average, to U.S. Mexican girls' altruistic prosocial behaviors. Conversely, childhood trauma predicted higher public intercepts for girls, but was unrelated to their public prosocial behavior slopes, suggesting childhood trauma being beneficial, on average, to U.S. Mexican girls' levels of public prosocial behaviors in middle adolescence. For boys, childhood trauma did not predict altruistic or public prosocial behavior intercepts or slopes.

Familism and problem-focused coping as moderators of relations between trauma and prosocial behavior growth factors

Moving beyond the previous models, which examined the associations between childhood trauma and prosocial behavior growth factors, we conducted model tests that examined whether the associations between trauma exposure and prosocial behaviors varied for those youth higher and/or lower on familism or coping. Model fit was adequate for all models such that RMSEAs were between 0.01 and 0.06 and CFIs were between 0.96 and 0.99. Unstandardized path coefficients are presented in Table 4

TABLE 3 Prosocial behaviors unconditional growth trajectories ($N = 749$).

	Intercept		Slope		Correlation
	Mean (SE)	Variance (SE)	Mean (SE)	Variance (SE)	*r* (SE)
Altruistic					
Boys	3.30** (0.05)	0.49** (0.07)	0.11** (0.01)	0.00 (0.00)	−0.77 (0.47)
Girls	3.73** (0.05)	0.53** (0.06)	0.11** (0.01)	0.00 (0.00)	−0.99 (0.16)
Public					
Boys	3.02** (0.04)	0.27** (0.06)	−0.09** (0.01)	0.01 (0.00)	−0.03 (0.27)
Girls	2.73** (0.05)	0.49** (0.07)	−0.09** (0.01)	0.01* (0.00)	−0.68 (0.09)

Unstandardized estimates are presented for means and variances and standardized estimates are presented for correlations of slopes and intercepts. Model fit for altruistic prosocial behaviors: χ^2 (6) = 21.82, $p < 0.01$; RMSEA = 0.08 (90% CI: 0.05, 0.12); SRMR = 0.15; CFI = 0.96. Model fit for public prosocial behaviors: χ^2 (6) = 9.07, $p = 0.17$; RMSEA = 0.04 (90% CI: 0.00, 0.08); SRMR = 0.09; CFI = 0.98. $^*p < 0.05$, $^{**}p < 0.001$.

(i.e., Models 2a and 2b). Intercept and slope means as well as relations between trauma and the growth factors did not change in direction or in significance levels in the models that added the interactions. Therefore, for efficiency, we highlight significant interaction effects and present simple slope tests when needed in text, and present all additional model parameters in Table 4.

Altruistic and public prosocial behaviors for girls

For altruistic prosocial behaviors, there were significant familism (but not coping) interactions with trauma for the intercept and slope. Trauma exposed girls who were high on familism were significantly lower on altruistic prosocial behaviors in 10th grade than girls high on familism with no trauma exposure ($B = -0.60$, $SE_B = 0.13$, $p < 0.01$). Trauma exposed girls who were low on familism values were not significantly different on altruistic prosocial behaviors in 10th grade than girls low on familism and not exposed to trauma ($B = 0.05$, $SE_B = 0.13$, $p = 0.68$).

Importantly, girls who were trauma exposed and who reported high levels of familism showed significant positive (slope) increases in altruistic behaviors from middle adolescence to early adulthood ($B = 0.08$, $SE_B = 0.02$, $p < 0.01$) (see Figure 1). For girls who were lower on familism, trauma level did not significantly affect changes in altruistic behaviors across middle adolescence to early adulthood (STAT). Overall, these findings suggest that exposure to earlier traumatic events may be initially more costly to U.S. Mexican girls who report high familism, but these same girls later experience the steepest increases in altruistic prosocial behaviors into early adulthood. Thus, the findings are consistent with a recovery response to adversity.

For girls' public prosocial behaviors there was a significant interaction effect of problem-focused coping (but not familism) and trauma on the intercept. Girls low on problem focused coping and unexposed to trauma were significantly higher on public prosocial behaviors than girls low on coping who reported trauma exposure ($B = 0.51$, $SE_B = 0.14$, $p < 0.01$). For girls high on problem focused coping, trauma levels were not significantly associated with public prosocial behaviors. This pattern is consistent with problem focused coping supporting a resilience response to adversity vis-à-vis public prosocial behaviors.

Altruistic and public prosocial behaviors for boys

Familism and problem-focused coping did not modify the effect of trauma on the growth factors of altruistic or public prosocial behaviors. However, boys who were trauma exposed and who reported high levels of problem-focused coping showed a positive trend in altruistic prosocial behaviors across middle adolescence to early adulthood as compared to boys who reported no trauma and high levels of coping ($B = 0.05$, $SE_B = 0.03$, $p = 0.07$). This pattern is consistent with a growth response to adversity. In contrast, trauma exposed boys who reported relatively low levels of coping showed no changes in altruistic prosocial behaviors across middle adolescence to early adulthood as compared to boys who reported no trauma and low levels of coping.

Discussion

Although scholars have theorized much on the possibility of post-traumatic growth in prosocial behaviors, few longitudinal studies exist that examine such possibilities, and no studies exist in U.S. ethnic/racial minority youth. The present findings yielded supportive evidence that U.S. Mexican girls manifested increases in altruistic prosocial behaviors after exposure to earlier traumatic events in a manner consistent with positive adaptations to adversity, including recovery, growth, and resilience (Luthar and Eisenberg, 2017). Specifically, U.S. Mexican girls who reported earlier trauma exhibited increases in altruistic prosocial behaviors in young adulthood when they reported relatively high levels of familism values in middle adolescence. Similarly, although statistically nonsignificant, U.S. Mexican boys who reported earlier traumatic events exhibited a trend increase in altruistic prosocial behaviors in young adulthood when they reported relatively high levels of problem-focused coping in middle adolescence. Gender-specific, patterns of relations and developmental changes in public prosocial behaviors were also revealed. The overall findings are generally in accord with culturally-integrated theories of prosocial development (Davis and Carlo, 2019) and resiliency frameworks (Joseph and Linley, 2008; Luthar and Eisenberg, 2017; Infurna

TABLE 4 Models of trauma exposure in relation to growth trajectories of prosocial behaviors (from grade 10 to early adulthood) moderated by familism and coping.

Altruistic		Model 1: Trauma only						Model 2a: Familism as moderator						Model 2b: Coping as moderator					
		Girls			Boys			Girls			Boys			Girls			Boys		
		B	*SE*	β	*B*	*SE*	β	*B*	*SE*	β	*B*	*SE*	β	*B*	*SE*	β	*B*	*SE*	β
	Int on trauma	−0.28**	0.10	−0.19	−0.15	0.10	−0.10	−0.27**	0.09	−0.19	−0.10	0.10	−0.07	−0.29**	0.10	−0.19	−0.15	0.10	−0.10
	Slo on trauma	0.03	0.02	0.25	0.00	0.02	0.03	0.03	0.02	0.28	−0.00	0.01	−0.03	0.03	0.02	0.25	0.00	0.02	0.03
	Int on growth trigger							0.07	0.07	0.10	−0.20**	0.06	−0.28	0.05	0.07	0.07	−0.06	0.06	−0.09
	Slo on growth trigger							−0.01	0.01	−0.13	0.02	0.01	0.35	0.00	0.01	0.04	0.02	0.01	0.50
	Int on growth trigger x trauma							−0.33**	0.10	−0.32	−0.00	0.10	−0.00	−0.02	0.10	−0.02	0.02	0.10	0.02
	Slo on growth trigger x trauma							**0.05****	0.02	0.60	0.03	0.02	0.37	−0.01	0.02	−0.09	0.05+	0.03	0.88
Public		**Girls**			**Boys**			**Girls**			**Boys**			**Girls**			**Boys**		
		B	*SE*	β	*B*	*SE*	β	*B*	*SE*	β	*B*	*SE*	β	*B*	*SE*	β	B	SE	β
	Int on trauma	0.27**	0.10	0.20	0.15	0.09	0.14	0.27**	0.10	0.19	0.10	0.09	0.09	0.25*	0.10	0.18	0.15	0.09	0.14
	Slo on trauma	−0.02	0.02	−0.10	0.01	0.03	0.06	−0.02	0.02	−0.10	0.02	0.03	0.10	−0.02	0.02	−0.08	0.01	0.03	0.06
	Int on growth trigger							0.21**	0.08	0.30	0.24***	0.06	0.47	0.26**	0.08	0.38	0.20***	0.06	0.38
	Slo on growth trigger							−0.04*	0.02	−0.39	−0.02	0.02	−0.18	−0.04*	0.03	−0.41	−0.04*	0.02	−0.47
	Int on growth trigger x trauma							0.04	0.10	0.04	−0.05	0.09	−0.05	**−0.26***	0.10	−0.29	−0.04	0.09	−0.05
	Slo on growth trigger x trauma							0.01	0.02	0.08	−0.04	0.03	0.30	0.04	0.03	0.30	0.01	0.03	0.05

Int, Intercept; Slo, slope. Bolded coefficient, significant slope interaction. $+p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$. Bolded coefficients = statistically significant interaction effects.

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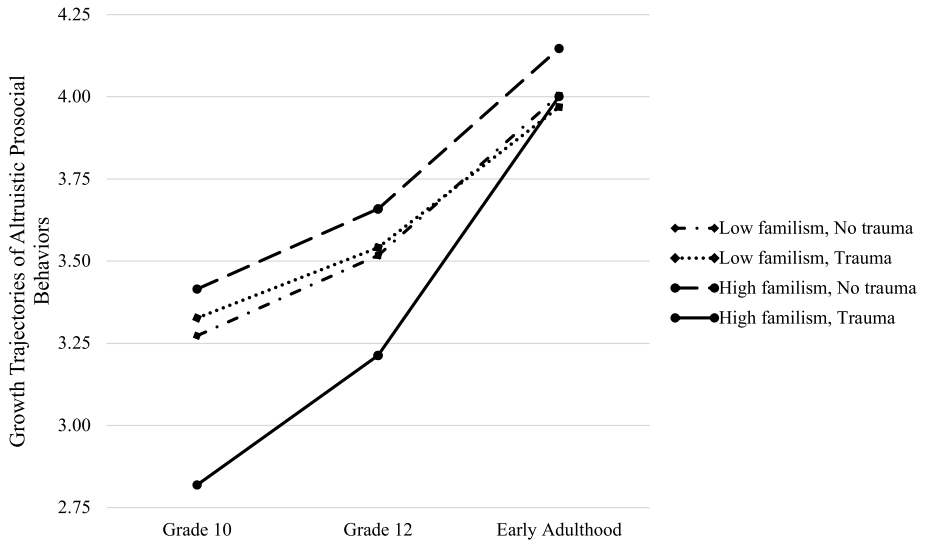

FIGURE 1
Interaction between familism and trauma in relation to the growth factor (slope) of altruistic prosocial behaviors among girls. Solid line indicates statistically significant simple slope and dashed lines indicate non-significant simple slopes.

and Jayawickreme, 2019), as well as, the *altruism-born-of-suffering* hypothesis, and yield compelling evidence of nuanced-pattern of moral growth amongst some trauma-exposed U.S. ethnic/racial minority youth.

Predicting gender-specific positive adaptations to trauma-exposure as a function of growth triggers

Of particular importance were the novel findings that suggest increases in altruistic prosocial behaviors for U.S. Mexican girls from early adolescence to young adulthood. Although the evidence demonstrates that such growth occurred, the findings were gender-specific such that, among those exposed to trauma, U.S. Mexican girls who reported relatively high levels of familism displayed this growth. For boys, there was a similar but nonsignificant pattern of findings, such that those who reported relatively high levels of problem-focused coping showed such positive adaptations.

For girls who reported relatively high levels of trauma experiences, high levels of familism (compared to lower levels of familism) initially were associated with lower scores on altruistic prosocial behaviors. The initial negative relation between relatively high levels of familism and altruistic behavior scores might be due to the initial challenges of coping with trauma, such that the relative immediacy of trauma exposure undermines one's ability to selflessly consider the needs of others. This is consistent with recovery patterns (Infurna and Luthar, 2018; Infurna and Jayawickreme, 2019), such that there were relatively low levels of altruistic prosocial behaviors for highly familistic, trauma-exposed girls in middle adolescence (compared to low-familistic, trauma-exposed girls). Given the emphasis on familism in Latinas, as compared to Latinos, these findings might reflect the comparative greater benefits on a strong connection to the family for U.S. Mexican girls even when exposed to trauma. This notion is consistent with higher levels of altruistic tendencies for girls relative to boys in the present study and with prior evidence that U.S. Latinas more strongly endorse familism and exhibit closer parent-child relationships than U.S. Latinos (Updegraff et al., 2005). Thus, the closer connection and greater importance placed on the family in girls might provide an important resource to help trauma exposed girls, as compared to trauma exposed, low familistic girls, to demonstrate increasingly levels of altruistic prosocial tendencies.

In contrast, findings for trauma-exposed U.S. Mexican boys who were high (compared to low) on problem-focused coping, showed trend (at the $p < 0.07$, statistically nonsignificant level) evidence of increases in altruistic prosocial behaviors from middle adolescence to early adulthood. Given that boys' altruistic prosocial behaviors were increasing over developmental time (see Table 3 for slope), their pattern suggests that trauma-exposed boys with high levels of problem-focused coping were showing relatively steeper increases in altruistic prosocial behaviors as compared to all other groups of boys. Thus, for trauma-exposed boys with high problem-focused coping resources, the positive trend in altruistic prosocial behaviors is consistent with growth (Infurna and Luthar, 2018; Infurna and Jayawickreme, 2019). The pattern is also in accord with stress and coping scholars who assert that problem-focused coping is generally a constructive set of strategies that can help persons effectively deal with stressors (Lazarus and Folkman, 1984; Compas et al., 2001). That the beneficial trend effects of problem-focused coping were manifested in U.S. Mexican boys rather than girls might reflect the strong instrumental orientation that boys tend to exhibit relative to girls (Maccoby, 1990). Alternatively, boys who are strong in problem-focused coping might be more likely to take responsibility for others in ways that are congruent with traditional gender-typed expectations linked to masculinity (machismo). However, given the nonsignificant findings, there is

a great need for future studies to determine whether these findings are reliable.

To our knowledge, these are first empirical findings that show age-related increases in altruistic prosocial behaviors in a U.S. ethnic/racial minority group exposed to childhood trauma experiences. That, for girls, familism (and non-significantly, problem-focused coping for boys) served as a trigger for patterns of positive adaptation from relatively low baseline levels of altruistic prosocial behaviors demonstrates suggestive evidence of growth and recovery stemming from culture- and non-culture-specific person traits. Such evidence is consistent with resilience and posttraumatic growth scholars who assert the need to identify protective and enhancer mechanisms for high-risk youth (Masten and Narayan, 2012; Infurna and Luthar, 2018; Carlo et al., 2022). These overall findings are also in accord with prior research that links familism, problem-focused coping, and other stressors (e.g., discrimination) to prosocial behaviors and with contemporary culture-specific approaches to understanding prosocial development in U.S. ethnic/racial minority youth (Carlo and de Guzman, 2009; Knight and Carlo, 2012). By considering the interplay of culture-group and non-culture-group specific mechanisms, researchers might be better able to account for distinct developmental trajectories of prosocial development in ethnic/racial minority youth even when such youth experience exposure to trauma.

Moral developmental scholars (Staub and Vollhart, 2008) who postulate that moral growth can manifest from exposure to adverse circumstances (*altruism-born-of-suffering*) have not directly examined how such growth occurs. The present findings show a nuanced pattern of moral development increases that differed across gender and growth triggers. Increases in altruistic prosocial behaviors were revealed by patterns of recovery, as well as, growth. In other words, *altruism-born-of-suffering* for some youth were present after initial declines in altruistic prosocial behaviors followed by growth (girls high on familism); whereas, for trauma exposed boys who reported relatively high levels of problem focused coping, altruistic prosocial behaviors showed a nonsignificant trend with little initial decline in such behaviors. Because altruistic prosocial behaviors were not assessed prior to trauma exposure, determination of resiliency growth or chronic low trajectories were not possible. Nonetheless, the overall patterns of distinct forms of *altruism-born-of-suffering* provocatively suggests distinct trajectories of some ethnic/racial minority youth who are capable of overcoming adverse earlier life experiences. Such findings might inform the moral development of ethnic/racial minority persons from adverse life circumstances who significantly contribute to improving the lives of needy others.

Effects of trauma exposure, familism, and problem-focused coping on public prosocial behaviors

Beyond the effects in predicting altruistic prosocial behaviors, there were also several nuanced patterns of relations among trauma exposure, familism and coping in predicting public prosocial behaviors. For both boys and girls, regardless of trauma exposure, coping was associated with high levels of public prosocial behaviors. These findings might reflect the possibility that public forms of prosocial behaviors might serve similar instrumental function as that of problem-focused coping given that public prosocial behaviors can result in positive feedback and approval from others and subsequently reduce stress (Carlo and Randall, 2002). However, higher levels of coping were also linked to decreases in public prosocial behaviors over time. This latter pattern of relations suggests that, over time, the efficiency of problem-focused coping in managing stress could trigger less need to engage in such prosocial behaviors designed to gain others' approval or positive social feedback. Although further longitudinal research is needed to better understand these findings, it is possible that the effects of coping or self-regulation on other specific forms of prosocial behaviors could change over time.

Girls low on problem-focused coping and unexposed to trauma scored higher on public prosocial behaviors than those low on problem-focused coping who reported trauma. These findings are somewhat surprising given prior work in U.S. Latino/a adolescents that revealed positive relations between acculturative stress (including discrimination) and public prosocial behaviors (Brittian et al., 2013; Davis et al., 2016). Scholars have recognized that prosocial behaviors can sometimes serve as a coping mechanism to alleviate one's own distress or to improve one's mood (e.g., Schacter and Margolin, 2019). Other scholars note that stress experiences might orient persons to focus on one's self (rather than others), which might facilitate public prosocial actions that could evoke positive social feedback to gain social support and resources to deal with such experiences (Davis et al., 2016). However, the present findings suggest that U.S. Mexican girls exposed to trauma are less engaged in problem-focused strategies to manage such stress, which inhibits public prosocial behaviors. The fact that this pattern held for girls and not boys could be due to the relative importance of familism (Carlo, 2014), peer relationships, and social approval in girls during adolescence (e.g., Brown et al., 1999).

In addition, girls' and boys' familism was positively linked to public prosocial behaviors, regardless of trauma exposure. This finding aligns with prior research that familism consistently positively predicts public prosocial behaviors in U.S. Latino/a youth (see Carlo, 2014). Although prior research shows that familism also positively predicts other care-based forms of prosocial behaviors (such as when requested or in crisis situations), familism might orient youth toward helping family members in particular, especially in order to gain family members approval or to comply with family duties (Carlo and de Guzman, 2009). Indeed, encouragement and practice of public prosocial behaviors toward family members earlier in life might play an important role in the subsequent development of other forms of prosocial behaviors and, eventually, in such actions toward non-family members (Zhao et al., 2022). However, research on the developmental trajectories and interrelations of specific forms of prosocial behaviors toward distinct targets across childhood and adolescence will be needed to examine this possibility.

Age- and gender-related changes in U.S. Mexican youth prosocial behaviors

The strength-based approach in the present study also revealed age- and gender-related trends in specific forms of U.S. Mexican youth prosocial behaviors. There were increases in altruistic prosocial behaviors for both genders from adolescence to young adulthood though girls scored higher than boys on both altruistic and public prosocial behaviors. On the other hand, the findings also yielded evidence for declines in public prosocial behaviors for both genders. The overall decline in public prosocial behaviors for both genders (although boys scored higher than girls) complements the earlier reported increases in altruistic prosocial behaviors and suggests a greater consideration of others' needs and less attention to gaining the approval of others and practical concerns during adolescence. Such findings might inform prior work that suggested declines in prosocial behaviors in early to middle adolescence but apparent increases in late adolescence in European heritage youth (Van der Graaff et al., 2018; Shi et al., 2021). The present findings are novel in extending these increases into young adulthood, in specific forms of prosocial behaviors, and in a sample of U.S. Mexican youth. Additionally, the demonstrated evidence of increases of altruistic prosocial behaviors in U.S. Mexican heritage youth across adolescence and into young adulthood run counter to conceptions of pathology and deficits in ethnic/racial minority youth.

Study limitations

Despite the many strengths of the present study, there were several limitations that call for caution in interpretation of the findings. First, the longitudinal study design did not allow for a fully prospective investigation, which tempers our ability to draw confident inferences regarding causality and direction of effects. Other study designs (e.g., intervention studies designed to increase coping and/or familism in trauma-exposed youth) are needed to draw stronger inferences. Second, the present sample focused on U.S. Latino/a youth of Mexican heritage and generalizability of the findings to other U.S. Latino/a groups is limited. And third, the present findings rely on self-reports of trauma, familism, coping, and prosocial behaviors. Studies using multiple methods are desirable to replicate the present findings and reduce concerns with self-presentational demands and shared method variance. Moreover, a number of concerns (e.g., narrowness of assessment, possible confounds between stress and coping) have been raised about the use of checklist measures of major life events and the need to consider alternative assessments (e.g., narrative measures) to better contextualize these constructs (Infurna and Jayawickreme, 2019). Future studies could also examine the impact of additional trauma experiences (such as parental/sibling death) that could have resulted in stronger effects of trauma exposure. Finally, as noted previously, there is evidence that scores on the self-report measure of prosocial behavior are significantly related to behavioral tasks and show changes from prosocial behavior intervention programs. However, replication of the present findings using behavioral, other-reported (e.g., peers, teachers), or observational measures of prosocial behaviors is desirable in future studies.

Conclusions

The present study is the first study to demonstrate increases in positive social contributions across adolescence to young adulthood in an U.S. ethnic/racial minority youth group exposed to earlier trauma experiences. The findings align with moral developmental scholars who assert the existence of *altruism-born-of-suffering* though the pattern is nuanced and we show support for this notion in a subsample of U.S. ethnic/racial minority youth. Consistent with resiliency and cultural developmental models, there were general increases in some forms of prosocial behaviors across this age period and familism predicted relative increases in altruistic behaviors for U.S. Mexican girls (but not boys) exposed to earlier trauma experiences. The present findings present evidence for prosocial growth in often-maligned and pathologized U.S. ethnic/racial minority youth group. The evidence suggests the need for further research aimed at identifying additional growth trigger mechanisms that might enhance positive youth development for ethnic/racial minority youth exposed to adverse life circumstances. Such findings yield promising avenues for future intervention efforts designed to enhance positive moral youth outcomes in trauma-exposed U.S. ethnic/racial minority youth.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by Arizona State University IRB Committee. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation in this study was provided by the participants' legal guardians/next of kin.

Author contributions

GC: Conceptualization, Methodology, Project administration, Supervision, Visualization, Writing – original draft, Writing – review & editing. RW: Conceptualization, Data curation, Funding acquisition, Investigation, Methodology, Resources, Supervision, Writing – review & editing. AC: Formal analysis, Writing – review & editing. J-YT: Methodology, Supervision, Writing – review & editing. RP: Data curation, Formal analysis, Methodology, Writing – review & editing. GK: Data curation, Investigation, Methodology, Project administration, Resources, Supervision, Writing – original draft, Writing – review & editing. NG: Data curation, Funding acquisition, Investigation, Project administration, Resources, Supervision, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fdpys.2024.1393252/full#supplementary-material

References

Armenta, B. E., Knight, G. P., Carlo, G., and Jacobson, R. P. (2011). The relation between ethnic group attachment and prosocial tendencies: the mediating role of ethnically related cultural values. *Eur. J. Soc. Psychol.* 41, 107–115. doi: 10.1002/ejsp.742

Ayers, T. S., Sandler, I. N., West, S. G., and Roosa, M. W. (1996). A dispositional and situational assessment of children's coping: Testing alternative models of coping. *J. Pers.* 64, 923–958. doi: 10.1111/j.1467-6494.1996.tb00949.x

Batson, C. D. (1998). Altruism and prosocial behavior. *The Handb. Soc. Psychol.* 2, 282–316.

Bonanno, G. A. (2004). Loss, trauma, and human resilience: Have we underestimated the human capacity to thrive after extremely aversive events? *Am. Psychol.* 59, 20–28. doi: 10.1037/0003-066X.59.1.20

Brittian, A. S., O'Donnell, M., Knight, G. P., Carlo, G., Umaña-Taylor, A. J., Roosa, M. W., et al. (2013). Associations between adolescents' perceived discrimination and prosocial tendencies: the mediating role of Mexican American values. *J. Youth Adoles.* 42, 328–341. doi: 10.1007/s10964-012-9856-6

Brown, L. M., Way, N., and Duff, J. L. (1999). "The others in my I: adolescent girls' friendships and peer relations," in *Beyond Appearance: A New Look at Adolescent Girls*, eds. N. G. Johnson, M. C. Roberts, and J. Worell (London: American Psychological Association), 205–225.

Buka, S. L., Stichick, T. L., Birdthistle, I., and Earls, F. J. (2001), Youth exposure to violence: prevalence, risks, and consequences. *Am. J. Orthopsychiatr.* 71, 298–310. doi: 10.1037/0002-9432.71.3.298

Cabrera, N. J., Beeghly, M., and Eisenberg, N. (2012). Positive development of minority children: introduction to the special issue. *Child Dev. Persp.* 6, 207–209. doi: 10.1111/j.1750-8606.2012.00253.x

Carlo, G. (2014). "The development and correlates of prosocial moral behaviors," in *Handbook of Moral Development, 2nd Edn*, eds. M. Killen and J. G. Smetana (New York, NY: Psychology Press), 208–234.

Carlo, G., and de Guzman, M. R. T. (2009). "Theories and research on prosocial competencies among U.S. Latinos/as," in *Handbook of U.S. Latino Psychology*, eds. F. Villaruel, G. Carlo, M. Azmitia, J. Grau, N. Cabrera, and J. Chahin (London: Sage Publications), 191–211.

Carlo, G., Hausmann, A., Christiansen, S., and Randall, B. A. (2003). Sociocognitive and behavioral correlates of a measure of prosocial tendencies for adolescents. *J. Early Adoles.* 23, 107–134. doi: 10.1177/0272431602239132

Carlo, G., Knight, G. P., McGinley, M., Zamboanga, B. L., and Jarvis, L. (2010). The multidimenionality of prosocial behaviors: evidence of measurement invariance in early Mexican American and European American adolescents. *J. Res. Adolesc.* 20, 334–358. doi: 10.1111/j.1532-7795.2010.00637.x

Carlo, G., Mestre, M. V., McGinley, M. M., Samper, P., Tur, A., and Sandman, D. (2012). The interplay of emotional instability, empathy, and coping on prosocial and aggressive behaviors. *Pers. Individ. Diff.* 53, 675–680. doi: 10.1016/j.paid.2012.05.022

Carlo, G., Murry, V. M., Davis, A. N., Gonzalez, C. M., and Debreaux, M. L. (2022). Culture-related adaptive mechanisms to race-related trauma among African American and U.S. Latinx youth. *Adv. Res. Sci.* 3, 247–259. doi: 10.1007/s42844-022-00065-x

Carlo, G., and Randall, B. (2001). "Are all prosocial behaviors equal? A socioecological developmental conception of prosocial behavior," in *Advances in Psychology Research, Vol. 2,* ed. F. Columbus (Huntington, NY: Nova Science Publishers), 151–170.

Carlo, G., and Randall, B. A. (2002). The development of a measure of prosocial behaviors for late adolescents. *J. Youth Adolesc.* 31, 31–44. doi: 10.1023/A:1014033032440

Cicchetti, D. (2016). Understanding developmental pathways from adversity to maladaptation, psychopathology, or resilience. *Bullet. Am. Acad. Arts Sci.* 22, 27–28.

Colby, A., and Damon, W. (1992). *Some Do Care: Contemporary Lives of Moral Commitment*. New York, NY: Free Press

Coll, C. G., Lamberty, G., Jenkins, R., McAdoo, H. P., Crnic, K., Wasik, B. H., et al. (1996). An integrative model for the study of developmental competencies in minority children. *Child Dev.* 67, 1891–1914. doi: 10.2307/1131600

Compas, B. E., Connor-Smith, J. K., Saltzman, H., Thomsen, A. H., and Wadsworth, M. E. (2001). Coping with stress during childhood and adolescence: problems, progress, and potential in theory and research. *Psychol. Bullet.* 127, 87–127. doi: 10.1037/0033-2909.127.1.87

Davis, A., and Carlo, G. (2019). "Towards an integrative conceptual model on the relations between discrimination and prosocial behaviors in U.S. Latino/a youth," in *Handbook of Children and Prejudice: Integrating Research, Practice, and Policy*, eds. H. E. Fitzgerald, D. Johnson, D. Qin, F. Villarruel, and J. Norder (Cham: Springer Press), 375–388.

Davis, A. N., Carlo, G., Schwartz, S. J., Unger, J. B., Zamboanga, B. L., Lorenzo-Blanco, E. I., et al. (2016). The longitudinal associations between discrimination, depressive symptoms, and prosocial behaviors in U.S. Latino/a recent immigrant adolescents. *J. Youth Adoles.* 45, 457–470. doi: 10.1007/s10964-015-0394-x

Dinić, B., and Bodroža, B. (2020). "My precious… toilet paper": stockpiling during the COVID-19 pandemic is related to selfishness, but not to fear. *Primenjena Psihol.* 13, 489–504. doi: 10.19090/pp.20.4.489-504

Eisenberg, N., Spinrad, T. L., and Knafo-Noam, A. (2015). "Prosocial development," in *Handbook of Child Psychology and Developmental Science: Socioemotional Processes, Vol. 3*, eds. M. E. Lamb, and R. M. Lerner (London: John Wiley and Sons Inc), 610–656.

Federal Interagency Forum on Child and Family Statistics (1997). *America's Children: Key national Indicators of Well-Being. Forum on Child and Family Statistics*. Available oline at: https://www.cdc.gov/nchs/data/misc/amchild.pdf (accessed March 1, 2020).

Fuller, B., and García Coll, C. (2010). Learning from Latinos: contexts, families, and child development in motion. *Dev. Psychol.* 46, 559–565. doi: 10.1037/a0019412

Garbanzo-Rodríguez, G., Pérez-Sánchez, R., Rivera-Villareal, C., and Smith-Castro, V. (2017). Efectos de un videojuego de simulación sobre tendencias altruistas en un contexto de educación abierta. *Revista Colombiana de Educ.* 73, 41–58. doi: 10.17227/01203916.73rce39.56

Gaylord-Harden, N. K., Gipson, P., Mance, G., and Grant, K. E. (2008). Coping patterns of African American adolescents: a confirmatory factor analysis and cluster analysis of the Children's Coping strategies checklist. *Psychol. Assessm.* 20, 10–22. doi: 10.1037/1040-3590.20.1.10

Gonzales, N. A., Tein, J., and Sandler, I. N., and Friedman, R. J. (2001). On the limits of coping: interactions between stress and coping for inner-city adolescents. *J. Adoles. Res.* 16, 372–395. doi: 10.1177/0743558401164005

Grossman, F. K., Sorsoli, L., and Kia-Keating, M. (2006). A gale force wind: meaning making by male survivors of childhood sexual abuse. *Am. J. Orthopsychiatr.* 76, 434–443. doi: 10.1037/0002-9432.76.4.434

Grusec, J. E. (2011). Socialization processes in the family: social and emotional development. *Ann. Rev. Psychol.* 62, 243–269. doi: 10.1146/annurev.psych.121208.131650

Harel, Z., Kahana, B., and Kahana, E. (1993). "Social resources and the mental health of aging Nazi Holocaust survivors and immigrants," in *International Handbook of Traumatic Stress Syndromes. The Plenum Series on Stress and Coping*, eds. J. P. Wilson, B. Raphael (Boston, MA: Springer), 1–14.

Hart, D., and Fegley, S. (1995). Prosocial behavior and caring in adolescence: relations to self-understanding and social judgment. *Child Dev.* 66, 1346–1359. doi: 10.2307/1131651

Hoffman, M. L. (2000). *Empathy and Moral Development: Implications for Caring and Justice*. New York, NY: Cambridge University Press.

Hu, L. T., and Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Struct. Eq. Modeling Multidisciplinary J.* 6, 1–55. doi: 10.1080/10705519909540118

Hussey, J. M., Chang, J. J., and Kotch, J. B. (2006). Child maltreatment in the United States: prevalence, risk factors, and adolescent health consequences. *Pediatrics* 118, 933–942. doi: 10.1542/peds.2005-2452

Infurna, F. J., and Jayawickreme, E. (2019). Fixing the growth illusion: new directions for research in resilience and posttraumatic growth. *Curr. Direct. Psychol. Sci.* 28, 152–158. doi: 10.1177/0963721419827017

Infurna, F. J., and Luthar, S. S. (2018). Re-evaluating the notion that resilience is commonplace: a review and distillation of directions for future research, practice, and policy. *Clin. Psychol. Rev.* 65, 43–56. doi: 10.1016/j.cpr.2018.07.003

Joseph, S., and Linley, P. A. (2008). *Trauma, Recovery, and Growth: Positive Psychological Perspectives on Posttraumatic Stress.* London: John Wiley and Sons.

Knight, G. P., and Carlo, G. (2012). Prosocial development among Mexican American youth. *Child Dev. Persp.* 6, 258–263. doi: 10.1111/j.1750-8606.2012.00233.x

Knight, G. P., Carlo, G., Basilio, C. D., and Jacobson, R. P. (2014). Familism values, perspective taking, and prosocial moral reasoning: predicting prosocial tendencies among Mexican American adolescents. *J. Res. Adolesc.* 25, 717–727. doi: 10.1111/jora.12164

Knight, G. P., Gonzales, N. A., Saenz, D. S., Bonds, D., German, M., Deardorff, J., et al. (2010). The Mexican American cultural values scale for adolescents and adults. *J. Early Adoles.* 30, 444–481. doi: 10.1177/0272431609338178

Lazarus, R., and Folkman, S. (1984). *Stress, Appraisal, and Coping*. New York, NY: Springer.

Linley, P. A., and Joseph, S. (2004). Positive change following trauma and adversity: A review. *J. Traum. Stress Off. Pub. Int. Soc. Traum. Stress Stu.* 17, 11–21. doi: 10.1023/B:JOTS.0000014671.27856.7e

Luthar, S. S., Cicchetti, D., and Becker, B. (2000). The construct of resilience: a critical evaluation and guidelines for future work. *Child Dev.* 71, 543–562. doi: 10.1111/1467-8624.00164

Luthar, S. S., and Eisenberg, N. (2017). Resilient adaptation among at-risk children: harnessing science toward maximizing salutary environments. *Child Dev.* 88, 337–349. doi: 10.1111/cdev.12737

Maccoby, E. E. (1990). Gender and relationships: a developmental account. *Am. Psychol.* 45:513. doi: 10.1037/0003-066X.45.4.513

MacKay, A. P., Fingerhut, L. A., and Duran, C. R. (2000). *Adolescent Health Chartbook, United States.* Hyattsville, MD: National Center for Health Statistics.

Masten, A. S., and Narayan, A. J. (2012). Child development in the context of disaster, war, and terrorism: pathways of risk and resilience. *Ann. Rev. Psychol.* 63, 227–257. doi: 10.1146/annurev-psych-120710-100356

McGinley, M., Davis, A. N., Carlo, G., Schwartz, S. J., Lorenzo-Blanco, E. I., Unger, J. B., et al. (2021). A parallel process model of integration and multidimensional prosocial behaviors in recent immigrant US Latinx adolescents. *Psychol. Rep.* 124, 1237–1267. doi: 10.1177/0033294120928268

McGinley, M., Opal, D., Richaud, M. C., and Mesurado, B. (2014). "Cross-cultural evidence of multidimensionality of prosocial behavior: An examination of the prosocial tendencies measure (PTM)," in *Prosocial Development: A Multidimensional Approach*, eds. L. Padilla-Walker and G. Carlo (Oxford: Oxford University Press), 258–277

Muthén, L. K., and Muthén, B. O. (2017). *Mplus User's Guide, 8th Edn.* Los Angeles, CA: Muthén and Muthén.

Oliner, S. P., and Oliner, P. M. (1988). *The Altruistic Personality: Rescuers of Jews in Nazi Europe*. New York, NY: Free Press.

Pew Research Center (2015). *Future Immigration Will Change the Face of America by 2065*. Available online at: https://www.pewresearch.org/short-reads/2015/10/05/future-immigration-will-change-the-face-of-america-by-2065/

Prelow, H., Michaels, M., Reyes, L., Knight, G., and Barrera Jr, M. (2002). Measuring coping in low-income European American, African American, and Mexican American adolescents: an examination of measurement equivalence. *Anxiety Stress Coping* 15, 135–147. doi: 10.1080/10615800290028440

Quintana, S. M., Aboud, F. E., and Chao, R. K., Contreras-Grau, J., Cross, W. E., Hudley, C., Hughes, D., Liben, L. S., Nelson-Le Gall, S., and Vietze, D. L. (2006). Race, ethnicity, and culture in child development: contemporary research and future directions. *Child Dev.* 77, 1129–1141. doi: 10.1111/j.1467-8624.2006.00951.x

Roberts, A., Gilman, S., Breslau, J., Breslau, N., and Koenen, K. (2011). Race/ethnic differences in exposure to traumatic events, development of post-traumatic stress disorder, and treatment-seeking for post-traumatic stress disorder in the United States. *Psychol. Med.* 41, 71–83. doi: 10.1017/S0033291710000401

Rodrigues, J., Ulrich, N., and Mussel, P., Carlo, G., and Hewig, J. (2017). Measuring prosocial tendencies in Germany: sources of validity and reliability of the revised prosocial tendency measure. *Front. Psychol.* 8:2119. doi: 10.3389/fpsyg.2017.02119

Romero, A. J., and Gonzalez, H., and Smith, B. A. (2015). Qualitative exploration of adolescent discrimination: experiences and responses of Mexican-American parents and teens. *J. Child Family Stu.* 24, 1531–1543. doi: 10.1007/s10826-014-9957-9

Roosa, M. W., Liu, F. F., Torres, M., Gonzales, N. A., Knight, G. P., Saenz, D., et al. (2008). Sampling and recruitment in studies of cultural influences on adjustment: a case study with Mexican Americans. *J. Family Psychol.* 22, 293–302. doi: 10.1037/0893-3200.22.2.293

Sabogal, F., Marín, G., Otero-Sabogal, R., Marín, B. V., and Pérez-Stable, E. J. (1987). Hispanic familism and acculturation: What changes and what doesn't? *Hispanic J. Behav. Sci.* 9, 397–412. doi: 10.1177/07399863870094003

Schacter, H. L., and Margolin, G. (2019). When it feels good to give: depressive symptoms, daily prosocial behavior, and adolescent mood. *Emotion* 19, 923–927. doi: 10.1037/emo0000494

Shaffer, D., Fisher, P., Lucas, C. P., Dulcan, M. K., and Schwab-Stone, M. E. (2000). NIMH diagnostic interview schedule for children version IV (NIMH DISC-IV): description, differences from previous versions, and reliability of some common diagnoses. *J. Am. Acad. Child Adoles. Psychiatr.* 39, 28–38. doi: 10.1097/00004583-200001000-00014

Shi, Q., Ettekal, I., Liew, J., and Woltering, S. (2021). Predicting differentiated developmental trajectories of prosocial behavior: a 12-year longitudinal study of children facing early risks and vulnerabilities. *Int. J. Behav. Dev.* 45, 327–336. doi: 10.1177/0165025420935630

Staub, E. (2013). Building a peaceful society: origins, prevention, and reconciliation after genocide and other group violence. *Am. Psychol.* 68:576. doi: 10.1037/a0032045

Staub, E., and Vollhart, J. (2008). Altruism born of suffering: the roots of caring and helping after victimization and other trauma. *Am. J. Orthopsychiatr.* 78, 267–280. doi: 10.1037/a0014223

Sukys, S., Majauskiene, D., and Dumciene, A. (2017). The effects of a three-year integrated Olympic education programme on adolescents' prosocial behaviours. *Eur. J. Sport Sci.*, 335–342. doi: 10.1080/17461391.2016.1254280

Tedeschi, R. G., and Calhoun, L. G. (2004). Posttraumatic growth: conceptual foundations and empirical evidence. *Psychol. Inq.* 15, 1–18. doi: 10.1207/s15327965pli1501_01

Updegraff, K. A., McHale, S. M., Whiteman, S. D., Thayer, S. M., and Delgado, M. Y. (2005). Adolescent sibling relationships in Mexican American families: exploring the role of familism. *J. Family Psychol.* 19, 512–522. doi: 10.1037/0893-3200.19.4.512

Van der Graaff, J., Carlo, G., and Crocetti, E., Koot, H. M., and Branje, S. (2018). Prosocial behavior in adolescence: gender differences in development and links with empathy. *J. Youth Adoles.* 47, 1086–1099. doi: 10.1007/s10964-017-0786-1

West, S. G., Finch, J. F., and Curran, P. J. (1995). "Structural equation models with nonnormal variables: problems and remedies," in *Structural Equation Modeling: Concepts, Issues, and Applications,* ed. R. H. Hoyle (Thousand Oaks, CA: Sage Publications, Inc), 56–75.

Whiting, B., and Edwards, C. P. (1988). "A cross-cultural analysis of sex differences in the behavior of children aged 3 through 11," in *Childhood Socialization*, ed. G. Handel (London: Aldine de Gruyter), 281–297.

Wilson, D. S. (1975). A theory of group selection. *Proc. Nat. Acad. Sci.* 72, 143–146. doi: 10.1073/pnas.72.1.143

Xiao, S. X., Hashi, E. C., Korous, K. M., and Eisenberg, N. (2019). Gender differences across multiple types of prosocial behavior in adolescence: a meta-analysis of the prosocial tendency measure-revised (PTM-R). *J. Adoles.* 77, 41–58. doi: 10.1016/j.adolescence.2019.09.003

Yu, C. Y. (2002). *Evaluating Cutoff Criteria of Model Fit Indices for Latent Variable Models With Binary and Continuous Outcomes*. Los Angeles, CA: University of California, Los Angeles.

Zhao, C., White, R. M. B., and Roche, K. (2022). Familism values, family assistance, and prosocial behaviors among U.S. Latinx adolescents. *The J. Early Adoles.* 42, 914–936. doi: 10.1177/02724316221078831