

Childhood emotional but not physical or sexual maltreatment predicts prosocial behavior in late adolescence: A daily diary study

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ABSTRACT

Background: Childhood maltreatment (CM), including physical, emotional, and sexual maltreatment, is detrimental to adolescents' psychological and behavioral outcomes. However, most studies on the relationship between CM and prosocial behavior focused on the overall experience of CM. Since different forms of CM exert various influences on adolescents, it is essential to find out which form of CM has the strongest link with prosocial behavior and the underlying mechanism behind it to fully understand this relationship and design a specific intervention for promoting prosocial behavior.

Objective: Guided by internal working model theory and hopelessness theory, this study aimed to investigate the connections of multiple forms of CM with prosocial behavior, and explore the mediating mechanism of gratitude from the perspective of the broaden-and-build theory through a 14-day daily diary study.

Participants: A total of 240 Chinese late adolescents (217 females; $M_{age} = 19.02$, $SD_{age} = 1.83$) from a college volunteered for this study and completed questionnaires regarding CM, gratitude, and prosocial behavior.

Methods: A multilevel regression analysis was conducted to investigate which form of CM was correlated to prosocial behavior, and a multilevel mediation analysis was applied to examine the underlying mechanism (i.e., gratitude) behind this relationship.

Results: The results of the multilevel regression analysis showed that it was childhood emotional maltreatment, but not physical or sexual maltreatment that negatively predicted prosocial behavior. The results of the multilevel mediation analysis indicated that gratitude mediated the relationship between childhood emotional maltreatment and prosocial behavior.

Conclusions: Findings from the present study highlight the predictive effect of childhood emotional maltreatment on late adolescents' prosocial behavior and the mediating role of gratitude in this link.

1. Introduction

Prosocial behavior refers to the encompassing actions defined by the society that aid or benefit others, such as sharing, cooperating, helping, and caring (Eisenberg et al., 2006; Piliavin et al., 1981). As an adaptive behavior in social interactions (Declerck & Boone, 2016), prosocial behavior can not only yield benefits for the recipients, but also be widely linked to the better well-being of helpers

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(Weinstein & Ryan, 2010). For example, in the short term, the mood of helpers improves right after they help someone in need (Zhao & Epley, 2022). And in the long term, those who help others more often have better physical health (Brown & Brown, 2015) and mental health (Schwartz et al., 2003); they also have a higher level of happiness (Dunn et al., 2014) and life satisfaction (Caprara & Steca, 2005), and lower level of depression (Nantel-Vivier et al., 2014) and meaninglessness (Van Tongeren et al., 2016).

Effective transition from adolescence to adulthood during late adolescence is a basic component of a functional society (Gelinias et al., 2018), because late adolescence is a critical period when youth develop skills, attitudes, values, and social capital they need for a successful transition into adulthood (Zarrett & Eccles, 2006). Prosocial behavior, in particular, is the hallmark of social competence during adolescence (Wentzel et al., 2007), and plays a vital role in youth's well-being and positive development (Yang et al., 2017). It is a key aspect for late adolescents to successfully navigate and manage the transition to adulthood. In addition, prosocial behavior is still in development during late adolescence (Eisenberg et al., 1995), especially when adolescents develop personal and interpersonal attitudes in college (Flanagan et al., 1993). Therefore, exploring the influencing factors of prosocial behavior and methods to promote prosocial behavior among late adolescents is urgent.

Prosocial behavior usually emerges from an early age (Eisenberg et al., 1987; Martin & Olson, 2015; Svetlova et al., 2010), and children learn the actions of helping and sharing mainly through interactions with their parents (Deković & Janssens, 1992). Therefore, it is reasonable to consider that family aspects could be key influencing factors of prosocial behavior. Given that childhood maltreatment is the most common adverse experience that damages the relationship between children and their parents, affects children's psychological and behavioral functioning, and results in lifelong problems (Painter & Scannapieco, 2013), it is essential to investigate the relationship between childhood maltreatment and subsequent prosocial behavior among late adolescents.

1.1. Childhood maltreatment and prosocial behavior

Childhood maltreatment (CM), defined as the actions of commission or omission by caregivers that cause harm, potential harm, or threats of harm to a child intentionally or unintentionally (Gilbert et al., 2009), is a global phenomenon that requires urgent attention (Stoltenborgh et al., 2015). In the literature, CM can be conceptualized into three different forms (i.e., emotional, physical, and sexual form) (Gibb, Wheeler, et al., 2001). Childhood physical maltreatment (CPM) involves physical transgressions including abuse and neglect from caregivers, childhood sexual abuse (CSA) refers to sexual contact or conduct between children and their caregivers, and childhood emotional maltreatment (CEM) includes the acts like verbal hostility, taunting, rejection and emotional negligence to the child (Egeland, 2009; World Health Organization, 2006). Adverse experiences during childhood like maltreatment could damage children's developmental process (Chandler et al., 2021; Cohen & Thakur, 2021; Font & Berger, 2015) and have a negative impact on psychological and behavioral outcomes of adolescents and adults (Clark et al., 2014; Hyman et al., 2007; Skinner et al., 2016). Grounding on this background, the current study focused on the associations of multiple forms of CM with subsequent prosocial behavior among late adolescents.

The internal working model provides a proper perspective to understand the relationship between CM and prosocial behavior. According to the internal working model of attachment, the interaction between children and their caregivers will form an internal working pattern (Bowlby, 1977). Specifically, children with caregivers who were attentive, had their signals interpreted correctly, and reacted promptly would develop "secure" internal working models. While others with caregivers who were unconcerned, had their signals misread, and didn't respond developed "insecure" internal working models (Lamb, 1981). This emotionally based representation of self and others (Freedman & Gorman, 1993) would influence individuals' interpretation of others' behavior and plan of their own actions (Hewlett et al., 2000), guiding their attitudes and behaviors toward others from childhood to adolescence (Jones et al., 2018). By developing secure internal working models, adolescents would have more empathic engagement and interactive reciprocity with others, leading to more prosocial behaviors (Cui et al., 2002; Padilla-Walker et al., 2015; Sroufe et al., 1993; Zhao et al., 2020). However, the experience of CM would undermine the development of a secure internal working model (Riggs, 2010; Wright et al., 2009), and thus may negatively predict prosocial behavior among late adolescents (Allen et al., 2021; Yang et al., 2022; Yu et al., 2020).

To go further, the process of CM impairing the development of secure internal working models may be explained by the hopelessness theory (Rose & Abramson, 1992). When experiencing recurrent adverse events like maltreatment, the child would make hopeless attributions of self and others which would crystallize into a negative cognitive style over time (Gibb, 2002), resulting in an insecure internal working model (Bretherton, 1985). As CEM was defined as repeated non-physical expressions conveyed to children that made them feel they are flawed, unloved, unwanted, endangered, or of valued only in meeting another's needs (Hart et al., 2011). CEM, in particular, is more likely to cause a negative cognitive style and thus interfere with the development of a secure internal working model than either CPM or CSA because the depressive cognitions (e.g., "You are worthless") are directly conveyed to the child by abusive caregivers, while physical and sexual maltreatment events can be attributed to other causes (Rose & Abramson, 1992), especially in Chinese culture where the idea of "beating is caring" make physical maltreatment could even be attributed to love (Qiao & Chan, 2005). Therefore, the consequent insecure internal working model could help to explain the association between CEM and psychological outcomes among adolescents. Accordingly, a great deal of research has found that CEM was most strongly linked to both negative outcomes of adolescents like anxiety, depression, and aggression (Humphreys et al., 2020; Wright et al., 2009; Zurbriggen et al., 2010), and positive outcomes of adolescents like self-esteem, self-compassion and subjective well-being (Badr et al., 2018; Brodski & Hutz, 2012; Tanaka et al., 2011). Therefore, it is reasonable to presume that CEM is more likely to have a negative association with prosocial behavior among late adolescents.

Although the association of CM with prosocial behavior among late adolescents has been examined by recent studies (Allen et al., 2021; Yang et al., 2022; Yu et al., 2020), nearly all of them assessed prosocial behavior by subjective and retrospective assessments in

which participants were asked to appraise their tendencies of prosocial behavior and the scores depend on how prosocially they behaved during a long-time period. Because prosocial behavior is highly socially desirable (Platow, 1994), and individuals' remembered experiences hugely rely on the most intense and the final part of it (Fredrickson & Kahneman, 1993), this retrospective self-report measure may cause biases in the data due to social desirability and recall biases (Coughlin, 1990; Phillips & Clancy, 1972). In addition, most prior research utilized the average score of all three forms of CM, in which case the specific connection of different forms of maltreatment with prosocial behavior was confounded. To solve the problems above, the current study thus examined prosocial behavior through a daily diary method to capture everyday experience (i.e., helping behavior) of participants (Gunthert & Wenzel, 2012). Compared to traditional designs, not only can this approach decrease the influence of social desirability by asking participants to recall the events of helping in a neutral way rather than the willingness to help (Krumpal, 2013), but also reduce recall biases by minimizing the time gap between experiencing and recalling (Bolger et al., 2003). Therefore, this approach may obtain a more precise assessment of prosocial behavior over a period of time. What's more, the present study examined multiple forms of CM to find out whether there is a unique association of CEM, CPM, or CSA with prosocial behavior.

1.2. CM, gratitude and prosocial behavior

Gratitude is a moral emotion that is generated from perceiving the benefits of others' good intentions (McCullough et al., 2001; Tsang & Jo-Ann, 2006). From the perspective of the broaden and build theory (Fredrickson, 2004), gratitude, like other positive emotions, can broaden people's mindsets to enact indirect and long-term adaptive behaviors to build enduring personal resources. Thus, gratitude may widen people's thoughts and make them enact prosocial behaviors for perennial relationships. Previous research has demonstrated the relationship between gratitude and prosocial behavior. For instance, experimental evidence has shown that feelings of gratitude not only motivated helping behaviors toward benefactors (Tsang & Jo-Ann, 2006), but also drove people to help strangers even if such behaviors were costly (Bartlett & Desteno, 2006). In addition, longitudinal studies showed that the predictive effect of gratitude on prosocial behavior could last for months and years (Bono et al., 2019; Froh et al., 2010). Thus, the broaden and build theory and prior studies have supported the relationship between gratitude and prosocial behavior sufficiently.

However, maltreatment during childhood may negatively affect adolescents' gratitude (Kwok et al., 2019; Wu et al., 2018). Given that gratitude develops over the course of childhood (Freitas et al., 2012; Li, 2014; Vale, 2012) and needs time, experience, and encouragement offered by caregivers to be fully developed (Tudge et al., 2015), those late adolescents with unfit parents may have trouble developing gratitude and thus have low levels of trait gratitude growing up (Kwok et al., 2019). In addition, the experience of CM may result in negative interpretations of others' behavior by influencing the development of the internal working model (Carlson et al., 1989; Hewlett et al., 2000), which makes adolescents that suffered from CM less likely to feel grateful to others. Although a recent study has investigated the mediating role of gratitude in the relationship between CM and prosocial behavior among adolescents (Yu et al., 2020), they evaluated CM combining all types together and thus the unique effect of multiple forms of CM on gratitude and prosocial behavior remained unclear. Therefore, it is necessary to explore if gratitude acts as a mediator in the relationship between specific forms of CM and prosocial behavior using a daily recall method less subject to recall bias and social desirability than rating forms.

1.3. The present study

The current study aimed to explore the relationship between multiple forms of CM and prosocial behavior among late adolescents and examine the mediating role of gratitude. For one thing, we employed the daily diary approach to test the independent effects of three forms of CM on prosocial behavior. In light of the internal working model theory (Bowlby, 1977) and hopelessness theory (Rose & Abramson, 1992), along with the fact that CEM is more destructive because it hurts the child in a more direct way (Rose & Abramson, 1992). We hypothesized that CEM is the strongest negative predictor of prosocial behavior among late adolescents compared with CPM and SCM. For another thing, we launched a multilevel 2-1-1 mediation analysis to test the mediating role of gratitude between CEM and prosocial behavior. Based on the broaden and build theory (Fredrickson, 2004) and the destructive influence of CEM on gratitude (Kwok et al., 2019), we expected gratitude would act as a mediator that links CEM with prosocial behavior.

2. Methods

2.1. Participants and procedure

A total of 274 participants were recruited from the local university community in November 2021, and they volunteered to participate. They were informed to take surveys about "Well-being and Mental Health", and written informed consent was obtained before the assessment. At the start, they were requested to conduct a survey about childhood maltreatment using an online questionnaire platform (www.wjx.cn). Next, the daily diary data were collected online for 14 consecutive nights. We sent a link to the participants through Tencent QQ, an instant messenger, at about 6 pm every day. Participants needed to complete a questionnaire including daily gratitude and prosocial behavior before 24:00 that night. We removed 17 participants who didn't answer daily surveys, 14 participants who answered fewer than 10 days of daily surveys, and 3 participants who were older than 25 years old, resulting in a final sample of 240 participants (217 females, $M_{\text{age}} = 19.02$, $SD_{\text{age}} = 1.83$), and their age ranged from 16 to 25 years old. Some researchers defined late adolescence as youth from 16 to 20 years old (e.g., Forsman et al., 2008; Sourander et al., 2007); others defined it as youth from 18 to 25 years old (e.g., Borchet et al., 2015; Borovanska et al., 2011). As in our sample, there were 198 participants aged

from 16 to 20 and 210 participants aged from 18 to 25, it is reasonable to say most of our participants were late adolescents under either standard.

At the end of the study, 18 days' entries were missing due to incomplete responses. Therefore, a total of 3342 daily diary observations were obtained, which were distributed with a mean of 13.93 days per person (ranging from 10 to 14 days). We used Monte-Carlo simulations (1000 iterations) (Paxton et al., 2001) by Mplus (Muthén & Muthén, 2002) to check whether the sample size is sufficient to detect associations between CM and prosocial behavior in a multilevel analysis.

2.2. Measures

2.2.1. Within-person level variables

2.2.1.1. Prosocial behavior. Prosocial behavior was evaluated by Daily Helping Checklist developed by Armstrong-Carter et al. (2020). The items of this questionnaire were first translated into Chinese by six bilingual psychologists, and the Chinese version was then back-translated into English by another two bilingual psychologists in order to test for inaccuracies and ambiguities. Finally, the original version of the scale was compared with the back-translation. Where there were inconsistencies, all translators worked co-operatively to make corrections to the Chinese version. The checklist includes four yes or no questions. One item examines emotional assistance (i.e., listened, gave advice and comforted), and the other three items examine instrumental assistance (i.e., lent an item or money, helped with schoolwork and helped with chores). Participants were asked to indicate whether they did each kind of helping behavior to their roommates or friends on that day, since those are the most common targets of their help, and support for peers has the most rewards during adolescence (Fulgini, 2019). No (coded as 0) indicates they didn't do it, while yes (coded as 1) indicates they did it. The scores were summarized (ranging from 0 to 4) to represent the frequency of participants' daily prosocial behavior. The reliability was tested by the method developed by Geldhof et al. (2014) in which the residual variances of binary variables were calculated by the method recommended by Raykov et al. (2010). The Daily Helping Checklist showed excellent within-person reliability ($\omega = 0.85$) and between-person reliability ($\omega = 0.99$) in this study.

2.2.1.2. Gratitude. We applied the Gratitude Adjective Checklist (GAC, McCullough et al., 2002) to evaluate participants' daily experience of gratitude. The GAC was widely used in previous studies and has shown good reliability and validity (e.g., Zhang, Li, et al., 2022; Zhang, Zhu, et al., 2022). There are three items that asked participants to rate how grateful, thankful, and appreciative they felt on that day. Each item was rated on a 5-point Likert scale ranging from 1 = not at all to 5 = extremely. The scores of three items were summed up and averaged to create a measure of gratitude in the present study. The GAC has been adopted in many previous daily diary studies (e.g., LaBelle, 2020; Nezlek et al., 2017). In this study, omega reliability was 0.86 (within-person) and 0.97 (between-person).

2.2.2. Between-person level variables

2.2.2.1. Childhood maltreatment. We evaluated CM by the Chinese version of the Childhood Trauma Questionnaire-Short Form (CTQ-SF; Bernstein et al., 2003), which was translated and validated by Zhao et al. (2005). It assesses five subtypes of CM occur before age 16: sexual abuse, physical abuse, emotional abuse, physical neglect, and emotional neglect. Each item is rated on a 5-point Likert scale ranging from 1 = never true to 5 = very often true. The Chinese version of the CTQ-SF has shown good validity and reliability in previous studies (e.g., He et al., 2019; Li et al., 2023). In the present study, internal consistency reliability for each subtype of CM was acceptable: emotional abuse (Cronbach's $\alpha = 0.75$), emotional neglect (Cronbach's $\alpha = 0.87$), physical abuse (Cronbach's $\alpha = 0.84$), physical neglect (Cronbach's $\alpha = 0.65$) and sexual abuse (Cronbach's $\alpha = 0.90$). Scores of emotional abuse and emotional neglect were combined to create a measure of CEM, scores of physical abuse and physical neglect were combined to create a measure of CPM, and CSA was presented by the score of sexual abuse.

2.3. Data analysis

The data included between- and within-person level data, and the daily diary data (level 1, $N_1 = 3342$) was nested in participants (level 2, $N_2 = 240$). We used Mplus 8 to perform multilevel analyses (Muthén & Muthén, 2017). First, we employed descriptive and correlative analysis on all variables through a null model. Second, we conducted a multilevel regression analysis to examine if three types of CM could negatively predict prosocial behavior. Third, we launched a multilevel 2–1–1 mediation analysis following the guidance provided by Preacher et al. (2010) to examine the mediating role of gratitude in the link between CEM and prosocial behavior. In this model, the between-person level variable was grand-mean centered, and the intercept of gratitude and prosocial behavior variables was modeled as random. In addition, the effect size of CM and gratitude on prosocial behavior was estimated by Cohen's d (Cohen, 1988).

3. Results

3.1. Preliminary analysis

In the daily diary procedure, there were 8 participants who missed the survey for one day, 1 participant for two days, and 2

participants for four days. After filling in the 18 missing entries with “999”, we launched a full information maximum-likelihood (FIML) estimation which is the default function to deal with the missing data in Mplus. Next, we conducted power analysis by the Monte-Carlo approach (Paxton et al., 2001). By drawing random samples from a specified population, the proportion of the samples that have a significant effect size, which is the outcome of the Monte-Carlo simulation, represents the power to detect this effect size (Schoemann et al., 2014). The result of Monte-Carlo simulations (1000 iterations) showed that the sample of 240 individuals and an average of 13.93 daily assessments gave us 94.6 % power to detect even small effects ($r = 0.10$, $\alpha = 0.05$, two-tailed).

Of the 240 participants, 89.58 % reported having experienced emotional maltreatment, 61.67 % physical maltreatment, and 15.83 % sexual abuse. Most adolescents (90.42 %) indicated having experienced at least one type of childhood maltreatment. Among them, 25.83 % of the total sample indicated one form, 52.50 % two forms, and 12.08 % three forms. In addition, they exhibited medium to high levels of gratitude (average score = 3.47) and prosocial behavior (average score = 2.15).

The descriptive results and correlations among three types of CM, gratitude, and prosocial behavior are presented in Table 1. As predicted, gratitude and prosocial behavior were positively related to each other, and both negatively correlated with CEM. The intraclass correlation coefficients (ICC) shown in Table 1 refer to the ratio of between-person variance to the total variance, and it is used to determine whether there is greater variability within-person or between-person for variables. Specifically, the ICC of gratitude and prosocial behavior were 0.68 and 0.57, which indicated that the multilevel analysis could be conducted.

3.2. The relationship between CM and prosocial behavior: a multilevel regression analysis

To test whether CM has negative predictive effects on prosocial behavior, we performed a multilevel regression analysis with 3 types of CM as the predictors and prosocial behavior as the outcome. The results showed that only CEM had significant effects on prosocial behavior ($B = -0.47$, $p = .001$, $d = 0.45$), while the association of CPM ($B = 0.36$, $p = .16$, $d = 0.18$) and CSA ($B = 0.29$, $p = .17$, $d = 0.18$) with prosocial behavior were not significant. That is, people with a higher level of CEM exhibited a lower frequency of prosocial behavior, and such effect was not found in CPM or CSA.

3.3. The multilevel mediation analysis

To test the effect of the mediator on the link between CEM and prosocial behavior, we performed the Multilevel Structural Equation Modeling (MSEM) analysis with CEM as the independent variable, gratitude as the mediator, and prosocial behavior as the dependent variable. As we expected, the results showed that CEM negatively predicted gratitude ($B = -0.30$, $p < .001$, 95 % CI = [-0.46, -0.13], $d = 0.46$). That is, adolescents who reported more experience of CEM tended to have less experience of gratitude. In addition, gratitude had a positive association with prosocial behavior ($B = 0.50$, $p < .001$, 95 % CI = [0.35, 0.66], $d = 0.83$), which indicated those adolescents who feel more grateful may enact more prosocial behavior.

Importantly, the results of MSEM showed that the relationship between CEM and prosocial behavior ($B = -0.11$, $p = .26$, $d = 0.15$) was no longer statistically significant when the mediator was included in the model (see Fig. 1). In addition, gratitude mediated the relationship between CEM and prosocial behavior ($B = -0.15$, $p = .002$, 95 % CI = [-0.24, -0.06], $d = 0.40$). The proportion mediated which is the ratio of indirect to total effects was used to evaluate the effect size of mediation. In the current mediation model, the proportion mediated was 59.76 %.

4. Discussion

As a worldwide concern, CM has pernicious effects on children through the development and has significant adverse influences on the victims' whole life (Bernstein et al., 1998; Rikhye et al., 2008; Stoltenborgh et al., 2015; Teicher et al., 2016). Previous studies have not only investigated its role in personal negative outcomes (Nanni et al., 2012; Teicher & Samson, 2013; Wright et al., 2009), but also have raised attention to its adverse effects on personal positive functioning such as psychological well-being (Herrenkohl et al., 2012), gratitude (Wu et al., 2018) as well as prosocial behavior (Yu et al., 2020). However, prior studies on CM and prosocial behavior in

Table 1
Descriptive results and correlations for all study variables.

Variables	M	SDB	SDw	ICC	1	2	3	4	5	6	7
1. Gender	-	-	-	-	1						
2. Age	19.02	1.83	-	-	0.01	1					
3. CEM	1.64	0.62	-	-	0.07	0.18**	1				
4. CPM	1.25	0.36	-	-	-0.01	0.19**	0.73***	1			
5. CSA	1.12	0.39	-	-	-0.07**	0.13	0.33***	0.43**	1		
6. Gatitude	3.47	0.91	0.52	0.68	-0.04	-0.07	-0.25***	-0.12	0.02	1	
7. Prosocial behavior	2.15	1.27	0.83	0.57	0.03	-0.08	-0.17*	-0.04	-0.08	0.42***	1

Note. CEM, childhood emotional maltreatment; CPM, childhood physical maltreatment; CSA, childhood sexual abuse; SDB and SDw reflect between-person and within-person level standard deviations, respectively; ICC represents intraclass correlation.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

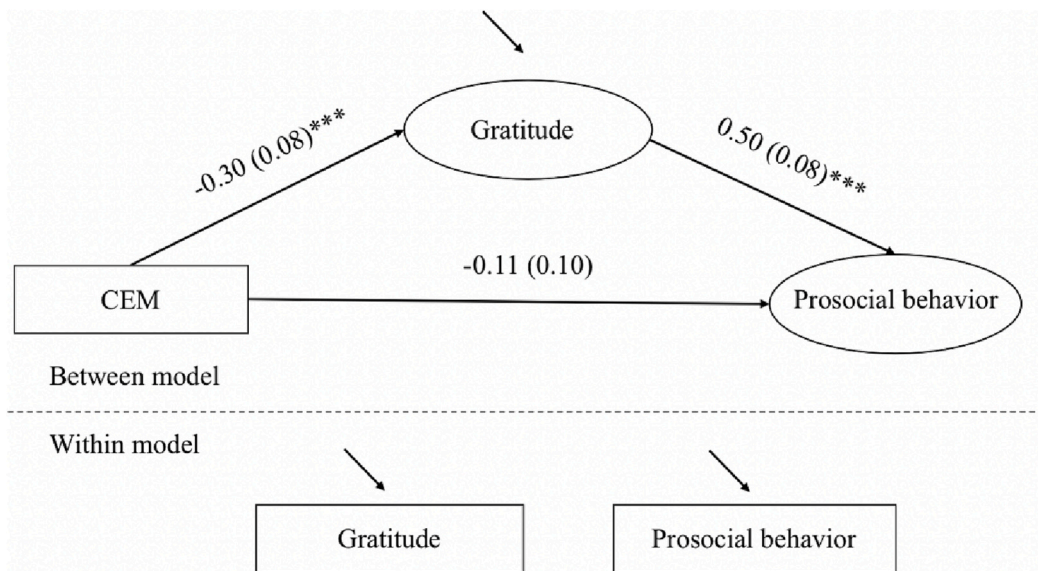


Fig. 1. The multilevel 2-1-1 model with CEM as the independent variable, gratitude as the mediator and prosocial behavior as the dependent variables ($N = 240$). Note. The unstandardized multilevel regression coefficients are displayed. *** $p < .001$.

adolescence have exclusively focused on the combination of all forms of CM and used the traditional way of evaluating prosocial behavior (Liu et al., 2022; Yu et al., 2020). In consequence, the specific effects of different forms of CM on prosocial behavior remain unknown, and the traditional self-report approach has disadvantages compared to the daily diary method taking the high social desirability of prosocial behavior and recall bias into account.

To address these problems, the present study resolves this contamination of forms of CM by verifying the unique effect of different kinds of maltreatment on prosocial behavior and found a specific association of CEM with prosocial behavior rather than CPM and CSA. What's more, based on the theory of internal working model, hopelessness theory, and broaden and build theory, we further formulated the mediation model with CEM as the independent variable, gratitude as the mediator, and prosocial behavior as the dependent variable. As expected, gratitude mediated the association of CEM with prosocial behavior. Findings of this study support the distinctions of multiple forms of CM and provide us with a better understanding of the association of CM with prosocial behavior.

4.1. Multiple forms of CM and prosocial behavior

Considering that different forms of CM have various influences on personal development (Egeland et al., 1983), we examined the predictive effects of all three forms of maltreatment on prosocial behavior among late adolescents. Consistent with hypothesis 1, the results suggested that CEM negatively predicted prosocial behavior independently, whereas neither CPM nor CSA had a significant association with prosocial behavior. In line with this finding, previous research has found that CEM is independently related to depression (Gibb, Alloy, et al., 2001), distress (Wright et al., 2009), and psychopathology (Iffland et al., 2012) among adolescents and adults. As prior studies have exclusively focused on the negative outcomes of CM, the present research enriches the literatures regarding CM and positive behavior and is the first to demonstrate the predictive effects of all three forms of maltreatment on prosocial behavior in late adolescence.

The reason for this pattern may be explained by the theory of internal working model (Bowlby, 1977) and hopelessness theory (Rose & Abramson, 1992). Experiences of CEM including emotional abuse and emotional neglect may plant destructive beliefs into the child about self and others (Glaser, 2002), which poses a serious challenge to the formation and maintenance of secure attachments and result in higher risks of negative internal working models (Riggs, 2010). This maladaptive cognitive schema about self and negative interpersonal expectations about others make people more likely to possess self-focused goals and thus less likely to enact helping behaviors (Mikulincer & Shaver, 2007). CEM is more likely to cause an insecure internal working model than either CPM or CSA because the destructive beliefs are directly conveyed to the child by the abusive caregiver. While the events of physical and sexual maltreatment could be attributed to other causes (Rose & Abramson, 1992). In summary, those with CEM experiences are more likely to develop a maladaptive internal working model (Hankin, 2005) and thus demonstrate less prosocial behavior. Findings of the current study are in line with prior work on internal models that demonstrated the specific effects of CEM (Glaser, 2002; Hankin, 2005; Riggs, 2010).

4.2. CEM, gratitude and prosocial behavior

In line with hypothesis 2, the results suggested that gratitude was a mediator in the association of CEM with prosocial behavior

among late adolescents.

For the relationship between CEM and gratitude, our finding is in accordance with the previous studies which found CM undermines the development of gratitude (Wu et al., 2018; Xiang et al., 2021). On the one hand, the attribute of gratitude is developed during childhood through positive interactions between parents and the child (Graham & Weiner, 1986), which needs time, experience, and encouragement offered by caregivers to be fully developed (Tudge et al., 2015). Those children whose parents were neglectful to their emotional needs would be more likely to have trouble developing gratitude. On the other hand, having been planted with negative beliefs about the self and others during CEM, the child who experienced emotional abuse or neglect would have trouble forming secure attachments and have higher risks of developing an insecure internal working model (Wright et al., 2009). Subsequently, the child would have negative mental representations and beliefs about others' intentions, and thus be less likely to feel grateful for others (Bowlby, 1973; Mikulincer et al., 2006).

As to the relationship between gratitude and prosocial behavior, our findings indicated that individuals feeling less gratitude are less likely to engage in prosocial behavior. According to the broaden and build theory (Fredrickson, 2004), gratitude can widen people's thoughts to build enduring social resources and thus raise the likelihood of engaging in prosocial behavior. Accordingly, much research has demonstrated gratitude's positive association with prosocial behavior. In summary, the current study provides the initial evidence that CEM may undermine the development of gratitude, which further leads to a decrease in prosocial behavior in late adolescence.

4.3. Limitations and future directions

First, although the retrospective self-report measure of CM has received extensive validation in prior studies like corroboration with external evidence (Bernstein et al., 1997; Bernstein et al., 2003; Thombs et al., 2009), it is still possible that participants either over- or under-reported the events or misunderstand the questions (Cohen et al., 2014). Thus, the combination of informant and self-report measures would obtain a more accurate evaluation of CM (Stoltenborgh et al., 2015). Second, participants in the current study are from Chinese culture. However, both CM and prosocial behavior are hugely influenced by cultural differences. For example, cultural differences in child-rearing practices may cause different understanding of CM (Zhang et al., 2013), and individuals from different cultures exhibit different frequencies of prosocial behavior even during childhood (Trommsdorff et al., 2007). Therefore, it is necessary for future studies to examine this relationship from a cross-cultural perspective. Third, the measure we used to evaluate daily prosocial behavior only focused on behavior toward friends and roommates. Although these are the targets that Chinese college students help most in everyday life, there are other characters (e.g., families, faculties, and strangers) who may be helped by them. Thus, future studies would benefit by examining the relationships between CM and prosocial behavior toward different targets.

4.4. Implications

Despite these limitations, the current study has significant implications both theoretically and practically.

From a theoretical perspective, through a daily diary study, we found that CEM had negative predictive effects on prosocial behavior rather than CPM and CSA. Further, the mediating effect of gratitude in this relationship was examined. Findings of this study shed lights on the differences between multiple forms of CM, and the mechanism of CEM predicting prosocial behavior.

From a practical perspective, on the one hand, given that CEM is the most prevalent form of CM and has independent predictive effects on prosocial behavior, caregivers should not only avoid physical transgressions on children, but also increase emotional care for them to make them more grateful and enact more prosocial behavior in late adolescence. On the other hand, considering the result that gratitude fully mediated the association of CEM with prosocial behavior, psychological interventions should be focused on improving individuals' gratitude (e.g., the 'three good things in life' exercise, Seligman et al., 2005) so as to encourage prosocial actions among late adolescents with a history of CEM.

5. Conclusion

To sum up, using a sample of Chinese participants, the current study examined the relationships between multiple forms of CM and prosocial behavior. The results showed that CEM, but not CSA or CPM negatively predicted prosocial behavior, and gratitude mediated this relation. Findings of this study enrich the literature by verifying which type of CM has predictive effects on prosocial behavior and the underlying mechanism, which contribute to knowledge popularization about CEM and intervention on gratitude to encourage individuals' prosocial behavior.

Informed consent

Written informed consents were gained in advance from all participants included in the study.

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Declaration of competing interest

The authors declare that there are no potential conflicts of interest or financial conflicts related to the research, authorship, and/or publication of this article.

Data availability

Data will be made available on request.

References

- Allen, E. K., Desir, M. P., & Shenk, C. E. (2021). Child maltreatment and adolescent externalizing behavior: Examining the indirect and cross-lagged pathways of prosocial peer activities. *Child Abuse & Neglect*, *111*, Article 104796. <https://doi.org/10.1016/j.chiabu.2020.104796>
- Armstrong-Carter, E., Guassi Moreira, J. F., Ivory, S. L., & Telzer, E. H. (2020). Daily links between helping behaviors and emotional well-being during late adolescence. *Journal of Research on Adolescence*, *30*(4), 943–955. <https://doi.org/10.1111/jora.12572>
- Badr, H. E., Naser, J., Al-Zaabi, A., Al-Saeedi, A., Al-Muneifi, K., Al-Houli, S., & Al-Rashidi, D. (2018). Childhood maltreatment: A predictor of mental health problems among adolescents and young adults. *Child Abuse & Neglect*, *80*, 161–171. <https://doi.org/10.1016/j.chiabu.2018.03.011>
- Bartlett, M. Y., & Desteno, D. (2006). Gratitude and prosocial behavior: Helping when it costs you. *Psychological Science*, *17*(4), 319. <https://doi.org/10.1111/j.1467-9280.2006.01705.x>
- Bernstein, D. P., Ahluvalia, T., Pogge, D., & Handelsman, L. (1997). Validity of the childhood trauma questionnaire in an adolescent psychiatric population. *Journal of the American Academy of Child & Adolescent Psychiatry*, *36*(3), 340–348. <https://doi.org/10.1097/00004583-199703000-00012>
- Bernstein, D. P., Stein, J. A., & Handelsman, L. (1998). Predicting personality pathology among adult patients with substance use disorders. *Addictive Behaviors*, *23*(6), 855–868. [https://doi.org/10.1016/S0306-4603\(98\)00072-0](https://doi.org/10.1016/S0306-4603(98)00072-0)
- Bernstein, D. P., Stein, J. A., Newcomb, M. D., Walker, E., Pogge, D., Ahluvalia, T., Stokes, J., Handelsman, L., Medrano, M., Desmond, D., & Zule, W. (2003). Development and validation of a brief screening version of the childhood trauma questionnaire. *Child Abuse & Neglect*, *27*(2), 169–190. [https://doi.org/10.1016/S0145-2134\(02\)00541-0](https://doi.org/10.1016/S0145-2134(02)00541-0)
- Bolger, N., Davis, A., & Rafaeli, E. (2003). Diary methods: Capturing life as it is lived. *Annual Review of Psychology*, *54*(1), 579–616. <https://doi.org/10.1146/annurev.psych.54.101601.145030>
- Bono, G., Froh, J. J., Disabato, D., Blalock, D., McKnight, P., & Bausert, S. (2019). Gratitude's role in adolescent antisocial and prosocial behavior: A 4-year longitudinal investigation. *The Journal of Positive Psychology*, *14*(2), 230–243. <https://doi.org/10.1080/17439760.2017.1402078>
- Borchet, J., Lewandowska-Walter, A., & Rostowska, T. (2015). Parentification in late adolescence and selected features of the family system. *Health Psychology Report*, *4*(2), 116–127. <https://doi.org/10.5114/hpr.2016.55921>
- Borovanska, M., Jankovska, M., & Tyrlik, M. (2011). Commitment to conventional norms and self-concept in late adolescence and early adulthood. In *6th international conference on child and adolescent psychopathology (11–12 July 2011)*. London: Roehampton University.
- Bowlby, J. (1973). *Attachment and loss (Vol. 2). Separation: Anxiety and anger*. Basic Books.
- Bowlby, J. (1977). The making and breaking of affectional bonds: II. Some principles of psychotherapy: The fiftieth Maudsley lecture (expanded version). *British Journal of Psychiatry*, *130*(5), 421–431. <https://doi.org/10.1192/bjp.130.5.421>
- Bretherton, I. (1985). Attachment theory: Retrospect and prospect. In I. Bretherton, & E. Waters (Eds.), *Growing points in attachment theory and research. Monograph for the society for research in child development* (pp. 3–35). University of Chicago Press.
- Brodski, S. K., & Hutz, C. S. (2012). The repercussions of emotional abuse and parenting styles on self-esteem, subjective well-being: A retrospective study with university students in Brazil. *Journal of Aggression, Maltreatment & Trauma*, *21*(3), 256–276. <https://doi.org/10.1080/10926771.2012.666335>
- Brown, S. L., & Brown, R. M. (2015). Connecting prosocial behavior to improved physical health: Contributions from the neurobiology of parenting. *Neuroscience & Biobehavioral Reviews*, *55*, 1–17. <https://doi.org/10.1016/j.neubiorev.2015.04.004>
- Caprara, G. V., & Steca, P. (2005). Self-efficacy beliefs as determinants of prosocial behavior conducive to life satisfaction across ages. *Journal of Social and Clinical Psychology*, *24*(2), 191–217. <https://doi.org/10.1521/jscp.24.2.191.62271>
- Carlson, V., Cicchetti, D., Barnett, D., & Braunwald, K. (1989). Disorganized/disoriented attachment relationships in maltreated infants. *Developmental Psychology*, *25*(4), 525–531. <https://doi.org/10.1037/0012-1649.25.4.525>
- Chandler, C. E., Shanahan, M. E., & Halpern, C. T. (2021). The association between early reports to child protective services and developmental trajectories through middle childhood. *Child Abuse & Neglect*, *122*, Article 105303. <https://doi.org/10.1016/j.chiabu.2021.105303>
- Clark, C. J., Spencer, R. A., Everson-Rose, S. A., Brady, S. S., Mason, S. M., Connett, J. E., Henderson, K. M., To, M., & Suglia, S. F. (2014). Dating violence, childhood maltreatment, and BMI from adolescence to young adulthood. *Pediatrics*, *134*(4), 678–685. <https://doi.org/10.1542/peds.2014-1179>
- Cohen, J. (1988). Statistical power analysis for the behavioral sciences. *Routledge*. <https://doi.org/10.4324/9780203771587>
- Cohen, J. R., & Thakur, H. (2021). Developmental consequences of emotional abuse and neglect in vulnerable adolescents: A multi-informant, multi-wave study. *Child Abuse & Neglect*, *111*, Article 104811. <https://doi.org/10.1016/j.chiabu.2020.104811>
- Cohen, L. J., Tanis, T., Bhattacharjee, R., Nesci, C., Halmi, W., & Galyner, I. (2014). Are there differential relationships between different types of childhood maltreatment and different types of adult personality pathology? *Psychiatry Research*, *215*(1), 192–201. <https://doi.org/10.1016/j.psychres.2013.10.036>
- Coughlin, S. S. (1990). Recall bias in epidemiologic studies. *Journal of Clinical Epidemiology*, *43*(1), 87–91. [https://doi.org/10.1016/0895-4356\(90\)90060-3](https://doi.org/10.1016/0895-4356(90)90060-3)
- Cui, M., Conger, R. D., Bryant, C. M., & Elder, G. H. (2002). Parental behavior and the quality of adolescent friendships: A social-contextual perspective. *Journal of Marriage and Family*, *64*(3), 676–689. <https://doi.org/10.1111/j.1741-3737.2002.00676.x>
- Declerck, C., & Boone, C. (2016). *Neuroeconomics of prosocial behavior: The compassionate egoist*. Academic Press.
- Deković, M., & Janssens, J. M. (1992). Parents' child-rearing style and child's sociometric status. *Developmental Psychology*, *28*(5), 925–932. <https://doi.org/10.1037/0012-1649.28.5.925>
- Dunn, E. W., Aknin, L. B., & Norton, M. I. (2014). Prosocial spending and happiness: Using money to benefit others pays off. *Current Directions in Psychological Science*, *23*(1), 41–47. <https://doi.org/10.1177/0963721413512503>
- Egeland, B. (2009). Taking stock: Childhood emotional maltreatment and developmental psychopathology. *Child Abuse & Neglect*, *33*(1), 22–26. <https://doi.org/10.1016/j.chiabu.2008.12.004>
- Egeland, B., Sroufe, L. A., & Erickson, M. (1983). The developmental consequence of different patterns of maltreatment. *Child Abuse & Neglect*, *7*(4), 459–469. [https://doi.org/10.1016/0145-2134\(83\)90053-4](https://doi.org/10.1016/0145-2134(83)90053-4)
- Eisenberg, N., Carlo, G., Murphy, B., & van Court, P. (1995). Prosocial development in late adolescence: A longitudinal study. *Child Development*, *66*(4), 1179. <https://doi.org/10.2307/1131806>
- Eisenberg, N., Fabes, R. A., & Spinrad, T. L. (2006). Prosocial development. In N. Eisenberg, W. Damon, & R. M. Lerner (Eds.), *Handbook of child psychology: Social, emotional, and personality development* (pp. 646–718). John Wiley & Sons Inc.
- Eisenberg, N., Shell, R., Pasternack, J., Lennon, R., amp, et al. (1987). Prosocial development in middle childhood: A longitudinal study. *Developmental Psychology*, *23*(5), 712–718. <https://doi.org/10.1037/0012-1649.23.5.712>
- Flanagan, C., Schulenberg, J., & Fuligni, A. (1993). Residential setting and parent-adolescent relationships during the college years. *Journal of Youth and Adolescence*, *22*(2), 171–189. <https://doi.org/10.1007/BF01536651>

- Font, S. A., & Berger, L. M. (2015). Child maltreatment and children's developmental trajectories in early to middle childhood. *Child Development, 86*(2), 536–556. <https://doi.org/10.1111/cdev.12322>
- Forsman, M., Lichtenstein, P., Andershed, H., & Larsson, H. (2008). Genetic effects explain the stability of psychopathic personality from mid- to late adolescence. *Journal of Abnormal Psychology, 117*(3), 606–617. <https://doi.org/10.1037/0021-843X.117.3.606>
- Fredrickson, B. L. (2004). Gratitude, like other positive emotions, broadens and builds. In *The psychology of gratitude*. Oxford University Press.
- Fredrickson, B. L., & Kahneman, D. (1993). Duration neglect in retrospective evaluations of affective episodes. *Journal of Personality and Social Psychology, 65*(1), 45–55. <https://doi.org/10.1037/0022-3514.65.1.45>
- Freedman, D. G., & Gorman, J. (1993). Attachment and the transmission of culture—An evolutionary perspective. *Journal of Social and Evolutionary Systems, 16*(3), 297–329. [https://doi.org/10.1016/1061-7361\(93\)90037-R](https://doi.org/10.1016/1061-7361(93)90037-R)
- Freitas, L. B. d. L., O'Brien, M., Nelson, J. A., & Marcovitch, S. (2012). A compreensão da gratidão e teoria da mente em crianças de 5 anos. *Psicologia: Reflexão e Crítica, 25*(2), 330–338. <https://doi.org/10.1590/S0102-79722012000200015>
- Froh, J. J., Bono, G., & Emmons, R. (2010). Being grateful is beyond good manners: Gratitude and motivation to contribute to society among early adolescents. *Motivation and Emotion, 34*(2), 144–157. <https://doi.org/10.1007/s11031-010-9163-z>
- Fulgini, A. J. (2019). The need to contribute during adolescence. *Perspectives on Psychological Science, 14*(3), 331–343. <https://doi.org/10.1177/1745691618805437>
- Geldhof, G. J., Preacher, K. J., & Zyphur, M. J. (2014). Reliability estimation in a multilevel confirmatory factor analysis framework. *Psychological Methods, 19*(1), 72–91. <https://doi.org/10.1037/a0032138>
- Gelinas, J. N., Baillet, S., Bertrand, O., Galván, A., Kolling, T., Lachaux, J.-P., Lindenberger, U., Ribary, U., Sawa, A., & Uhlhaas, P. J. (2018). Late adolescence: Critical transitions into adulthood. In A. A. Benasich, & U. Ribary (Eds.), *Emergent brain dynamics: Prebirth to adolescence*. The MIT Press. <https://doi.org/10.7551/mitpress/11957.001.0001>
- Gibb, B. E. (2002). Childhood maltreatment and negative cognitive styles. *Clinical Psychology Review, 22*(2), 223–246. [https://doi.org/10.1016/S0272-7358\(01\)00088-5](https://doi.org/10.1016/S0272-7358(01)00088-5)
- Gibb, B. E., Alloy, L. B., Abramson, L. Y., Rose, D. T., Whitehouse, W. G., Donovan, P., Hogan, M. E., Cronholm, J., & Tierney, S. (2001). History of childhood maltreatment, negative cognitive styles, and episodes of depression in adulthood. *Cognitive Therapy and Research, 25*(4), 425–446. <https://doi.org/10.1023/A:1005586519986>
- Gibb, B. E., Wheeler, R., Alloy, L. B., & Abramson, L. Y. (2001). Emotional, physical, and sexual maltreatment in childhood versus adolescence and personality dysfunction in young adulthood. *Journal of Personality Disorders, 15*(6), 505–511. <https://doi.org/10.1521/pedi.15.6.505.19194>
- Gilbert, R., Widom, C. S., Browne, K., Fergusson, D., Webb, E., & Janson, S. (2009). Burden and consequences of child maltreatment in high-income countries. *The Lancet, 373*(9657), 68–81. [https://doi.org/10.1016/S0140-6736\(08\)61706-7](https://doi.org/10.1016/S0140-6736(08)61706-7)
- Glaser, D. (2002). Emotional abuse and neglect (psychological maltreatment): A conceptual framework. *Child Abuse & Neglect, 26*(6–7), 697–714. [https://doi.org/10.1016/S0145-2134\(02\)00342-3](https://doi.org/10.1016/S0145-2134(02)00342-3)
- Graham, S., & Weiner, B. (1986). From an attributional theory of emotion to developmental psychology: A round-trip ticket? *Social Cognition, 4*(2), 152–179. <https://doi.org/10.1521/soco.1986.4.2.152>
- Gunther, K. C., & Wenzel, S. J. (2012). Daily diary methods. In M. R. Mehl, & T. S. Conner (Eds.), *Handbook of Research Methods for Studying Daily Life* (pp. 144–159). The Guilford Press.
- Hankin, B. L. (2005). Childhood maltreatment and psychopathology: Prospective tests of attachment, cognitive vulnerability, and stress as mediating processes. *Cognitive Therapy and Research, 29*(6), 645–671. <https://doi.org/10.1007/s10608-005-9631-z>
- Hart, S. N., Brassard, M., Davidson, H. A., Rivelis, E., Diaz, V., & Binggeli, N. J. (2011). Psychological maltreatment. In J. E. B. Myers (Ed.), *The American Professional Society on the Abuse of Children (APSAC) handbook on child maltreatment* (3rd ed.), pp. 125–144. Sage.
- He, J., Zhong, X., Gao, Y., Xiong, G., & Yao, S. (2019). Psychometric properties of the chinese version of the childhood trauma questionnaire-short form (CTQ-SF) among undergraduates and depressive patients. *Child Abuse & Neglect, 91*, 102–108. <https://doi.org/10.1016/j.chiabu.2019.03.009>
- Herrenkohl, T. I., Klika, J. B., Herrenkohl, R. C., Russo, M. J., & Dee, T. (2012). A prospective investigation of the relationship between child maltreatment and indicators of adult psychological well-being. *Violence and Victims, 27*(5), 764–776. <https://doi.org/10.1891/0886-6708.27.5.764>
- Hewlett, B. S., Lamb, M. E., Leyendecker, B., & Schömlerich, A. (2000). Internal working models, trust, and sharing among foragers. *Current Anthropology, 41*(2), 287–297. <https://doi.org/10.1086/300135>
- Humphreys, K. L., LeMoult, J., Wear, J. G., Piersiak, H. A., Lee, A., & Gotlib, I. H. (2020). Child maltreatment and depression: A meta-analysis of studies using the childhood trauma questionnaire. *Child Abuse & Neglect, 102*, Article 104361. <https://doi.org/10.1016/j.chiabu.2020.104361>
- Hyman, S. M., Paliwal, P., & Sinha, R. (2007). Childhood maltreatment, perceived stress, and stress-related coping in recently abstinent cocaine dependent adults. *Psychology of Addictive Behaviors, 21*(2), 233–238. <https://doi.org/10.1037/0893-164X.21.2.233>
- Iffland, B., Sansen, L. M., Catani, C., & Neuner, F. (2012). Emotional but not physical maltreatment is independently related to psychopathology in subjects with various degrees of social anxiety: A web-based internet survey. *BMC Psychiatry, 12*(1), 49. <https://doi.org/10.1186/1471-244X-12-49>
- Jones, J. D., Fraley, R. C., Ehrlich, K. B., Stern, J. A., Lejuez, C. W., Shaver, P. R., & Cassidy, J. (2018). Stability of attachment style in adolescence: An empirical test of alternative developmental processes. *Child Development, 89*(3), 871–880. <https://doi.org/10.1111/cdev.12775>
- Krumpal, I. (2013). Determinants of social desirability bias in sensitive surveys: A literature review. *Quality & Quantity, 47*(4), 2025–2047. <https://doi.org/10.1007/s11335-011-9640-9>
- Kwok, S. Y. C. L., Gu, M., & Cheung, A. (2019). A longitudinal study on the relationship among childhood emotional abuse, gratitude, and suicidal ideation of chinese adolescents. *Child Abuse & Neglect, 94*, Article 104031. <https://doi.org/10.1016/j.chiabu.2019.104031>
- LaBelle, O. P. (2020). Daily associations between helping behavior, gratitude, and selfishness in members of alcoholics anonymous. *Alcoholism Treatment Quarterly, 38*(4), 470–483. <https://doi.org/10.1080/07347324.2020.1768992>
- Lamb, M. E. (1981). The development of social expectations in the first year of life. In M. E. Lamb, & L. R. Sherrod (Eds.), *Infant social cognition* (pp. 155–175). Li, S. (2014). How to make a grateful child? Reflection on gratitude campaigns in China in recent years. *SAGE Open, 4*(4). <https://doi.org/10.1177/2158244014559017>, 215824401455901.
- Li, C., Zhu, N., Zhang, L., Li, W., & Kong, F. (2023). The relation between childhood maltreatment and hedonic and eudaimonic well-being in emerging adults: A daily diary study. *Child Abuse & Neglect, 138*, Article 106057.
- Liu, J., Li, B., Xu, M., Luo, J., & Li, X. (2022). Effects of childhood maltreatment on prosocial behaviors among chinese emerging adults: A mediated moderation model of psychological suzhi and gratitude. *Children and Youth Services Review, 132*, Article 106334. <https://doi.org/10.1016/j.chilyouth.2021.106334>
- Martin, A., & Olson, K. R. (2015). Beyond good and evil: What motivations underlie children's prosocial behavior? *Perspectives on Psychological Science, 10*(2), 159–175. <https://doi.org/10.1177/1745691615568998>
- McCullough, M. E., Emmons, R. A., & Tsang, J.-A. (2002). The grateful disposition: A conceptual and empirical topography. *Journal of Personality and Social Psychology, 82*(1), 112–127. <https://doi.org/10.1037/0022-3514.82.1.112>
- McCullough, M. E., Kilpatrick, S. D., Emmons, R. A., & Larson, D. B. (2001). Is gratitude a moral affect? *Psychological Bulletin, 127*(2), 249–266. <https://doi.org/10.1037/0033-2909.127.2.249>
- Mikulincer, M., & Shaver, P. R. (2007). Boosting attachment security to promote mental health, prosocial values, and inter-group tolerance. *Psychological Inquiry, 18*(3), 139–156. <https://doi.org/10.1080/10478400701512646>
- Mikulincer, M., Shaver, P. R., & Slav, K. (2006). Attachment, mental representations of others, and gratitude and forgiveness in romantic relationships. In M. Mikulincer, & G. S. Goodman (Eds.), *Dynamics of romantic love: Attachment, caregiving, and sex* (pp. 190–215). The Guilford Press.
- Muthén, L. K., & Muthén, B. O. (2002). How to use a Monte Carlo study to decide on sample size and determine power. *Structural Equation Modeling: A Multidisciplinary Journal, 9*(4), 599–620. https://doi.org/10.1207/S15328007SEM0904_8
- Muthén, L. K., & Muthén, B. O. (2017). *Mplus user's guide* (8th ed.). Muthén & Muthén.

- Nanni, V., Uher, R., & Danese, A. (2012). Childhood maltreatment predicts unfavorable course of illness and treatment outcome in depression: A meta-analysis. *American Journal of Psychiatry*, 169(2), 141–151. <https://doi.org/10.1176/appi.ajp.2011.11020335>
- Nantel-Vivier, A., Pihl, R. O., Côté, S., & Tremblay, R. E. (2014). Developmental association of prosocial behaviour with aggression, anxiety and depression from infancy to preadolescence. *Journal of Child Psychology and Psychiatry*, 55(10), 1135–1144. <https://doi.org/10.1111/jcpp.12235>
- Nezlek, J. B., Newman, D. B., & Thrash, T. M. (2017). A daily diary study of relationships between feelings of gratitude and well-being. *The Journal of Positive Psychology*, 12(4), 323–332. <https://doi.org/10.1080/17439760.2016.1198923>
- Padilla-Walker, L. M., Dyer, W. J., Yorgason, J. B., Fraser, A. M., & Coyne, S. M. (2015). Adolescents' prosocial behavior toward family, friends, and strangers: A person-centered approach. *Journal of Research on Adolescence*, 25(1), 135–150. <https://doi.org/10.1111/jora.12102>
- Painter, K., & Scannapieco, M. (2013). Child maltreatment: The neurobiological aspects of posttraumatic stress disorder. *Journal of Evidence-Based Social Work*, 10(4), 276–284. <https://doi.org/10.1080/10911359.2011.566468>
- Paxton, P., Curran, P. J., Bollen, K. A., Kirby, J., & Chen, F. (2001). Monte Carlo experiments: Design and implementation. *Structural Equation Modeling: A Multidisciplinary Journal*, 8(2), 287–312. https://doi.org/10.1207/S15328007SEM0802_7
- Phillips, D. L., & Clancy, K. J. (1972). Some effects of "social desirability" in survey studies. *American Journal of Sociology*, 77(5), 921–940. <https://doi.org/10.1086/225231>
- Piliavin, J. A., Dovidio, J. F., Gaertner, S. L., & Clark, R. D. (1981). *Emergency intervention* ((3rd ed.). Academic Press.
- Platow, M. J. (1994). An evaluation of the social desirability of prosocial self—Other allocation choices. *The Journal of Social Psychology*, 134(1), 61–68. <https://doi.org/10.1080/00224545.1994.9710884>
- Preacher, K. J., Zyphur, M. J., & Zhang, Z. (2010). A general multilevel SEM framework for assessing multilevel mediation. *Psychological Methods*, 15(3), 209–233. <https://doi.org/10.1037/a0020141>
- Qiao, D. P., & Chan, Y. C. (2005). Child abuse in China: A yet-to-be-acknowledged "social problem" in the Chinese Mainland. *Child & Family Social Work*, 10(1), 21–27. <https://doi.org/10.1111/j.1365-2206.2005.00347.x>
- Raykov, T., Dimitrov, D. M., & Asparouhov, T. (2010). Evaluation of scale reliability with binary measures using latent variable modeling. *Structural Equation Modeling: A Multidisciplinary Journal*, 17(2), 265–279. <https://doi.org/10.1080/10705511003659417>
- Riggs, S. A. (2010). Childhood emotional abuse and the attachment system across the life cycle: What theory and research tell us. *Journal of Aggression, Maltreatment & Trauma*, 19(1), 5–51. <https://doi.org/10.1080/10926770903475968>
- Rikhye, K., Tyrka, A. R., Kelly, M. M., Gagne, G. G., Mello, A. F., Mello, M. F., Price, L. H., & Carpenter, L. L. (2008). Interplay between childhood maltreatment, parental bonding, and gender effects: Impact on quality of life. *Child Abuse & Neglect*, 32(1), 19–34. <https://doi.org/10.1016/j.chiabu.2007.04.012>
- Rose, D. T., & Abramson, L. Y. (1992). Developmental predictors of depressive cognitive style: Research and theory. In D. Cicchetti, & S. Toth (Eds.), *Rochester symposium of developmental psychopathology* (Vol. IV, pp. 323–349). University of Rochester Press.
- Schoemann, A. M., Miller, P., Pornprasertmanit, S., & Wu, W. (2014). Using Monte Carlo simulations to determine power and sample size for planned missing designs. *International Journal of Behavioral Development*, 38(5), 471–479. <https://doi.org/10.1177/0165025413515169>
- Schwartz, C., Meisenholder, J. B., Ma, Y., & Reed, G. (2003). Altruistic social interest behaviors are associated with better mental health. *Psychosomatic Medicine*, 65(5), 778–785. <https://doi.org/10.1097/01.PSY.0000079378.39062.D4>
- Seligman, M. E. P., Steen, T. A., Park, N., & Peterson, C. (2005). Positive psychology progress: Empirical validation of interventions. *American Psychologist*, 60(5), 410–421. <https://doi.org/10.1037/0003-066X.60.5.410>
- Skinner, M. L., Hong, S., Herrenkohl, T. I., Brown, E. C., Lee, J. O., & Jung, H. (2016). Longitudinal effects of early childhood maltreatment on co-occurring substance misuse and mental health problems in adulthood: The role of adolescent alcohol use and depression. *Journal of Studies on Alcohol and Drugs*, 77(3), 464–472. <https://doi.org/10.15288/jsad.2016.77.464>
- Sourander, A., Jensen, P., Rönning, J. A., Elonheimo, H., Niemelä, S., Helenius, H., Kumpulainen, K., Piha, J., Tamminen, T., Moilanen, I., & Almqvist, F. (2007). Childhood bullies and victims and their risk of criminality in late adolescence: The Finnish from a boy to a man study. *Archives of Pediatrics & Adolescent Medicine*, 161(6), 546. <https://doi.org/10.1001/archpedi.161.6.546>
- Sroufe, L. A., Carlson, E., & Shulman, S. (1993). Individuals in relationships: Development from infancy through adolescence. In D. C. Funder, R. D. Parke, C. Tomlinson-Keasey, & K. Widaman (Eds.), *Studying lives through time: Personality and development* (pp. 315–342). American Psychological Association.
- Stoltenborgh, M., Bakermans-Kranenburg, M. J., Alink, L. R. A., & van IJzendoorn, M. H. (2015). The prevalence of child maltreatment across the globe: Review of a series of meta-analyses. *Child Abuse Review*, 24(1), 37–50. <https://doi.org/10.1002/car.2353>
- Svetlova, M., Nichols, S. R., & Brownell, C. A. (2010). Toddlers' prosocial behavior: From instrumental to empathic to altruistic helping. *Child Development*, 81(6), 1814–1827. <https://doi.org/10.1111/j.1467-8624.2010.01512.x>
- Tanaka, M., Wekerle, C., Schmuck, M. L., & Paglia-Boak, A. (2011). The linkages among childhood maltreatment, adolescent mental health, and self-compassion in child welfare adolescents. *Child Abuse & Neglect*, 35(10), 887–898. <https://doi.org/10.1016/j.chiabu.2011.07.003>
- Teicher, M. H., & Samson, J. A. (2013). Childhood maltreatment and psychopathology: A case for ecophenotypic variants as clinically and neurobiologically distinct subtypes. *American Journal of Psychiatry*, 170(10), 1114–1133. <https://doi.org/10.1176/appi.ajp.2013.12070957>
- Teicher, M. H., Samson, J. A., Anderson, C. M., & Ohashi, K. (2016). The effects of childhood maltreatment on brain structure, function and connectivity. *Nature Reviews Neuroscience*, 17(10), 652–666. <https://doi.org/10.1038/nrn.2016.111>
- Thombs, B. D., Bernstein, D. P., Lobbestael, J., & Arntz, A. (2009). A validation study of the dutch childhood trauma questionnaire-short form: Factor structure, reliability, and known-groups validity. *Child Abuse & Neglect*, 33(8), 518–523. <https://doi.org/10.1016/j.chiabu.2009.03.001>
- Trommsdorff, G., Friedlmeier, W., & Mayer, B. (2007). Sympathy, distress, and prosocial behavior of preschool children in four cultures. *International Journal of Behavioral Development*, 31(3), 284–293. <https://doi.org/10.1177/0165025407076441>
- Tsang, & Jo-Ann. (2006). BRIEF REPORT: Gratitude and prosocial behaviour: An experimental test of gratitude. *Cognition & Emotion*, 20(1), 138–148. <https://doi.org/10.1080/02699930500172341>
- Tudge, J. R. H., Freitas, L. B. L., & O'Brien, L. T. (2015). The virtue of gratitude: A developmental and cultural approach. *Human Development*, 58(4–5), 281–300. <https://doi.org/10.1159/000444308>
- Vale, L. G. d. (2012). *Desenvolvimento moral: A generosidade relacionada à justiça e à gratidão sob a ótica das crianças [Doutorado em Psicologia Escolar e do Desenvolvimento Humano, Universidade de São Paulo]*. <https://doi.org/10.11606/T.47.2012.tde-25072012-100222>
- Van Tongeren, D. R., Green, J. D., Davis, D. E., Hook, J. N., & Hulseley, T. L. (2016). Prosociality enhances meaning in life. *The Journal of Positive Psychology*, 11(3), 225–236. <https://doi.org/10.1080/17439760.2015.1048814>
- Weinstein, N., & Ryan, R. M. (2010). When helping helps: Autonomous motivation for prosocial behavior and its influence on well-being for the helper and recipient. *Journal of Personality and Social Psychology*, 98(2), 222–244. <https://doi.org/10.1037/a0016984>
- Wentzel, K. R., Filisetti, L., & Looney, L. (2007). Adolescent prosocial behavior: The role of self-processes and contextual cues. *Child Development*, 78(3), 895–910. <https://doi.org/10.1111/j.1467-8624.2007.01039.x>
- World Health Organization. (2006). Preventing child maltreatment: A guide to taking action and generating evidence / World Health Organization and International Society for Prevention of Child Abuse and Neglect. Guide sur la prévention de la maltraitance des enfants : intervenir et produire des données. <https://apps.who.int/iris/handle/10665/43499>.
- Wright, M. O., Crawford, E., & Del Castillo, D. (2009). Childhood emotional maltreatment and later psychological distress among college students: The mediating role of maladaptive schemas. *Child Abuse & Neglect*, 33(1), 59–68. <https://doi.org/10.1016/j.chiabu.2008.12.007>
- Wu, Q., Chi, P., Lin, X., & Du, H. (2018). Child maltreatment and adult depressive symptoms: Roles of self-compassion and gratitude. *Child Abuse & Neglect*, 80, 62–69. <https://doi.org/10.1016/j.chiabu.2018.03.013>
- Xiang, Y., Chen, D., & Zhao, J. (2021). How is childhood abuse associated with moral disgust? The mediating role of social support and gratitude—Based on the theory of mind. *Journal of Aggression, Maltreatment & Trauma*, 30(8), 1028–1040. <https://doi.org/10.1080/10926771.2020.1806974>

- Yang, Y., Li, P., Fu, X., & Kou, Y. (2017). Orientations to happiness and subjective well-being in Chinese adolescents: The roles of prosocial behavior and internet addictive behavior. *Journal of Happiness Studies*, 18(6), 1747–1762. <https://doi.org/10.1007/s10902-016-9794-1>
- Yang, Y., Yang, Z., & Qu, W. (2022). Childhood maltreatment and prosocial behavior: Roles of social support and psychological capital. *Social Behavior and Personality: An International Journal*, 50(1), 1–14. <https://doi.org/10.2224/sbp.10610>
- Yu, G., Li, S., & Zhao, F. (2020). Childhood maltreatment and prosocial behavior among Chinese adolescents: Roles of empathy and gratitude. *Child Abuse & Neglect*, 101, Article 104319. <https://doi.org/10.1016/j.chiabu.2019.104319>
- Zarrett, N., & Eccles, J. (2006). The passage to adulthood: Challenges of late adolescence. *New Directions for Youth Development*, 2006(111), 13–28. <https://doi.org/10.1002/yd.179>
- Zhang, L., Li, W., Ye, Y., Yang, K., Jia, N., & Kong, F. (2022a). Being grateful every day will pay off: A daily diary investigation on relationships between gratitude and well-being in Chinese young adults. *The Journal of Positive Psychology*, 1–13. <https://doi.org/10.1080/17439760.2022.2131606>
- Zhang, L., Zhu, N., Li, W., Li, C., & Kong, F. (2022b). Cognitive-affective structure of gratitude and its relationships with subjective well-being. *Personality and Individual Differences*, 196, Article 111758. <https://doi.org/10.1016/j.paid.2022.111758>
- Zhang, T. H., Chow, A., Wang, L. L., Yu, J. H., Dai, Y. F., Lu, X., Good, M.-J. D., Good, B. J., & Xiao, Z. P. (2013). Childhood maltreatment profile in a clinical population in China: A further analysis with existing data of an epidemiologic survey. *Comprehensive Psychiatry*, 54(7), 856–864. <https://doi.org/10.1016/j.comppsych.2013.03.014>
- Zhao, F., Liu, M., & Li, S. (2020). Paternal coparenting behavior and adolescent prosocial behaviors: Roles of parent-child attachment, peer attachment, and gender. *Children and Youth Services Review*, 119, Article 105629. <https://doi.org/10.1016/j.chilyouth.2020.105629>
- Zhao, X., & Epley, N. (2022). Surprisingly happy to have helped: Underestimating prosociality creates a misplaced barrier to asking for help. *Psychological Science*, 33(10), 1708–1731. <https://doi.org/10.1177/09567976221097615>
- Zhao, X. F., Zhang, Y. L., Li, L. F., & Zhao, Y. F. (2005). Evaluation on reliability and validity of Chinese version of childhood trauma questionnaire. *Chinese Journal of Clinical Rehabilitation*, 9, 209–211.
- Zurbriggen, E. L., Gobin, R. L., & Freyd, J. J. (2010). Childhood emotional abuse predicts late adolescent sexual aggression perpetration and victimization. *Journal of Aggression, Maltreatment & Trauma*, 19(2), 204–223. <https://doi.org/10.1080/10926770903539631>