

Childhood Maltreatment and Gratitude: A Multilevel, Meta-Analytic Review

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Abstract

During the past decade, research on the association between childhood maltreatment (CM) and gratitude has been accumulating, but there is a lack of systematic, quantitative evaluation of existing literature. The present systematic review aims to fill this gap by conducting a three-level meta-analysis. After a comprehensive search in five English and three Chinese databases, we retrieved 33 effect sizes from 16 studies with a total sample of 13,818 participants. The results showed that CM (aggregated across forms) was negatively and moderately linked to gratitude ($r = -.311$, 95% CI $[-0.382, -0.235]$, $p < .001$). Childhood neglect (i.e., physical and emotional neglect) exhibited more substantial effects on gratitude than emotional abuse, while the effects of childhood physical and sexual abuse were insignificant. In addition, the mean effect sizes were larger in studies with younger samples. However, the effect did not vary as functions of CM measurement, methodological rigor, whether the sample included college students only, publication type, or region of the sample. Last, we highlighted the limitations of existing research, proposed agendas for future studies, and discussed practical implications.

Keywords

childhood maltreatment, gratitude, systematical review, meta-analysis

Childhood maltreatment (CM) has been acknowledged to be a worldwide issue due to its widespread prevalence and profound impact on physical and mental health of children (World Health Organisation [WHO], 2022). The examination of the long-term consequences from distinct forms of CM has drawn more and more attention. Not only its association with adverse mental outcomes has been well documented (Choi & Sikkema, 2016; Miller et al., 2013; Nelson et al., 2017), but concerns have also been raised regarding its negative effects on personal characteristic strengths (Crandall et al., 2019). Recently, there has been a growing body of research exploring the impact of CM on gratitude, and theories have been proposed to explain this association. However, a comprehensive examination of this relationship and the associated theories is currently lacking. Since gratitude has been linked to subjective well-being (Emmons & McCullough, 2003), prosocial behavior (Ma et al., 2017), and interpersonal relationships (Bartlett et al., 2012), research in this area has significant practical value. Therefore, both theoretical and practical fields would benefit from a clear understanding of how CM is connected to gratitude. Due to the absence of a systematic review of existing literature in this field, this study aims to synthesize previous findings using a three-level, meta-analytic approach.

Conceptualizations of Central Constructs

CM has been defined as the actions of commission or omission by caregivers that intentionally or unintentionally cause harm, potential harm, or threats of harm to a child (Gilbert et al., 2009). It consists of adverse experiences of both abuse (i.e., physical, emotional, and sexual abuse) and neglect (i.e., physical and emotional neglect) during childhood (Bernstein et al., 2003). Numerous studies have demonstrated the positive association between CM and subsequent adverse outcomes (Angelakis et al., 2020; Bruce et al., 2012; Nelson et al., 2017), as well as its detrimental influences on well-being and personal psychological strengths (Cao et al., 2022; Kong, 2018; Li et al., 2023; Zhang et al., 2021). As CM has been examined in the existing literature either as five subtypes separately (e.g., Wu et al., 2018) or as overall

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maltreatment combining all subtypes (e.g., Yu et al., 2020), in this study, CM was coded as a six-category variable at the effect size level: overall CM, childhood physical abuse, childhood physical neglect, childhood emotional abuse, childhood emotional neglect, and childhood sexual abuse.

Gratitude is a moral emotion that arises from recognizing the benevolent intentions of others (McCullough et al., 2001; Tsang et al., 2006). Like any other emotions, it can be conceptualized at trait and state levels (McCullough et al., 2004). Conceptually, trait gratitude (i.e., disposition of gratitude) is characterized by individual differences in the experience of gratitude, while state gratitude (i.e., episodes of gratitude) refers to temporary affects or moods that arises from perceiving positive aspects of life (Wood et al., 2008). Typically, individuals with higher levels of trait gratitude tend to have more frequent and intense experiences of state gratitude (McCullough et al., 2004). Previous research has predominantly focused on the association between CM and trait gratitude. Therefore, gratitude was coded as a one-dimensional construct at the effect size level.

The Mechanisms Underlying the relationship Between Two Constructs

Prior studies have consistently identified a negative relationship between CM and gratitude, and the potential mechanisms underlying this relationship have been proposed in recent studies. Based on our review, most of the existing literature has examined this relationship from a developmental perspective. Specifically, it is widely agreed that gratitude is not a genetically endowed trait but rather develops during childhood and adolescence as certain capacities become available and cognitive abilities mature (Emmons & Shelton, 2002; Freitas et al., 2011; Li, 2014). As a matter of fact, the most well-acknowledged prerequisite capacity in childhood that lays the foundation for later gratitude is theory of mind (ToM). It describes the ability to understand the mental states of others and recognize that one's own knowledge and beliefs may differ from those of others (Frith & Frith, 2005; Gallagher & Frith, 2003). Two different components of ToM have been proposed: cognitive and affective ToM (Duval et al., 2011). Cognitive ToM involves understanding thoughts, beliefs, and intentions, which is conceptually linked to comprehending the intentions and motivations behind gift giving in the case of gratitude (Morgan & Gulliford, 2017). Affective ToM refers to recognizing emotions and feelings, which is also considered as a prerequisite for experiencing gratitude (Layous & Lyubomirsky, 2014; Nelson et al., 2013). However, experiences of maltreatment could diminish the child's abilities to understand others both cognitively and emotionally (Luke & Banerjee, 2013). Moreover, it could even alter the connectivity of brain network related to ToM, and this impact can persist into adulthood (Boccardo et al., 2019; Pang et al., 2022). Thus, through undermining the child's ToM, experiences of CM are linked to decreased levels of gratitude (Xiang et al., 2021).

On top of that, another factor that may be related to the development of gratitude is social support. Specifically, children start learning gratitude through their everyday activities and interactions with family, friends, and other important social partners (Tudge & Freitas, 2017). Consequently, many important interactions between youth and influential individuals play a role in the development of children and adolescents, particularly in the cultivation of virtues like gratitude (Smetana et al., 2014; Theokas & Lerner, 2006). Parents, as the primary figures in children's lives, are most likely to influence their development of gratitude through a complex process (O'Brien et al., 2017). From an early age, parents teach their children to say "thank you" when they receive a gift or assistance (Freitas et al., 2011). Through this kind of interactions, youth are able to acquire the behaviors by observing and imitating their parents, receiving reinforcement, and potentially internalizing these behaviors (Hurd et al., 2009; Zimmerman et al., 2002). Considering that children and adolescents have not yet fully established the level of autonomy from their parents needed to base their identity on the new social relationships, their connections to family support are crucial for their development (Levitt et al., 1993). Consistent with this, studies have shown that perceived social support from parents is strongly correlated with gratitude development (Bono et al., 2019; Reckart et al., 2017). Indeed, the interactions mentioned above that teach children the principles of morality is lengthy and requires patience, and parents sacrifice their own freedoms and forgo many personal pleasures to raise their children appropriately (Visser, 2009). Thus, those parents who engage in negative interactions (e.g., abuse) or exhibit passive behaviors (e.g., neglect) toward their children can significantly hinder the development of gratitude in children. Without sustained focus and effort from parents, maltreated children and adolescents may struggle to develop gratitude (Doi et al., 2021; Kong et al., 2023).

The Present Study

A comprehensive understanding of the association between different forms of CM and gratitude is essential for uncovering the underlying mechanisms and developing effective intervention strategies to mitigate the detrimental effects of CM and promote individuals' gratitude. Despite recent evidence highlighting the negative impact of CM on gratitude, to the best of our knowledge, there has yet to be a published meta-analysis to address this topic comprehensively. Therefore, the aim of this study was to quantitatively evaluate the existing literature on the relationship between CM and gratitude. To this end, we employed a three-level meta-analytic approach in which Level 1 accounts for the sampling variation for each effect estimate, Level 2 captures the variation within each study, and Level 3 encapsulates the variation between studies. This approach was recommended because it can effectively address the dependence among

effect sizes within and between studies, allowing for more accurate parameter estimates when multiple effect sizes can be retrieved from a single study, as is the case in the present meta-analysis. We then examined the relationship between overall CM (aggregated across different types) and gratitude. Next, we tested whether this relationship was moderated by primary effect-level (e.g., maltreatment form, sample age, sample gender) and study-level variables (e.g., sample type, publication type, region), which have been commonly considered as moderators in previous meta-analyses (e.g., Cao et al., 2022; Kale et al., 2018; Murphy & Dockray, 2018). Taken together, this study would provide a comprehensive overview of the existing studies assessing the impact of CM on gratitude.

Method

Literature Search and Study Selection

We performed a systematic literature search encompassing five English databases (PubMed, PsycINFO, Web of Science, ProQuest, and Elsevier ScienceDirect) and three Chinese databases (China National Knowledge Infrastructure, Wanfang, and Weipu) from inception to October 31, 2022. In both English and Chinese databases, we used the following algorithms and terms: (child* maltreatment OR child* mistreatment OR child* trauma OR child* violence OR child* abuse OR child* neglect OR child* physical abuse OR child* sexual abuse OR child* emotional abuse OR child* physical neglect OR child* emotional neglect) AND (gratitude OR appreciation OR gratefulness OR thankful OR blessings). We further went through the literature reviews and reference lists of the articles closely aligned with the theme of this study to identify additional eligible studies.

The following were the inclusion criteria for studies: (a) original quantitative research; (b) published before October 31, 2022, and written in Chinese or English; (c) the sample or subsample of the research experienced at least one type of CM, such as physical abuse, physical neglect, emotional abuse, emotional neglect, or sexual abuse; (d) CM and gratitude measured by reliable and valid measurements; (5) contained the zero-order correlation or regression coefficient between any form of CM and gratitude. A study was excluded if it (a) was not quantitative research, (b) was not written in English or Chinese, (c) used an overlapping sample, or (d) did not present a zero-order correlation coefficient or the relevant statistical information needed to calculate the zero-order correlation coefficient between CM and gratitude. Finally, 16 studies with 33 effect sizes were obtained (see Figure 1).

Coding and Data Set Preparation

We chose the zero-order correlation (r) as the effect size to present the relationship between CM and gratitude. Since

both variables are most often measured on a continuous scale and assessed in non-experimental settings, the correlation coefficient is the most appropriate metric to capture their association. Furthermore, the included studies predominantly reported zero-order correlation coefficients as the primary metric. In cases where regression coefficients (β) were provided, we converted them to r following the instruction provided by Peterson and Brown (2005). In addition to the effect design factors, we also coded the methodological rigor for each effect size.

The Effect Design Factors. We extracted the following data from all eligible studies: (a) study factor which was publication type (i.e., journal article or thesis/dissertation); (b) method factors including study design (cross-sectional or longitudinal), sampling methods (probability sampling or not), measurement of CM (e.g., Childhood Trauma Questionnaire [CTQ]; Childhood Trauma Questionnaire-Short Form [CTQ-SF]), and measurement of gratitude (e.g., Gratitude Questionnaire [GQ]; Gratitude Affect Checklist [GAC]); (c) sample factors including the total sample size, the sample type (i.e., college student or non-college student), the mean age of the sample (mean and standard deviations), gender of the sample (percentage of women participants), and the country where the sample came from (i.e., China, United States, or Japan); (d) variable factors including the dimensions of CM (i.e., Maltreatment composite, physical abuse, physical neglect, emotional abuse, emotional neglect, and sexual abuse).

Effect Rigor. The methodological rigor of each effect size was evaluated using a method developed by Buehler et al. (1997) and has been used in previous meta-analyses (e.g., Cao et al., 2022). The scale ranges from 0 to 5, and the points were assigned for the following aspects: quality of sample, quality of study design, quality of measurement, and quality of analyses. For quality of sample, 1.00 point was assigned if the sample size exceeded 500, and additional 1.00 point was assigned if the sample was selected using random or probability sampling. For quality of study design, 1.00 point was assigned if a study used a longitudinal design, while 0 point was assigned for a study using a cross-sectional design. For quality of measurement, 0.50 point was assigned if a study used multiple methods to measure CM, and additional 0.50 point was assigned if gratitude was measured using multiple methods. As to quality of analyses, 1.00 point was assigned if a study used structural equation model to estimate the effect size, and 0.50 point was assigned if a study used correlation or β coefficient to estimate the effect size. Therefore, the total score of methodological rigors varied between 0 and 5. We coded this variable because it is likely for the less methodologically stringent research to overestimate effect sizes, and not considering methodological rigor could lead to biased results from meta-analyses (Juni, 2001). The methodological rigor of each included study is presented in Supplemental Table S1.

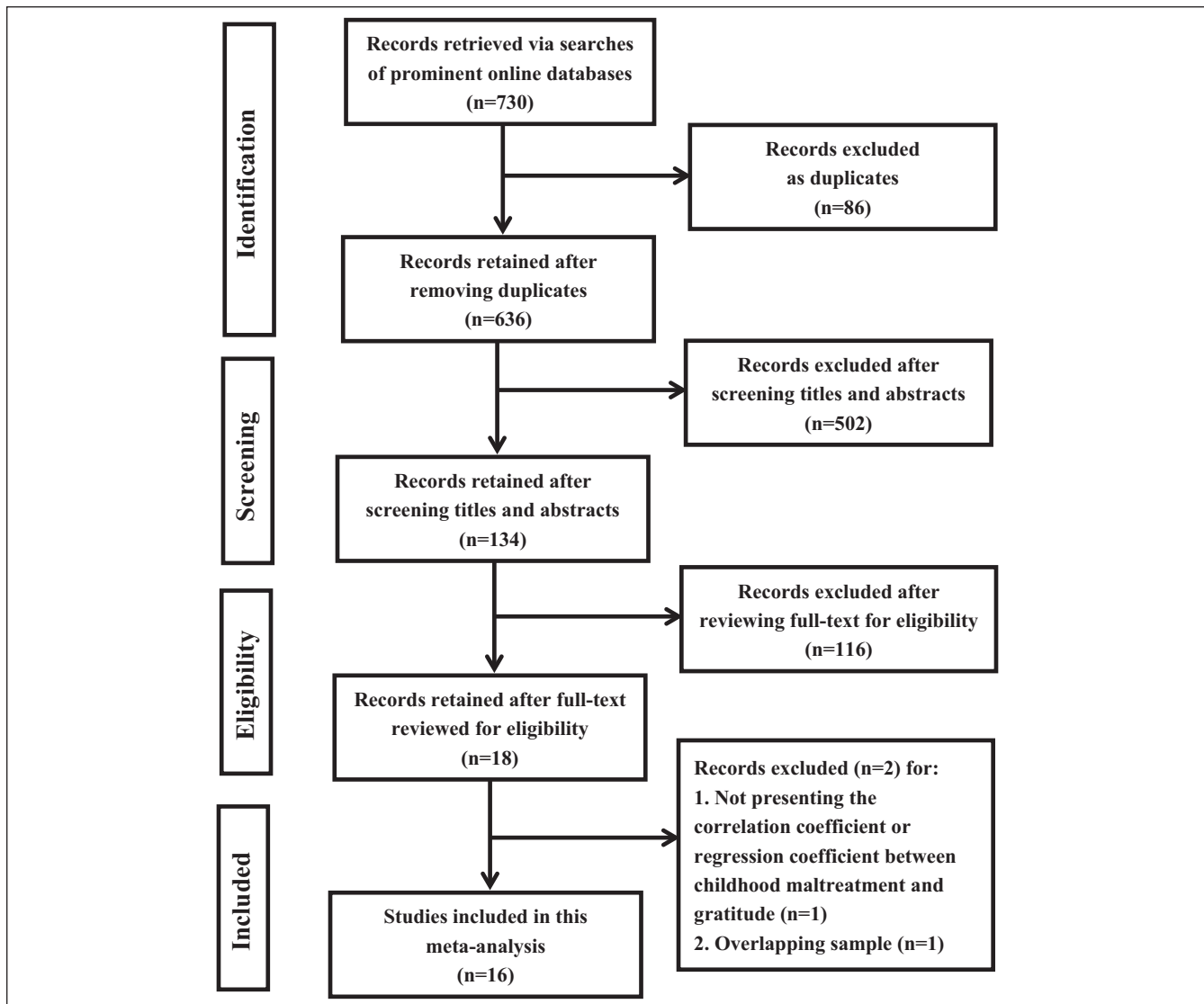


Figure 1. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA).

Statistical Analyses

Calculation of Effect Sizes. First, we transformed beta coefficients (β) to correlation coefficients (r) following the instruction provided by Peterson and Brown (2005). Next, all r s were converted to Zr s through the Fisher's Zr transformation, and pooled Zr s were converted back to r s for analyses and reports.

Meta-Analytic Procedures. Given that multiple effect sizes can be extracted from many eligible studies because of the multi-dimensions of CM, it is necessary to account for various sources of dependency and heterogeneity between and within studies by conducting a three-level meta-analysis (Van den Noortgate et al., 2013). Therefore, we performed the present analyses using the metafor package (Viechtbauer, 2010) in R Version 4.1.0 (R Core Team,

2021). We used a random-effect model because it takes the potential heterogeneity among the included studies into account and thus could obtain a more generalized result. Specifically, variations at three distinct levels were modeled including the sampling variation for each effect size (Level 1), variation across multiple effect sizes from the same sample within a study (Level 2), and variation across different studies (Level 3). Initially, an unconditional model was employed to obtain the overall association between CM and gratitude. Subsequently, effect- and study-level factors were incorporated as moderators within this relationship.

We used both Q and I^2 indices to estimate heterogeneity of the effect sizes (Higgins, 2003). Cochran's Q index (Cochran, 1954) represents the total variance of the estimated effect sizes, while the I^2 index reflects the proportion of the total variance (Higgins & Thompson, 2002). Moderator

analyses were used to explain heterogeneity in the association between CM and gratitude (Shadish & Sweeney, 1991). At each level, we used R^2 to indicate the proportion of explained variance when including a moderator variable, and I^2 to indicate the heterogeneity between effect sizes. For categorical variables, we dummy-coded the variables. While for continuous variables (i.e., mean age, percentage of women, and the methodological rigor of effect sizes), we employed meta-regression to examine their influence. In addition, we conducted an omnibus analysis of variance (ANOVA) test to determine the significance of the moderation effect. And the χ^2 differences ($\Delta\chi^2$) between the original model and the model with moderators were reported to illustrate the extent to which the moderator explained the heterogeneity.

Publication Bias Evaluation. We examined publication bias through the symmetry of the funnel plot and the moderating role of publication type. A funnel plot displays the effect sizes on the x -axis and standard errors (SEs) on the y -axis (Torgerson, 2006). In this study, Fisher's Z transformed effect values were used to construct the funnel plot. If the present meta-analysis was not influenced by publication bias, the points representing the effect sizes would be symmetrically distributed around the mean transformed effect size (Liu, 2011). Furthermore, compared to the dissertations/theses, published journal articles usually undergo more rigorous peer review processes. Therefore, we also evaluated whether publication type played a significant moderating role in the link between CM and gratitude.

Sensitivity Analyses. Considering that a multilevel random-effects model may not capture the intricate dependence structure of our data perfectly well, there may still be biased SEs resulting from insufficient modeling of dependence. It may cause biased statistical inferences if ignoring these dependencies (Becker, 2000). Thus, we used the sandwich estimator for sensitivity analyses in the present meta-analysis. The sandwich estimator is a robust variance estimator to handle the dependence within and between studies, and it has been widely used in prior meta-analyses (e.g., Cao et al., 2022; Weymouth et al., 2016). It is appropriate for sensitivity analysis in three-level meta-analyses due to the need to consider the correlation among effect sizes within studies (Hempel et al., 2012). Using the sandwich estimator, we obtained robust estimation of variances by calculating the design matrix including the covariate values of all studies through the asymptotically consistent estimator (Yuan & Bentler, 2002). And the results from the three-level meta-analysis were compared with the results generated through the sandwich estimator. In addition, we also coded the number of effect sizes for each study and evaluated the moderating effect of it to see if there are differences between the effect sizes retrieved from studies including more than three effect sizes and studies including less than three effect sizes. Furthermore, we conducted

influence analyses by leave-one-out method to examine the impacts of each individual study on the overall effect size (Viechtbauer & Cheung, 2010). Specifically, we systematically removed each study one by one and re-estimated the effect sizes. If the re-estimated effect sizes were significantly deviated from the original effect size, it meant that the original results were not robust.

Results

Characteristics of Studies

In Supplemental Table S1, we have provided a summary of the characteristics of the 16 studies included in our meta-analysis. These studies involved a total of 13,818 participants with an overall mean age of 21.39 years. Among the participants, 63.90% were females. The participants were from three countries (China: $k=11$; America: $k=4$; and Japan: $k=1$). Among the 16 studies, 12 were journal articles and 4 were dissertations/theses. Eleven studies were written in English, while 5 were in Chinese.

The sample sizes in the studies ranged from 240 to 2,396 participants. In terms of participant type, one study was conducted among children, 14 studies involved adolescents and adults, and one study was conducted among the elderly. Among the studies involving adolescents and adults, 10 studies specifically included university students, while the remaining 4 studies included other participant groups, such as middle school students and Amazon Mechanical Turk (Mturk) users. Regarding gender, 2 studies included only female participants, while the other 14 studies included both male and female participants.

All studies, apart from one that employed a daily diary approach, utilized a cross-sectional design to investigate the correlation between CM and gratitude. One study adopted probability sampling, while the other 15 studies used convenience sampling. In regard to the measurement tools, nine studies evaluate CM using the CTQ or CTQ-SF. The other seven studies used other scales, such as the Adverse Childhood Experience Questionnaire, Risky Families Questionnaire, and Emotional Abuse Scale. Thirteen studies used the GQ to examine gratitude, and the remaining three studies used the Adolescents Gratitude Scale, GAC, and Chinese Trait Gratitude Questionnaire, respectively.

Zero-order correlation coefficients (r) ($k=15$) and beta coefficients (β) ($k=1$) were reported to show the association between CM and gratitude. The 16 studies included in the analysis presented the relationships between overall CM and gratitude ($k=9$), physical abuse and gratitude ($k=4$), physical neglect and gratitude ($k=5$), emotional abuse and gratitude ($k=5$), emotional neglect and gratitude ($k=7$), and sexual abuse and gratitude ($k=3$). All studies treated CM as the independent variable, and gratitude as a dependent ($k=2$), mediating or moderating variable ($k=14$).

Table 1. Summary of Multilevel Meta-Analytic Results (With Fisher's Z transformed Back to *r*).

Study Variables	<i>k</i>	#ES	<i>r</i>	LCI	UCI	<i>I</i> ² ₂	<i>I</i> ² ₃	<i>R</i> ² ₂	<i>R</i> ² ₃	ANOVA $\Delta\chi^2$	<i>Q</i> Statistic
Overall mean effect	16	33	-.311***	-0.382	-0.235	43.932	50.770	—	—	—	590.034
Effect-level factors											
Maltreatment form								.000	.680	32.070***	
Overall maltreatment	9	9	-.342 ^{a***}	-0.422	-0.258	45.435	45.435				79.293
Physical abuse	4	4	-.178 ^c	-0.427	0.097	46.977	46.977				42.170
Physical neglect	5	5	-.311 ^{a*}	-0.502	-0.090	47.980	47.980				56.374
Emotional abuse	5	5	-.202 ^{b*}	-0.372	-0.018	46.864	46.864				61.368
Emotional neglect	7	7	-.374 ^{a***}	-0.529	-0.196	48.375	48.375				145.467
Sexual abuse	3	3	-.201 ^c	-0.624	0.312	47.694	47.694				26.982
Maltreatment measure								.092	.000	1.878	
CTQ	8	22	-.346 ^{a***}	-0.430	-0.257	47.500	48.035				339.436
Non-CTQ	8	11	-.266 ^{a***}	-0.395	-0.127	3.651	90.731				152.390
Methodological rigor								.000	.000	3.698	
Age	16	33	.006 ^{d***}	0.002	0.009	—	—	.048	.422	10.941***	—
Gender	16	33	.002 ^d	-0.001	0.006	—	—	.000	.000	1.695	—
Study-level factors											
Publication type								.000	.000	.004	
Journal articles	12	28	-.309 ^{a***}	-0.394	-0.219	35.863	60.299				528.875
Theses/dissertations	4	5	-.321 ^{a*}	-0.509	-0.105	0.000	93.728				58.400
Sample type								.000	.000	.007	
College students	10	24	-.307 ^{a***}	-0.387	-0.223	46.656	46.408				354.845
Non-college students	6	9	-.328 ^{a***}	-0.488	-0.147	4.560	91.898				229.532
Region								.000	.306	5.843	
China	11	26	-.331 ^{a***}	-0.411	-0.247	43.691	52.067				415.780
America	4	4	-.327 ^{a***}	-0.452	-0.191	38.177	38.177				13.790
Japan	1	3	-.023 ^a	-0.187	0.141	56.957	0.000				4.647

Note. The “*k*” refers to the number of studies and the “#ES” refers to the number of effect sizes. Superscripts a, b, and c are used to indicate differences between subgroups: Subgroups with different superscripts represent significant differences, and subgroups with the same superscript represent nonsignificant differences. LCI= lower 95% confidence interval; UCI= upper 95% confidence interval; *I*²₂=heterogeneity at Level 2; *I*²₃=heterogeneity at Level 3; *R*²₂=explained variance at Level 2; *R*²₃=explained variance at Level 3; ANOVA $\Delta\chi^2$ =chi-square difference for the omnibus analysis of variance test between each mixed-effects model with moderators and the original mixed-effects model; *Q* statistic=the heterogeneity for the effect sizes; CTQ=Childhood Trauma Questionnaire.

^d β estimates for continuous moderators.

p* < .05. *p* < .01. ****p* < .001.

The Overall Effect Size and Variance Within and Between Studies

Table 1 provides an overview of the multilevel, meta-analytic results. In general, the overall mean effect size of included studies was statistically significant, $r = -.311$, 95% CI [-0.382, -0.235], and the heterogeneity was substantial, $Q = 590.034$, $p < .001$. According to Cohen's (1988) criteria evaluating the strength of effect size r , a value of .10 is considered small, .30 is considered moderate, and .50 is considered large. Therefore, the results suggested that the association between overall CM and gratitude was moderate.

Furthermore, the *I*² indices showed that the proportions of heterogeneity in each effect size that could be attributed to variance within (i.e., $I^2 = 43.9\%$ at Level 2) and between studies (i.e., $I^2 = 50.8\%$ at Level 3) were both “moderate to high.” According to Hunter and Schmidt (1990), if the

sampling variation (i.e., Level 1) explains fewer than 75% of the total variance, the heterogeneity within studies and between studies can be assumed substantial. In the present meta-analyses, the sampling variation only accounted for 5.3% of the variance, indicating that the majority of the variance was due to factors other than sampling variation. Therefore, it would be necessary to further test whether the magnitude of the association between CM and gratitude changed with the variation of the effect- and study-level factors.

The Effect Sizes Across Maltreatment Forms

The results indicated that the magnitude of the association between CM and gratitude significantly varied depending on the maltreatment type (ANOVA $\Delta\chi^2 = 32.070$, $p < .001$). Specifically, the effect sizes for overall maltreatment, physical neglect, emotional abuse, and emotional neglect were

found to be statistically significant. However, the effect sizes for physical abuse and sexual abuse were not significant. Besides, the further analyses revealed that the magnitude of effect sizes for overall maltreatment ($r = -.342, p < .001$), physical neglect ($r = -.311, p < .05$), and emotional neglect ($r = -.374, p < .01$) were significantly larger than that for emotional abuse ($r = -.202, p < .05$).

The Moderating Roles of Coded Factors

In addition, as reported in Table 1, (a) the negative effect of CM was positively connected to the mean age of the samples ($b = 0.006, p < .001, \text{ANOVA } \Delta\chi^2 = 10.941, p < .001$). This suggests that as the samples' mean age increases by 1 year, the strength of the negative link between CM and gratitude decreases by 0.006; (b) the association between CM and gratitude did not significantly differ between the studies that measured CM with the CTQ (Bernstein et al., 2003) ($r = -.346, p < .001$) and studies that utilized other scales to measure CM ($r = -.266, p < .001$): $\text{ANOVA } \Delta\chi^2 = 1.878, p = .171$; (c) the effect sizes were not found to be significantly related to the methodological rigor ($b = 0.125, p = .066$), which indicated that the magnitude of the effect sizes did not fluctuate according to the methodological rigor; (d) the region (i.e., China, America, and Japan) of the samples did not significantly affect the strength of the association between CM and gratitude: $\text{ANOVA } \Delta\chi^2 = 5.843, p = .054$; and (e) the magnitude of the link did not significantly differ based on the publication type ($\text{ANOVA } \Delta\chi^2 = .004, p = .942$) or whether the sample consisted exclusively of college students ($\text{ANOVA } \Delta\chi^2 = .007, p = .932$).

Publication Bias and Sensitivity Analyses

As shown in Figure 2, the funnel plot could be regarded roughly symmetrical with the mean effect size (-0.321) as the center. Also, the plot shows that even small effect sizes were allowed to be reported in publications, indicating that publication bias was not a concern in this meta-analysis. In accordance with this, the ANOVA test comparing the association between CM and gratitude in journal articles and dissertations/theses yielded a nonsignificant result ($\text{ANOVA } \Delta\chi^2 = .004, p = .942$).

The sensitivity analyses conducted using the sandwich estimator revealed that the estimated overall mean effect size and SE ($r = -.310, 95\% \text{ CI } [-0.385, -0.233], p < .001$) were almost identical to the results obtained from the primary three-level meta-analysis ($r = -.311, [-.382, -.235], p < .001$). Furthermore, the number of effect sizes contributed by each study did not significantly influence the effect sizes in the analyses: $\text{ANOVA } \Delta\chi^2 = 1.518, p = .218$. In other words, the results of studies that included less than three effect sizes (i.e., $r = -.342, [-0.403, -0.277], p < .001, Q \text{ statistic} = 160.460$) were similar to the results of studies that included more than three effect sizes ($r = -.245, [-0.423, -0.048], p < .05, Q \text{ statistic} = 411.065$).

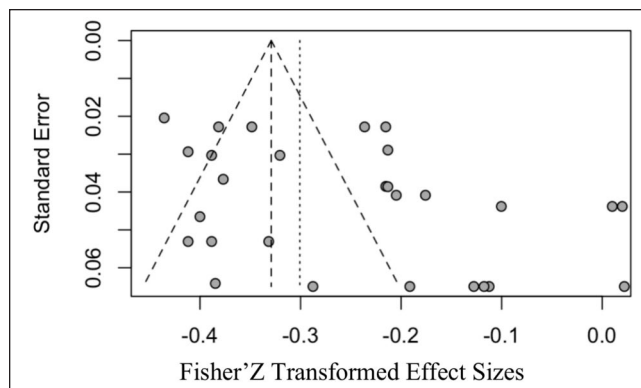


Figure 2. The funnel plot of Fisher's Z transformed effect sizes. Note. This plot depicts the distribution of standard errors as a function of the Fisher's Z transformed effect sizes. In the absence of publication bias, the plot should look like a funnel in which research reports are distributed symmetrically around the overall weighted mean of the Fisher's Z transformed effect sizes (i.e., -0.321 in this study).

The influence analyses conducted by excluding one study at a time and re-estimating the effect sizes of the remaining studies demonstrated the stability and consistency of the original meta-analysis results. Although the effect sizes varied when individual studies were excluded, the 95% CIs consistently did not overlap with zero. This indicates that the overall findings and conclusions of the original meta-analysis remained robust and were not unduly influenced by any single study (see Figure 3).

Discussion

This study synthesized the existing research on the relationship between CM and gratitude. As far as we know, this is the first systematic review and meta-analysis of the relationship between CM and gratitude based on a comprehensive synthesis of 16 studies involving 13,818 participants. Specifically, we provided a comprehensive understanding of the association between distinct types of CM and gratitude by differentiating the effects of five subtypes of CM on gratitude. Furthermore, we explored various moderators that may influence the relationship by conducting additional analyses concerning several effect- and study-level factors. Taken together, the findings of this study not only provided a comprehensive theoretical explanation of the relationship between CM on gratitude, but also suggested a few agendas for future research and provided important implications in both practical and political areas.

The Overall Association Between CM and Gratitude

Results from this study reconfirmed that CM was on average negatively associated with gratitude, and the magnitude of the overall effect size was moderate based on Cohen's (1988) criteria: $r = -.311, [-0.382, -0.235], p < .001$. This magnitude is

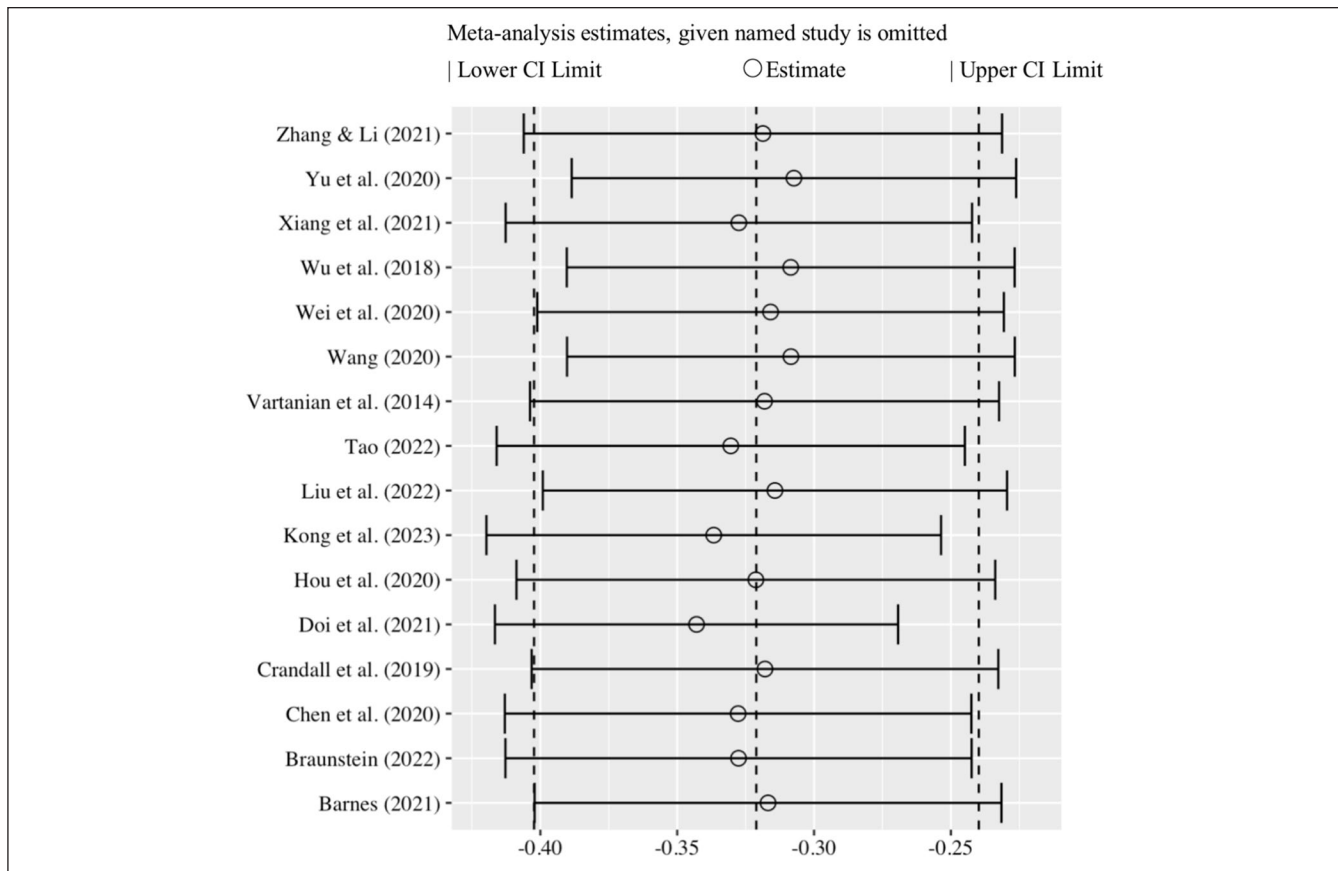


Figure 3. Influence analysis of the included studies.

Note. The dotted line represent the estimate of Fisher's Z transformed effect sizes (i.e., -0.321 in the present study) and 95% CI for the original meta-analysis (i.e., $[-0.402, -0.240]$ in this study). The hollow circles represent the re-estimated effect size after deleting one study. The error bar represent the 95% CI for the re-estimated effect size.

relatively larger than the association of CM with other psychological strengths, such as self-esteem ($r = -.24$) (Zhang et al., 2022) and self-compassion ($r = -.28$) (Zhang et al., 2021). The potential reason may be that the cognitive ability (i.e., ToM) that is crucial to experience gratitude fully develops around the age of 7 (Froh et al., 2007), and this is the time when the child's ability to precisely interpret the intention of others fully developed. In the scenario of benefit, this ability is crucial for experiencing gratitude via perceiving the benefactor's good intentions. However, given that most maltreated children suffered abuse and neglect from caregivers at age 2 to 4 (Green et al., 2018; WHO, 2022), their necessary cognitive abilities to experience gratitude may be significantly disrupted, limiting their capacity to experience gratitude (Layous & Lyubomirsky, 2014; Luke & Banerjee, 2013). Consequently, these individuals may exhibit lower levels of gratitude as they grow older.

The finding of a moderate negative association between CM and gratitude opens up opportunities for studying the role of resilience in buffering the effects of CM on gratitude. The results of this study suggest that not all victims of CM will necessarily have low levels of gratitude. Otherwise, the influences from CM on gratitude may be buffered by

resilience emerging from different aspects such as social support (Xiang et al., 2021), self-esteem (Kalalo et al., 2021), and socioeconomic status (Reckart et al., 2017). Thus, future research in this field could focus on understanding the conditions and factors that contribute to individuals who have experienced CM still exhibiting high levels of gratitude.

Effects of Different Types of Maltreatment on Gratitude

The results of this study highlight the differential effects of various types of CM on gratitude. Specifically, although CM was comprehensively and negatively associated with gratitude, the effects were larger for emotional neglect ($r = -.374$, 95% CI $[-0.529, -0.196]$) and physical neglect ($r = -.311$, $[-0.502, -0.090]$), smaller for emotional abuse ($r = -.202$, $[-0.372, -0.018]$), and nonsignificant for physical abuse and sexual abuse.

The nonsignificant effects of physical and sexual abuse on gratitude could be attributed to limitations in the sample type. Judging by appearance, physical and sexual abuse can cause

significant harm, while other forms of maltreatment (i.e., physical neglect, emotional abuse, and emotional neglect) may not display indicators of serious harm. As a result, many countries have implemented sanctions against childhood physical and sexual abuse (Mathews, 2014). Consequently, the rates of childhood physical abuse and sexual abuse both decreased substantially (Child Trends, 2019). Thus, typical samples of the studies included in the present meta-analysis may have limited exposure to these two forms of maltreatment, resulting in a narrow range and lower incidence among all forms of maltreatment (Freeman, 2012). Therefore, analyses based on the low-risk samples are likely to provide conservative tests of the association of childhood physical and sexual abuse with gratitude, which makes the effect sizes too small to be detected.

The finding that childhood neglect has a stronger link with gratitude than child abuse seems to be appropriately explained from the perspective of social support. Specifically, perceived social support from parents is crucial for gratitude development (Bono et al., 2019; Reckart et al., 2017). Obviously, people differ in their experience of gratitude toward others depending on whether they tend to trust or mistrust benefactors' intentions (Mikulincer & Shaver, 2010). When individuals can trust that others truly care about their happiness and can satisfy their needs, they are more likely to infer the kindness of the benefactor in the scenario of a benefit (Watkins, 2014). To go further, this interpersonal trust is determined by obtained security, which comes from perceiving social support, especially from parents (Hamid & Lok, 2000). Thus, a child who is not given attention, care, and protection within the attachment relationship might develop assumptions that one is not of interest to others or not worthy of being loved (Watkins, 2014). As a consequence, individuals with a negative self-image and lack of interpersonal trust tend to misinterpret the intention of a benefit because due to their expectations of others as not being interested in their needs (Eikenaes et al., 2015). Given that childhood neglect is a stronger sign of a discouraging home climate with less parental demonstration of love, the often less dramatic or silent maltreatment experiences of emotional and physical neglect might be risk factors for the development of gratitude over and above the effects of abuse experiences.

Moreover, research has established that childhood neglect and childhood abuse have distinct impacts on neurobiological and cognitive development (McLaughlin et al., 2019; Sheridan & McLaughlin, 2014). Specifically, childhood abuse experiences can strongly influence neural systems related to threat detection (McLaughlin et al., 2014), while instances of childhood neglect, characterized by inadequate cognitive and social nurturing, can significantly affect higher-order cognition, such as social cognitive ability (Kilian et al., 2018; McLaughlin et al., 2017). Consequently, ToM, a widely recognized core social cognitive ability (Heleniak & McLaughlin, 2020), is more likely to be impacted by childhood neglect rather than childhood abuse. In line with this, numerous studies have found a stronger

association between childhood neglect and ToM (Kincaid et al., 2018; Schwartz, 2016; Vaskinn et al., 2021). Given that ToM serves as a foundational capacity for gratitude, and considering its heightened susceptibility to childhood neglect compared to childhood abuse, it is reasonable to conclude that childhood neglect has a more profound detrimental effect on gratitude.

The Roles of Effect-Level and Study-Level Factors

The present meta-analysis also revealed that the strength of the link between CM and gratitude weakened as individuals grew older. The potential explanation may be that there are more resilience factors available to older individuals that can attenuate the negative influences of CM on gratitude. For example, individuals are likely to have accumulated more social support (Hayman et al., 2017), more enriched coping repertoires (Golant, 2015), and fewer focuses on the intensities with parents during childhood (Budziszewska & Dryll, 2013) as they get older. All these resilience factors play important roles in buffering the influences of CM on mental outcomes (Collishaw et al., 2007).

Notably, the strength of the link between CM and gratitude did not change depending on the methodological rigor. The potential reason may be that most studies included in the present meta-analysis used a cross-sectional design, a single method to evaluate two variables, and did not use probability sampling. As a result, the overall low levels of methodological rigor limit the ability to detect significant moderating effects. Therefore, future research should aim to investigate this relationship using more rigorous designs to obtain more reliable results (Shadish et al., 2002), such as evaluating CM and gratitude with multimethod, drawing random samples, and using longitudinal designs. Moreover, the cultural backgrounds of the samples did not alter the strength of the association between CM and gratitude as well. Although the development of gratitude has been found to be varied across cultures (Tudge et al., 2015), CM is a global phenomenon affecting the lives of millions of children all over the world (Stoltenborgh et al., 2015). Furthermore, the impacts of CM on brain networks related to ToM, a prerequisite capacity for gratitude development, are identical across cultures (Boccardo et al., 2019; Pang et al., 2022). Therefore, the detrimental influences of CM on gratitude could be consistent across cultures. In addition, recruiting college students as subjects has long been a tradition in social science research, and there is an ongoing debate about its benefits and problems (Druckman & Kam, 2011). Nevertheless, the present meta-analysis revealed no differences on the magnitude of effect size regarding the impact of CM on gratitude between samples of college students and non-college students. This suggested that findings obtained from college student samples in this field can be considered as having adequate external validity.

Limitations of the Present Study

Although the present meta-analysis has yielded significant findings in many aspects, a few limitations should be noted. First, although concerns have been raised over the detrimental influences of CM on psychological strengths like gratitude, this topic is relatively recent. Thus, so far, the number of published studies focusing on the association between CM and gratitude is relatively small. This prevents us from further analyzing the effects of moderators in the links between different types of CM and gratitude, considering that different forms of CM may be susceptible to distinct factors such as gender (Hyman et al., 2006) and cultural backgrounds (Zhang et al., 2013). Moreover, the link between CM and state gratitude has not been examined due to the relatively slim body of research focusing on this topic. Thus, we could not test whether there was a difference between the effect of CM on trait gratitude and state gratitude. Second, the majority of studies included in the present meta-analysis used a cross-sectional design, nonprobability sampling, and self-report measures of CM. While most studies have large sample sizes, the relatively low level of methodological rigor may threaten the validity of the effects of CM on gratitude. Third, although we coded lots of effect-level and study-level factors, many of them were not tested in this study because there were very few of the certain effect sizes (e.g., the study design, the sampling method, and gratitude measures). Furthermore, the unavailability of precise information on the timing of CM in the included studies hindered our ability to analyze the potential moderating effects of maltreatment onset (Russotti et al., 2021). Last, as the main body of studies included in the current meta-analysis is from China, whether the findings can be generalized to other cultures needs further confirmation.

Conclusion

This study is the first attempt to synthesize the relationship between CM and gratitude by conducting a three-level, meta-analysis of the existing research. Our findings revealed a significantly and moderately negative overall association between CM and gratitude. Furthermore, we identified that childhood neglect (i.e., emotional neglect and physical neglect) was more detrimental to the development of gratitude compared with childhood abuse (i.e., emotional abuse, physical abuse, and sexual abuse). The above findings provide valuable insights into the negative impact of CM on gratitude and offer potential mechanisms underlying this association.

Critical Findings of This Review

1. CM is negatively associated with gratitude, and the magnitude of the overall effect size is moderate.

2. The effects were larger for emotional neglect and physical neglect, smaller for emotional abuse, and insignificant for physical abuse and sexual abuse.
3. The magnitude of the association between CM and gratitude varies depending on the mean age of the sample.

Potential Implications for Research, Practice, and Policy

1. The current research on the association between CM and gratitude exhibits relatively low methodological rigor. Therefore, it is important for future research to employ more stringent designs (e.g., multimethod, multi-informant, longitudinal designs, and random or stratified sampling). Moreover, the samples used in the research predominantly consist of young adults, resulting in a lack of diversity. Hence, studies that involve multicultural and wider age range samples, as well as special communities such as clinical samples, are urgently needed.
2. The findings of this study highlighted the importance of examining the relationships between different types of CM and gratitude to gain a more comprehensive understanding of this relationship. In addition, it is necessary to explore potential moderators that contribute to individuals who have suffered from CM but still exhibit high levels of gratitude.
3. The ToM and social support perspectives have been identified as valuable frameworks for explaining the relationship between CM and gratitude. Thus, future research devoted to exploring the mechanisms underlying this relationship would benefit from incorporating these theories into their investigations.
4. Our meta-analytic review demonstrated that the effects of childhood physical and sexual abuse on gratitude were insignificant, and childhood neglect had a stronger impact on gratitude compared to childhood abuse. Undoubtedly, the prohibition of childhood physical and sexual abuse was effective, and may exhibit profound changes in the influences of CM on gratitude. Consequently, it becomes imperative for the government to adopt equally strict sanctions against childhood neglect, including both physical and emotional neglect. Specifically, in developing countries like China, considering that families in poverty are at a higher risk of neglecting their children (Slack et al., 2004), the government should increase the availability of services for families in need, identify high-risk families, and provide additional community and individual support. Furthermore, as the one-child generations in China become parents, early childhood education programs that teach parents about crucial periods of early development and emphasize the importance of nurturing and

care could also help prevent parents from neglecting their children. While in developed countries, effective approaches for identifying and addressing the needs of children at risk of neglect should be implemented, such as Family Support Hubs, the Early Intervention Transformation Program, and Targeted Community-Based Interventions (Devaney & McConville, 2016). Such preventions are likely to yield benefits to the development of children's gratitude and further promote the well-being of individuals and the harmony of society.

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Supplemental Material

Supplemental material for this article is available online.

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