

Article

Childhood Trauma and Malevolent Creativity in Chinese College Students: Moderated Mediation by Psychological Resilience and Aggression

Wenfu Li ^{1,*†}, Linghui Zhang ^{1,2,†}, Zhilei Qin ¹, Jingting Chen ^{3,*} and Chuanxin Liu ¹¹ School of Mental Health, Jining Medical University, Jining 272067, China² Department of Child and Adolescent Psychiatry, Shandong Daizhuang Hospital, Jining 272051, China³ Labour Union, Jining Medical University, Jining 272067, China

* Correspondence: wenfulee@mail.jnmc.edu.cn (W.L.); chenjingting@mail.jnmc.edu.cn (J.C.)

† These authors contributed equally to this work.

Abstract: Although a previous study has shown that childhood trauma influences malevolent creativity, aggression and psychological resilience have been linked with childhood trauma and creativity. However, little is known about the complex correlations among these factors in Chinese college students. The present study aimed to investigate the mediating role of aggression and the moderating role of psychological resilience between childhood trauma and malevolent creativity. A total of 389 undergraduates were enrolled in this cross-sectional study. The moderated mediation model was conducted to explore whether aggression mediated the correlation between childhood trauma and malevolent creativity and whether psychological resilience moderated the indirect role of childhood trauma. The results showed that childhood trauma positively correlated with aggression and malevolent creativity and was negatively associated with psychological resilience. Aggression partly mediated the association of childhood trauma with malevolent creativity. Resilience moderated the indirect effect of the mediation model, such that the indirect effect of childhood trauma on malevolent creativity through aggression increased as the level of resilience increased. The study indicated that childhood trauma exposure is associated with malevolent creativity behavior, and aggression mediated this association. The level of psychological resilience differentiates the indirect paths of childhood trauma on malevolent creativity. These results have important implications for preventing and containing expressions of malevolent creativity.

Keywords: childhood trauma; malevolent creativity; aggression; psychological resilience; college students

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1. Introduction

Creativity, as a crucial force for human survival and social progress (Runco 2004), is widely defined as the ability to generate ideas, solutions, or products that are both novel and useful (Runco and Jaeger 2012; Sternberg and Lubart 1999). Creativity is commonly considered to be a benevolent thing. However, recent reports have begun to acknowledge the dark side of creativity, or malevolent creativity generated to purposely harm others (Crompton et al. 2008; Harris and Reiter-Palmon 2015). A wide variety of malevolent creativity instances can be found everywhere. Extreme examples can be creative terrorist attacks or criminal behaviors, and more common instances can be creative deception, theft, cheating, kidnap, or sexual harassment (Crompton and Crompton 2011; Gill et al. 2013; Harris and Reiter-Palmon 2015). These malevolent creativity behaviors usually cause damage in original or innovative ways and therefore are hard to detect and prevent (Gutworth et al. 2018). The academic research identifying predictors of malevolent creativity behavior and interaction mechanisms not only contributes to the systematized understanding of the nature of creativity but also reminds the public that creativity generated to purposely harm others may cause vast hurt to individuals and great damage to the whole society (Jia et al.

2020). Therefore, an in-depth study of the occurrence mechanism underlying malevolent creativity contributes to preventing malevolent creativity behavior and has significant social value.

Malevolent creativity has previously been linked to both environmental and individual factors (Cropley et al. 2014; Gong and Liu 2016; Harris et al. 2013; James et al. 1999; Jia et al. 2020; Perchtold-Stefan et al. 2021). For example, James et al. (1999) pointed out that malevolent creativity is related to a negative social climate. Other studies found that an unfair environment (Clark and James 1999) and social threat (Baas et al. 2019) could increase the likelihood of malevolent creativity behaviors. Additionally, researchers also found a close association between malevolent creativity behaviors and individual personality or personal characteristics. For instance, Jonason et al. (2017) found that Machiavellianism and psychopathy are positively related to malevolent creativity among both males and females, with male-specific associations in psychopathy. In addition, numerous studies indicate that malevolent creativity has been associated with aggression (Harris and Reiter-Palmon 2015), antagonism (Perchtold-Stefan et al. 2021), and integrity (Beaussart et al. 2013). Besides environment and personality factors, other emotional or motivational factors, such as negative emotion (James et al. 1999), approach motivation (Hao et al. 2020), and moral reasoning (Zhao et al. 2022a) could also increase the likelihood of malevolent creativity behaviors. In addition, early adverse life factors are shown to be correlated with the increased emergence of malevolent creativity behaviors (Jia et al. 2020), but the underlying mechanisms accounting for this correlation are largely unknown. In the present study, we aimed to investigate the environmental and individual difference factors shown to relate to malevolent creativity behaviors in the general population.

1.1. Childhood Trauma and Malevolent Creativity

Childhood trauma is usually characterized by physical, emotional, sexual abuse and/or physical and emotional neglect, which happened before 18 years old (Bernstein et al. 2003). Previous studies have shown that childhood trauma is correlated with various negative outcomes, such as post-traumatic stress disorder (Doba et al. 2022), food addiction (Wattick and Olfert 2022), schizotypy (Gong et al. 2019), and decreased level of executive function (Bernardes et al. 2020), cognitive flexibility (Spann et al. 2012), working memory (Chiasson et al. 2021), and openness to experience (Fletcher and Schurer 2017) in adolescence and young adulthood. These negative influences usually endure through adolescence and adulthood (Odgers et al. 2008).

Some research studies have shown that the adverse experiences that happened in early life impose limits on benevolent creativity (Zhang et al. 2018). As for the malevolent creativity phenomenon, to date, there has been only one study that has explored the correlation of childhood trauma with malevolent creativity behaviors. Jia et al. (2020) first explored the association between childhood neglect and malevolent creativity in undergraduates. The results indicated that childhood neglect was positively associated with individual malevolent creativity behaviors. As an initial attempt, this research does provide important insight into the effect of childhood adverse experiences on malevolent creativity behaviors, but the underlying environmental mechanisms accounting for this correlation are largely unknown. Basically, the association between childhood trauma and malevolent creativity is demonstrated, but the psychological mechanism still needs to be investigated deeply. Of note, it remains unclear to date that the psychological mechanism that could account for this association (i.e., the mediation effects) and alter it (i.e., the moderation effects).

Numerous studies have shown that childhood trauma, aggressive behaviors, and psychological resilience are associated with malevolent or benevolent creativity (Anser et al. 2022; Harris and Reiter-Palmon 2015; Lee and Dow 2011; Marwa and Milner 2013; Zhang et al. 2018). Therefore, the present research utilized a Chinese adolescent sample to investigate the roles of aggression and psychological resilience in the association between childhood trauma and malevolent creativity. Specifically, we aimed to examine whether

aggression mediated the association between childhood trauma and malevolent creativity and whether psychological resilience moderated this mediating process.

1.2. Aggression as a Mediator

Aggressive behavior is correlated with various negative outcomes, such as low academic performance, emotional recognition, and social competence (Acland et al. 2021; Chen et al. 2010; Vuoksima et al. 2021). In some ways, malevolent creativity can be regarded as aggressive creativity because it is intentional and harmful in nature (Harris and Reiter-Palmon 2015). General Aggression Model (GAM) suggests that those higher in aggression-prone have a natural tendency to think, believe, and perceive in a malevolently-jaundiced way and have a biased tendency to show aggressive responses (Anderson and Bushman 2002). An empirical study found that the trait of physical aggression was positively associated with malevolent creativity measured by divergent thinking tasks (Lee and Dow 2011). Harris and Reiter-Palmon (2015) have also reported that malevolently creative ideas generated in problem-solving tasks were significantly higher in participants who are more implicitly aggressive than in participants who are less implicitly aggressive. Therefore, aggression-prone individuals tend to construct their inner worlds in hostile and competitive ways and spend a huge amount of time and effort generating many different types of aggressive behaviors (Harris and Reiter-Palmon 2015). Each of the aggressive individuals is an expert in thinking aggressively and flexibly when producing harmful behaviors under certain circumstances. This flexibility may increase the likelihood of generating more original and harmful responses or more malevolent creative behaviors (Harris and Reiter-Palmon 2015). Thus, we hypothesize that aggression will positively predict malevolent creativity behavior.

Among various factors that influence a person's aggression, childhood trauma is widely considered one of the most important factors (Bland et al. 2018; Rasche et al. 2016). Aggressive behavior is one of the externalizing symptoms of individuals with exposure to childhood adversity (Fava et al. 2019). Previous empirical studies have consistently indicated that maltreated individuals are more likely to generate aggressive behavior (He and Xiang 2021; Ma et al. 2022; Schwarzer et al. 2021; Xiao et al. 2021). The association between childhood trauma and aggressive behavior is consistent with the theoretical perspectives of GAM (Anderson and Bushman 2002), which propose that individuals with childhood trauma experience tend to normalize the use of violence and shape it into aggressive scripts. These behavioral scripts will further affect the preparedness for aggressive behavior. Additionally, the longitudinal study also has shown that childhood neglect positively predicts later aggressive behavior, supporting that neglect damages mental functioning obviously (Logan-Greene and Semanchin Jones 2015). The Developmental Traumatology Model (DTM) posits that exposure to childhood trauma increases the risk of post-traumatic stress disorder (PTSD), which is characterized by avoidance, overactive, and mistrust of others (De Beilis and Putnam 1994). PTSD patients are inclined to think that others will deliberately hurt them and thus become more hostile and aggressive (Lawrence-Wood et al. 2021). Considering the influence of childhood trauma on aggression and the association between aggression and malevolent creativity, we can reasonably assume that aggression may be conducted as a mediating variable in the hypothesized connection between childhood trauma and individual malevolent creativity.

1.3. Psychological Resilience as a Moderator

Psychological resilience, as one of the crucial protective factors, is defined as the ability to adapt positively to stressors or adversity and keep mental health in the presence of stressful events in the opinion of positive psychology (Kalisch et al. 2015; VanMeter and Cicchetti 2020). Despite exposure to adverse experience in early-life, individuals with higher resilience may not suffer emotional or psychological issues. A growing line of studies suggests that high psychological resilience is positively associated with decreased mental health issues (Anyan and Hjemdal 2016; Min et al. 2015). A longitudinal study

also found that about one-third of the high-risk children who had experienced severe stressful life events grew into healthy adults without grievous mental disorders (Werner 1996). Other studies have explored psychological resilience as the moderating variable between childhood trauma and aggression and also as a protective factor against aggressive behaviors (Kim et al. 2015; Nooripour et al. 2022). For instance, Kim et al. (2015) found that psychological resilience could attenuate aggressive behaviors in individuals who had been exposed to early life stress. Nooripour et al. (2022) supported that resilient individuals exhibited fewer aggressive behaviors and had better mental health. Therefore, psychological resilience may play a moderating role in the correlation between childhood trauma and aggressive behaviors. However, relatively little research has touched on the interaction effect of childhood trauma and psychological resilience on aggression.

Previous studies have pointed out that psychological resilience enables people to acquire the positive side of adversity, get rid of negative emotional experiences, and adapt to stressful environments (Tugade and Fredrickson 2004). Other studies also indicated that psychological resilience could alleviate negative emotions and reduce problem behavior in individuals who had experienced childhood trauma (Canale et al. 2019; Chang et al. 2021; Fedina et al. 2021). Additionally, The Rutter's Model of Development states that psychological resilience could reduce the negative influences of risk factors and minimize the severe adverse reactions to stressful events (Rutter 1999). Based on the literature above, it is reasonable to expect that psychological resilience may also attenuate the possible effects of childhood trauma on malevolent creativity. Therefore, we hypothesized that psychological resilience might moderate the indirect association between childhood trauma and malevolent creativity.

1.4. The Present Study

Taken together, the aims of the present study were two-fold. Firstly, the present research investigated whether aggression would mediate the association between childhood trauma and malevolent creativity. Secondly, we explored whether psychological resilience would moderate the correlation between childhood trauma and aggression. Specifically, a structural equation modeling was used to construct a moderated mediation model (Figure 1) to examine the association between childhood trauma and malevolent creativity. Based on the above literature, the present study predicted that childhood trauma would be positively correlated with malevolent creativity (Hypothesis 1). In addition, we predicted that aggression would mediate the association between childhood trauma and malevolent creativity (Hypothesis 2). We also predicted that psychological resilience would moderate the association between childhood trauma and aggression (Hypothesis 3).

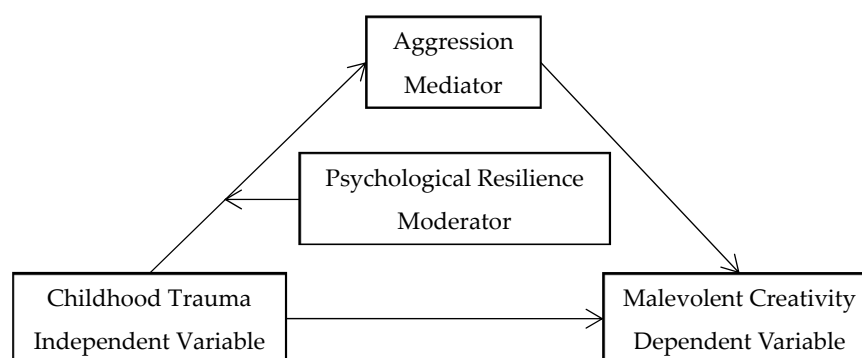


Figure 1. The hypothetical moderated mediation model.

2. Methods

2.1. Participants

The present study recruited 440 Chinese undergraduates. All subjects volunteered for an online survey on the website www.wjx.cn (accessed on 29 March 2022). The ques-

tionnaires selected in the present study were all modified or developed following a standard procedure, and the items were all in a concise and easily understandable Chinese version. The survey takes about eight minutes to fill out all questions. The data from 29 questionnaires were excluded from the further analysis because they included invalid answers or consumed time beyond three standard deviations ($\pm 3\sigma$). Additionally, the data from 22 questionnaires that included multivariate outliers (beyond $\pm 3\sigma$) were also excluded. Lastly, the valid data included 389 participants, which consisted of 144 males and 248 females, the mean age was 20.53 ± 1.70 years, ranging from 17 to 29 years. Participants were heterogeneous with regard to only-child (only-child = 35.40%, $n = 136$; non-only-child = 64.60%, $n = 253$) and place of birth (city = 25.60%, $n = 100$; town = 23.90%, $n = 94$; country = 50.50%, $n = 195$). G*Power was used to conduct the power analysis with statistical power = 0.95, significance level = 0.05 (two-tailed), and the number of predictors = 7, and the results revealed that the minimum sample of 153 participants would be adequate for detecting a medium effect size of 0.15 for the linear multiple regression analysis followed [Cohen \(1992\)](#). This indicated that the sample size of the present study was appropriate. The research procedure was approved by the local Ethics Committee.

2.2. Measures

2.2.1. Short Form of Childhood Trauma Questionnaire (CTQ-SF)

The original CTQ-SF, one of the widely used instruments ([Georgieva et al. 2021](#)), was developed to provide a reliable and valid retrospective evaluation of child abuse and neglect ([Bernstein et al. 2003](#)). The Chinese version of CTQ-SF was revised by [Zhao et al. \(2005\)](#), which had satisfactory reliability and validity. The scale consisted of 25 clinical items and three validity items. Each item asked about objective experiences and subjective evaluations in childhood and adolescence and was graded on a five-point Likert scale. Participants were asked to choose one of five options ranging from Never to Always. CTQ-SF consisted of five clinical factors: physical abuse, emotional abuse, sexual abuse, physical neglect, and emotional neglect. The examples of items and conceptions of abuse and neglect could be referred to in previous research ([Bernstein et al. 1994](#); [Bernstein et al. 2003](#)). The total score equaled the sum of all 25 clinical items. The higher the total score, the more severe any childhood trauma was. The Cronbach's alpha coefficient in the present study was 0.755.

2.2.2. Chinese Version of Buss & Perry Aggression Questionnaire (AQ-CV)

The Aggression Questionnaire (AQ) is a self-administered inventory that was initially developed by [Buss and Perry \(1992\)](#) and widely used to measure the trait of aggression. It was considered the gold standard for the survey of aggression ([Gerevich et al. 2007](#)). The Chinese version of AQ-CV was revised by [Li et al. \(2011\)](#) and is suitable for measuring Chinese college students. The AQ-CV consisted of 30 items which were rated on a five-point Likert scale. Each scale had five forced-choice options ranging from totally disagree to totally agree. The total score was the sum of the numerical answers of 30 items. The higher score of AQ-CV indicated a higher level of aggression. The Cronbach's alpha coefficient of AQ-CV in the present study was 0.927.

2.2.3. Connor-Davidson Resilience Scale (CD-RISC)

The CD-RISC was originally developed to provide a reliable and valid evaluation of psychological resilience ([Connor and Davidson 2003](#)) and was the most widely utilized measurement of resilience ([Velickovic et al. 2020](#)). The Chinese version of CD-RISC was translated and back-translated by [Yu and Zhang \(2007\)](#). This scale was rated based on how the participants felt about some particular situation, such as "able to adapt to change," "coping with stress strengthens," or "best effort no matter what". The CD-RISC included 25 items which were rated on a five-point Likert scale. Each item had five forced-choice options ranging from Not true at all to True all the time. The total score was computed by adding all the numerical answers of 25 items. The higher the score of CD-RISC, the greater

the psychological resilience. The Cronbach's alpha coefficient of CD-RISC in the present study was 0.964.

2.2.4. Malevolent Creativity Behavior Scale (MCBS)

The MCBS was utilized to measure the malevolent creative behaviors that occurred in daily life (Hao et al. 2016). Previous studies widely used MCBS to measure individuals' malevolent creativity (Hao et al. 2020; Jia et al. 2020). This scale consisted of 13 self-assessment items. Instructions for the MCBS asked participants to rate the frequency of the ideas or behaviors of malevolent creativity, such as the idea about "the new ways to punish people", "how to suppress people who are in your way", or "how to pull pranks on others", on a five-point Likert scale with five response options ranging from Never to Always (Hao et al. 2016). The total score of MCBS equaled the sum of all 13 items. The higher score of MCBS indicated more behaviors of malevolent creativity. The Cronbach's alpha coefficient of MCBS in the present study was 0.883.

2.3. Statistics Analysis

The descriptive statistical analysis and correlation analysis were conducted using SPSS. Model 7 in PROCESS 3.3 (Hayes 2013), a macro developed to analyze the mediation and moderation models, was utilized to test the hypothetical moderated mediation model. In model 7, in which psychological resilience was considered as the moderation variable, the interaction role of childhood trauma \times psychological resilience predicted the mediating variable (aggressive behavior). The demographic variables of participants containing gender, age, place of birth, and only child status, were entered in the model as covariates. The bias-corrected bootstrap method was used to calculate the 95% confidence interval (CI) for verifying the path coefficient. The effect would be regarded as statistical significance if zero was not contained in the 95% CI.

3. Results

3.1. Common Method Bias Assessment

Harman's single-factor test in SPSS was used to assess the common method bias. All the items of CTQ-SF, AQ-CV, CD-RISC, and MCBS were put into the un-rotated exploratory factor analysis. The results showed 19 components with initial eigenvalues greater than one were extracted. The first component accounted for 17.88% of the total variance, which was not greater than the critical value of 40%. The results indicated that the common method bias was not severe in the present study.

3.2. Descriptive Statistical Analysis

Table 1 shows the results of the descriptive statistical analysis. The value of the Skewness and Kurtosis showed that the score of CTQ-SF, AQ-CV, CD-RISC, and MCBS basically fitted the normal distribution (Hancock et al. 2010). On the advice from Tabachnick and Fidell (2007) and the large sample size in the present study, the raw data were used for the following statistical analysis.

Table 1. Descriptive statistical results of study variables.

| Variables | M | SD | Skewness | Kurtosis |
|--------------------------|-------|-------|----------|----------|
| Childhood trauma | 36.70 | 10.62 | 0.90 | −0.15 |
| Aggression | 56.70 | 16.47 | 0.29 | −0.25 |
| Psychological resilience | 80.64 | 21.56 | −0.47 | 0.19 |
| Malevolent creativity | 9.30 | 7.00 | 0.67 | −0.22 |

3.3. Correlation Analysis

Table 2 shows the results of the Spearman correlation analysis of the study variable. Results displayed that childhood trauma was significantly associated positively with aggres-

sion and malevolent creativity and significantly associated negatively with psychological resilience. The aggression was positively related to malevolent creativity.

Table 2. Correlation analysis results of study variables.

| | 1 | 2 | 3 | 4 |
|-----------------------------|-----------|----------|------|---|
| 1. Childhood trauma | — | | | |
| 2. Aggression | 0.23 *** | — | | |
| 3. Psychological resilience | −0.45 *** | −0.07 | — | |
| 4. Malevolent creativity | 0.19 *** | 0.56 *** | 0.01 | — |

Note: *** $p < 0.001$.

3.4. Aggression as the Mediator

After controlling the effects of gender, age, place of birth, and only child status, the mediation role of aggression between childhood trauma and malevolent creativity was tested using the linear regression analysis based on SPSS. Figure 2 shows the results of multiple linear regression analysis. The total effect (path c) of childhood trauma on malevolent creativity was statistically significant ($c = 0.17$, $p < 0.01$). Both Path a ($a = 0.18$, $p < 0.01$) of childhood trauma on aggression and path b ($b = 0.52$, $p < 0.001$) of aggression on malevolent creativity were significant. The indirect effect of aggression between childhood trauma and malevolence was 0.09 ($a \times b$), and the 95% CI was 0.038 to 0.159 , which indicated that the mediation role of aggression was statistically significant. The ratio of indirect effect to total effect was 52.94% . Additionally, the direct effect (path c') of childhood trauma on malevolent creativity was marginally significant ($c' = 0.08$, $p = 0.07$), which indicated that the relationship between childhood trauma and malevolent creativity was partially mediated by aggression.

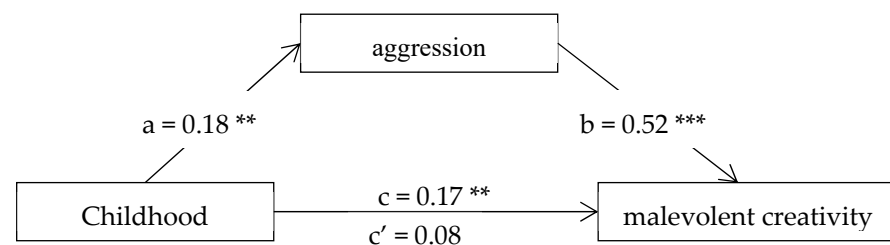


Figure 2. The mediation role of aggression between childhood trauma and malevolent creativity. Note. The mediation model was adjusted for the effects of gender, age, place of birth, and only child status. The letters a , b , c and c' denote standardized regression coefficients: c = total effect of childhood trauma on malevolent creativity; c' = direct effect of childhood trauma on malevolent creativity. ** $p < 0.01$, *** $p < 0.001$.

3.5. The Moderated Mediation Model Analysis

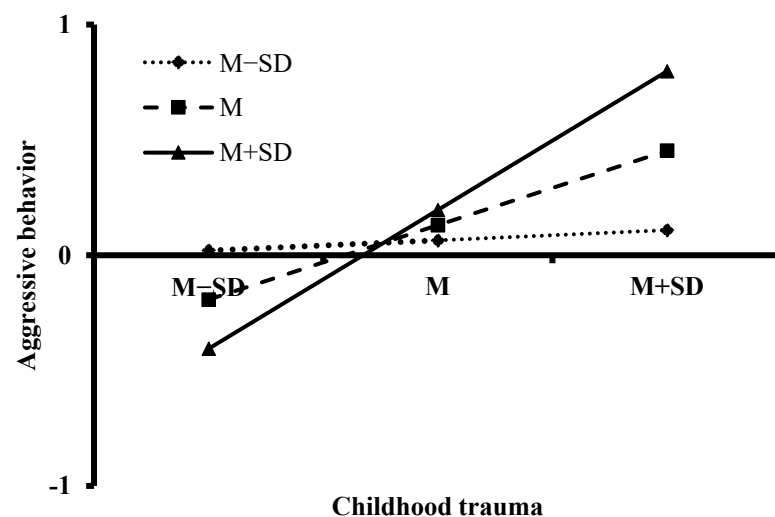
Model 7 in PROCESS 3.3 developed by (Hayes 2013) was used to explore the hypothetical moderated mediation model in which the indirect relations between childhood trauma and malevolent creativity would be moderated by psychological resilience. The results can be found in Table 3. The results showed that the interaction of childhood trauma and resilience significantly predicted aggression ($\beta = 0.28$, $t = 6.09$, $p < 0.001$). This result indicated that psychological resilience moderated the relationship between childhood trauma and aggression.

Table 3. Testing the moderation effect of resilience.

| | Aggression | | | |
|--------------------------------------|------------|-------|----------|---------------|
| | β | SE | t | 95% CI |
| Gender | 0.09 | 0.050 | 1.83 | −0.007, 0.190 |
| Age | 0.04 | 0.049 | 0.77 | −0.058, 0.133 |
| Residence | 0.03 | 0.051 | 0.59 | −0.071, 0.131 |
| One child | 0.03 | 0.052 | 0.64 | −0.069, 0.135 |
| Childhood trauma | 0.32 | 0.056 | 5.76 *** | 0.213, 0.433 |
| Resilience | 0.07 | 0.056 | 1.18 | −0.044, 0.176 |
| Childhood trauma \times resilience | 0.28 | 0.046 | 6.09 *** | 0.189, 0.369 |
| R^2 | 0.15 | | | |
| F | 9.62 *** | | | |

Note. SE, standard error. CI, confidence interval. *** $p < 0.001$.

Additionally, the simple slope analysis was performed to test the interaction and explore whether the slopes for participants with stronger psychological resilience were different from that for the participants with weaker psychological resilience. The results are shown in Figure 3. The effect of childhood trauma on aggression was stronger for participants with higher ($M + 1SD$) psychological resilience ($\beta = 0.60$, $t = 7.59$, $p < 0.001$, 95% CI [0.446, 0.757]) than that for participants with medium (M) psychological resilience ($\beta = 0.32$, $t = 5.76$, $p < 0.001$, 95% CI [0.213, 0.433]) and lower ($M - 1SD$) psychological resilience ($\beta = 0.04$, $t = 0.68$, $p = 0.495$, 95% CI [−0.083, 0.172]). That is to say, the aggressive behaviors of college students with high and medium levels of psychological resilience were more likely to be affected by childhood trauma than that of college students with a low level of psychological resilience. Meanwhile, resilience buffered the negative roles of low-level childhood trauma on aggression but magnified the negative effects of high-level childhood trauma.

**Figure 3.** The interaction effect of childhood trauma and psychological resilience on aggression.

Further, the moderated mediation model analysis revealed that the mediation role of aggression between childhood trauma and malevolent creativity was statistically moderated by psychological resilience (Index = 0.14, $SE = 0.03$, 95% CI [0.092, 0.205]). The results are shown in Table 4, indicating that the conditional indirect effect was 0.02, 95% CI (−0.047, 0.090) for $-1SD$ resilience, 0.17, 95% CI (0.102, 0.243) for M resilience, and 0.31, 95% CI (0.213, 0.432) for $+SD$ resilience. Thus, the moderated mediation assumption regarding psychological resilience was fully supported.

Table 4. The moderated indirect effect.

| Psychological Resilience | Indirect Effect | BootSE | 95% CI |
|--------------------------|-----------------|--------|---------------|
| $M - SD$ | 0.02 | 0.035 | −0.047, 0.090 |
| M | 0.17 | 0.036 | 0.102, 0.243 |
| $M + SD$ | 0.31 | 0.056 | 0.213, 0.432 |

4. Discussion

In the present study, a moderated mediation model was used to investigate the mechanisms underlying the association between earlier childhood trauma and later malevolent creativity. Our findings indicated that the correlation between childhood trauma and malevolent creativity is mediated by aggression. Exposure to more childhood trauma increased aggressive behavior, which in turn boosted the likelihood of malevolent creativity. Moreover, this indirect connection was moderated by psychological resilience in that the indirect effects of childhood trauma on malevolent creativity through aggression were only significant in participants with high resilience and not those with low resilience.

4.1. The Association between Childhood Trauma and Malevolent Creativity

The results show that childhood trauma was positively correlated with malevolent creativity. This implies that individuals who experienced more trauma in childhood were more likely to generate more malevolent creative behaviors in adulthood. Similarly, a survey investigated in China also showed that childhood neglect was positively associated with malevolent creativity (Jia et al. 2020). Other studies also found that parental negligence facilitated children's antisocial behavior and decreased their pro-social behavior (Llorca et al. 2017). Additionally, Guo et al. (2021) found that parental warmth was positively correlated with benevolent creativity. The present results underlines that the association between home environment and individual creativity cultivation is extremely complicated. That is, an advantageous home environment, parenting attitudes, and growing-up experiences facilitate the development of benevolent creativity behavior, while disadvantaged ones not only prevent its development but promote the development of malevolent creativity behavior (Guo et al. 2021). In the light of social information processing theory, people who have been exposed to more neglect and abuse in early life may be more likely to consider neutral social information as threatening cues, which could evoke hostile thinking (Gawronski and Cesario 2013) and aggressive behavior (Mobbs et al. 2015). Furthermore, traumatized individuals tend to be more vulnerable and easily get anxious or depressed when exposed to a threatening environment (Infurna et al. 2016; Zhao et al. 2022b). From the perspective of developmental psychology, emotion is an ability that emerges from various properties containing attention, memory, theory of mind, and categorization. Each of these abilities may be affected by childhood maltreatment (Ruba and Pollak 2020). What's more, individuals immersed in negative emotions are more likely to be more introspective, analytical, and insistent on their inner cognitive processing (De Dreu et al. 2012). Therefore, they can generate more original, useful, and harmful ways to harm others (Jia et al. 2020).

4.2. The Mediating Role of Aggression

The findings that aggression partially mediated the connection between childhood trauma and malevolent creativity are consistent with Hypothesis 2. The results indicated that aggression was positively associated with malevolent creativity, which implies that individuals with a high level of aggression usually show more malevolent creativity behaviors. This is consistent with the study by Lee and Dow (2011), who reported that the trait of physical aggression is positively associated with malevolent creativity as measured by divergent thinking tasks. Other studies also report that malevolently creative ideas generated in the problem-solving task were significantly greater in participants who are more implicitly aggressive than in participants who are less implicitly aggressive. In addition, our findings indicated that childhood trauma was positively associated with aggression.

This result implies that individuals who are exposed to more maltreatment in early life usually show more aggressive behaviors in adolescence or adulthood. This is consistent with vast numbers of previous studies (He and Xiang 2021; Ma et al. 2022; Schwarzer et al. 2021; Xiao et al. 2021), which showed that maltreated individuals are more likely to generate aggressive behavior. This result is also consistent with the theoretical perspectives of GAM (Anderson and Bushman 2002), which indicated that individuals exposed to childhood trauma tend to normalize the use of violence and increase aggressive behavior. Therefore, individuals who were abused or neglected in childhood are more likely to generate more aggressive behaviors and then generate more malevolent creativity behaviors.

4.3. *The Moderating Role of Psychological Resilience*

This study further found that psychological resilience moderated the association between childhood trauma and aggression. The present results indicated that individuals with high resilience are more likely to be aggressive when they have experienced abuse and neglect in childhood. In other words, individuals exposed to high levels of childhood trauma were more likely to engage in aggressive behaviors when the level of resilience was high, while individuals exposed to low levels of childhood trauma were more likely to engage in aggressive behaviors when the level of resilience was low. There is inconsistent evidence concerning the boon of resilience for individuals who have experienced adversity. Some studies indicated that high-resilience individuals have enough ability to adapt to stressors or adversity and maintain mental health in the presence of stressful events or adversity (Kalisch et al. 2015; VanMeter and Cicchetti 2020). Other studies also showed that psychological resilience could attenuate the aggressive behaviors in individuals who had been exposed to early life stress (Kim et al. 2015; Nooripour et al. 2022).

One possible explanation might correlate with the stress-buffering model and reverse the stress-buffering model, which provides the theoretical framework with regard to the moderating effect of social support on the association between stressful events and depression (Rueger et al. 2016). The stress-buffering model posits that the negative effects of stress on mental health are more serious among those with insufficient social support than those with sufficient support (Rueger et al. 2016). Our results showed that the deleterious effects of low-level childhood trauma are greater among those with limited psychological resilience than those with adequate resilience. However, the reverse stress-buffering model supposes that the negative effects of stress on mental health are greater among those with sufficient support than those with insufficient support (Rueger et al. 2016). Our results were consistent with the reverse stress-buffering model. The harmful effects of high-level childhood trauma are greater among those with adequate resilience than those with limited resilience. Therefore, these results indicate that childhood trauma with different severity may not allow the individual to fully utilize the benefits of psychological resilience. It is possible to assume that some early traumatic contexts may restrain the effects of resilience, which emphasize the potential advantage of both “stress-buffering” (effects of resilience are enhanced while the level of childhood trauma is low) and “reverse stress-buffering” (effects of resilience are dampened while the level of childhood trauma is high).

Another possible explanation could be that resilience is a dynamic and ordinary process instead of a rare and extraordinary process (Masten 2001). Rutter (2012) pointed out that resilience has a “huge heterogeneity in response to all manners of environmental hazards”. Fincham et al. (2009) found, for example, that an individual’s resilience could not buffer the negative roles of high levels of stress on post-traumatic stress disorder (PTSD) symptoms. In their review article on re-evaluating resilience across various levels of risk, Vanderbilt-Adriance and Shaw (2008) indicated that psychological resilience might not attenuate the negative effects of childhood adversity because they were at a too high level of stress. Pauly et al. (2021) also found that a high-level conscientious persona trait correlated with high-level stress in individuals with high-level resilience. These studies seemed to indicate that the buffer effect of resilience was conditional on the severity of the negative or adverse experiences. Additionally, high levels of positive emotions were typically

characteristic of psychological resilience (Tugade and Fredrickson 2004). Another possible reason could be that high levels of childhood trauma and high levels of psychological resilience could be correlated with a strong feeling of having to release tension, stress, and pain, which might derive from childhood abuse and neglect. In turn, this would cause further aggressive behaviors. Thus, future studies will contribute to determining more consistent associations among childhood trauma, aggression, and psychological resilience. Particularly, the moderated mediation analysis revealed that psychological resilience moderated the strength of the association between childhood trauma and malevolent creativity mediated by aggression. That is, the indirect effect was highest in the group with high psychological resilience while lowest with those in the low resilient group. It seems that with increasing psychological resilience, the correlation between childhood trauma and malevolent creativity mediated by aggression was strengthened. However, when resilience decreased to a certain level (lower than $M - SD$), the indirect effect of childhood trauma on malevolent creativity had no statistical significance. This results partially consistent with the association between psychological resilience and creativity (Anser et al. 2022; Chen 2015; Marwa and Milner 2013; Xu et al. 2021), which indicated that psychological resilience positively predicted benevolent creativity. Thus, psychological resilience might also increase the emergence of malevolent creativity when individuals exposed to childhood trauma. Additionally, it is also possible to speculate that the buffering effects of resilience are enhanced while the level of childhood trauma is low, and the effects of resilience are dampened while the level of childhood trauma is high.

This finding is roughly consistent with the perspectives of Rutter (2012), who claimed that exposure to adversity might contribute to increased resilience to later adversity (called the steeling effect) rather than a sensitization or increased vulnerability. In the present study, the association between severe trauma and adversity with increased aggressive behaviors and malicious creative behaviors may reflect the steeling effect (Rutter 2012), which released negative effects of childhood trauma by attacking others and further resulted in more malevolent creativity. The steeling effects might let individuals with greater childhood abuse and/or neglect be better able to successfully adapt to adversity or stressors by the emergence of aggressive behaviors instead of depression and maintain mental health in the face of trauma or stressor. Of course, further studies are needed to explore this conjecture of whether individuals with low-level resilience may be more vulnerable to depression when exposed to high-level childhood trauma, and individuals with high-level resilience may display more aggressive behaviors instead of depressive symptoms.

5. Limitations and Implications

There are some limitations of the present research that should be mentioned. Firstly, the cross-sectional design and correlation analysis used in the present study to investigate the moderated mediation model cannot establish the causal association among study variables and may lead to possible biased estimates of parameters (Maxwell and Cole 2007). Further longitudinal or experimental studies will be needed to identify the moderated mediation model. Secondly, the retrospective self-reported questionnaire was used to measure childhood trauma, which may lead to inaccurate answers because of the distant memory that occurred in childhood. Multiple forms of measures should be taken to assess early life experiences. Thirdly, the participants enrolled in the present study were all undergraduates, who are a special group compared with other age colonies. This limited the interpretation and prediction of the malevolent creativity of other age colonies based on the results of the present study. Various age groups will be needed to replicate our findings in future studies. Only then will it be possible to improve the quality of the survey data and provide more possible insights into the associations among variables investigated than that being explored in the present study.

Although the present study has some limitations, these should not overshadow its implications. The results of the present study further explain malevolent creativity in connection with early environmental and individual difference factors and extend the

understanding of malevolent creativity. Childhood adverse experiences can strongly facilitate the emergence of malevolent creativity. These negative growing environments also have indirect effects on malevolent creativity through the mediating role of aggression, but depending on a person's resilience level. With that in mind, the interaction effect indicated that high resilience could buffer the negative roles of low-level childhood trauma on aggression but magnify the negative effects of high-level childhood trauma. Resilient individuals with exposure to high-level childhood trauma will have more aggressive behavior. Therefore, we must draw attention to the malevolent creativity of individuals who have experienced more childhood abuse and neglect and have high-level resilience and guide them with the proper way to due attention to childhood trauma and decrease the expression of malevolent creativity.

6. Conclusions

In summary, the present study further validated the association between childhood trauma and malevolent creativity in the sample of Chinese college students. The findings illustrated the mediating effect of aggression in the pathway from childhood trauma to malevolent creativity behavior. Additionally, the results also showed evidence of two-way interaction, indicating that psychological resilience moderated the correlation between childhood trauma and aggression. Participants with low resilience had bigger changes of aggression and smaller changes of malevolent creativity across both low and high levels of childhood trauma than those with high resilience.

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