

Deliberate Rumination and Post-Traumatic Growth in College Students With Childhood Trauma: A Moderated Mediation Model

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Abstract

This survey study aims to investigate the relationship between positive coping and post-traumatic growth among trauma survivors, as well as the mediating role of positive coping and the moderating role of perceived social support. Methods: This study screened 811 university students aged 18-28 with trauma experience using the Life Events Checklist (Student Version) as research participants. The survey covered multiple universities in Hunan Province, and the Deliberate Rumination Scale, Post-traumatic Growth and Positive Coping Scales, and Perceived Social Support Scale were administered. Results: Correlation analysis revealed that deliberate rumination, positive coping, and post-traumatic growth were significantly correlated. Regression analysis showed that the direct effect of deliberate rumination on post-traumatic growth was significant ($\beta=0.148$, $p<0.001$). Results from the moderated mediation model indicated that positive coping mediated the relationship between deliberate rumination and post-traumatic growth, while perceived social support moderated the relationship between positive coping and post-traumatic growth. Further simple slopes analysis revealed that when perceived social support was high, deliberate rumination did not significantly predict PTG; when perceived social support was low, deliberate rumination significantly and positively predicted PTG, indicating that as perceived social support decreased, the predictive effect of deliberate rumination on PTG showed a gradually increasing trend.

Full Text

The Relationship Between Purposeful Rumination and Post-Traumatic Growth in College Students with Childhood Trauma Experiences: A Moderated Mediation Model

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This survey study aims to explore the relationship between positive coping and post-traumatic growth in individuals with trauma experiences, as well as the mediating role of positive coping and the moderating role of perceived social support. Methods: This study screened 811 college students aged 18-28 with trauma experiences through the Traumatic Events Lifelong Experience Questionnaire (Student Version). The survey covered multiple universities in Hunan Province, and data were collected using the Purposeful Rumination Scale, Post-Traumatic Growth Inventory, Positive Coping Scale, and Perceived Social Support Scale. Results: Correlation analysis revealed significant correlations among purposeful rumination, positive coping, and post-traumatic growth. Regression analysis showed that purposeful rumination had a significant direct effect on post-traumatic growth ($\beta=0.148$, $p<0.001$). Results from the moderated mediation model indicated that positive coping mediated the relationship between purposeful rumination and post-traumatic growth, while perceived social support moderated the relationship between positive coping and post-traumatic growth. Further simple slope analysis revealed that when perceived social support was high, the predictive effect of purposeful rumination on PTG was not significant; when perceived social support was low, purposeful rumination significantly and positively predicted PTG, indicating that as perceived social support decreased, the predictive effect of purposeful rumination on PTG gradually increased.

Keywords: post-traumatic growth; purposeful rumination; perceived social support; positive coping

Abstract

The purpose of this study was to explore the relationship between positive coping and post-traumatic growth in trauma experiencers, as well as the mediating role of positive coping and the moderating role of perceived social support. Meth-

ods: In this study, 811 college students aged 18-28 who had traumatic experience were selected through the Traumatic Events Lifelong Experience Questionnaire (Student Version) as the research subjects. The survey covered many universities in Hunan Province, and the Purpose Rumination Scale, Post-Traumatic Growth Inventory, Positive Coping Scale, and Perceived Social Support Rating Scale were used for investigation. Results: Correlation analysis showed that purposeful rumination, positive coping, and post-traumatic growth were significantly correlated. Regression analysis showed that purposeful rumination had a significant direct effect on post-traumatic growth ($\beta=0.148$, $p<0.001$). The results of the moderated mediation model showed that positive coping played a mediating role in the relationship between purposeful rumination and post-traumatic growth, and perceived social support played a moderating role in the relationship between positive coping and post-traumatic growth. Furthermore, the simple slope analysis showed that the predictive effect of purposeful rumination on PTG was not significant when perceived social support was high, and the positive predictive effect of purposeful rumination on PTG was significant when perceived social support was low, indicating that the predictive effect of purposeful rumination on PTG gradually increased with the decrease of perceived social support.

Keywords: post-traumatic growth; purposeful rumination; perceived social support; positive coping

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I. Introduction

During individual development, people may experience traumatic events such as domestic violence, school bullying, and natural disasters. Research has found that over 70% of individuals experience at least one traumatic event in their lifetime, with 85% of college students having experienced trauma during childhood. When individuals experience traumatic events, their trauma symptoms mainly manifest as recurrent intrusive traumatic experiences, persistent hypervigilance, negative emotional experiences, and avoidance behaviors (Zhang Yuejuan et al., 2013). Traumatic symptoms may appear after experiencing or witnessing severe harm or life-threatening events such as bullying, violence, sexual assault, accidental injury, or illness. Trauma symptoms are an extremely common psychological disorder, and research on the relationship between traumatic events and psychological disorders in college students is currently an important topic in injury epidemiology (Dai Jinhui and Yuan Jing, 2016). Previous trauma research has primarily focused on the negative impacts of trauma on individuals. However, studies have found that after experiencing traumatic events, individuals may not only experience negative consequences but also positive changes and achieve a certain degree of growth. Tedeschi and Calhoun termed these changes Post-Traumatic Growth (PTG) (Teng Yan, 2023). Post-traumatic growth has positive effects on individuals, such as enabling them to handle similar events calmly in the future and comprehending more lessons from traumatic events, thereby promoting individual growth. When we begin to emphasize the positive effects following trauma, we can better provide psychological guidance to college students and facilitate the development of mental health education in universities.

With the rise and development of positive psychology, the influencing factors and mechanisms of post-traumatic growth have gradually become a focal point for researchers. Purposeful rumination is considered an important factor affecting post-traumatic growth, referring to individuals' conscious positive thinking about trauma-related cues, tendency to face difficulties calmly, and problem-solving orientation. It is a constructive form of cognition (Zhou Xiao et al., 2014; Cann et al., 2011). Research has shown that purposeful rumination is positively correlated with post-traumatic growth and can promote psychological growth after trauma, manifested in various aspects such as courage in facing life, interpersonal relationship management, and spiritual changes. Purposeful rumination has a significant positive predictive effect on post-traumatic growth (Yao Lingyu et al., 2019; Henson et al., 2021). Therefore, this study proposes Hypothesis 1: Purposeful rumination can positively predict post-traumatic growth.

Purposeful rumination leads individuals to think about whether they can find meaningful things and whether their lives have changed after trauma. As the frequency of purposeful rumination increases, individuals' post-traumatic growth levels also increase accordingly, prompting continuous reflection and positive influence. When individuals experience traumatic events without sufficient coping resources, they may trigger many stress responses, including post-traumatic

stress disorder symptoms (Trickey et al., 2012). However, if these stress disorder symptoms are overcome by individuals, they can become catalysts for growth and may lay the foundation for individuals' self-identity (Taku & McDiarmid, 2015). After experiencing trauma, individuals may not only experience pain and disorders but also have an opportunity for self-change and can use these experiences to better cope with trauma, enabling better self-meaning and personal growth (Chen Jieling et al., 2015). This demonstrates that purposeful rumination can help individuals better cope with traumatic events, achieve psychological growth and transformation, and change people's cognition and processing methods regarding events. Theoretically, the premise of post-traumatic growth is that the trauma is sufficient to shake the basic assumptions of self and world (Tedeschi & Calhoun, 2004; Zhang Qian and Zheng Yong, 2009). These basic assumptions can guide individuals' cognition and behavior, help individuals clarify the causes of events, and include individuals' understanding and thinking about self, others, and the world (Zhang Xuehua, 2011). Therefore, purposeful rumination can prompt individuals to think positively after experiencing traumatic events, enabling them to face and solve problems effectively. It can be seen that only when individuals engage in purposeful rumination can they adopt correct coping methods, which are positive and thus promote post-traumatic growth. Previous studies have also confirmed that positive coping is closely related to post-traumatic growth, and individuals who adopt positive coping methods to deal with traumatic events can often recover from trauma more quickly, reduce psychological distress, and promote post-traumatic growth. The study by An Yuanyuan et al. (2013) also confirmed that positive coping can significantly and positively predict individuals' PTG. In summary, Hypothesis 2 is proposed: Purposeful rumination promotes post-traumatic growth through positive coping.

The stress-buffering model suggests that perceived social support can provide a buffer for individuals after trauma (Cohen & Wills, 1985). When individuals experience trauma, if they can obtain social support, they will feel strength and support from others, enabling them to have a more positive attitude when processing and facing traumatic events. When facing stress and challenges, they can better receive care and support from others, thus adopting more positive coping methods. Perceived social support can not only improve individuals' problem-solving abilities but also alleviate psychological stress, promote positive reflection on traumatic events, and facilitate post-traumatic growth. Perceived social support differs from actual social support; it is a subjective evaluation of one's intuitive feelings and various degrees of social support [3], and it can regulate negative emotions and self-pressure, allowing individuals to receive more support and help on the basis of positive coping, continuously improving their psychological intervention mechanisms, cultivating psychological qualities of loving life, and simultaneously promoting individual post-traumatic growth. Brooks (2016) and other scholars confirmed in their research on post-traumatic growth in students facing adversity that the level of social support can directly predict their post-traumatic growth level. Similar research results

include Tian Ruijie et al. (2018), who confirmed in their study on post-traumatic growth levels in dialysis patients that patients with higher perceived social support also had higher post-traumatic growth levels. Based on the above research, the following Hypothesis 3 is proposed: The latter path of purposeful rumination promoting post-traumatic growth through positive coping is moderated by perceived social support.

Based on the above research and hypotheses, this paper proposes a moderated mediation model to explore the mechanism of purposeful rumination, positive coping, and perceived social support on post-traumatic growth. Purposeful rumination directly affects post-traumatic growth, positive coping mediates the relationship between purposeful rumination and post-traumatic growth, and perceived social support plays a moderating role in this process (see Figure 1).

II. Methods

(I) Participants

This study selected college students from various grades at three universities as participants. A total of 1,000 questionnaires were distributed, with 900 successfully recovered, of which 811 were valid questionnaires. The recovery rate was 90%, and the validity rate was 90.1%. Using the Traumatic Events Lifelong Experience Questionnaire-Student Version (LITE-S) for screening, we identified college students aged 18-28 with trauma experiences as research subjects. The screening criterion was that participants selected “yes” for at least one of the 16 traumatic events listed in the questionnaire. The results showed that 597 individuals (85% of the total) had experienced at least one traumatic event. Among them, 204 individuals (29% of the total) had experienced four or more traumatic events, while 105 individuals (15% of the total) had not experienced any traumatic events. Participants’ ages ranged from 18-28 years, with the largest number of participants aged 20 and 21, accounting for 45.1% of the total. The average age was 21.70 years. In terms of gender distribution, there were 328 males and 483 females. Basic participant information is detailed in the tables.

(II) Measures

1. Purposeful Rumination Scale The Chinese version revised by Dong Chaogun (2013) was used, with a 4-point Likert scoring method where 0 represents “never” and 4 represents “often.” Higher scores indicate higher levels of rumination. This questionnaire was developed based on post-traumatic growth theory and assesses both adaptive and maladaptive dimensions of post-trauma cognitive processing. In this study, the Cronbach’s α coefficients for the total scale and each dimension were 0.974, 0.963, and 0.960, respectively. See Appendix [2].

2. Post-Traumatic Growth Inventory Developed by Tedeschi and Calhoun in 1996, this scale includes 21 items divided into five dimensions: interpersonal

relationships, new possibilities, personal strength, spiritual change, and appreciation of life. Scoring uses a 0-5 point 6-level rating system, with higher scores indicating higher levels of post-traumatic growth. The scale's internal consistency reliability is $\alpha=0.90$, with a two-month test-retest reliability of 0.71. This study used the Chinese version revised by Zhang Yuejuan et al. (2013), which has been validated in military academy students and other groups. See Appendix [3].

3. Positive Coping Scale The positive coping subscale from the Simple Coping Style Scale compiled by Xie Yaning et al. (2000) was used, including 12 items with a 4-point scoring method. The Likert 4-point scale ranges from 0 (“never”) to 4 (“often”), with higher scores representing more positive coping styles. The positive coping dimension includes items 1-12. Reliability measurement showed a Cronbach's α of 0.90 and validity of 0.89 for the positive coping dimension. See Appendix [4].

4. Perceived Social Support Scale Based on Zimet et al.'s Multidimensional Scale of Perceived Social Support (MSPSS), Jiang Qianjin et al. translated and revised it into the Perceived Social Support Scale (PSSS) as a tool to measure individuals' self-perceived social support from multiple sources. The scale consists of 3 dimensions with 12 items: family support (items 3, 4, 8, 11), friend support (items 6, 7, 9, 12), and other support (items 1, 2, 5, 10). The scale uses a 7-point rating method (1=“completely disagree” to 7=“completely agree”). Higher total scores reflect higher levels of perceived support from others. Scores are categorized as: 12-36 (low perceived support), 37-60 (medium perceived support), and 61-84 (high perceived support). Reliability measurement showed Cronbach's α coefficients of 0.87, 0.85, 0.91, and 0.88 for family support, friend support, other support, and the full scale, respectively, with test-retest reliabilities of 0.85, 0.75, 0.72, and 0.85.

5. Traumatic Experience Scale The Traumatic Events Lifelong Experience Questionnaire-Student Version, developed by Greenwald and Rubin (1999) and translated by Liao Ximing (2007), was used. The scale includes 16 items, with the first 15 covering various types of traumatic events and the 16th being an open-ended question. Participants responded “yes” or “no” to the first 15 items; if answering “yes,” they further rated “pain level at that time” using a 3-point scale from 0 (none) to 2 (a lot). In this study, the overall Cronbach's α coefficient was 0.82.

(III) Data Processing

Data were processed using SPSS 27.0 and the SPSSPRO 2024 web platform. Harman's single-factor analysis was conducted, and bias-corrected non-parametric percentile Bootstrap method was used to test mediation effects. Questionnaires with missing values were directly excluded.

III. Results

(I) Common Method Bias Test

According to Harman's single-factor analysis theory, unrotated exploratory factor analysis was conducted. Results showed that six common factors with eigenvalues greater than 1 were extracted, with the first principal factor explaining 17.906% of variance, below the 40% criterion (Zhou Hao and Long Lirong, 2004). Therefore, this study was not severely affected by common method bias. See Appendix [1].

(II) Descriptive Statistics

1. Demographic Characteristics This study used SPSS 27.0 to conduct case statistics and demographic characteristic analysis. The results are shown in Table 1 (demographic variables summary table) and Table 2.

2. Demographic Differences in Purposeful Rumination, Positive Coping, and Post-Traumatic Growth Analysis of demographic differences revealed several key findings. Gender differences showed that males and females differed significantly only on perceived social support (male mean=56.253, female mean=58.462, $P=0.025^{**}$, Cohen's $d=0.161$), with no significant differences in post-traumatic growth ($P=0.103$, Cohen's $d=0.121$), purposeful rumination ($P=0.126$, Cohen's $d=0.11$), or positive coping ($P=0.403$, Cohen's $d=0.06$). Independent samples t-tests showed that different genders differed significantly only on perceived social support dimension scores ($p<0.05$), with males scoring significantly lower than females.

Regarding family structure differences, no significant differences were found between single-parent and non-single-parent families in perceived social support ($P=0.657$, Cohen's $d=0.042$), post-traumatic growth ($P=0.093$, Cohen's $d=0.142$), purposeful rumination ($P=0.961$, Cohen's $d=0.004$), or positive coping ($P=0.658$, Cohen's $d=0.038$). However, only-child status showed significant differences in post-traumatic growth ($p<0.05$), with only-children scoring significantly higher than non-only-children.

Across grade levels (freshman, sophomore, junior, senior), no significant differences were found in positive coping dimension ($P=0.303$), perceived social support ($P=0.568$), post-traumatic growth (Welch's $F=0.326$, $P>0.05$), or purposeful rumination ($P=0.054$). This indicates no significant grade-level differences in post-trauma psychological responses and growth.

Significant differences were found across hometown regions in all variables: positive coping ($F=3.52$, $P=0.030$), **perceived social support ($F=3.616$, $P=0.028$)**, post-traumatic growth ($F=8.558$, $P=0.000$), and **purposeful rumination ($F=7.536$, $P=0.001$)**. Post-hoc analysis revealed that post-traumatic growth differed significantly across regions ($P=0.000^{***}$), indicating that hometown region significantly influences trauma recovery outcomes.

3. Correlation Analysis Considering the linear relationships among variables, this study used Pearson correlation analysis to calculate correlation coefficients. The results are presented in Table 7. The correlation matrix revealed complex patterns: purposeful rumination showed negative correlations with gender, age, hometown region, family structure, and only-child status, with a particularly significant negative association with hometown region. However, purposeful rumination demonstrated positive correlations with post-traumatic growth and positive coping. Positive coping showed a significant positive association with only-child status but negative associations with other demographic factors, while correlating significantly with both purposeful rumination and post-traumatic growth. Post-traumatic growth exhibited negative correlations with age, hometown region, and only-child status, but positive correlations with purposeful rumination and positive coping. These findings highlight the multifaceted relationships between demographic factors and psychological variables in trauma recovery.

4. Mediating Effect of Positive Coping Since demographic variables (gender, hometown region, age) and core variables (purposeful rumination, positive coping, post-traumatic growth) were partially correlated, gender, hometown region, and age were controlled in mediation and moderated mediation tests. All continuous variables were centered, and Process macro Model 4 was used for mediation testing. Results showed that purposeful rumination had a significant direct positive predictive effect on PTG ($\beta=0.148$, $t=4.259$, $p<0.001$). After adding positive coping as a mediator, the positive predictive effect of purposeful rumination on PTG remained significant ($\beta=0.095$, $t=2.196$, $p<0.005$). Purposeful rumination significantly predicted positive coping ($\beta=0.143$, $t=4.106$, $p<0.001$), and positive coping significantly predicted PTG ($\beta=0.368$, $t=11.32$, $p<0.001$). The mediating effect value of positive coping between purposeful rumination and PTG was 0.143, with a Bootstrap 95% confidence interval of [0.059, 0.240], not containing zero, indicating that both direct and indirect effects were significant. The mediating effect (0.143) accounted for 35.83% of the total effect (0.399).

5. Moderating Effect of Perceived Social Support Building on the mediation model, perceived social support was added to examine whether it moderated the direct path from purposeful rumination to PTG and the first half of the mediation model. With gender, age, and hometown region as control variables, positive coping as the mediator, perceived social support as the moderator, and PTG as the dependent variable, SPSS macro PROCESS Model 8 was used to test the moderating effect.

Results showed that Equation 1 was significant overall, $F(5,805)=34.715$, $p<0.001$. Purposeful rumination had a significant positive effect on positive coping ($\beta=0.456$, $p<0.001$), and the interaction between positive coping and perceived social support had a significant effect on cognitive reappraisal ($\beta=1.338$, $p<0.001$), indicating that the effect of positive coping on PTG was influenced by perceived social support. Equation 2 was also significant,

$F(6,804)=30.508, p<0.001$. The direct effect of purposeful rumination on PTG was significant ($\beta=0.194, p<0.001$), and the interaction between purposeful rumination and perceived social support had a significant effect on PTG total score ($\beta=-0.016, p<0.005$), indicating that perceived social support moderated the direct prediction of PTG by purposeful rumination.

To further reveal the moderating mechanism, simple slope analysis was conducted by dividing perceived social support into high ($M+1SD$) and low ($M-1SD$) groups. Simple slope tests indicated that when perceived social support was high, purposeful rumination did not significantly predict PTG; when perceived social support was low, purposeful rumination significantly and positively predicted PTG. This demonstrates that as perceived social support decreases, the predictive effect of purposeful rumination on PTG gradually increases.

IV. Discussion

(I) Analysis of Demographic Variables in Trauma Experiencers

This study analyzed seven demographic variables (gender, hometown region, grade level, only-child status, mother's education level, father's education level, and single-parent family status) to examine differences in post-traumatic growth. Based on the Pearson correlation matrix and heatmap analysis, the correlation coefficients between these demographic variables and post-traumatic growth were: gender (0.059), age (-0.039), grade level (-0.038), only-child status (-0.059), and single-parent family status (0.02). These varying correlations (in direction and magnitude) suggest that different demographic variables relate differently to post-traumatic growth, indicating the presence of demographic differences.

(II) Overall Post-Traumatic Growth Levels in Trauma Experiencers

At the individual level of demographic variables, analysis of differences in post-traumatic growth revealed that when hometown region served as the demographic variable, the P-value was 0.000^{***} , reaching the 1% significance level, leading to rejection of the null hypothesis. This indicates significant overall differences, suggesting that different hometown regions show significant differences in post-traumatic growth. However, based on data from other demographic variables, significance levels were above 10% ($p>0.1$), failing to reject the null hypothesis. Therefore, it is difficult to conclude that other demographic variables (besides hometown region) show significant individual differences in post-traumatic growth. This finding demonstrates that post-traumatic growth is not uniform but varies due to hometown region factors, leading to diverse recovery processes. Therefore, when researching and intervening in post-traumatic growth, it is necessary to fully consider the role of these factors to develop more precise and effective strategies.

(III) Analysis of the Relationship Between Purposeful Rumination and Positive Coping

According to the correlation analysis, Pearson correlation testing revealed a correlation coefficient of 0.146** between purposeful rumination and positive coping (**significant at the 0.01 level, two-tailed). The data show a significant positive correlation between purposeful rumination and positive coping variables. This indicates that when individuals face stress or challenges, those who tend to engage in purposeful reflection are more likely to adopt positive coping methods. By cultivating individuals' purposeful reflection abilities and positive coping styles, we can effectively promote individual growth and adaptation.

(IV) Predictive Effect of Purposeful Rumination on Post-Traumatic Growth Level

According to the mediation analysis results, the predictive effect analysis of purposeful rumination on post-traumatic growth level showed $\beta=0.148$, $t=4.259$, $p<0.001$. With $p<0.001$ at the 1% significance level, the null hypothesis is rejected, indicating significant results. The positive β value shows that purposeful rumination has a direct positive predictive effect on post-traumatic growth level. This predictive effect is achieved by promoting adaptive thinking, reducing negative emotions, enhancing psychological resilience, and facilitating self-awareness. Therefore, in post-trauma interventions, individuals should be encouraged to engage in purposeful rumination to promote their post-traumatic growth.

(V) Analysis of the Mediating Role of Positive Coping

After adding the mediating variable (positive coping), analysis showed that purposeful rumination had direct positive predictive effects on post-traumatic growth, positive coping, and positive coping had a direct positive predictive effect on post-traumatic growth. The predictive factors β were 0.095, 0.143, and 0.368, respectively. Mediation effect test results showed ab (P -value)=0.002**, reaching the 1% significance level, indicating that the overall mediation effect of “purposeful rumination \rightarrow positive coping \rightarrow post-traumatic growth” was significant. Further Bootstrap testing confirmed a partial mediating effect. Therefore, purposeful rumination promotes the formation of positive coping styles, which in turn facilitate post-traumatic growth. Positive coping plays a partial mediating role between purposeful rumination and post-traumatic growth, providing important insights for understanding and promoting individual growth under stress.

(VI) Analysis of the Moderating Role of Perceived Social Support

Perceived social support serves as a moderating variable that influences the direct effect of positive coping on post-traumatic growth. Research results showed that the interaction term between purposeful rumination and perceived social

support had a significant effect on cognitive reappraisal ($\beta=1.338$, $p<0.001$), and the interaction between purposeful rumination and perceived social support significantly affected post-traumatic growth total score ($\beta=-0.016$, $p<0.005$). Simple slope analysis revealed that when perceived social support was high, purposeful rumination did not significantly predict PTG, but when perceived social support was low, purposeful rumination significantly and positively predicted PTG. This demonstrates that perceived social support, as an individual's perception of care, respect, and help from others, significantly affects mental health and growth. When experiencing trauma or stress, perceived social support provides emotional comfort and substantive help, reducing psychological pressure and promoting recovery and growth. Perceived social support significantly moderates the mediating effect of positive coping on the relationship between purposeful rumination and post-traumatic growth. Higher levels of perceived social support strengthen the promoting effect of positive coping on the relationship between purposeful rumination and post-traumatic growth, likely because social support provides more resources, enhancing individuals' confidence and ability to cope with stress and challenges.

V. Recommendations

(I) Positive Thinking and Self-Acceptance

Demographic variables lead to diverse post-traumatic growth processes. During individual growth, people inevitably experience traumatic events. Purposeful rumination for post-traumatic growth is a positive cognitive approach that enables cognitive processing and transformation. Individuals can correctly face the negative effects of traumatic events, reprocess these events, recognize and accept their emotions (including trauma-related feelings), learn to distinguish healthy rumination from unhealthy rumination, and prevent negative emotions from “assimilating” or “accommodating” core beliefs, thereby effectively promoting post-traumatic growth and adaptation.

(II) Personalized Intervention

Each individual's experiences and needs differ, as do their methods for alleviating negative emotions. When developing precise and effective strategies, demographic differences should be fully considered. Individuals can adopt appropriate methods to regulate pain from traumatic events and engage in positive self-adjustment, such as producing dopamine through exercise, releasing stress through singing, or cultivating sentiments through painting. Art therapy and expressive writing can be researched, and personalized services such as career planning and personal development counseling can be provided to help individuals set goals, enhance self-efficacy, and promote post-traumatic growth.

(III) Enhance Social Support

When individuals experience trauma or stress, perceived social support provides emotional comfort and substantive help. By encouraging individuals to actively participate in social activities and build social networks, and by involving family members, teachers, and classmates, we can promote understanding and communication within individuals' social circles, open their hearts, and build a more supportive internal recovery environment. This gives individuals more confidence and ability to cope with stress and challenges, thereby achieving post-traumatic growth and reducing psychological pressure to promote recovery and development.

(IV) Build Psychological Support Systems and Conduct Regular Educational Interventions

Society can provide psychological counseling and support services for processing traumatic events, helping individuals understand their emotions and reactions and how to effectively manage them. Local mental health service institutions should assume social responsibility by providing referral services for individuals needing deeper treatment, especially students with childhood trauma experiences, helping them process emotions and learn healthy psychological coping mechanisms. Additionally, regular educational activities on post-traumatic growth, emotion management, and psychological resilience can be held to help individuals understand and accept their experiences and promote self-growth. Skills training such as meditation, mindfulness, and art therapy can help individuals develop effective coping strategies, strengthen purposeful rumination, and promote positive psychological states.

(V) Establish Safe Learning and Living Environments

For key student groups, schools should create safe, supportive, and understanding environments by providing psychological counseling and support services so all students feel accepted and respected. This can help students who have experienced trauma better adapt to university life, promote their awareness of purposeful rumination, and facilitate better post-traumatic growth. Support groups composed of students who have experienced similar situations can provide a safe environment for sharing experiences, reducing loneliness, and enhancing belonging.

(VI) Continuous Follow-up Research and Effectiveness Evaluation

This study has limitations, and its practical application requires further follow-up research and evaluation feedback. Long-term tracking of survey participants is needed to assess the impact of demographic variables, the process of post-traumatic growth, and changes in purposeful rumination to provide data support for subsequent interventions. Regular evaluation of intervention effectiveness

and collection of feedback from individuals and professionals can continuously optimize service strategies.

VI. Conclusions, Limitations, and Future Directions

(I) Research Conclusions

This study aimed to explore the relationship between purposeful rumination, positive coping, and post-traumatic growth, differences in related factors across demographic variables, and to test the mediating role of positive coping and the moderating role of perceived social support. The following conclusions were drawn:

1. **Common Method Bias Test:** Through unrotated exploratory factor analysis, the first principal factor explained 17.906% of variance, below the 40% criterion, indicating that this study was not severely affected by common method bias. The research data have certain reliability and validity, laying a foundation for subsequent conclusions.
2. **Correlation Analysis:** Results showed that the positive coping dimension was significantly positively correlated with post-traumatic growth and purposeful rumination. This indicates that after experiencing traumatic events, individuals with stronger positive coping attitudes and methods are more conducive to promoting post-traumatic growth. Simultaneously, more purposeful rumination is also beneficial for post-traumatic growth, and this rumination may further promote post-traumatic growth through positive coping methods.
3. **Demographic Differences:** For gender differences, males scored significantly lower than females on perceived social support, but no significant gender differences were found in post-traumatic growth, purposeful rumination, or positive coping. This suggests that while psychological responses and coping after trauma are relatively consistent across genders, females may have certain advantages in obtaining social support.
4. **Family Structure Differences:** No significant differences were found between single-parent and non-single-parent families in perceived social support, post-traumatic growth, purposeful rumination, or positive coping, suggesting that family structure completeness does not significantly affect post-trauma psychological responses and growth processes. Regarding only-child status, significant differences were found only in post-traumatic growth, with only-children scoring significantly higher than non-only-children, possibly due to receiving more resources and support in the family. For grade-level differences, no significant differences were found across freshman, sophomore, junior, and senior years in positive coping, perceived social support, post-traumatic growth, or purposeful rumination, indicating no obvious stage-specific changes in post-trauma psychological responses and growth during the university period.

5. **Mediating Role of Positive Coping:** Positive coping played a partial mediating role between purposeful rumination and post-traumatic growth. Purposeful rumination not only directly and positively predicted post-traumatic growth but also indirectly promoted post-traumatic growth through the mediating variable of positive coping. The mediating effect value was 0.143, accounting for 35.83% of the total effect. This result suggests that in promoting post-traumatic growth, we can enhance individuals' post-traumatic growth levels by cultivating their positive coping abilities and strengthening purposeful rumination.
6. **Moderating Role of Perceived Social Support:** Perceived social support moderated the relationship between purposeful rumination and post-traumatic growth. When perceived social support was high, purposeful rumination did not significantly predict post-traumatic growth; when perceived social support was low, purposeful rumination significantly and positively predicted post-traumatic growth, with the predictive effect gradually increasing as perceived social support decreased. This indicates that perceived social support plays an important moderating role in the post-traumatic growth process. Higher perceived social support may weaken the promoting effect of purposeful rumination on post-traumatic growth, while lower perceived social support makes the promoting effect of purposeful rumination on post-traumatic growth more prominent.

In summary, this study systematically analyzed relevant variables to deeply explore the psychological response and growth mechanisms of post-trauma individuals, providing valuable reference for theoretical research and practical application in trauma psychology. Future research can further expand research subjects and situations, deeply explore the complex mechanisms of post-trauma psychological growth, and provide more effective intervention strategies and support for improving trauma individuals' mental health and quality of life.

(II) Limitations and Future Directions

1. Theoretical Expansion and Deepening - Further 完善理论模型: Based on existing conclusions, it's necessary to explore and incorporate more potential relevant factors to build a more comprehensive theoretical framework. Beyond individual personality traits, trauma event nature and severity, and family parenting styles, factors such as cognitive style, emotion regulation ability, and early life experiences should be considered. Incorporating these factors can more accurately explain the formation mechanisms and influencing factors of post-traumatic growth, providing stronger theoretical guidance for intervention and promotion. - **Cross-Cultural Theoretical Comparison:** Different cultural backgrounds may lead to differences in trauma cognition, coping methods, and growth understanding. Conducting comparative studies on post-traumatic growth theories across cultures is crucial. By comparing relationships among purposeful rumination, positive coping, perceived social support, and post-traumatic growth across cultural groups, we can understand how cul-

tural factors influence these interactions and develop more culturally adaptive theories and intervention strategies. - **Dynamic Development Theory Research:** Strengthening dynamic tracking studies of post-traumatic growth processes is essential. Through long-term observation of variable changes and interactions across time periods, we can reveal the dynamic development patterns and stage characteristics of post-traumatic growth. This helps understand how post-traumatic growth gradually forms and evolves over time and provides basis for developing personalized intervention strategies according to individuals' needs at different stages.

2. Research Method Optimization - Diversified Research Methods: Single methods have limitations in revealing complex psychological phenomena. Integrating experimental methods, case analysis, narrative research, and other methods can provide more comprehensive understanding. Experimental methods can precisely explore causal relationships, while case and narrative methods can deeply understand individuals' subjective experiences and underlying psychological mechanisms. - **Application of Advanced Technology:** Introducing neuroscientific technologies such as fMRI and EEG can provide new perspectives and evidence for post-traumatic growth research. These technologies can explore relevant brain neural mechanisms from the physiological level, revealing brain activity changes and functional connectivity during post-traumatic growth processes. - **Improved Sample Representativeness:** To ensure result generalizability, sample sources should be expanded to cover different ages, occupations, socioeconomic statuses, and trauma types. Only through broad sample collection can we comprehensively understand differences and commonalities across groups, making results more representative and applicable.

3. Practical Application and Intervention - Personalized Intervention Plans: Based on research conclusions, developing personalized intervention plans for individuals with different demographic characteristics and psychological features is crucial. Different intervention strategies should be adopted for individuals with different personality traits, trauma experiences, and coping abilities to strengthen social support, enhance positive coping abilities, and guide purposeful rumination. - **Early Intervention:** Timely preventive psychological intervention in the early stage after trauma is key to promoting post-traumatic growth. Early intervention can help individuals restore psychological balance quickly, establish positive coping patterns, and reduce psychological disorder risks. - **Comprehensive Intervention Model Development:** Single intervention methods are often ineffective. Integrating psychotherapy, social support network construction, family intervention, and other means to form comprehensive intervention models is an effective approach. Combining group counseling with individual consultation and family support can provide all-around support and create a favorable growth environment.

4. Education and Training - Strengthening Professional Talent Cultivation: Enhancing trauma psychology curriculum and practical teaching in relevant professional education is key to cultivating professionals with assessment

and intervention capabilities. Systematic learning and practical training can cultivate students' mastery of trauma recovery theories, assessment methods, and intervention techniques. - **Promoting Public Education:** Popularizing post-traumatic growth knowledge and coping strategies through various channels can improve public awareness and coping abilities. Public understanding directly affects coping attitudes and behaviors when facing trauma. Through science popularization, lectures, and media communication, more people can understand the importance and pathways of post-traumatic growth.

5. Social Support System Construction - Policy Support: Government policies should increase investment in post-trauma psychological recovery work, including establishing special funds, service institutions, and improving medical insurance reimbursement policies to provide necessary resources and guarantees. - **完善社区支持网络:** Strengthening community psychological support network construction, organizing volunteer teams, and conducting community assistance activities can create caring and supportive atmospheres. Communities are important living spaces for individuals, and establishing community support networks can provide timely and convenient psychological support.

6. Interdisciplinary Collaboration - Promoting Interdisciplinary Research: Collaboration among psychology, medicine, sociology, neuroscience, and other disciplines is key to exploring complex issues. Interdisciplinary cooperation can integrate theories, methods, and technologies from different fields to provide new perspectives for post-traumatic growth research. - **International Exchange and Cooperation:** Actively participating in international academic exchanges, introducing advanced foreign theories and technologies, and promoting domestic research results internationally can broaden research perspectives and improve research levels.

In summary, through theoretical expansion, methodological optimization, practical application, education and training, social support system construction, and interdisciplinary collaboration, we can further advance post-traumatic growth research and provide stronger support for individual mental health and growth.

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Appendices

(1) Reliability and Validity Tests

Appendix Table 1: Total Variance Explained Total Variance Explained
Initial Eigenvalues | Extracted Loadings Sum of Squares Extraction Method:
Principal Component Analysis

(2) Scales

Instructions for Purposeful Rumination Scale (Appendix Table 2):

After experiencing these traumatic and painful events, we sometimes find that we frequently think about the experience even without deliberately trying to, or we may intentionally (purposefully) think about the experience. Please read the following statements and mark “√” in the box according to your feelings about

that event in the past month. There are no right or wrong answers. Options: Never, Occasionally, Sometimes, Often.

Appendix Table 2: Purposeful Rumination Scale - I thought about whether I could find meaningful things from that experience - I thought about whether my coping with that experience changed me - I prompted myself to think about my feelings regarding that experience - I thought about whether I could learn something from that experience - I thought about whether that experience changed some of my views about the world - I thought about what that experience meant for my future - I thought about whether that experience changed my interactions with others - I prompted myself to organize my feelings about that event - I intentionally thought about how that event affected me - I thought about that event and tried to figure out what happened

Instructions for Post-Traumatic Growth Inventory (Appendix Table 3): The following are some things people experience in daily life. Indicate how often you have experienced each in recent times. Please read each item carefully and mark “√” on the number to the right according to your true situation. Scale: 0=Not at all; 1=Very slightly; 2=Slightly; 3=Moderately; 4=Greatly; 5=Extremely. Please do not omit any questions.

Appendix Table 3: Post-Traumatic Growth Inventory - I learned what matters most in life - I have a deeper understanding of spiritual matters - I know I can count on others when I have problems - I appreciate each day more - New opportunities have emerged in my life that didn't exist before - I value my relationships more - I'm more willing to try to change things that need changing - I acknowledge and accept that I need help from others

Instructions for Positive Coping Scale (Appendix Table 4): Options: A=Do not use; B=Occasionally use; C=Sometimes use; D=Often use

Appendix Table 4: Positive Coping Scale - Change your thinking to re-discover what's important in life - Stand your ground and fight for what you want - Change some of your original practices or personal issues - Try to control feelings of disappointment, regret, sadness, and anger - Comfort yourself

Instructions for Perceived Social Support Scale (Appendix Table 5): There are 12 sentences below, each with 7 possible answers. Please choose one answer for each sentence according to your actual situation. For example, choosing means you strongly disagree (your actual situation is extremely inconsistent with the sentence); choosing means you strongly agree (your actual situation is extremely consistent with the sentence); choosing represents a neutral state. The rest follow similarly.

Appendix Table 5: Perceived Social Support Scale - When I encounter problems, some people (leaders, relatives, colleagues) appear by my side - I can share happiness and sorrow with some people (leaders, relatives, colleagues) - My family can provide concrete help to me - I can obtain emotional help and support from my family when needed - When I have difficulties, some people

(leaders, relatives, colleagues) are a true source of comfort - My friends can truly help me - I can rely on my friends when difficulties occur - I can discuss my problems with my family - My friends can share happiness and sorrow with me

Note: Figure translations are in progress. See original paper for figures.

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