



**ARTICLE**

# The Link between Social Exclusion and Tendencies of Malevolent Creativity Behavior: The Chain Mediation Model of Ruminative Thinking and Depression

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**ABSTRACT: Background:** Experiences of social exclusion can significantly affect individuals' cognitive and emotional well-being, potentially resulting in maladaptive coping strategies or harmful behaviors. College students are at a critical stage of personal development, exhibiting distinctive psychological and behavioral patterns. Therefore, exploring the underlying mechanisms connecting social exclusion and malevolent creativity among college students is particularly important. This study aims to reveal the relationship between social exclusion and malevolent creative behavior among undergraduates and its potential mechanisms. **Methods:** This cross-sectional study collected data from 500 undergraduates across three universities in Guangxi via convenience sampling. Participants completed the Ruminative Responses Scale (RRS), the Malevolent Creativity Behavior Scale (MCBS), the Social Exclusion Questionnaire for Undergraduates (SEQU), and the Self-Rating Depression Scale (SDS). Descriptive statistics, Pearson correlations, and a structural equation model (SEM) were used to analyze the data. **Results:** A strong correlation was found among social exclusion, depression, ruminative thinking, and malevolent creativity, with correlation coefficients ranging from  $r = 0.49$  to  $0.58$  ( $p < 0.001$ ). The results of the mediation analysis showed that ruminative thinking and depression each independently mediated the relationship between social exclusion and malevolent creativity, accounting for 15.25% and 18.38% of the total effect, respectively. Additionally, ruminative thinking and depression played a role of chain mediation between social exclusion and malicious creativity, contributing 11.73% to the total effect. **Conclusion:** Social exclusion significantly impacted malevolent creativity directly. Additionally, it had an indirect effect through ruminative thinking and depression, which included a chain mediation involving both factors. This study uncovers the mechanisms that connect social exclusion to malevolent creativity in university students.

**KEYWORDS:** Social exclusion; depression; rumination; malevolent creativity; chain mediation

## 1 Introduction

Creative motivations can be both positive and harmful, as pointed out by cultural anthropologist Rogers as early as 1954 [1]. Clark and James subsequently established the notion of “negative creativity,” whereby creative outcomes may possess negative traits, although the creativity itself does not cause harm to individuals or society [2]. Later, malevolent creativity was originally defined by Cropley et al., who characterized it as the capacity of an individual to purposefully produce ideas or products that are harmful and successful, which can also be interpreted as destructive activities that an individual consciously engages in with the intention of causing harm to others or themselves [3,4]. Malevolent creativity can manifest in

various contexts, exhibiting intricate and wide-ranging effects [5]. Notably, everyone in daily life has the potential to come up with malicious creative ideas to varying degrees, indicating it is not solely a trait of terrorists or criminals [6,7]. Specifically, in everyday situations, this phenomenon can be observed in small but destructive ways, such as playing pranks, manipulating others, spreading misleading information, and engaging in cyber shaming. Furthermore, in more extreme circumstances, it can be leveraged to commit serious crimes, including drug production, smuggling, and fraud [8–11].

Both personal traits and the outside surroundings have an impact on malevolent creativity [12,13]. We can have a more thorough grasp of the intricate elements influencing malevolent creativity by utilizing the 4P model [14], which takes into account the multifaceted interaction of person, product, process, and press. Recent studies have further examined the mechanisms and consequences of malevolent creativity, underscoring its unique psychological and social impacts [15,16]. Against this backdrop, the present study explores how social exclusion relates to malevolent creativity and examines ruminative thinking and depression as potential chain mediators. Therefore, this study systematically explores the formation and occurrence of malevolent creativity, treating social exclusion as a social environmental variable and ruminative thinking and depression as individual-level variables.

## 2 Theoretical Foundations and Hypotheses

The 4P model states that creativity evolves from the intricate interplay between individual traits, cognitive processes, external circumstances, and creative outputs [14]. Accordingly, this study considers social exclusion as an external environmental stress, while rumination and depression can be considered cognitive processes and emotional traits that individuals exhibit while coping with negative situations. These characteristics collectively influence an individual's destructive creativity. Response Styles Theory indicates that persons experiencing unfavorable experiences may engage in rumination—repeatedly pondering on the reasons and implications of the event—which can generate negative emotions and is closely tied to potential negative coping techniques [17]. To sum up, this study adds ruminative thinking and depression to the study of the relationship between social exclusion and malevolent creativity in college students and creates a chain mediation model (Fig. 1).

### 2.1 Association between Social Exclusion and Malevolent Creativity

Social exclusion, a process where individuals are rejected by others or groups, strongly affects mental health and behavior [18]. According to well-established research, unfavorable external situational factors frequently inspire malevolent creativity [19]. Ostracism and racial discrimination are only a few examples of the many ways that social exclusion manifests itself in people's daily lives [20–22]. Empirical research has demonstrated that social exclusion causes negative emotional reactions in addition to impairing cognitive ability [23–25]. Additionally, a study by Ren et al. discovered that malevolent creativity tended to increase in contexts involving social exclusion [26]. Social exclusion often occurs alongside violent behaviors, which create conditions that are more conducive to the emergence of malevolent creativity [27]. Besides, Perchtold-Stefan et al. discovered that excluded people's performance on malevolent creativity was noticeably better than that of the social inclusion group [28].

Social exclusion is linked to destructive acts ranging from cheating and bullying to terrorism and crime [29]. It weakens an individual's fundamental need for belonging, which is correlated with malevolent creativity, according to the Temporal Need-Threat Model [25,30]. When people feel their resources are insufficient, they often turn to negative coping strategies [31]. Moreover, negative coping patterns are often

accompanied by higher levels of malevolent creativity [16]. Thus, we put forth Hypothesis 1 (H1): Social exclusion is positively associated with malevolent creativity.

## ***2.2 Ruminative Thinking's Mediating Function***

Rumination is characterized by a persistent focus on negative emotions and thoughts about the causes, course, and consequences of unpleasant feelings [32]. According to Response Styles Theory, individuals use rumination as an adaptive response to distressing situations [17]. Social exclusion, a form of bullying, can lead to various negative outcomes, including low self-esteem, an increased risk of internalizing and externalizing issues, and depressive states [23,24]. Lincoln et al. found that social exclusion dramatically raised paranoid ideation in those who were at high risk for mental illnesses, and this rise was partly explained by the use of rumination and other emotion regulation strategies [33]. According to a study among Chinese college students, social exclusion indirectly predicted NSSI through rumination [34]. College students who experienced social exclusion were more likely to experience unpleasant emotions and rumination. The psychological distress arising from social exclusion and subsequent rumination may ultimately lead to NSSI.

According to the General Aggression Model (GAM), individuals with sufficient cognitive resources may repeatedly revisit negative events, a process similar to rumination [35,36]. In such states, they are more likely to perceive others' actions as hostile and react impulsively. Ceballos also found that early traumatic experiences increase reliance on maladaptive coping strategies such as rumination, which is linked to higher levels of malevolent creativity [37]. Individuals repeatedly reflect on the details of negative experiences, such as social exclusion. This sustained reflection can stimulate novel thinking, which may in turn positively influence the generation of creativity. Anger rumination is also associated with malevolent creativity [38,39]. In summary, social exclusion influences individuals' mental health and behavior partly by increasing their tendency to engage in ruminative thinking. Thus, Hypothesis 2 (H2) is put out in this study: ruminative thinking mediates the relationship between social exclusion and malevolent creativity.

## ***2.3 Depression's Mediating Function***

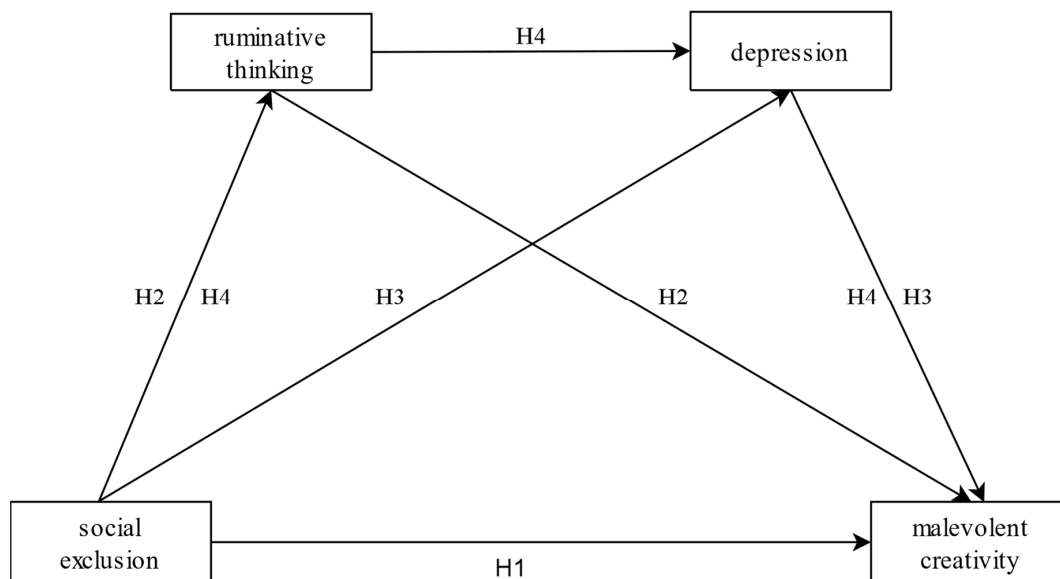
Depressive states involve low mood, apathy, pessimism, and disappointment, and are marked by diminished well-being, irritability, and loss of interest [40]. Jamison et al. elaborated in their study that a depressive state enhances self-introspection, making them more attentive to their feelings and thus more clearly and acutely perceiving their inner self, which helps to drive creativity [41]. Emotions not only affect social cognitive functions [42] but also affect creativity [19]. Copley et al. emphasized that mood is an important factor influencing creativity [43]. Recent studies by Stefan et al. also report a positive link between depressive symptoms and malevolent creativity [44]. It suggests that individuals experiencing depressive emotions may be more likely to engage in a greater tendency towards malevolent creative behavior.

Slavich et al. raised the psycho-biological model of social rejection and depression [45]. They argued stress can stimulate brain changes linked to social exclusion. These govern negative emotions and may increase vulnerability to depression via a cascade of physiological changes. The study by Lincoln et al. also demonstrates that social exclusion is directly associated with individuals' unpleasant emotions [46]. Further research has indicated that there is a positive association between social exclusion and depressive emotions [47,48]. Depressive mood during rumination may be associated with impulsivity and aggression tendencies, which could impair effective behavioral control [49,50]. This could lead to an increased likelihood of angry reactions to perceived injustices, thereby correlating with tendencies towards malevolent creative behavior. Therefore, this study offers Hypothesis 3 (H3): Depression may mediate the association between malevolent creativity and social exclusion.

## 2.4 The Chain Mediation Model of Ruminative Thinking and Depression

In recent years, studies have become more numerous on the association between ruminative thinking and depression. According to response style theory, individuals with elevated levels of rumination are more prone to continuously ruminate about unfavorable occurrences, which can elicit negative emotions such as depression and anxiety [51]. Research indicates that the interaction between stressful life events and ruminative thinking increases an individual's risk of developing depressive symptoms, with rumination serving as a key susceptibility factor influencing depression [52]. Individuals with higher levels of rumination experience more intense negative emotions, thereby increasing their risk of experiencing a depressive mood [53]. As a passive and negative cognitive evaluation process, rumination triggers greater negative emotions, fostering pessimistic attitudes towards external circumstances and consequently exacerbating depression. Several investigations have also revealed that ruminative thinking is directly associated with depressive mood [54,55]. Specifically, ruminating prolongs the length of negative emotional experiences [32,56]. Rumination is regarded as an essential cognitive risk factor for depressive feelings, not only activating depressive emotions but also increasing their severity [57,58]. A longitudinal investigation by Zou et al. [59] indicated that ruminative thinking can unidirectionally predict subsequent depressive symptoms over six months, while the link between ruminative thinking and depression is bidirectional over a one-year time frame.

Social cognitive theory posits that behavior arises from the dynamic interaction between individual, environmental, and behavioral factors. Based on this theory, Wood and Bandura proposed the concept of triadic reciprocal determinism, which states that environmental factors influence individual psychology, and in turn, individual psychology influences behavioral performance [60]. Within this model, social exclusion is a variable in the environment that disrupts an individual's cognitive processing (e.g., rumination) first. Rumination, in turn, further induces and intensifies negative emotional responses (e.g., depression). These internal psychological processes ultimately shape tendencies toward malicious creativity, offering a theoretical framework for understanding how social exclusion affects this type of creativity. In summary, this study suggests Hypothesis 4 (H4): Ruminative thinking and depression perform the role of chain mediators between malevolent creativity and social exclusion.



**Figure 1:** Chain mediation hypothesis model.

### 3 Methods

#### 3.1 Participants

This study employed convenience sampling at three undergraduate colleges in Guangxi, distributing a total of 520 questionnaires via an online link. Inclusion criteria: (1) Full-time undergraduates who are currently enrolled at the school; (2) Aged 18 years or over; (3) Informed consent from research subjects, who are willing to participate in the survey. Exclusion criteria: (1) Students who have graduated, taken a leave of absence, withdrawn, or accumulated over one month of absence; (2) Students diagnosed with severe mental illness; (3) Students who have recently experienced major traumatic events. According to the Kendall criterion [61], the number of respondents is roughly 5-10 times the number of scale items. This study comprised 74 items. Therefore, considering the 20% loss rate, the investigation needed at least 463 participants. After eliminating invalid questions, 500 acceptable questionnaires were received, generating an effective response rate of 96.15%. The average age was 21 years. Among the respondents, 299 were male (59.80%), and 201 were female (40.20%); 117 were first-year students (23.40%), 112 were second-year students (22.40%), 212 were third-year students (42.40%), and 59 were fourth-year students (11.80%). The studies involving human participants were reviewed and approved by the Ethics Committee of Guangxi Medical University (No. KY20250026). Written informed consent to participate in this study was provided by all participants.

#### 3.2 Measures

##### 3.2.1 Social Exclusion Questionnaire for Undergraduates (SEQU)

This questionnaire was devised by Chinese researchers Wu et al. based on theoretical explanations of social exclusion. It has strong reliability and validity, comprising two dimensions—direct exclusion and indirect exclusion—with a total of 19 items. Larger scores suggest a larger degree of social exclusion [62]. In this study, the Cronbach's alpha for this questionnaire was 0.92.

##### 3.2.2 Ruminative Responses Scale (RRS)

The Ruminative Responses Scale [63], designed by Professor Nolen-Hoeksema of Yale University in the United States and translated and modified by Han et al., was utilized. The measure consists of 22 items spanning three dimensions: depression-related factors, reflective factors, and compulsive meditation factors. The scale uses a 4-point Likert scale, with higher scores indicating higher degrees of ruminative thinking. The Cronbach's alpha of this questionnaire in this study was 0.89.

##### 3.2.3 Malevolent Creativity Behavior Scale (MCBS)

This scale was developed by Hao et al. and includes three dimensions: trickery, lying, and hurting others. The scale comprises a total of 13 items and employs a 5-point Likert scale. The greater the score, the higher the tendency to malevolent creativity behaviors [64]. The Cronbach's alpha of this questionnaire in this study was 0.81. It is worth noting that the malevolent creativity measurement tool utilized in this study is the MCBS scale. This scale measures components that concentrate mostly on individuals' subjective self-evaluations of their trait-based tendency for malevolent creativity, rather than objective manifestations of this creativity.

### 3.2.4 Self-Rating Depression Scale (SDS)

The self-rating depression scale (SDS) was established by Zung and was re-examined by Dunstan and Scott [65]. This scale has 20 items and employs a 4-point Likert scale, with some items requiring reverse scoring. A higher score indicates a more serious case of depression. This study's questionnaire had a Cronbach's alpha of 0.85.

### 3.3 Data Analysis

The Harman single-factor method was utilized to analyze the potential common method bias. Descriptive statistics were used to analyze the demographic characteristics of the research subjects. Pearson's correlation coefficient was employed to examine the correlation between variables. Descriptive statistics and correlation analysis for each variable were conducted using the SPSS 26.0 software (IBM Corp., Armonk, NY, USA). To test our hypothesized mediation model, we assessed it using a chain mediation model with the SPSS macro PROCESS (v4.1; Model 6), based on 5,000 bootstrap samples and a 95% bias-corrected confidence interval (CI) [66]. The effect is considered significant if the 95% CI does not include zero. The significance level for all statistical tests is 0.05.

## 4 Results

### 4.1 Common Method Bias Test

Because this study relies on a questionnaire survey, it might be susceptible to common method bias. To dampen the influence of common method bias in the investigation, all questionnaires were completed anonymously and showed good validity and reliability. Furthermore, Harman's single-factor test was utilized to examine common method bias. The results of the unrotated factor analysis indicated that 10 components had eigenvalues greater than 1. The first factor accounted for 30.26% of the total variance, which is less than the critical threshold of 40% [67], which indicates that there were no significant common method bias effects in the study.

### 4.2 Descriptive Statistics and Correlation Analysis for Each Variable

Table 1 presents the descriptive statistics and correlation coefficients for the parameters. The correlation study demonstrates that the four variables of social exclusion, ruminative thinking, depression, and malevolent creativity are significantly and positively associated with one another.

**Table 1:** Descriptive statistics and correlation analysis of each variable (n = 500).

Variable	Mean	SD	1	2	3	4
1. depression	2.66	0.60	1			
2. ruminative thinking	2.87	0.77	0.58***	1		
3. malevolent creativity	2.15	1.03	0.56***	0.49***	1	
4. social exclusion	1.81	0.56	0.56***	0.57***	0.56***	1

Note: \*\*\* $p < 0.001$ .

### 4.3 Testing the Chain Mediation Effect of Ruminative Thinking and Depression

Fig. 2 and Tables 2 and 3 display the consequences of evaluating the chain mediation effect. The covariates are gender and age; the independent variable is social exclusion; the dependent variable is malevolent creativity; and the mediating variables are depression and ruminative thinking. The regression

analysis results demonstrate that social exclusion ( $\beta = 0.559, p < 0.001$ ), ruminative thinking ( $\beta = 0.202, p < 0.01$ ), and depression ( $\beta = 0.504, p < 0.001$ ) are positively related to malevolent creativity.

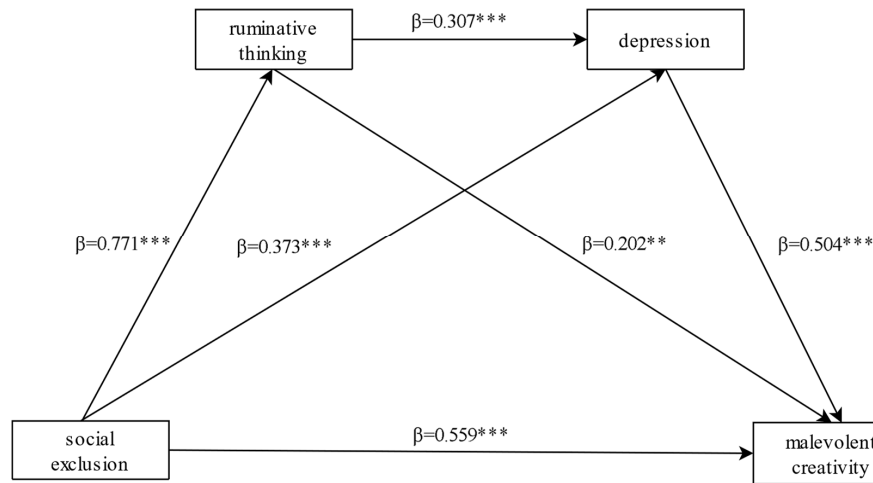


Figure 2: The chain mediating effect of ruminative thinking and depression. Note: \*\*\*  $p < 0.001$ , \*\*  $p < 0.01$ .

Table 2: Regression analysis results (n = 500).

Outcome variable	Predictor variable	R <sup>2</sup>	F	$\beta$	t	Boot 95%CI
Y	X	0.313	75.386***	1.023	15.012***	0.889, 1.156
M1	X	0.328	80.547***	0.771	15.341***	0.672, 0.870
M2	X	0.428	92.763***	0.373	8.404***	0.286, 0.460
	M1			0.307	9.410***	0.243, 0.375
Y	X	0.411	68.9763***	0.559	6.814***	0.398, 0.720
	M1			0.202	3.292**	0.081, 0.322
	M2			0.504	6.496***	0.352, 0.657

Note: \*\*\*  $p < 0.001$ , \*\*  $p < 0.01$ . X: social exclusion; M1: ruminative thinking; M2: depression; Y: malevolent creativity.

The results of the chain mediation effect of social exclusion and malevolent creativity show that the direct effect is 0.559, accounting for 54.64% of the total effect (effect value = 1.023); the total indirect effect is 0.464, accounting for 45.36% of the total effect. Specifically, the total indirect effect includes three different paths: Path 1: social exclusion → ruminative thinking → malevolent creativity (effect value = 0.156), accounting for 15.25% of the total effect; Path 2: social exclusion → depression → malevolent creativity (effect value = 0.188), accounting for 18.38% of the total effect; Path 3: social exclusion → ruminative thinking → depression → malevolent creativity (effect value = 0.120), accounting for 11.73% of the total effect. Since none of the three mediating paths' 95% CI included 0, all of the mediating effects were considered significant.

Table 3: Bootstrap analysis of the mediation effect test (n = 500).

Path	Effect	BootSE	Boot 95% CI	Percent (%)	
Direct effect	X-Y	0.559	0.082	0.398, 0.720	54.64
	X-M1-Y	0.156	0.050	0.055, 0.255	15.25
Indirect effect	X-M2-Y	0.188	0.037	0.121, 0.267	18.38
	X-M1-M2-Y	0.120	0.025	0.074, 0.173	11.73
Total indirect effect		0.464	0.060	0.345, 0.580	45.36
Total effect		1.023	0.068	0.889, 1.156	100

Note: X: social exclusion; M1: ruminative thinking; M2: depression; Y: malevolent creativity.

## 5 Discussion

The current results reveal a positive association between social exclusion and malevolent creativity among college students, which is in line with earlier studies. One possible reason is that social exclusion challenges individuals' fundamental desire to belong, which may provoke unpleasant emotions and retaliatory tendencies that can show in damaging ideas. Moreover, the results suggest that ruminative thinking and depression serve as pathways linking social exclusion and malevolent creativity. Students who focus on exclusion experiences on a regular basis may feel increased unpleasant emotions and cognitive fixation, which may provide fertile ground for malevolent creativity. These findings not only deepen our understanding of the intricate connection between social exclusion and malevolent creativity among college students but also give vital recommendations for the prevention and intervention of malevolent creativity.

Consistent with Hypothesis 1, this study found a positive correlation between social exclusion and malevolent creativity among college students, which is consistent with earlier studies [27–29]. In addition to being sensitive to uncomfortable social experiences, college students are also more vulnerable to the risk of social exclusion because they frequently are highly motivated to develop harmonious relationships with their peers and achieve social acceptance and a sense of belonging [68,69]. Social exclusion is a common and often threatening experience that can impact how students feel and behave. When university students perceive themselves as excluded, drops in self-esteem frequently follow, and these emotional strains are sometimes accompanied by more negative coping responses—conditions that have been linked to higher levels of malevolent creativity [23,24,70]. The current study's findings provide support for the idea that malevolent creativity is positively related to social exclusion. The inclusion of mediating variables revealed notable direct and indirect effects, suggesting that social exclusion may be linked to malevolent creativity in college students both directly and indirectly through depression and ruminative thinking.

Building on this, the results also supported Hypothesis 2, indicating that ruminative thinking plays a mediation function between social exclusion and malevolent creativity. Social exclusion is often associated with ruminative thinking, in which individuals repeatedly revisit the experience of exclusion, a process that may be linked to intensified negative emotions. Individuals who think negatively and regularly may develop a negative psychological state, which could increase their emotional and psychological stress [32,34]. Ruminative thinking, on the other hand, may involve excessive analysis of one's behaviors and thoughts, which is associated with greater susceptibility to malevolent thoughts and behaviors [37–39]. People are more likely to exhibit malevolent creativity in the face of social exclusion due to the detrimental effects of ruminative thinking. The results of this research support those of related surveys. Students who frequently engage in excessive ruminating may misinterpret equivocal social cues and become more susceptible to perceived exclusion. Similarly, adolescents who frequently engage in malevolent deceit and lying may face peer rejection. In order to separate these bidirectional processes in the future, longitudinal or cross-lagged strategies will be required.

In line with Hypothesis 3, the results reveal that depression had a significant role in mediating the association between malevolent creativity and social exclusion. Experiences of social exclusion are often linked to intense negative emotions, and the psychological stress that follows may be associated with depressive symptoms like low mood, lack of interest, and low self-esteem. If these negative emotions are not adequately regulated, they may be associated with mood disorders like anxiety, depression, and fear [45,71,72]. Emotions have a significant impact on creativity. In certain circumstances, a depressive state characterized by persistent negative emotions and recurrent rumination may facilitate the generation of malevolent creativity [43,44]. These depressive symptoms may also increase psychological vulnerability, making individuals more susceptible to negative emotions. When experiencing social exclusion, individuals

with depressed moods may show a greater tendency toward malevolent behavior, potentially related to negative cognitive processes and difficulties in emotion regulation.

Finally, the evidence supports Hypothesis 4, demonstrating depression and ruminative thinking played a chain mediation role in the relationship between social exclusion and malevolent creativity. People who are socially excluded are more likely to engage in ruminative thinking, which is characterized by recurrent negative thoughts [33]. This ruminative thinking further aggravates people's psychological stress and emotional pain and is associated with the emergence of depressive symptoms [59]. According to the Social Signal Transduction Theory of Depression, social exclusion may contribute to depressive symptoms via neurophysiological pathways, which can change a person's thought and behavior patterns [73]. This notion was further supported by Shields et al. [74], who discovered that female teenagers who were in danger of social exclusion showed increased brain activity and functional connectivity responses. Individuals who experience depressive symptoms while ruminating exhibit impaired emotional regulation and cognitive flexibility. This can trap them in negative thought patterns and increase their likelihood of engaging in harmful malevolent creativity [49,50]. This series of mediating mechanisms suggests that depression and ruminative thinking may play important roles in the relationship between social exclusion and malevolent creativity, potentially interacting to influence its occurrence. According to the study's findings, social exclusion may be indirectly associated with malevolent creativity via a series of mediating effects involving depression and ruminative thinking. This supports the potential role of this mediating pathway. It is vital for higher education institutions to strengthen their peer support systems within campus mental health services. They should also carry out early screening of students who are socially excluded or prone to rumination. Furthermore, they need to implement timely interventions to prevent malevolent creative behavior tendencies from developing.

## 6 Limitations

The following are the limitations of this study. From the beginning, due to its cross-sectional design, it has failed to determine the causal interaction between factors. Future research could adopt longitudinal or experimental designs, as well as multi-informant approaches, to more rigorously examine causal relationships and reduce potential biases. Another limitation is the reliance on self-reported data, which suggests the possibility of common method variance issues. To minimize common method bias and enhance measurement validity, future work should integrate multiple assessment methods, including behavioral tasks, experimental paradigms, and objective indicators. This study did not consider the impact of other possible influencing variables on the results. Factors such as the Dark Triad, academic stress, and familial circumstances may all have a negative impact on one's emotions. Future research should include more control variables to analyze the robustness of the estimated interactions more effectively. The MCBS has been criticized for failing to assess the uniqueness of malevolent behavior, as only a few items directly address the novelty and originality of ideas [11,75]. Future research could explore the relationship between social exclusion and the various dimensions of malevolent creativity. In addition, developing task-based measures that better capture the originality aspect of malevolent creativity, or creating new self-report tools tailored to everyday contexts, would help improve its assessment [76]. While negative emotions and personality traits form the basis of the current framework, other psychological mechanisms may also play a role in malevolent creativity. Future work should therefore explore these additional pathways, such as cognitive flexibility, moral disengagement, and stress response styles, to construct a more comprehensive theoretical model. Future studies should broaden the sample size to include more diverse populations, such

as working adults, adolescents, clinical groups, individuals with personality disorders, and those involved with the criminal justice system, to determine whether the findings generalize across different contexts.

Ultimately, the study was conducted in Guangxi, a region characterized by distinctive cultural traditions and a large ethnic minority population. However, our analyses did not explicitly consider cultural and regional factors. Future research should incorporate cross-regional or cross-cultural comparative designs to better understand how sociocultural contexts shape the relationship between social exclusion and malevolent creativity.

## 7 Conclusions

The findings of this investigation are as follows: Firstly, there is a significant correlation between depression, malevolent creativity, social exclusion, and ruminative thinking. Secondly, the results show a positive correlation between malevolent creativity and social exclusion among college students. Thirdly, ruminative thinking and depression independently mediate the relationship between social exclusion and malevolent creativity, and the two factors have a chain-mediated effect.

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**Author Contributions:** The authors confirm contribution to the paper as follows: conceptualization, Huiyue Jiang; data curation, Zhenlian Luo; formal analysis, Rongning Luo, Zhenlian Luo; methodology, Zhenzhu Cao, Zhenlian Luo; writing—original draft, Zhenlian Luo; writing—review & editing, Zhenlian Luo, Rongning Luo, Zhenzhu Cao. All authors reviewed the results and approved the final version of the manuscript.

**Availability of Data and Materials:** The data that support the findings of this study are available from the Corresponding Author, Huiyue Jiang, upon reasonable request.

**Ethics Approval:** The studies involving human participants were reviewed and approved by the Ethics Committee of Guangxi Medical University (No. KY20250026).

**Informed Consent:** Written informed consent to participate in this study was provided by all participants.

**Conflicts of Interest:** The authors declare no conflicts of interest to report regarding the present study.

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