Empirical Article

Associations Between Parental Psychological Control and COVID-19 Pandemic-Related Negative Emotions: The Role of Resilience and Emotion Regulation

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Abstract

Studies focusing on risk factors for negative emotions related to the COVID-19 pandemic remain limited. We examined the underlying mechanism of resilience and emotion regulation on the association between parental psychological control and COVID-19 pandemic-related negative emotions. A total of 400 Chinese college students (207 males; *M*age = 19.78 ± 1.72 years) completed a cross-sectional survey including Parental Psychological Control Scale, Profile of Mood States Scale, Brief Resilience Scale, and Emotion Regulation Questionnaire during the pandemic. Using PROCESS macro, results indicated that resilience partially mediated the association between parental psychological control and COVID-19 pandemic-related negative emotions. Expressive suppression, but not cognitive reappraisal, moderated the mediating path. Specifically, parental psychological control was a stronger predictor of resilience among those who rarely used expressive suppression. Correcting maladaptive parenting would be beneficial for college students' mental health during COVID-19 as well as for the improvement of coping capacity and adaptation outcomes to stress.

Keywords

COVID-19, parental psychological control, emotional reactivities, resilience, emotion regulation

Introduction

The worldwide spread of the COVID-19 pandemic has presented unprecedented public health, socio-economic crises, and unbearable psychological pressure to people (e.g., Gruber et al., 2021). Facing this critical situation, a wide range of COVID-19 pandemic-related negative emotions, which can be considered as emotional consequences of the individual caused by external pressure, including anxiety, anger, depression, have emerged in the general population (Canet-Juric et al., 2020). Accumulating studies have also demonstrated an increase in psychological stress responses during the initial and recovery periods of the COVID-19 pandemic in college students, who are also among the most vulnerable groups (Manchia et al., 2022; Saravanan et al., 2020; Zheng et al., 2021). In China, college students showed depressive symptoms (12.2%–37.0%) and anxiety symptoms (7.7%–41.1%) due to the ongoing spread of the epidemic, risks of infection, isolation at home and delays in academic activities (Fu et al., 2021; Wang et al., 2020; Zhou et al., 2021). Considering the long-term effects of COVID-19, the role of personality and other psychological variables (e.g., epidemic rumination and neuroticism) in the mental health problems during the COVID-19 pandemic has also been of interest to psychologists (e.g., Somma et al., 2020; Tang et al., 2020; Ye B. et al., 2020). Meanwhile, some research attempted to find the environmental and social factors in the risk for mental health challenges during the pandemic, including parenting behaviours. For example, family cohesion and parent-child relationships were confirmed to be associated with stress consequences during COVID-19 pandemic (Ye, Y. et al., 2022c; Zeng et al., 2021). Around 10% of college students

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had persistent and/or developed new mental health problems during the pandemic and low quality of family function were significant predictors of lower mental health (Li et al., 2021b, 2022). However, research focusing on risk factors of college student's mental health during COVID-19, especially the role of family, were still limited (Al-Omiri et al., 2021; Marchetti et al., 2020).

Parental Psychological Control and COVID-19 Pandemic-related Negative Emotions

In line with many other countries, the Chinese government ordered nationwide separation and restriction measures to reduce the spread of the infection during the initial period of the COVID-19 pandemic. College students in China were required to be isolated at home (Zhang Y. et al., 2021b), thus the influence of specific parenting may be amplified for longstanding close interactions with parents (Wei S. et al., 2022). As one of the core components of family environment, parental psychological control, which refers to the control through psychological tactics (i.e., guilt induction, love withdrawal, and shaming) in the parenting process, may be linked to ones' responses in the context of a stressor, including COVID-19 (Barber & Harmon, 2002). This is an intrusive, restrictive, and manipulative parenting style that may hinder the establishment of positive self-awareness, the development of self-efficacy, and a sense of self-worth, thus leading to various problems of internalization, externalization, and socialization of individuals (Schäfer & Goldner, 2018; Faherty et al., 2020). In contrast to the self-determination theory suggesting that parenting should satisfy one's basic psychological needs of autonomy, competence and relatedness so as to achieve individual self-growth (Deci & Ryan, 2008) and to develop social adaptability (Feeney & Collins, 2015), psychological control hinders such satisfaction and brings internal pressure (Costa et al., 2015; Pearlin et al., 1981). The negative effect of parental psychological control on mental health has been well documented across all stages of individual growth (Choe et al., 2020). Emerging adulthood differs from adolescence and adulthood in that it is characterized by unique challenges related to self-exploration, autonomy seeking, and parent-child relationships re-establishment due to moving away from their family of origin (Arnett, 2000). This is particularly evident for college students living on campus. An investigation into the role of parental psychological control during this transitional period in college students would enhance our comprehension of parenting in emerging adulthood (Chou & Chou, 2020). Previous research has suggested that parenting plays a significant role in the psychological adjustment of college students from diverse ethnic backgrounds (Zong et al., 2019). The consistent influence of parental psychological control on the adaptive development of college students is evident (Gong & Wang, 2021). Specifically, several studies have highlighted a significant correlation between parental psychological control and negative outcomes for college students including friendship quality, academic outcomes, and stress responses (Abaied & Emond, 2013; Baumgardner & Boyatzis, 2018; Deneault et al., 2020). Compared to Western cultures, Chinese parenting styles place greater emphasis on familial interdependence and involve higher levels of parental engagement, resulting in a sustained influence from parents even for those who have moved away from home (Ma C. et al., 2022). Moreover, individuals from relatively more collectivistic cultures exhibited similar reactivity to psychological control, which were different from those observed in their European American counterparts (Chao & Aque, 2009). Thus, the present study aimed to investigate the influence of parental psychological control on COVID-19 pandemic-related negative emotions of Chinese college students.

The Mediating Role of Resilience

Resilience refers to one's capacity to bounce back and to recover from adversity, extreme stress or threat (Smith et al., 2008). Current models of resilience suggested resilience is distributed across multiple systems, both internal (e.g., self-efficiency, mindset) and external (e.g., attachment, social support) to the person (Masten et al., 2021), which can play a pronounced role in effectively resisting external risks. Therefore, this internal psychological mechanism may play a part in mediating the link between parental psychological control and COVID-19 pandemic-related negative emotions (Seery et al., 2010).

Resilience develops over time, and its development requires a supportive environment. Maladaptive parenting style can be regarded as environmental risk factors for poor resilience. Previous studies have indicated that authoritarian parenting and parental psychological control were negatively associated with resilience (Zhong et al., 2016; Geng et al., 2020), whereas autonomy-supportive parenting was positively related to resilient functioning (Nair et al., 2020; Reeve et al., 2020).

In addition, resilience has been reported to effectively reduce the possibility and severity of mental diseases for depression, anxiety and traumatic stress disorder (Liu et al., 2019; Xi et al., 2020) and to be reversely associated with the negative emotional response (Killgore et al., 2020) as well as depression, anxiety, and somatic symptoms (Ran et al., 2020) during COVID-19. In college students, resilience was found to have a significant negative correlation with negative emotions (Li et al., 2021a) and lockdown fatigue (Hassan et al., 2022), while having a positive correlation with mental well-being (Rasheed et al., 2022) and school adaptation (Zhang X. et al., 2021a) during the COVID-19 epidemic. These findings suggest that resilience may play a crucial role in facilitating psychosocial adaptation to cope with the ongoing stress caused by the pandemic.

According to the dynamic model of mental resilience (Lu et al., 2020), positive family factors enhance individuals'

mental health by improving their resilience. Some studies have investigated the mediating role of resilience in both adolescents (e.g., Swanson et al., 2011) and adults (e.g., Reilly & Semkovska, 2018). For example, the associations between perceived helicopter parenting (i.e., perception of overprotection and control) and depressive symptoms was mediated via decreased resilience in college students (Reilly & Semkovska, 2018). Additionally, resilience was found to be a mediator in the association between parental acceptance-rejection and depressive symptoms among college students (Sart et al., 2016). Similarly, a recent study conducted among college students has demonstrated that the practice of helicopter parenting impacts various mental health indicators (such as depression, anxiety, and stress) through resilience (Seki et al., 2023). Another study found that resilience mediated the influence of parental psychological control on suicide ideation in Chinese adolescents (Sun & Ban, 2022). Given the above, we proposed that resilience should be vital for maintaining mental health during COVID-19, and may play a mediating role in the associations between parental psychological control and COVID-19 pandemic-related negative emotions of college students. That is, parental psychological control may be associated with college students' poorer resilience, which in turn can threaten their coping capacity and adaptation outcomes during the COVID-19 pandemic.

The Moderating Role of Emotion Regulation

College students with disparate emotion regulation may also show heterogeneity in their psychological processes, that is, individuals under parental psychological control will not equally develop lower resilience. Emotion regulation refers to the process of regulating the internal state of emotional experience and the occurrence, form, intensity or duration of physiological processes (Koole, 2009). Among the most studied emotion regulation strategies are cognitive reappraisal and expressive suppression (Gross, 2002; 2015).

Cognitive reappraisal involves modifying the emotional impact of an event by reinterpreting that event in a different manner (Gross, 1998). In response to aversive events, cognitive reappraisal has been demonstrated to reduce subjective ratings of negative emotions and modulate the neurobiological correlates of negative emotion (Buhle et al., 2014). Expressive suppression refers to the act of inhibiting the outward expressions of emotions after they have been elicited (Gross, 1998). This behavior has been linked to an increase in symptoms of depression (Diedrich et al., 2017) and anxiety (Zawadzki, 2015). The process model of emotion regulation posits that cognitive reappraisal can effectively reduce negative emotional feelings through reframing the emotion-eliciting events in a more positive way while expressive suppression, referring to the inhibition of external cues to one's internal emotional state, is considered as a maladaptive strategy (Gross & Thompson, 2006; Schäfer et al., 2017).

Although the positive correlation between emotion regulation and resilience has been established (Ye, B. et al., 2022a), more evidence supports the idea that emotion regulation strategies do not serve as mediators in the relationship between parental psychological control and outcomes, given that no relationship was found between psychological control and emotion regulation (i.e., cognitive reappraisal & emotion suppression) in emerging adults (Aznar & Battams, 2022). Cross-lagged panel analyses further revealed that psychological control did not significantly predict emotion regulation 1 year later (Gao et al., 2021).

From the perspective of individual environment interaction theory, development of individual adaptive ability is not only affected by their proximal processes and external environment but also by their internal characteristics (Lerner, 2004). Previous research also provided empirical support for the moderating role of emotion regulation. Evidence has shown that psychological control was negatively correlated with adolescent adaptation, especially in adolescents with difficulty in emotion regulation (Cui et al., 2014). The use of emotion regulation strategies has also been found to limit the effect of aversive events on resilience (Troy & Mauss, 2011) while emotional awareness moderated the association between childhood maltreatment experiences and resilience (Lee et al., 2019). Such findings suggest that efficient regulation of emotions may protect college students from parental psychologically control, which creates a coercive, strained climate of the family and impedes one's volitional functioning, independency, and adjustment.

Perhaps most relevant to this study, the tendency to use cognitive reappraisal moderated the association between adverse life experiences and psychological distress (Boyes et al., 2016). Further studies indicated cognitive reappraisal may buffer the negative effect of childhood emotional neglect on adult resilience (Holman & Jignea, 2022). Additionally, research has demonstrated that the use of expressive suppression, similar to cognitive reappraisal, can both effectively mitigate the impact of stressful events on emotional well-being (Franz et al., 2021). However, it remains unknown whether cognitive reappraisal and expressive suppression can moderate the negative effects of parental psychological control on resilience in college students. In this study, cognitive reappraisal and expressive suppression were tested as possible moderating factors to further explore the mechanism of internal and external interaction, and to understand the mechanism in alleviating the negative effects of parental psychological control.

The Present Study

The current study investigated the effect of parental psychological control on college students' COVID-19 pandemic-related negative emotions, which might be mediated by resilience and moderate by emotion regulation. Based on the above, we hypothesized that parental psychological control would be

positively related to COVID-19 pandemic-related negative emotions of college students (H1); Resilience would play a mediating role in the association between parental psychological control and COVID-19 pandemic-related negative emotions (H2); Emotion regulation would moderate the association between parental psychological control and resilience. Specifically, parental psychological control on resilience might be weaker for college students who use more cognitive reappraisal and less expressive suppression emotion strategy (H3).

Methods

Participants

To determine the target sample size, we performed a priori power analysis using G * Power 3.1 (Faul et al., 2007). The power analysis for a multiple regression suggested a sample size of $n = 377$ with a small-to-moderate effect size ($f^2 = .05$) and a power of .95 ($\alpha = .05$, four predictors). In our study, data were collected from a web-based survey during the initial period of COVID-19 (February, 2020) when all of the population were home isolated due to the pandemic. Convenience sampling was used in this study, and 400 college students (51.8% male; range_{age} = 18–25; M_{age} = 19.78 ± 1.72 years) from several universities in China who agreed to take part in the survey were recruited. The majority of participants were not from single-child family (N = 276, 69%). The present study was conducted in line with the guidelines of the Declaration of Helsinki and was under the approval of the Ethics Committee of the first author's university (No. SXULL2020001) and all participants completed the informed consent form.

Measures

Parental Psychological Control. The 18-item Parental Psychological Control Scale was adopted to assess parental psychological control (Wang et al., 2007b). Participants reported their perceptions of parents' use of strategies including love withdrawal (e.g., "My parents act cold and unfriendly if I do something they do not like"), guilt induction (e.g., "My parents tell me that I should feel guilty when I do not meet their expectations"), and authority assertion (e.g., "My parents tell me that what they want me to do is the best for me and I should not question it"). A Likert-5 points scale was used with 1 representing "never," and 5 representing "always." The average scores were calculated, with a higher score indicating higher experience of parental psychological control. The scale has shown adequate reliability and validity in Chinese college students (Li et al., 2020). The Cronbach's α of the scale was .92 in this study.

COVID-19 Pandemic-Related Negative Emotions. The Profile of Mood States with 40 items served as a tool to measure the COVID-19 pandemic-related negative emotions (Grove & Prapavessis, 1992; Zhu, 1995). The scale was initially developed to assess general mood state and has adequate internal consistency in Chinese college students (Zhu, 1995). For the purposes of this study, participants were asked to report their mood state within the last week during COVID-19 in respect of seven moods subscales related to tension, anger, fatigue, depression, vigor, panic and self-esteem. Participants rated each item on a Likert-5 point scale, with 0 representing "not at all", and 4 meaning "extremely". The subscale of vigor and self-esteem was reversed coded and the average score of the scale were calculated with higher score indicating stronger COVID-19 pandemic-related negative emotions. In this study, the Cronbach's α of the scale was .94.

Resilience. The Brief Resilience Scale (BRS) was adopted to measure the resilience (Smith et al., 2008; Chen et al., 2020). The college students reported their resilience by responding to a 6-item measure (e.g., "I tend to bounce back quickly after hard times"). A Likert-5 point scale was used with 1 representing "completely disagree" and 5 representing "completely agree." There are three reverse coded items and the average score of the scale was calculated with higher score indicating the higher levels of resilience. The reliability and validity of the scale have been confirmed among college students (Chen et al., 2020). In this study, the Cronbach's α of the scale was .75.

Emotion Regulation. The 10-item Emotion Regulation Questionnaire (ERQ) was adopted to measure the emotion regulation process (Gross & John, 2003; Wang et al., 2007a). A Likert 5-point scale was used with 1 representing "totally disagree" and 5 representing "completely agree." The scale assessed emotion regulation strategies in two dimensions: cognitive reappraisal (e.g., "I control my emotions by changing the way I think about the situation I'm in") and expressive suppression (e.g., "I control my emotions by not expressing them"). Higher scores are reflective of higher inclination to adopt the corresponding emotion regulation strategy. The scale has been widely used and good reliability and validity of the scale were shown in Chinese college students (Ye et al., 2022b). The Cronbach's α of cognitive reappraisal and expressive suppression was 0.80 and 0.70, respectively.

Data Analysis

The statistical analyses were conducted using SPSS 24.0. Descriptive statistics and Pearson correlation analysis were computed for each variable. Scatterplots of the relations between variables were performed and the relations between variables were linear. Hayes's PROCESS macro for SPSS with Bootstrap method based on 5000 random samples was used to test the moderated mediation model. All variables were standardized before data analyses. The effect was regarded as significant if the 95% bias-corrected confidence

intervals (CI) did not include zero. Consistent with previous literature, simple slope analyses were conducted to determine the nature of the moderation effects when interactions were found to be significant (Aiken & West, 1991).

Results

Descriptive Analysis and Correlations

Table 1 showed descriptive statistics, including means, standard deviations, and correlations of all variables. Parental psychological control was positively correlated with COVID-19 pandemic-related negative emotions and expressive suppression, but negatively correlated with resilience. Additionally, resilience was positively correlated with cognitive reappraisal and reversely with COVID-19 pandemic-related negative emotions. Cognitive reappraisal was negatively correlated with COVID-19 pandemic-related negative emotions and positively to expressive suppression. Age had no significant correlation with these variables ($p > .05$). Independent t test analyses examining sex as a possible covariate revealed that male participants scored significantly lower on COVID-19 pandemic-related negative emotions than their female counterparts ($t(398) = -3.60$, $p < .001$, Cohen's $d = .36$), while scoring higher on parental psychological control ($t(398) = 2.10$, $p < .05$, Cohen's $d = .21$), resilience ($t(398) = 4.71$, $p < .001$, Cohen's $d = .47$), and expressive suppression ($t(398) = 4.08$, $p < .001$, Cohen's $d = .41$). Therefore, sex was regarded as a covariate in the subsequent analyses.

Mediation Effect Analysis

Results of linear regression revealed that parental psychological control was significantly related to COVID-19 pandemic-related negative emotions ($\beta = .28$, $t = 5.81$, $p < .001$, 95% CI = .18, .38). Model 4 in SPSS PROCESS macro (Model 4 is a simple mediation model) was used to test the mediating effect of resilience). Parental psychological control was significantly associated with resilience ($\beta = -.16$, $t = -3.30$, $p < .01$, 95% CI = $-.28$, $-.04$). Resilience was significantly associated with COVID-19 pandemic-related negative emotions ($\beta = -.46$, $t = -10.42$, $p < .001$, 95% CI = $-.54$, $-.37$). After controlling for the resilience, parental psychological control was still significantly associated with resilience ($\beta = .20$, $t = 4.76$, $p < .001$, 95% CI [.12, .29]). The total effect was .27, 95% CI [.17, .38]. The indirect effect of resilience was .07, 95% CI [.02, .13]. After controlling for resilience, the direct effect of parental psychological control on COVID-19 pandemic-related negative emotions was still significant, with an effect value of .20, 95% CI [.12, .29]. The mediating effect accounted for 25.93% of the total effect. (Table 2). Therefore, resilience plays a partial mediating role in the prediction of COVID-19 pandemic-related negative emotions by parental psychological control.

Moderated Mediation Effect Analysis

The moderated mediating effect was further tested with Model 7 in SPSS PROCESS macro (Model 7 demonstrates a moderated-mediation with a moderated a-path) with resilience as the mediating variable, cognitive reappraisal and expressive suppression as the moderating variables, respectively. The product (interaction term) of parental psychological control and cognitive reappraisal didn't have a significant predictive effect on resilience ($\beta = .05$, $t = 1.21$, $p > .05$, 95% CI [$-.03$, .12]. Parental psychological control was negatively associated with resilience ($\beta = -.17$, $t = -3.58$, $p < .001$, 95% CI [$-.28$, $-.07$]. In the meanwhile, cognitive reappraisal was positive associated with resilience ($\beta = .23$, $t = 4.92$, $p < .001$, 95% CI [.13, .33].

As Table 3 showed, the product of parental psychological control and expressive suppression had a significant prediction effect on resilience ($\beta = .14$, $t = 3.53$, $p < .001$, 95% CI [.06, .23]), indicating a moderating role of expressive suppression in the mediating path (Figure 1). Particularly, the indirect effect of parental psychological control on COVID-19 pandemic-related negative emotions through resilience was .14, 95% CI [.07, .21], for those who use less expressive suppression. The indirect effect was .07, 95% CI [.02, .12], for those who had medium expressive suppression. The indirect

Table 1. Descriptive Statistics and Correlations.

Variable	*Possible Range*	*Observed Range*	*M*	*SD*	1	2	3	4	5	6
1. Age	[18,25]	[18,25]	19.78	1.72	—					
2. Parental psychological control	[1,5]	[1,5]	2.47	0.75	0.04	—				
3. Resilience	[1,5]	[1,5]	3.34	0.65	−0.03	−0.13**	—			
4. COVID-19 pandemic-related negative emotions	[0,4]	[0.10,3.03]	1.23	0.57	0.05	0.26***	−0.51***	—		
5. Cognitive reappraisal	[1,5]	[1.33,5]	3.48	0.61	−0.06	0.03	0.25***	−0.16**	—	
6. Expressive suppression	[1,5]	[1,5]	3.02	0.76	0.04	0.20***	−0.07	0.06	0.13*	—

*$p < 0.05$, **$p < 0.01$,, ***$p < 0.001$ (two-tailed test).

Table 2. The Mediating Effect of Resilience.

	Effect Size	Boot SE	Boot LLCI	Boot ULCI	Relative Effect Size
Mediating effect of resilience	0.07	0.03	0.02	0.13	25.93%
Direct effect	0.20	0.04	0.12	0.29	74.07%
Total effect	0.27	0.05	0.17	0.38	

Table 3. The moderated mediating effect.

Dependent Variables	Independent Variables	R^2	F	β	95%CI	t
Resilience	Sex	0.11	12.82***	−0.27	[−0.37, −0.17]	−5.58***
	Parental psychological control			−0.15	[−0.26, −0.04]	−3.11**
	Expressive suppression			−0.10	[−0.22, 0.01]	−1.99*
	Parental psychological control ◊ expressive suppression			0.14	[0.01, 0.26]	3.53***
COVID-19 pandemic-related negative emotions	Sex	0.30	56.37***	0.09	[0.00, 0.18]	2.15*
	Parental psychological control			0.20	[0.12, 0.29]	4.76***
	Resilience			−0.46	[−0.54, −0.37]	−10.42***

N = 400; *p < 0.05, **p < 0.01, ***p < 0.001.

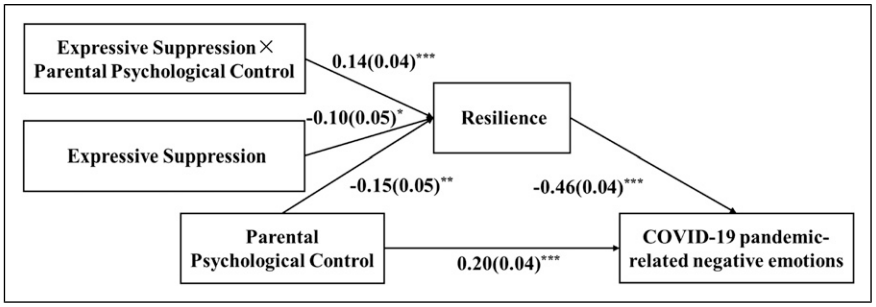

Figure 1. The moderated mediation model with expressive suppression. *Note*. Coefficients standardized. Sex were controlled in the model (not shown). *p < 0.05; **p < 0.01; ***p < 0.001.

effect of resilience was not significant for those who use more expressive suppression, 95% CI [−.07, .09].

To further interpret the interaction effect, we conducted simple slope analysis for low expressive suppression (1 SD below the mean), medium expressive suppression (mean) and high expressive suppression (1 SD above the mean). For descriptive purposes, we plotted the predicted resilience against parental psychological control (Figure 2). The result of simple slope tests showed that parental psychological control negatively predicted resilience for college students who use less expressive suppression (β = −.19, t = −4.54, p < .001) and those with medium expressive suppression to a lesser extent (β = −.10, t = −3.11, p < .01), but not significant for those who use more expressive suppression (β = −.004, t = −.10, p > .05). The results indicated that the effect of parental psychological control on resilience was more significant for individuals who use less expressive suppression.

Discussion

The present study aimed at exploring the effect of parental psychological control on COVID-19 pandemic-related negative emotions among Chinese college students and the underlying mechanism. The results showed that resilience partially mediated the association between parental psychological control and COVID-19 pandemic-related negative emotions, and expressive suppression instead of cognitive reappraisal further modulated the association between parental psychological control and resilience.

Parental Psychological Control and COVID-19 Pandemic-Related Negative Emotions

This research supported H1 that parental psychological control is an important risk factor for COVID-19 pandemic-related

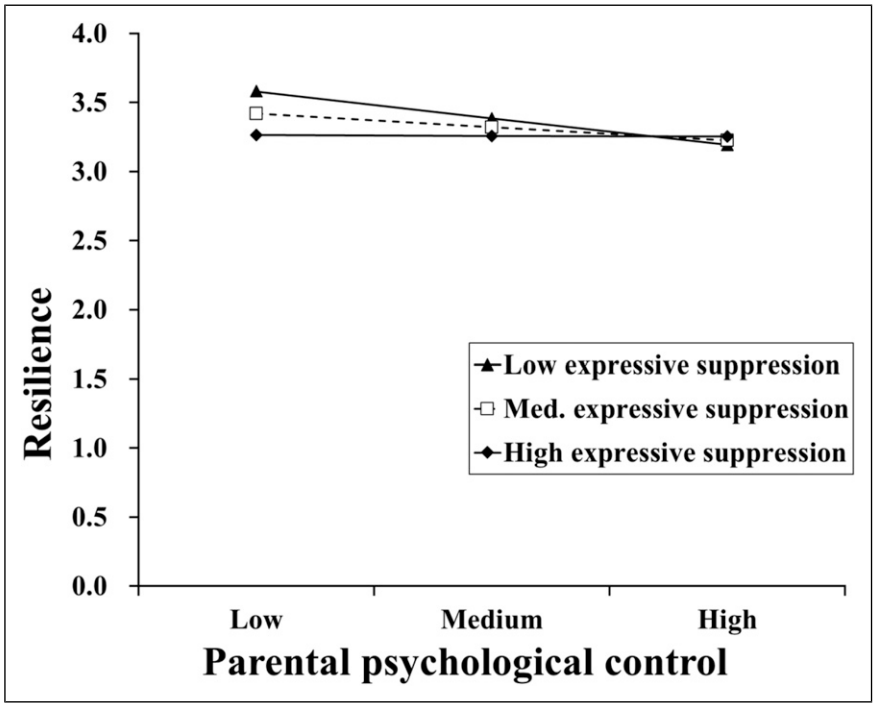

Figure 2. Interaction effect of parental psychological control and expressive suppression on resilience.

negative emotions in college students. This finding is consistent with those of previous studies on the association between parental psychological control and mental health in college students (Ingoglia et al., 2017) and with previous study using a larger sample of emerging adults (Ma & Wang, 2021). The current findings contribute to the existing evidence that psychological control is positively associated with depressive and anxiety symptoms among emerging adults in the context of public health emergencies (Zong et al., 2019). According to Self-determination Theory, parental psychological control can exert both internal and external pressure that impairs an individual's psychological adaptation (Wagner & Abaied, 2016) and self-esteem (Jorgensen et al., 2017). This has been associated with heightened negative emotional reactions to COVID-19, such as fear of the pandemic, anxiety about isolation, and a diminished sense of control (Zhang et al., 2022).

The Role of Resilience

This study further explored the mediating role of resilience in the association between parental psychological control and COVID-19 pandemic-related negative emotions and the results confirmed hypothesis H2. That is, resilience played a mediating role in the association between parental psychological control and COVID-19 pandemic-related negative emotions.

Several processes may be used to explain the association between parental psychological control and resilience. Firstly, parental psychological control is found to impair the development of volitional function (Soenens & Vansteenkiste, 2010), inhibit progress of identity development (Luyckx et al., 2007), and generate the sense of helplessness (Filippello et al., 2015), which weakens one's ability to cope successfully and independently even in stressful environments (Schäfer & Goldner, 2018). What's more, parental psychological control may also lead to estrangement of family members (Perlman et al., 2017), resulting in poor social bonds and social adjustment (Soenens et al., 2009). According to multisystem model of resilience, internal resilience can be developed from inter-personal sources such as family and other interaction experiences (Liu et al., 2017). Therefore, it is reasonable to find that individuals with high parental psychological control are more likely to reflect low resilience.

Consistent with previous results, resilience was found to negatively predict individuals' maladaptive emotional responses to COVID-19 (Killgore et al., 2020). Meanwhile, our results corroborated previous studies showing that resilience was associated with low-level depression and anxiety symptoms during the COVID-19 pandemic (Liu et al., 2020). Resilience is a positive characteristic, indicative of one's mental health (Wu et al., 2020). Individuals with higher resilience have enough psychological resources, such as strength, flexibility and optimism, and are open to external experience (Waugh et al., 2008; Zhou et al., 2016), thus helping maintain mental health during the COVID-19 epidemic period. In addition, recent studies indicated that individuals with high-level resilience perceived future anxiety of lower levels during COVID-19, thus experiencing higher

subjective well-being (Paredes et al., 2020). It is noteworthy that the observed mediation effect was not substantial, thereby highlighting the direct impact of parental control. While this is an indicator of the need for further investigation and refinement of models, it is also expected in complex conceptual frameworks. Overall, resilience played a mediating role between maladaptive parenting and poor adaptation during COVID-19.

The Role of Emotion Regulation

This study partially confirmed hypothesis H3 in exploring the moderating role of emotion regulation. Inconsistent with previous studies indicating cognitive reappraisal may buffer the negative effect of childhood emotional neglect on resilience, the moderating effect of cognitive reappraisal was not confirmed in this study, unexpectedly (Holman & Jignea, 2022). This suggested that the translation of parental psychological control to COVID-19 pandemic-related negative emotions through resilience appeared to be equally robust for those with low or high levels of propensity to use this form of emotion regulation. As previous studies showing cognitive reappraisal might be less strongly related to mental health, it is possible that the effects of cognitive reappraisal may not be as strong as once thought, at least when it comes to specific family risks (i.e., Aldao et al., 2010). The current findings also extend previous research by demonstrating that the adaptive emotion regulation strategies might not be sufficient to buffering risks of stressful situation (Braet et al., 2022). From a neuroendocrine perspective, the use of expressive suppression following stressful life events may lead to changes in HPA axis reactivity, whereas cognitive reappraisal does not (Roos et al., 2018).

Expressive suppression, however, modulated the mediating pathway that the indirect effect through resilience is more robust for individuals who seldom use expressive suppression. Specifically, the present results showed a stronger negative relationship between parental psychological control and resilience for college students who use less expressive suppression, which was inconsistent with previous studies indicating that the predictive effect of psychological control on maladjustment was stronger in adolescents with emotional regulation difficulties (Cui et al., 2014). Our data, however, were consistent with prior work showing that the association between adverse childhood experiences and perceived stress is strengthened when less expressive suppression is used (Kalia & Knauft, 2020). One possible reason is that the expression of emotion conflicts with parental psychological control, which is characterized by invalidating their child's point of view, and constraining their child's expression of emotions, and imposing their own views upon their child (Schäfer & Goldner, 2018). It should be noted that psychological control may undermine the resilience and adaptive responses to stress in college students, especially for those who rarely use expressive inhibition as an emotional regulation strategy. Therefore, parents should refrain from utilizing controlling parenting practices in such households.

Furthermore, individuals who tend to rely heavily on expressive suppression as an emotion regulation strategy exhibited relatively lower levels of resilience, with the exception of those who reported higher levels of perceived psychological control. It is speculated that these efforts of suppression may consume much resources and lead to negative feelings about the self (Gross & John, 2003). Thus, floor effects may have reduced the effect of psychological control on resilience. An alternative explanation for the result is that individuals with high expressive suppression may restrain the expression of negative emotions to achieve family harmony, which can protect college students from further adverse effects of parental psychological control (Wei M. et al., 2013).

Limitations and Implications

Several limitations in this study should be noted. Firstly, the cross-sectional design limited the ability to make causal inferences. Further studies should be explored from the perspective of development by adopting a tracking design. Secondly, the risk factors for COVID-19 pandemic-related negative emotions are complex, and other environmental variables or personality variables which may play a mediating or moderating role should also be delineated. Further research is needed to explore which aspects of resilience are most important in this mediation, and thus which areas might be most promising for intervention. Additionally, some demographic and background variables (i.e., socio-economic status, availability of support, & frequency of parent-child interaction) also should be taken into consideration in future research to better interpret the results. Thirdly, self-report questionnaires may lead to report bias, so other methods to measure parental psychological control should be used in the future. Fourthly, the associations were tested only in Chinese college students, calling for further investigation in other regions and populations.

The knowledge gained in this study would be beneficial in the development of pertinent intervention programs during COVID-19 pandemic for college students in terms of identifying risk populations, improving family environment, and bolstering psychological resources. This study lends further support to the idea that parental psychological control is an important risk factor for negative emotions associated with the COVID-19 pandemic among college students, and identifies the role of resilience and emotional regulation, which can inform the prevention and intervention of psychological crises in public health emergencies. To scientifically prevent the risk of depression, anxiety and other emotional problems among college students and maintain good mental health during the COVID-19 pandemic, a psychological control approach should be avoided, especially for those whose children are used to expressing their emotions. The current study also indicates that enhancing the resilience is a key intervention points for alleviating COVID-19 pandemic-related negative emotions in college students. Apart from ameliorating parenting, previous literature has identified that strategies to

strengthen individual resilience, such as compassion practicing and online communication, could be adopted by college students in the context of public health emergencies (George et al., 2022; Polizzi et al., 2020).

Conclusions

Our results provide preliminary support for the notion that parental psychological control has a predictive effect on negative emotions associated with the COVID-19 pandemic in college students, as well as a mediating role for resilience. Expressive suppression but not cognitive reappraisal moderated the association between parental psychological control and resilience. While we acknowledge the limitations of the present investigation, our findings still facilitate an expanded understanding of the family risk of college student adaptation in the context of a stressor such as the COVID-19 pandemic.

Data Availability Statement

The data that support the findings of this study are openly available in OSF at http://doi.org/10.17605/OSF.IO/9RSVG.

Declaration of Conflicting Interests

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