The Synergistic Effect of Emotion and Cognition under Gender Regulation on College Students' Mental Health: An Intermediary Analysis

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Abstract: This study investigates the mediating effect of cognitive flexibility on the relationship between positive emotions, negative emotions, and mental health among college students. Utilizing a sample of 676 undergraduate students from four universities in Wuhan, Hubei Province, China, data were gathered through questionnaire surveys and subsequently analyzed using a range of statistical methods, including descriptive statistics, t-tests, correlation analysis, and regression analysis. The results reveal that while no statistically significant gender differences were found in terms of positive emotions, negative emotions, or overall mental health among the participants, a notable gender disparity emerged in cognitive flexibility, with male students demonstrating significantly higher levels than their female counterparts. In terms of the underlying mechanisms, the study identified that both positive and negative emotions exert dual pathways on college students' mental health. Firstly, both types of emotions directly impact mental health. Secondly, they have indirect effects mediated through cognitive flexibility. Specifically, positive emotions enhance students' ability to adaptively adjust their cognitive frameworks in response to environmental changes, thereby significantly promoting mental well-being. Conversely, negative emotions impede the adaptation of cognitive frameworks to environmental shifts, leading to a decline in mental health. The findings of this study on the impact of positive emotions, negative emotions, and cognitive flexibility on college students' mental health provide crucial empirical evidence for the development of support programs aimed at enhancing student well-being. Furthermore, they offer valuable insights for the formulation of relevant policies and initiatives, with the potential to positively influence future practical applications in promoting mental health among college students.

Keywords: positive emotions, negative emotions, cognitive flexibility, mental health, college students

1 Introduction

1.1 Research Necessity and Objectives

College students are undergoing a pivotal transition from adolescence to adulthood, confronting a multitude of psychological challenges. Environmentally, they are exposed to a myriad of changes. Unlike the passive learning environment of junior high and high school, university life demands active engagement, placing significant emphasis on students' independence and self-governance. Concurrently, as they forge extensive interpersonal connections, anxieties regarding future career trajectories emerge. Moreover, the responsibilities of managing academic credits and acquiring various certifications impose substantial pressures, collectively contributing to considerable psychological stress. Additionally, societal factors such

as escalating youth unemployment rates and soaring tuition fees further intensify feelings of depression and anxiety among university students. Within this fiercely competitive social landscape, a growing number of students are grappling with psychological distress, with their overall sense of well-being facing significant threats. Existing research data underscores that the level of well-being among Chinese university students remains comparatively low. It is crucial to recognize that university life represents not only a springboard for positive personal transformation but also a critical transitional period from adolescence to full-fledged adulthood. The degree of happiness experienced during this formative stage profoundly influences their future trajectories. Therefore, it warrants our utmost attention to explore strategies for enhancing the happiness of Chinese university students and devising appropriate support mechanisms.

Research on well-being can broadly be divided into studies of subjective well-being and mental health. Subjective well-being focuses on an individual's overall perception and experience of life. Mental health, however, is a concept grounded in the theory of self-actualization, aiming to address certain limitations in subjective well-being research. Ryff (1989) defined mental health as "accepting one's true self, maintaining positive relationships, possessing the ability to regulate one's behavior, mastering one's environment, and having clear life goals," characterizing it as a state of being motivated and committed to realizing one's potential. Happiness cannot be fully captured by positive emotions, experiences, or life satisfaction alone; it should be viewed as a comprehensive concept encompassing an individual's psychological well-being and effective functioning. Therefore, in this study examining college students' well-being, we will focus on psychological well-being grounded in a multi-theoretical framework rather than subjective well-being.

Previous studies on college students have extensively explored the relationship between various variables and mental health, such as stress (Hubbar et al., 2018; Córdova et al., 2023), social support (Hefner & Eisenberg, 2009; Merianos et al., 2013), and parental attitudes (Barton & Hirsch, 2016; Barton & Kirtley, 2012). However, current research on the impact of emotions and cognition on mental health remains insufficient. Therefore, this study aims to delve into the intrinsic connections among emotions, cognition, and mental health among college students. As a key factor influencing mental health, emotions are typically categorized into positive and negative emotions in research. Positive emotions embody enthusiasm, vitality, and life force, encompassing diverse experiences such as happiness, pride, love, relief, hope, empathy, and aesthetic appreciation. Negative emotions, conversely, reflect subjective distress and discomfort, including anger, fear, anxiety, guilt, shame, sadness, jealousy, and disgust (Rhudy & Meagher, 2003). Although positive and negative emotions are often viewed as opposing concepts, emotion research treats them as two distinct and non-homogeneous dimensions (Solomon & Stone, 2002). Therefore, a comprehensive approach that considers both positive and negative emotions is more thorough and appropriate than examining only one component of emotion.

Cognitive flexibility, a crucial cognitive trait influencing mental health, refers to an individual's ability to adaptively adjust their cognitive framework in response to changing environmental stimuli (Dennis & Vander, 2010). It encompasses the tendency to perceive challenging situations as controllable and the capacity to devise multiple alternative solutions to events. During the period of rapid psychological change that is university life, flexible cognitive abilities significantly impact an individual's adaptation and mental health (Tong et al., 2024; Yurt & Hayli, 2025). Previous research indicates that individuals with high cognitive flexibility demonstrate greater environmental adaptability (Cañas, 2003) and higher levels of well-being (Yildiz & Eldeleklioglu, 2021).

Furthermore, cognitive flexibility influences life satisfaction and well-being (Odacı & Cikrikci, 2019; Polat et al., 2022). It follows that cognitive flexibility also impacts mental health. Emotions and cognition are closely intertwined (Pessoa, 2008; Fitness, 2006). Specifically, emotions can induce changes in cognitive processes (Petty & Briñol, 2015), with positive emotions exerting beneficial effects (Piskorska, 2012; Ullah, Khan, & Uddin, 2024) and negative emotions producing detrimental impacts (Joormann & Quinn, 2014; Garnefski, Kraaij, Spinhoven, 2001). It follows that emotions can influence mental health both directly and indirectly through cognitive pathways. Previous research confirms emotions positively impact individuals' lives via cognitive mechanisms (Izard, 2011), with positive emotions affecting life satisfaction through cognitive characteristics (Sanchez & Vazquez, 2014).

Positive emotions promote comprehensive cognition across domains, while negative emotions hinder flexible thinking (Tugade & Fredrickson, 2007). In this study, we hypothesize that cognitive flexibility serves as a key moderator in the relationship between emotions and mental health.

Specifically, cognitive flexibility describes an individual's ability to shift thinking based on environmental contexts, making it a suitable construct for examining emotions' effects on cognitive expansion and contraction. Both positive and negative emotions, as well as cognitive flexibility, directly influence mental health. Furthermore, positive and negative emotions are expected to indirectly affect mental health through cognitive flexibility. Positive emotions promote broad and flexible cognition, thereby enhancing well-being, while negative emotions may produce the opposite effect. Given that college students experience diverse emotions while developing advanced cognitive functions, both variables must be considered simultaneously to comprehensively understand their mental health status. Therefore, this study aims to clarify the specific effects of emotions and cognition on college students' mental health and to validate the role of positive and negative emotions in mental health through cognitive flexibility. Additionally, gender differences in positive emotions, negative emotions, cognitive flexibility, and mental health warrant further exploration. Research indicates that males tend to experience positive emotions more readily than females, while females are more prone to negative emotions (Alexander & Wood, 2000; Babin et al., 2003). However, other studies have suggested no gender differences in positive or negative emotions (Deng et al., 2016). Furthermore, findings on gender differences in cognitive flexibility remain inconsistent (Artawijaya & Supratiwi, 2024). Regarding mental health, while men exhibit higher overall health levels than women, specific sub-factors yield varying results (Rosenfield & Smith, 2010; Emslie et al., 2002). Therefore, it is necessary to re-examine gender differences in positive and negative emotions, cognitive flexibility, and mental health to provide targeted, differentiated support where disparities exist.

In summary, this study aims to investigate whether gender differences exist in the relationships among positive and negative emotions, cognitive flexibility, and mental health among college students, while comprehensively examining the specific effects of positive and negative emotions and cognitive flexibility on mental health.

Specifically, we will examine the mediating role of cognitive flexibility in the relationship between positive and negative emotions and mental health.
Furthermore, we expect these findings to serve as foundational data for developing support programs that promote well-being among college students.

1.2 Research Questions

To achieve the aforementioned research objectives, the following research questions are posed.

Research Question 1: Do gender differences exist in positive and negative emotions, cognitive flexibility, and mental health among college students?

Research Question 2. Does cognitive flexibility mediate the relationship between positive and negative emotions and mental health among college students?

2 Research Methodology

2.1 Research Participants

This study selected 676 undergraduate students from a four-year university in Wuhan, Hubei Province, China, as research subjects. During data collection, 701 questionnaires were distributed, with 692 successfully returned, achieving a high response rate of 98.72%. During further screening of valid questionnaires, those with inaccurate or careless responses were excluded. Ultimately, 676 valid questionnaires (97.69% of the returned questionnaires) were confirmed for subsequent analysis. In terms of gender distribution, the sample included 345 male participants (51.04%) and 348 female participants (48.96%). The average age of participants was 20.58 years, with a standard deviation of 2.23. In terms of grade distribution, 252 participants were second-year students (37.28%), 230 were third-year students (34.02%), and 194 were fourth-year students (28.7%).

2.2 Measurement Tools

This study employed the Positive and Negative Affect Schedule (PANAS), the Cognitive Flexibility Scale, and the Mental Health Scale.

2.2.1 Positive and Negative Affect Scales

The Emotional Experience Scale developed by Eun Gyeong Lee et al. (2006) was adopted to assess participants' positive and negative emotional states. This scale was constructed based on Watson's (1988) emotional classification framework and drew upon concepts from the Positive and Negative Affect Schedule (PANAS). It comprises 57 items covering two primary subdimensions: positive emotions and negative emotions. Higher scores on the positive emotion dimension indicate individuals more frequently experience positive feelings such as happiness, pride, love, hope, gratitude, and satisfaction. Conversely, higher scores on the negative emotion dimension reflect individuals frequently experiencing negative emotions like frustration, sadness, and betrayal, with related items including "sadness," "disappointment," and "anger." The scale employs a 4-point Likert scale, ranging from "Not at all" to "Very much," scored from 1 to 4 respectively. In this study's analysis, the positive emotion dimension achieved a Cronbach's α coefficient of .94, while the negative emotion dimension attained .93, both demonstrating excellent internal consistency reliability.

2.2.2 Cognitive Flexibility Inventory

In this study, we selected the Cognitive Flexibility Inventory (CFI) developed by Dennis and Vander Wal (2010) as the assessment tool to quantify participants' cognitive flexibility levels. This scale features 18 carefully designed items, comprising 12 positively worded statements and 6 reverse-scored (i.e., negatively worded) statements. The scale structure encompasses two core sub-factors: Substitution Factor and Control Factor. Scoring employs a 7-point Likert scale, where participants rate items from "Not at all true" (1 point) to "Very true" (7 points) based on their actual experiences. Consequently, the total CFI score ranges from 18 to 126 points, with higher scores indicating greater cognitive flexibility. In this study's data collection and analysis, the overall Cronbach's α coefficient for all items reached 0.89, further validating the scale's

reliability. At the sub-factor level, the Cronbach's α coefficient for the substitution factor was 0.89, and for the control factor, it was 0.85. Both values indicate the scale's sound applicability in this research.

2.2.3 Psychological Well-Being Scale

This study employed the Psychological Well-Being Scales (PWBS) developed by Ryff (1989) to assess participants' psychological well-being. The scale comprises 44 items, with 22 positively worded questions and 22 negatively worded questions (i.e., reverse-scored). The scale structure encompasses six key subscales: self-acceptance, quality of relationships, self-regulation, environmental mastery, sense of purpose in life, and personal growth. For scoring, the PWBS employs a 6-point Likert scale, requiring participants to rate each item based on their genuine feelings, ranging from "Not at all true" (1 point) to "Very true" (6 points). Accordingly, the total mental health score ranges from 44 to 264 points, with higher scores indicating better mental health. In this study's data analysis, the overall Cronbach's α coefficient reached 0.93, demonstrating excellent internal consistency. For each sub-dimension, the Cronbach's α coefficients were as follows: Self-Acceptance 0.84, Interpersonal Relationships 0.84, Self-Discipline 0.77, Environmental Adaptation 0.76, Life Goals 0.81, and Personal Growth 0.70. These values collectively confirm the reliability and stability of the scale in this study.

2.3 Data Analysis

Data analysis was conducted using SPSS software, following this methodology: First, to ensure the reliability and validity of the measurement tools, we performed validity and reliability tests. This involved calculating Cronbach's α coefficients for each scale to assess internal consistency and conducting factor analysis to validate the scales' construct validity. Second, to comprehensively characterize the research subjects, descriptive statistical analysis was conducted. This involved calculating frequency distributions, means, standard deviations, and other statistical measures to outline the basic profile of the participants. Next, to investigate differences in positive emotions, negative emotions, cognitive flexibility, and mental health between male and female college students, t-tests were employed. By comparing mean differences between gender groups, potential gender effects were revealed. Finally, to delve into the potential mediating role of cognitive flexibility in the relationship between positive emotion, negative emotion, and mental health among college students, we employed multiple regression analysis within a mediation framework (Baron & Kenny, 1986). We further validated the mediating effect through Sobel tests (Leinhart, 1982) to clarify the specific pathways of cognitive flexibility within this complex relationship.

3 Research Findings

3.1 Positive and Negative Emotions, Cognitive Flexibility, and Mental Health Among College Students by Gender

To investigate whether statistically significant gender differences exist in positive emotions, negative emotions, cognitive flexibility, and mental health among college students, this study employed independent samples t-tests for analysis. The relevant results are presented in Table 1. The analysis revealed no significant gender differences in positive or negative emotions. However, a highly significant statistical difference existed between genders in cognitive flexibility ($t = 3.55$, $p < .001$). Further breakdown revealed that overall cognitive flexibility scores were higher for males ($M = 5.09$, $SD = .79$) than females ($M = 4.69$, $SD = .74$). Regarding sub-factors of cognitive flexibility, males also scored higher on the substitution sub-factor ($M = 5.29$, $SD = .87$) compared to females ($M = 4.99$, $SD = .82$). and in the control factor, males scored higher ($M = 4.82$, $SD = 1.03$) than females ($M = 4.50$, $SD = 1.09$). Concurrently, the study found no

significant gender differences in college students' mental health status at the overall level or across any sub-factors.

Table 1 Mean Values, Standard Deviations, and Independent Samples t-Tests for Positive and Negative Emotions, Cognitive Flexibility, and Mental Health by Gender Among College Students

		Male (n=164)	Female (n=174)	*t*
		M(SD)	*M(SD)*	
Emotion	Positive Emotion	2.61(.53)	2.69(.47)	-1.73
	Negative Emotions	2.42(.47)	2.47(.50)	-.91
Cognitive Flexibility	Alternative Factors	5.29(.87)	4.99(.82)	3.04**
	Control Factors	4.82(1.03)	4.50(1.09)	2.89**
	Overall	5.09(0.79)	4.69(0.74)	3.55***
Mental Health	Self-Acceptance	3.89(.74)	3.99(.84)	-.62
	Interpersonal Relationships	4.52(.85)	4.44 (0.84)	.18
	Autonomy	3.83 (0.74)	3.74(0.68)	.64
	Environmental Adaptability	3.99 (0.69)	3.81 (0.68)	1.72
	Life Goals	4.26 (0.79)	4.29(.86)	-.69
	Personal Growth	4.29(.76)	4.31(.81)	-.46
	Overall	4.12(.58)	4.12(.61)	.05

$^{**}p < .01$, $^{***}p < .001$

3.2 Mediating Effect of Cognitive Flexibility on the Relationship Between Positive and Negative Emotions and Mental Health Among College Students

Before examining whether cognitive flexibility mediates the relationship between students' positive and negative emotions and mental health, Pearson correlation coefficients were calculated, with results shown in Table 2. Positive emotions were positively correlated with overall mental health (r=.55, p<.001), while negative emotions were negatively correlated with overall mental health (r=-.52, p<.001). Overall cognitive flexibility among college students was significantly positively correlated with overall mental health (r=.74, p<.001). Furthermore, positive emotions positively correlated with overall cognitive flexibility (r = .32, p < .001), while negative emotions negatively correlated with overall cognitive flexibility (r = -.33, p < .001).

To precisely examine the mediating role of cognitive flexibility in the relationship between positive emotion, negative emotion, and mental health among college students, this study strictly followed Baron and Kenny's (1986) mediation effect testing model. Multivariate regression analysis was conducted in three steps: First, regression analysis tested the influence of independent variables (positive emotion, negative emotion) on the mediating variable (cognitive flexibility); Step 2 examined the direct effect of independent variables on the dependent variable (psychological well-being); Step 3 incorporated both independent and mediating variables into the regression equation to observe changes in the effect of independent variables on psychological well-being after introducing cognitive flexibility. If the independent variables' effect on the dependent variable is significantly stronger without the mediating variable than with it, partial mediation is determined. If the independent variables' effect on the dependent variable becomes insignificant after introducing the mediating variable, full mediation is determined. The mediation effect is ultimately validated by comparing the changes in the degree of influence. Specific results are detailed in Tables 3 and 4.

Table 2 Relationships Among Positive and Negative Emotions, Cognitive Flexibility, and Mental Health Among College Students

		Emotion				Cognitive Flexibility				Mental Health			
		Positive Emotion	egative Emotions	Substitute factors	Controlling Factors	Holistic	Self-acceptance	Interpersonal Relationships	Self-discipline	Environmental Adaptation	Life Goals	Personal Growth	Holistic
Emotions	Positive Emotions		-.55***	.13*	33***	.32**	.59**	.24***	.25*	.57**	.43**	.38***	.55**
	Negative Emotions			-.13*	-.44**	-.33***	-.53**	-.37***	-.23**	-.5**	-.38***	-.28***	-.52***
Cognitive Flexibility	Alternative Factors				39***	.85*	.32***	.33***	.34***	.36***	.45***	.36***	.44***
	Control Factors					.75***	.57**	.46***	.51***	.62**	.55***	.54***	.71***
	Overall						.56***	.54***	.53***	.61***	.63***	.51***	.73***

**$p < .01$, ***$p < .001$

This study first examined the mediating role of cognitive flexibility in the relationship between positive emotions and mental health among college students. Data analysis revealed that positive emotions, as the independent variable, significantly predicted cognitive flexibility (mediating variable) ($\beta = .28$, $p < .001$) and also significantly directly influenced mental health (dependent variable) ($\beta = .53$, $p < .001$). Further mediation analysis revealed that when both positive emotion and cognitive flexibility were included in the regression model, the direct effect of positive emotion on mental health decreased to $\beta = .35$, indicating that cognitive flexibility partially mediated this relationship. Sobel's test (1982) confirmed the statistical significance of this mediating path ($z = 4.82$, $p < .001$). The integrated findings suggest that positive emotions among college students influence mental health both through a direct pathway and indirectly via cognitive flexibility.

Table 3 Mediating Effect of Cognitive Flexibility in the Relationship Between Positive Emotions and Mental Health Among College Students

	Mediation Effect Testing Phase	*β*	*adj* R^2	*F*
①	Positive Emotion → Cognitive Flexibility	.28***	.06	22.83***
②	Positive Emotion → Mental Health	.53***	.27	126.12***
③	Positive Emotions → Mental Health	.35***	.63	286.40***
	Cognitive Flexibility → Mental Health	.62***		

***$p<.001$

Table 4 Mediating Effect of Cognitive Flexibility on the Relationship Between Negative Emotions and Mental Health in College Students

	Mediation Effect Testing Phase	*β*	*adj* R^2	*F*
①	Negative Emotion → Cognitive Flexibility	-.33***	.10	37.62***
②	Negative Emotions → Mental Health	-.51***	.24	105.37***
③	Negative Emotions → Mental Health	-.30***	.58	233.40***
	Cognitive Flexibility → Mental Health	.62***		

***$p<.001$

This study investigated whether cognitive flexibility mediates the relationship between negative emotions and mental health among college students. Negative emotions, as the independent variable, exerted a significant negative effect on cognitive flexibility (mediating variable) ($\beta = -0.33$, $p < 0.001$), while also having a significant negative direct effect on mental health (dependent variable) ($\beta = -0.51$, $p < 0.001$). Further mediation analysis revealed that when both negative emotions and cognitive flexibility were included in the regression model, the direct effect of negative emotions on mental health weakened to $\beta = -0.30$, indicating partial mediation by cognitive flexibility. Sobel tests (1982) confirmed this mediating path with high statistical significance ($z = -5.82$, $p < 0.001$). Comprehensive analysis indicates that negative emotions among college students negatively impact mental health not only through direct pathways but also exacerbate mental health risks via an indirect pathway by impairing cognitive flexibility.

4 Conclusion

This study systematically examined gender differences in positive emotions, negative emotions, cognitive flexibility, and mental health among college students, and further explored the mediating role of cognitive flexibility in the relationship between emotions and mental health.

This study examined gender differences in positive and negative emotions among college students and found no significant differences in emotional experiences between genders. This result contrasts with earlier research by Kuehner (2017) and Alexander (2000), which demonstrated through large-scale surveys that men generally experience higher levels of positive emotions (such as happiness), while women are more prone to negative emotions like depression and anxiety. Conversely, Ch en et al. (2023) similarly failed to detect significant gender differences in emotional experiences among Chinese university students. This divergence in conclusions may stem from three factors: First, cultural differences alter norms governing emotional expression, with collectivist cultures tending to weaken the influence of gender roles on emotional display. Second, the evolution of measurement tools—modern scales emphasize the situational specificity of emotional experiences rather than overall tendencies. Third, generational shifts have altered the emotional characteristics of contemporary university students compared to earlier research samples. Given the lack of consensus in existing findings, future studies should integrate behavioral observations to systematically examine the gender trajectories of emotional experiences among university students within the context of sociocultural change. Additionally, attention should be paid to the emotional characteristics of non-binary gender groups to construct a more comprehensive theoretical framework for emotional gender differences.

Analysis of gender differences in college students' cognitive flexibility reveals that males demonstrate significant advantages in overall cognitive flexibility and its subdimensions, consistent with findings from Wang et al. (2022) and Artawijaya & Supratiwi (2024). Discrepancies in research findings primarily stem from differing conceptual definitions and measurement tools: previous studies often incorporated creative thinking generation abilities into cognitive flexibility assessments, whereas this study focused on foundational cognitive control processes. Additionally, some traditional scales include items such as "proposing innovative solutions in group discussions," which involve communication skills, leading to measurement results contaminated by social cognitive factors. Given the limited sample sizes and lack of longitudinal data in current cognitive flexibility research, the stability of existing gender difference conclusions requires further validation. Future studies should standardize conceptual operationalization, optimize measurement tools to distinguish core cognitive functions from social skills, and employ

multi-time-point tracking designs to explore the mechanisms underlying gender differences.

Analysis of gender differences in college students' mental health reveals no significant overall gender disparities, consistent with Afifi's (2007) findings. However, it is noteworthy that previous studies have reported divergent findings across mental health subdimensions: Ryff (1989) found women outperformed men in dimensions such as self-acceptance and life purpose, while Scott-Young (2020) reported higher scores for men in dimensions like environmental mastery and personal growth. This contradiction may stem from differences in mental health assessment tools, with some studies employing unidimensional scales while others utilize multidimensional models, leading to varying measurement sensitivities across subdomains. The study suggests that the convergence in overall mental health levels between men and women may reflect adaptive adjustments among contemporary college students amid shifting societal role expectations.

Further mediation analysis indicates that cognitive flexibility partially mediates the relationship between emotions and mental health. Specifically, positive emotions directly enhance mental health while also exerting indirect positive effects by boosting cognitive flexibility. Conversely, negative emotions impair mental health through dual pathways: directly reducing psychological adaptability and exacerbating psychological issues by weakening cognitive flexibility. This finding reveals the synergistic mechanism of emotion regulation and cognitive function in maintaining mental health, suggesting that university mental health interventions should concurrently focus on emotion management training and cognitive flexibility enhancement.

Positive emotions empower individuals to adaptively adjust cognitive frameworks in response to environmental changes, playing a pivotal role in enhancing mental health. This conclusion is corroborated by research on life satisfaction—a quintessential measure of well-being closely linked to mental health. Individuals with high cognitive flexibility tend to feel gratitude for their present circumstances and can identify new opportunities in unfamiliar situations, leading to positive transformations (Ionescu, 2012). Thus, positive emotions can be viewed as influencing cognitive characteristics, stimulating optimal states, and aiding individuals in realizing their potential.

Simultaneously, research indicates that negative emotions among college students directly impair mental health while also exerting indirect effects through cognitive flexibility. Specifically, negative emotions hinder the flexible adaptation of cognitive frameworks to environmental changes, thereby lowering mental health levels. These findings align with studies showing that negative emotions like depression and anxiety trigger somatization symptoms through cognitive distortions (Basha, 2015). Moreover, negative emotions also influence internet addiction (Liang et al., 2021), indicating that negative emotions alter cognitive characteristics and affect quality of life. When experiencing negative emotions, individuals struggle to view problems comprehensively and holistically, and flexible thinking becomes impaired (Pocnet et al., 2017).

Investigating the mediating role of cognitive flexibility in the relationship between positive and negative emotions and mental health among college students offers implications for education and counseling. Evidently, understanding emotions is crucial for enhancing college students' mental health, and intervening to regulate their ability to flexibly shift cognitive frameworks to adapt to environments is equally vital. This is particularly relevant for Korean middle and high school students, whose university life is viewed as the beginning of a positive transition, as they navigate adolescence amid intense competition for admission to

prestigious universities. Therefore, providing college students with programs or training during this critical life transition to help them find suitable alternatives while maintaining good control over situations could contribute to enhancing their future well-being.

Next, we review the limitations of this study and propose directions for future research. First, the sample was restricted to students at four-year universities in Wuhan, limiting generalizability to all Chinese college students. Subsequent studies should sample more diverse regional populations. Second, future research should comprehensively examine how both positive and negative emotions influence mental health through cognitive flexibility. While this study examined the effects of positive and negative emotions separately, establishing a model that incorporates both simultaneously and validating their mediating effects could yield a more unified understanding. Third, the mediating variable cognitive flexibility showed a relatively high correlation with the dependent variable mental health, necessitating caution in interpreting the results. Given the distinct characteristics of cognitive flexibility and mental health, treating them as similar concepts is problematic. Future research should delve deeper into their relationship.

Despite these limitations, this study draws attention to well-being among college students navigating a highly competitive society. Its significance lies in treating both emotions and cognition as factors influencing well-being. This study reveals that positive emotions, negative emotions, and cognitive flexibility are partial determinants of college students' mental health. Validating the mediating role of cognitive flexibility in the relationship between positive emotions, negative emotions, and mental health highlights its significance. Consequently, intervention and regulation efforts to enhance college students' mental health are warranted, and this research provides foundational data for such initiatives. Furthermore, it is anticipated to serve as a useful basis for developing support policies and programs for college students.

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