

# Family Support and Cognitive Empathy of College Students: A Moderated Mediation Model

Yuanhao Xi<sup>1,2</sup>, Yanling Bi<sup>1</sup>, and Shuo Yang<sup>3</sup>

Previous evidence suggests that the amount of support one received has an impact on the cognitive empathy, however, it is not clear what mechanism underlies this relationship. The present study examined the mediating and moderating mechanism between family support and cognitive empathy in 2,023 college students who completed self-report questionnaires assessing their level of family support, core self-evaluation, cognitive empathy and problematic mobile phone use. The results indicated that family support was positively associated with cognitive empathy. A mediation analysis indicated that core self-evaluation mediated the relationship between family support and cognitive empathy. Furthermore, the effect of core self-evaluation on cognitive empathy was moderated by problematic mobile phone use, depending on the level of core self-evaluation. When the core self-evaluation level of college students is high, the higher the degree of problematic mobile phone use, the lower the level of cognitive empathy ability; when the core self-evaluation level of college students is low, the situation will be the opposite. The current research reveals that family support can enhance core self-evaluation, thereby affecting cognitive empathy, and the effect of core self-evaluation on cognitive empathy was moderated by problematic mobile phone use.

*Keywords:* family support, core self-evaluation, problematic mobile phone use, cognitive empathy

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<sup>1</sup> School of Psychology, Shaanxi Normal University

<sup>2</sup> Shenzhen University Affiliated Education Group Houhai Primary School Tutoring Room

<sup>3</sup> School of Educational Science, Shenyang Normal University

**Corresponding author:**

Yanling Bi, School of Psychology, Shaanxi Normal University, 199 South Chang'an Road, Xi'an 710062, China. Email: [biyanling@snnu.edu.cn](mailto:biyanling@snnu.edu.cn)

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This research was supported by the National Social Science Fund of China (Grant No. 19XSH010).

The concept of empathy was proposed by the humanist Rogers. It refers to the individuals' ability to put themselves in the shoes of others in order to understand their feelings, needs and states, as well as produce consistent experience and accurate feedback (Thompson, 2001). Simply put, empathy means observing the world from perspective of others (Gladstein, 1983). Emotional empathy and cognitive empathy are two types of empathy. Smith (2006) assumed that emotional empathy and cognitive empathy were independent but complementary systems that harmonized and worked together. Emotional empathy is the experiential sharing of emotions with others, while cognitive empathy is the acceptance of another person's role or perspective on the cognitive level. Although they both belong to empathy and share the same basic characteristic, which is, experiencing the inner world of others, their development laws and working mechanism are quite different. Bailey et al. (2008) argue that cognitive empathy can better predict an individual's social functioning, while Hetemi et al. (2023)'s research findings reveal that empathy possesses strong social attributes and is closely related to social intelligence. Combining these perspectives, we believe that cognitive empathy is a social feature, which aligns closely with the concepts proposed by Jones and Gagnon (Bailey et al., 2008; Hetemi et al., 2023; Jones & Gagnon, 2007). Compared with emotional empathy, cognitive empathy, as an acquired ability, possesses some social characteristics. It has the power to prevent people from believing incorrect information that has been transmitted by others (Smith, 2006), as well as hostile online behavior, such as cyberbullying (Ang & Goh, 2010). People who have strong cognitive empathy skills can manage the emotional strain that comes from emotional empathy and make more logical decisions, which will encourage problem-solving (Ay et al., 2020; Van Lissa et al., 2016).

College is a critical period of self-integration. During this time period, the cognitive dimension of empathy predominates (Posner & Rothbart, 2000), and our capacity for cognitive empathy has an impact on our interpersonal communication and social adaptability in future social interactions (Chen et al., 2011). Research has shown that college students' cognitive empathy ability not only significant positive correlates with their interpersonal communication ability but also helps them to better address interpersonal communication issues, such as self-centeredness, high-interpersonal sensitivity, utilitarian communication and growing rebellious consciousness (Chung, 2014). Cognitive empathy significantly increases prosocial behavior (Eisenberg & Miller, 1987), which includes both offline and online prosocial behavior (Stocks et al., 2009). However, accompanied by social progress, the cognitive empathy ability of college students is declining, especially in samples from after 2000, attracting widespread attention from all sectors of society (Konrath et al., 2011). However, the influencing factors and mechanisms of empathy are less well understood (Quince et al., 2016). To better understand the development of cognitive empathy of the important groups, we selected college students who were born around 2003 as our sample to explore potential influencing factors and mechanisms.

### **Family Support and Cognitive Empathy**

Family support refers to the degree to which parents (or single parents) emotionally support or assist their children in resolving problems (Yan & Zheng, 2006). According to family-systems theory, an interaction system forms between family members, and each will influence and support one another, resulting in a complete support system (Grodin & Burton, 1988). A few studies have shown that college students with higher family support and extraverted personalities had more stable emotional states and received more social support from family members (Branje et al., 2004; Selvarajan et al., 2016). Additionally, they exhibited higher levels of cognitive empathy (Calandri et al., 2019). More importantly, the amount of online support individuals received significantly and positively predicted the level of their online empathy and altruistic behavior (Lönngqvist & große Deters, 2016). Individuals who claimed to receive more social support on social media during the Covid pandemic showed more empathy toward others (Qin et al., 2022).

The parenting style also plays an important role in shaping children's cognitive empathy (Silke et al., 2018). According to the family triangle theory, parental parenting styles may have an impact on how well and how much assistance their children provide to one another (Rothbaum et al., 2002). Studies have shown that the more democratic the parenting style is, the more support the children receive from their parents in the system, and the stronger their individual cognitive empathy will be (Green et al., 2007; Grodin & Burton, 1988). That is, the level of democracy in family's upbringing positively predicts the amount of family support received by children. For some special groups, however, such as internet addicts, the lack of family support also reflects the more laissez-faire or autocratic parenting style of their parents, which indirectly impedes the development of their cognitive empathy (Dogan et al., 2015).

Furthermore, interpersonal relationships and communication ability are important indicators of cognitive empathy ability (Li et al., 2018; Reynolds & Scott, 1999). The quantity of family support directly impacts the quality of interpersonal relationships, thereby influencing cognitive empathy ability (Caughlin et al., 2011). While most family support originates from parents, recent research has revealed that siblings can also provide significant family support. Siblings with strong relationships tend to exhibit higher levels of empathy (Gungordu et al., 2022).

H<sub>1</sub>: Family support can positively predict college students' cognitive empathy.

### **The Mediating Role of Core Self-Evaluation**

As cognitive empathy is a strong personal social trait, many researchers are more interested in learning about its neurophysiological basis (Jones & Gagnon, 2007) or the influence of interpersonal relationships and personal experience on it (Adams et al., 1996; Jian & Wang, 2021). Cognitive empathy grows with one's cognitive capacities. In early adulthood, cognitive empathy begins to regulate people's empathetic response (Bailey et al., 2008). Erikson's theory of personality formation states that our social traits do not become significant until our early adult years and until then, our families will continue to be our main social network. As a result, even in college, the family factor continues to have a big impact on an individual's ability of cognitive empathy. However, since there haven't been many studies on the association between family support and cognitive empathy, the possibility of mediating influences cannot be discounted. Therefore, more researches are needed to understand the factors that mediate the association between family support and cognitive empathy, as these findings could help to design effective methods for enhancing cognitive empathy.

Some well-known traits in the personality literature, such as self-esteem and generalized self-efficacy, are indicators of core self-evaluation, which is a broad, latent, higher-order trait of individuals (Judge et al., 2003). According to Judge and Hurst (2007), core self-evaluation, which is closely related to interpersonal sensitivity (Oh, 2022; Özer et al., 2016), is regarded to represent the underlying beliefs that people have about themselves and how they function in the environment (Judge & Hurst, 2007). It is the psychological basis of both job and life satisfaction. Social support is frequently correlated with core self-evaluation. Family support from family members is the major type of social support that college students might get because they are a group with limited prior social experience (Cheng et al., 2005; Gabardo-Martins et al., 2017). Moreover, a study found that the amount of family support obtained by college students significantly predicts their core self-evaluation (Wang et al., 2016). During the COVID-19 pandemic, remote workers' social support, including family support, was strongly associated with their level of core self-evaluation (George et al., 2022).

Core self-evaluation and cognitive empathy might be related in some way. Although there hasn't been much research on the relationship between the two, it can be inferred from the following facts. Firstly, some studies revealed that core self-evaluation can predict self-efficacy in a significant positive way (Jiang, 2015; Kahraman & Onsekiz, 2014), implying that an individual with a greater core self-evaluation has a higher level of self-efficacy. Secondly, people who had higher levels of self-efficacy also exhibited higher levels

of empathy (Goroshit & Hen, 2014; Kim, 2018). These results suggest that core self-evaluation can predict an individual's cognitive empathy through self-efficacy. Van-Dijk et al. (2011) found that individuals who experience a self-evaluation threat feel strong *schadenfreude* when other people encounter difficulties, indicating a lack of sympathy. These results also suggest that cognitive empathy may be influenced by core self-evaluation.

Based on the above findings, we hypothesized that core self-evaluation plays a mediating role in the relationship between family support and cognitive empathy.

H<sub>2</sub>: Family support can positively predict core self-evaluation of college students.

H<sub>3</sub>: College students' core self-evaluation can positively predict their cognitive empathy.

H<sub>4</sub>: College students' core self-evaluation plays a mediating role in the relationship between their family support and cognitive empathy.

### **The Moderating Effect of Problematic Mobile Phone Use**

Although family support, core self-evaluation, and cognitive empathy are related among college students, the relationships may be influenced by other factors. With the advancement of mobile phones, they have increasingly occupied our leisure time (Bianchi & Phillips, 2005). According to the 47th Report on Chinese Internet Development Status in 2021, students made up 21% of mobile phone users, and their problematic mobile phone use has attracted increased attention from the academic community (Martinotti et al., 2011). Problematic mobile phone use is the term used to describe the problem of excessive and unrestrained mobile phone use, which can negatively affect daily life. Such as, I have difficulty controlling the amount of time I spend on my phone, I experience anxiety and panic when I am separated from my phone for extended periods of time, and my family and friends often complain that I am constantly staring at my phone, among other manifestations (Foerster et al., 2015). The issue of problematic mobile phone use among college students raises various concerns. Research on the use of electronic devices by contemporary college students has indicated that excessive usage of these devices could cause interpersonal problems or affect physical and mental health that may impact the relationship between core self-evaluation and cognitive empathy (Chen et al., 2016; Chiang et al., 2024; Hao et al., 2020; Kim, 2018; Kuang-Tsan & Fu-Yuan, 2017; Peláez-Fernández et al., 2021; Zhou et al., 2022).

Individuals who experienced inadequate support from their families may display suboptimal interpersonal skills and experience heightened levels of loneliness. The findings from empathy selection tasks suggested a significant negative association between high levels of loneliness and both cognitive empathy and core self-evaluation (Barrera & Li, 1996; Cerit et al., 2018; Hamida et al., 2021; Hu et al., 2020; Zhang et al., 2023). Furthermore, excessive problematic mobile phone use could divert individuals' attention away from face-to-face social interactions, exacerbating such effects (Billieux, 2012; Hamida et al., 2021; Qian et al., 2022).

However, the relationship between mobile phone use and cognitive empathy may change when we take into account the fact that mobile phone use can buffer against the negative effects of low family support on empathy. A study found that when satisfying social needs is our primary goal for using our phones, our cognitive empathy can be enhanced through the social support and interpersonal fulfillment we receive online (Collins, 2014). According to Chhabra's (2020) research, individuals who are dissatisfied with their social-communication needs in real life can fulfill their social-communication needs online using electric devices such as mobile phone through online social channels, thereby improve their cognitive empathy level. In addition, the latest research confirms that young people are increasingly shifting their social media from offline to online and gradually increasing the proportion of online social activities (Cheng, 2023). Furthermore, individuals with lower levels of family support exhibit a greater need for interpersonal communication. In instances where familial support is insufficient, individuals may turn to social media platforms to obtain social support as a means of compensating for the lack of familial

support, thereby potentially improving their cognitive empathy. However, we postulate that this effect may only occur in cases where family support or core self-evaluation is low. Hong (2015) have conducted in-depth explorations on the moderating role of excessive mobile phone usage in interpersonal relationships, depression, and other manifestations. Specifically, they found that as mobile phone usage increases, the tendency for depression and anxiety caused by deteriorating interpersonal relationships becomes more severe, and this transition can be influenced by the level of family support in some extent (Ho & Kao, 2021; Hong, 2015; Remes et al., 2021). These two aspects, as typical signals of deteriorating social function, are also highly correlated with cognitive empathy (Chen et al., 2023; Hwang et al., 2012; Zhang et al., 2021). Therefore, we reasonably infer that excessive mobile phone usage may also moderate the pathways leading to cognitive empathy. Specifically, among college students characterized by low levels of family support or core self-evaluation, those with high levels of mobile phone usage tend to demonstrate higher levels of cognitive empathy compared to those with low levels of mobile phone usage. However, we are still unclear about which specific pathway this moderating variable affects, thus necessitating moderation tests for all three pathways.

H<sub>5</sub>: Problematic mobile phone use moderates the impact of college students' family support on cognitive empathy.

## Current Research

To summarize, the goal of the current study was to investigate the relationship between family support and cognitive empathy, as well as the underlying mechanisms. Based on the preceding discussion, we proposed a hypothesized model for the present study. To test our hypothesis, we employed a questionnaire method using college students as samples. The current study not only clarified the relationship between family support, core self-evaluation, cognitive empathy, and problematic mobile phone use, but also provided some theoretical suggestions for enhancing college students' cognitive empathy ability.

## Methods

### Participants

A total of 2,379 first- to third-year students from 7 universities (Northwest Minzu University, Fudan University, Shenyang Normal University, Hebei Normal University, Shanghai University, Chang'an University and Nanjing Agricultural University) participated in the present study, and their basic demographic information, family support, core self-evaluation, problematic mobile phone use and cognitive empathy were measured. After removing 356 surveys that had missing data, 2,023 valid questionnaires (85.03%) were obtained, including 986 male students (48.73%) and 1,037 female students (51.37%). Their average age is 22.15 years ( $SD = 1.41$ ).

### Measurements

#### *Family Support*

Family support scale was adapted from the Social Support Scale (Wang et al., 1999). It includes 4 items, such as "family members will accompany me when I meet difficulties." Each item is rated on a Likert scale anchored from 1 (strongly disagree) to 7 (strongly agree). The family support score was calculated by averaging the item scores, the higher the score, the higher amount of family support. The scale has been applied with good reliability and validity in Chinese college students (Yan & Zheng, 2006). In the present study, Cronbach's  $\alpha$  was .88.

### ***Core Self-Evaluation***

The Core Self-Evaluation Scale is a widely used 12-item (e.g., I am filled with doubts about my competence.) self-rating inventory that can depict how people perceive their worthiness, effectiveness, and capability (Judge et al., 2003). Each item is rated on a Likert scale anchored from 1 (strongly disagree) to 5 (strongly agree). After reverse scoring the negatively stated items and summing across all the scale items, higher scores indicated higher levels of core self-evaluation. The scale has been applied with good reliability and validity in Chinese college students (Xiang et al., 2019). In the present study, Cronbach's  $\alpha$  was .87.

### ***Problematic Mobile Phone Use***

Problematic mobile phone use was measured by the Mobile Phone Problem Use Scale (MPPUS) (Foerster et al., 2015). It consists of 10 items (e.g., Every time I do not look at my mobile phone for a while, I start to worry that I have missed a call). Each item was rated on a 5-point scale from 1 (strongly disagree) to 5 (strongly agree). After summing all the scale items, higher scores indicated higher levels of problematic mobile phone use. Previous studies have shown that the scale had good reliability and validity (Li et al., 2022; Zhuang et al., 2017). In the present study, Cronbach's  $\alpha$  was .81.

### ***Cognitive Empathy***

Cognitive empathy was measured using the Chinese version of the Interpersonal Response Index (IRI-C) (Siu & Shek, 2005; Zhang et al., 2010). It consists of 5 items (Item No.6: Before making a decision, I try to consider each person's position within the argument; item No.9: Sometimes I imagine how things look from my friends' perspectives in order to better understand them; item No.15: I believe that every issue has two sides, so I often try to view problems from these different perspectives; item No.19: When I am angry with someone, I usually try to put myself in their shoes and understand their perspective; item No.22: Before criticizing someone, I will try to imagine how I would feel if I were in his/her shoes). Each item was rated on a 5-point scale from 0 (never) to 4 (every time). After summing all the scale items, higher scores indicated higher levels of cognitive empathy. Cronbach's  $\alpha$  in the current study was .82.

## **Data Analysis Methods**

SPSS 26.0 and SPSS Process 3.5 were used to analyze the data of the current study, and models 4 and 14 were employed to test the moderated mediation model involved in this paper (Fang et al., 2014; Wen et al., 2006).

## **Results**

### **Assessment of Common Method Variance**

We used Harman's one-way test and SPSS software to examine the common method variance. All variables were subjected to an exploratory factor analysis. There were 4 factors with a characteristic root bigger than one, and the percentage of variance explained by the first common factor was 29.75%, which was less than the critical criterion of 40%, suggesting that there was no significant common method variance in this study.

## Descriptive Statistics

According to the results presented in Table 1, family support is positively correlated with both core self-evaluation ( $r = .45, p < .001$ ) and cognitive empathy ( $r = .30, p < .001$ ). At the same time, there was a positive correlation between core self-evaluation and cognitive empathy ( $r = .24, p < .001$ ). In contrast, problematic mobile phone use was negatively correlated with core self-evaluation and family support. The results are consistent with our theoretical expectations.

**Table 1**  
*Descriptive Statistics and Correlations for the Main Variables*

Variables	M	SD	1	2	3
1. FS	22.25	4.76			
2. CSE	42.37	8.17	.45**		
3. PMPU	31.90	7.50	-.06**	-.23**	
4. CE	14.79	3.74	.31**	.24**	.03

FS family support, CSE core self-evaluation, PMPU problematic mobile phone use, CE cognitive empathy

\*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

## Family support and cognitive empathy

As can be seen from the table above, in the case of a single-factor continuous variable, the results of the univariate linear regression analysis are consistent with the correlation results. Therefore, family support can significantly predict cognitive empathy ( $\beta = .31, p < .001$ ).  $H_1$  was supported.

## The Mediating Effect of Core Self-Evaluation

According to Hayes & Scharkow (2013) and Wen et al. (2014), we used model 4 in SPSS Process 3.5 to test the mediating effect of core self-evaluation, and we employed the bootstrap method for testing the indirect effects, with a bootstrap sample size of 5000 (Hayes & Scharkow, 2013; Wen & Ye, 2014). The results showed that family support continued to significantly predict cognitive empathy,  $c' = .19, SE = .01, t = 10.64, p < .001, 95\% CI = [.16, .23]$ ; family support significantly positively predicted core self-evaluation ( $H_2$  was supported),  $a = .77, SE = .03, t = 22.76, p < .001, 95\% CI = [.70, .84]$ ; moreover, core self-evaluation also significantly positively predicted cognitive empathy ability ( $H_3$  was supported),  $b = .06, SE = .01, t = 5.64, p < .001, 95\% CI = [.03, .08]$ . In addition, in the mediation equation,  $R^2 = .20, F = 518.27$ , the indirect effect  $ab = .04, Boot SE = .01, 95\% CI = [.02, .05]$ . This suggested that core self-evaluation played a mediating role in family support and cognitive empathy, with a mediating effect of  $ab/(ab+c') = 19.55\%$ .  $H_4$  was also supported.

## The Moderated Mediation Model

We use model 5, 7 and 14 in SPSS process 3.5 program to test the moderating effect of problematic mobile phone use, and we employed the bootstrap method for testing the indirect effects, with a bootstrap sample size of 5000. The findings suggest that problematic mobile phone use did not exhibit a significant moderating effect between family support and cognitive empathy ( $b = -.00, SE = .00, t = -1.38, p = .166, 95\% CI = [-.00, .00]$ ), and it cannot be employed as a moderator between family support and core self-evaluation either ( $b = -.01, SE = .00, t = -1.86, p = .062, 95\% CI = [-.01, .00]$ ). However, the results showed that the relationship between core self-evaluation and cognitive empathy was moderated by problematic mobile phone use (See Table 2 for details).

**Table 2**  
*Moderated Mediation Model*

Variables	Cognitive empathy			
	SE	$\beta$	<i>t</i>	95% CI
FS	.02	.19	10.36***	[.15, .22]
CSE	.03	.15	4.28***	[.08, .22]
PMPU	.04	.15	3.28***	[.06, .25]
CSE x PMPU	.00	-.00	-2.43*	[-.00, -.00]
<i>R</i> <sup>2</sup>			.11	
<i>F</i>			68.95***	

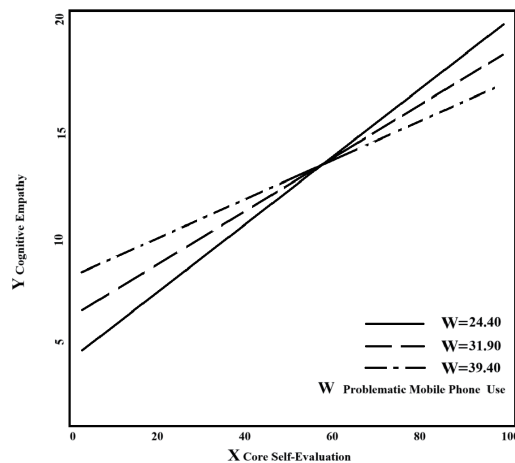
FS family support, CSE core self-evaluation, PMPU problematic mobile phone use, CE cognitive empathy

\*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

As the core self-evaluation is affected by mobile phone use, simple slope analysis of the moderating effect was carried out by R code. We used  $W$  (Problematic mobile phone use score) mean plus or minus 1 standard deviation ( $W = 24.40$ ,  $W = 31.90$  and  $W = 39.40$  respectively) to reflect the degree of phone use; the higher the score represented the more severe the problematic phone use. In order to more clearly present the moderating effect, the core self-evaluation score was scaled up to 100 points, while the cognitive empathy score was scaled up to 20 points.

As can be seen from Figure 1, for students with low problematic mobile phone use ( $W = 24.40$ ), core self-evaluation significantly predicted cognitive empathy ( $B = .06$ ,  $t = 6.25$ ,  $p < .001$ ). For students with high problematic mobile phone use ( $W = 39.40$ ), while core self-evaluation still significantly predicts cognitive empathy ( $B = .04$ ,  $t = 3.67$ ,  $p < .001$ ), the difference in slopes between the two regression equations is significant ( $F = 6.39$ ,  $p = .012$ ). These findings revealed that the relationship between core self-evaluation and cognitive empathy was significantly moderated by problematic phone use. In Figure 1, when core self-evaluation score was lower than 36, college students who used mobile phones more frequently had higher levels of cognitive empathy than those who used mobile phones less. While when the core self-evaluation score was higher than 36, college students who used mobile phones more frequently exhibited lower levels of cognitive empathy than those who used mobile phones less. The moderating effect was confirmed.  $H_3$  was partially supported.

**Figure 1**  
*The Moderating Effect of Problematic Mobile Phone Use between Core Self-Evaluation and Cognitive Empathy*





## Discussion

Cognitive empathy is a fundamental skill in interpersonal communication (Smith, 2006). Academic circles now frequently discuss the factors that are related to it and those that influence it (Jian & Wang, 2021). We discussed and examined the moderating effect of problematic mobile phone use on the relationship between core self-evaluation and cognitive empathy, as well as the mediating effect of core self-evaluation between family support and cognitive empathy. The present empirical findings partially supported our initial hypotheses.

Despite the fact that many studies have examined the relationship between family support and core self-evaluation (e.g., Adams et al., 1996), there has not been much research on their relationship with cognitive empathy ability. Although prior research has examined the effects of life satisfaction in the relationship between family support and core self-evaluation (Jiang et al., 2017), the current study extends beyond the correlation between family support and core self-evaluation to incorporate cognitive empathy. On the one hand, we confirmed that family support increased core self-evaluation among students (Metheny & Mcwhirter, 2013). On the other hand, despite deviating from our initial expectations, problematic mobile phone use is not found to exert a significant moderating effect in regulating the relationship between family support and cognitive empathy. Nevertheless, we found how the rise in problematic mobile phone use levels impact the association between core self-evaluation and cognitive empathy. In this study, problematic mobile phone use was employed as a moderating variable to investigate the mediating effect of core self-evaluation between family support and cognitive empathy, which improved our understanding of the underlying mechanisms.

As previously mentioned, the final data analysis results only partially supported our hypotheses because Problematic mobile phone use did not significantly moderate the relationship between family support and cognitive empathy. One of the possible explanations would be the specificity of family support, given that social interaction patterns of social support, as noted by Boyce (1985), are derived from family experiences, in particular, family support that plays a prominent role in promoting healthy child development. Research on family support, such as that carried out by Wills (1990), has shown that it possesses a certain uniqueness as part of social support. From this view, we believe that cell phone help cannot replace the support of a family in improving cognitive empathy. In addition, although online social networks can facilitate social support to some extent, the social support obtained from real-life interactions is more effective in promoting life satisfaction than that obtained through virtual connections and therefore, cannot be fully substituted by such means (Trepte et al., 2015).

According to our theoretical framework and data analysis results, we posit two possible explanations for the moderating impact of problematic mobile phone use on the relationship between core self-evaluation and cognitive empathy. On the one hand, college students with high levels of core self-evaluation have more opportunities for interpersonal communication and receive more social supports, which enhances their cognitive empathy ability. On the other hand, as mentioned earlier, increased problematic mobile phone use leads to a deterioration in interpersonal relationships, resulting in a weakening of a range of social functions, including cognitive empathy (Chen et al., 2023; Hong, 2015; Hwang et al., 2012; Remes et al., 2021; Zhang et al., 2021). However, the data reveal that this effect is only observed among participants with higher levels of core self-evaluation. Since we did not delve deeply into the psychological needs behind mobile phone usage among participants, we posit that for those with lower scores in core self-evaluation, the problems associated with excessive mobile phone use may be outweighed by the enhancement in interpersonal relationships, which in turn leads to an improvement in their cognitive empathy. Consequently, on our simple effect analysis graph, three distinct slopes are observed for the three different levels of problematic mobile phone use, and a crossover point emerges. Considering core self-evaluation levels helps determine appropriate mobile phone use in interventions aimed at improving cognitive empathy, as core self-evaluation is a fundamental trait, it is challenging to change it in a short period (Judge et

al., 1998). Therefore, considering core self-evaluation levels helps determine appropriate mobile phone use in interventions aimed at improving cognitive empathy, the practical significance of this study lies in appropriately guiding different college student groups (with varying levels of core self-evaluation) in their mobile phone usage to influence cognitive empathy. College students with low CSE can be guided to use their mobile phones more for social interactions, while those with high CSE can be encouraged to control their mobile phone usage time. Furthermore, even though we encourage certain groups to engage in more social interactions via mobile phones, and research has indicated that this indeed enhances students' sense of connection with each other (Nesi et al., 2019), Mei et al. (2023) contend that this might lead to a series of health issues, including social anxiety, sleep problems, and depressive disorders (Mei et al., 2023). Consequently, how Mobile Phone Use (MPU) affects social interactions and subsequently cognitive empathy depends on factors such as the purpose and duration of MPU, which will be thoroughly examined in future research (Khalaf et al., 2023).

There are some limitations in the current study that should be addressed in future research. Firstly, the use of self-report scale questionnaires during data collection may have introduced a self-promotion effect and reduced the credibility of the results. Thus, future studies should consider using multiple methods to collect data (i.e., from family, friends, etc.) or employing experimental methods. Secondly, since cognitive empathy is a skill that develops over time, longitudinal studies can be used to more comprehensively investigate the factors that influence it. Thirdly, the psychological needs behind problematic mobile phone use were not investigated in this study. Different psychological needs may cause different outcomes, such as varied levels of support provided by different internet applications like mobile gaming or online social networking, which can affect cognitive empathy. Therefore, future research could examine the moderating effect of psychological needs behind problematic mobile phone use on the relationship between core self-evaluation and cognitive empathy.

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收稿日期：2024年02月08日

一稿修訂日期：2024年02月29日

二稿修訂日期：2024年03月06日

三稿修訂日期：2024年06月20日

四稿修訂日期：2024年07月18日

五稿修訂日期：2024年08月13日

六稿修訂日期：2024年08月15日

七稿修訂日期：2024年08月31日

八稿修訂日期：2024年09月18日

九稿修訂日期：2024年10月14日

接受刊登日期：2024年09月18日



國立臺灣師範大學教育心理與輔導學系  
教育心理學報, 2025, 56卷, 3期, 631-650頁

# 大學生的家庭支持與認知共情： 一個有調節的中介模型

奚源浩<sup>1,2</sup>、畢研玲<sup>1</sup>、楊碩<sup>3</sup>

先前之研究結果顯著揭示，個體所獲取的支持量對其認知共情能力具有影響作用，然而，截至目前，此關係背後的運作機制尚屬未知。為深入探討其內在的影響機制與作用路徑，本研究聚焦於探析 2023 名通過自我報告問卷的大學生群體，在家庭支持、核心自我評價、認知共情能力，以及問題性手機使用問題程度之間的調節與中介效應。研究結果明確指出，家庭支持與認知共情之間存在正向關聯。進一步的中介分析則彰顯，核心自我評價在這一關係中扮演了關鍵的中介角色，其影響力尤為顯著。此外，核心自我評價對認知共情的效應還受到問題性手機使用的調節，這一發現尤為引人矚目。值得注意的是，此調節機制並非單純線性，而是依據核心自我評價的不同水準而有所變化。具體而言，當大學生的核心自我評價處於較高水準時，問題性手機使用的增加反而導致認知共情能力的減弱；反之，若核心自我評價偏低，則問題性手機使用的提升或許能在某種程度上提升認知共情。此項研究不僅增進了我們對家庭支持與問題性手機使用如何及何時影響大學生認知共情能力的理解，亦為未來心理學領域的相關研究提供了寶貴的理论與實證基礎。

**關鍵詞：**家庭支持、核心自我評價、問題性手機使用、認知共情

<sup>1</sup> 陝西師範大學心理學院

<sup>2</sup> 深圳大學附屬教育集團後海小學輔導室

<sup>3</sup> 瀋陽師範大學教育科學學院

**通訊作者：**畢研玲，陝西師範大學心理學院。電子郵件：bryanling@snnu.edu.cn。  
本研究在畢研玲教授的指導下完成。感謝審查委員給予寶貴的建議，使本文能有更深入與多元的討論。

