

The Influence of Student-Teacher Relationship on School-Age Children's Empathy: The Mediating Role of Emotional Intelligence

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Objective: Empathy is the ability to adopt another person's perspective and experience the thoughts and emotions of that individual. A growing number of studies have shown that school-age children's empathy robustly contributes to their interpersonal communication, academic achievement and psychosocial adjustment. For school-age children, school becomes the main place for learning and socializing. The student-teacher relationship is an important interpersonal relationship between children and adults after they leave home, which plays an important role in the development of children's self-ability. However, the relationship between student-teacher relationship and children's empathy and its mechanisms are unclear. This study aimed to explore the influence of student-teacher relationship on school-age children's empathy, and the mediating roles of emotional intelligence.

Methods: 468 school-age children (250 boys and 238 girls) aged 8–11 ($M_{age} = 9.22$, $SD_{age} = 1.20$) from Guizhou Province completed questionnaires about student-teacher relationship, emotional intelligence, and children's empathy.

Results: The results showed that student-teacher relationship positively and directly predicted empathy for girls, but not for boys. In addition, we also found that emotional intelligence mediated the relationship between student-teacher relationship and children's empathy among both boys and girls.

Conclusion: This study reveals the effect of student-teacher relationship on the school-age children's empathy, and the unique mediating role of emotional intelligence. Moreover, this study further reveals the different effects of student-teacher relationship on boys' and girls' empathy, emphasizing that positive student-teacher relationship can directly promote the development of girls' empathy. Finally, this study emphasizes that cultivating and improving the emotional intelligence of school-age children may be an effective way to promote the development of children's empathy.

Keywords: student-teacher relationship, emotional intelligence, empathy, school-age children

Introduction

Empathy is a potential psychological motivator for helping others in distress. Empathy refers to an individual's ability to recognize the emotions of others, understand their emotional reactions and experiences, and respond appropriately.^{1,2} Previous studies have found that individuals with high empathy are better at observing others' emotional changes, sharing and understanding others' emotions, establishing good interpersonal relationships^{3,4} being better at solving interpersonal conflicts⁵ reducing the occurrence of aggressive or antisocial behaviors^{6,7} and showing more prosocial behaviors in life.^{8,9} In general, empathy is an important component of social and emotional development, affecting the quality of an individual's behavior toward others and social relationships.¹⁰ Therefore, it is of great significance to investigate the factors that promote the development of individual empathy to ensure individual mental health and social harmony.

In addition, it is necessary to further pay attention to the protective factors and internal mechanism of school-age children's empathy in childhood. On the one hand, the neurodevelopmental pattern of activation and functional connectivity supports the notion that neural structures associated with an individual's ability to empathize, such as the

amygdala, PAG, insula, and medial OFC, undergo considerable maturation during childhood.^{11–13} To explore the key factors and internal mechanisms that affect the development of children's empathy ability in this critical period is helpful for the cultivation and improvement of children's empathy ability. On the other hand, children's empathy develops rapidly in the context of a social interaction.^{14,15} School-age children move from a simple home environment where they interact with their parents to a more complex school environment. Positive relationships with adults (student-teacher relationships) may be a key factor in ensuring that their empathic abilities flourish in the school environment.^{16,17} However, only a few studies have examined the key factors of children's empathy, and no studies have focused on the protective factors (student-teacher relationship) of empathy in school-age children living in a more complex social interaction environment. Therefore, the purpose of this study is to explore the influence of student-teacher relationship on empathy of school-age children and its internal mechanism.

Student-Teacher Relationships and School-Age Children's Empathy

Student-teacher relationships are meaningful emotional and relational connections between students and teachers that develop as a result of long-term interactions.^{18,19} The student-teacher relationship has been conceptualized in terms of attachment theory and as an extension of the parent-child relationship.²⁰ Moreover, from the perspective of attachment, Hamre and Pianta (2001) proposed that student-teacher relationship includes three dimensions: close student-teacher relationship, which is warm, cordial and effective; conflicted student-teacher relationship, student-teacher relationship is negative, tense and ineffective; dependent student-teacher relationship means that students depend on teachers excessively, and the boundary between students and teachers is not clear.^{21,22} Positive teacher-student relationships are characterized by high intimacy and low conflict and dependence.^{23,24}

Positive student-teacher relationships may be beneficial to the development of school-age children's empathy. For school-age children, whose socialization begins when the family moves to school, close relationships with non-family adults (student-teacher relationships) can be beneficial in enabling them to construct adaptive beliefs about themselves and others and to develop good social-emotional skills, such as empathy.^{23,25} A positive student-teacher relationship provides a safe base for school-age children to secure the emotional security necessary to fully interact with others.²³ In this developmental context characterized by warmth and nurturance, school-age children are often free to explore and learn to understand the emotional changes of others, promoting the development of their empathic ability.²⁴ In addition, in the context of Chinese culture, the student-teacher relationship also emphasizes the relationship between "teaching" and "learning".²⁶ Furthermore, Chinese teachers not only teach students knowledge, but also subtly promote the development of students' social emotions in the process of interaction with students.²⁷ Specifically, in the interaction between school-age children and teachers, teachers often guide them to identify others' emotions and understand the reasons behind others' emotions and behaviors,¹⁶ which may promote the development of school-age children's empathy. Recent studies have found that supportive student-teacher relationships are associated with children's empathy.^{17,28} Therefore, it is reasonable to speculate that student-teacher relationships may affect the school-age children's empathy.

The Mediating Role of Emotional Intelligence

Emotional intelligence refers to an individual's ability to process emotional information accurately and effectively, including the ability to recognize, understand, express, manage, and use emotions.^{29,30} According to the Person-context interaction theories,³¹ the external environment often affects the development of individual ability by acting on internal factors. The student-teacher relationship may promote the development of empathy by promoting the development of emotional intelligence of school-age children.

According to Goleman (1998), children learn early on from the reactions of adults how to manage their emotions and internalize them into their own unique emotional processing patterns. For school-age children, in the interaction and communication with teachers in the school environment, they can often learn to correctly express and effectively manage their emotions through teachers' feedback, which may improve the development of their emotional intelligence. In addition, school-age children who have a positive relationship with their teachers are more likely to receive the guidance and support they need for emotional development,³² including ways to identify and understand their emotions and skills to effectively deal with their negative emotions, which can contribute to their emotional intelligence development.

Moreover, previous studies have found that a positive and supportive student-teacher relationship can promote the development of children's emotional intelligence.^{33,34} Besides, Individuals who can effectively identify, understand and manage their own emotions may also be better able to identify, understand the emotions of others, that is, an individual's emotional intelligence may promote the development of their empathic ability. According to Mayer & Salovey (1997), an individual with optimum emotional intelligence can better perceive, understand, and manage their own emotions, and are more likely to generalize expertly and migrate to the ability to perceive, understand, and manage the emotions of others. Similarly, subsequent researchers have shown that individuals with high levels of emotional intelligence tend to understand the reasons behind others' emotions and behaviors in interpersonal interactions, and to respond appropriately to others' negative emotions.³⁵ Specifically, children who were able to accurately understand their own emotions were more sensitive to changes in the emotions of their peers, teachers and parents when interacting with others, and were able to respond in a way that matched the current social context. Moreover, previous studies have shown that individual's emotional intelligence can promote them to show more empathic behaviors.^{36,37} Therefore, it is possible that emotional intelligence of school-age children mediates the relationship between student-teacher relationship and empathy.

Gender Differences

Additionally, the impact of student-teacher relationship on children's empathy may be different between boys and girls. In Chinese culture, teachers treat girls and boys differently.^{26,27} In general, teachers' guidance to girls is gentle and euphemistic, and the influence of student-teacher relationship on girls is generally warm and emotional. For boys, teachers emphasize that boys should have the spirit of independence, challenge and innovation. Teachers' attitude and behavior towards boys are stiff, and their guidance is generally ordered and forced.^{26,38} Student-teacher relationship developed in differential treatment may have different effects on empathy of children of different genders in China. In addition, previous studies have suggested that student-teacher relationship, emotional intelligence and empathy may vary based on child gender. Specifically, girls but not boys reported higher student-teacher relationship and empathy,^{16,39} Boys were found to have higher emotional intelligence than girls.⁴⁰ Therefore, we designed a mediation model among boys and girls respectively, to better understand how the processes might operate differently for boys and girls.

The Present Study

To sum up, the purpose of this study is to explore the influence and internal mechanism of student-teacher relationship on empathy in Chinese boys and girls at school age. Taking into account the influence of children's age on emotional intelligence and empathy,^{41,42} the age of children was controlled in this study. Our hypotheses were as follows: (a) Student-teacher relationship can affect the development of children's empathy, which may be different in boys and girls; (b) The student-teacher relationship can influence empathy by promoting the development of children's emotional intelligence.

Methods

Participants

We recruited a total of 500 school-age children from three primary schools in Guizhou Province, China. Only 468 (93.6%) school-age children (250 boys and 238 girls) aged 8–11 ($M_{\text{age}} = 9.22$, $SD_{\text{age}} = 1.20$) completed a series of questionnaires after we informed them of the purpose of the study. Most fathers (85.0%) and mothers (81.0%) had junior high school diplomas or above. Most of the families (81.4%) had a middle or higher socioeconomic status.

Procedures

We first went into three elementary school in Guizhou Province, China, separately to recruit children willing to participate in the study, with the permission of the school principals. Once the participating children were identified, we further contacted their guardians and teachers and obtained their informed consent. Finally, we informed the participants of the purpose of the study, and after obtaining their informed consent, the children were randomly assigned to complete a set of questionnaires in a quiet classroom under the guidance of a research assistant (2 research assistants

and 20 children per classroom). After about 30 to 40 minutes, the survey was completed and each participant was given a small gift in appreciation for their participation. This study was approved by the Ethics Committee of Zhejiang Normal University.

Measures

Student-Teacher Relationship

Student-teacher relationship quality was measured using the Student-teacher Relationship instrument (STRI), which was originally developed by Pianta and Nimetz (1991) and revised by Zou et al (2007). The subscale consists of 23 items that measure four factors: closeness (eg, I have a close and warm relationship with my teachers), supportive (eg, Whenever I made progress, my teacher would praise me), conflicting (eg, Teachers and I always seem to be fighting with each other) and satisfaction (eg, Overall, I am very happy with my relationship with my teachers). Each item is rated on a 5-point frequency response scale ranging from 1 (*definitely does not apply*) to 5 (*definitely applies*). The conflicting subscales were reversed so that high scores represent a positive student-teacher relationship. Cronbach's alphas for this study were 0.78. McDonald's omega (ω) for student-teacher relationship were 0.75.

Emotional Intelligence

School-age children's emotional intelligence was measured using the Chinese version of the Emotional Intelligence Scale (EIS).⁴³ The subscale consists of 33 items that measure four factors: emotion perception (eg, I can be aware of my emotions at every moment), self-emotion regulation (eg, When I encounter difficulties, I remember when I used to encounter and solve the same difficulties), understanding emotions (eg, I try to make people feel satisfied by arranging things) and emotion utilization (eg, I wish I could do most of the things I want to do). Each item is rated on a 5-point frequency response scale ranging from 1 (*completely inconsistent*) to 5 (*completely consistent*) was used. The higher the score, the more frequent the behavior on that dimension. Cronbach's alphas for this study were 0.86. McDonald's omega (ω) for emotional intelligence were 0.86.

Empathy

School-age children's empathy was measured using the Interpersonal Reactivity Index (IRI), which was originally developed by Davis (1980) and revised by Rong et al (2010). This 28-item instrument assesses children's empathy of four dimensions: empathic concern (eg, I am often thoughtful and concerned about those who are not as fortunate as I am), perspective taking (eg, Before making a decision, I will go to the different opinions of everyone), fantasy (eg, I often daydream about what might happen to me), personal distress (eg, In an emergency situation, I feel worried and uncomfortable). Child reported their own dispositions on a 5-point scale, ranging from 1 (*does not describe me at all*) to 5 (*describes me very well*). The higher the score, the more frequent the behavior on that dimension. Cronbach's alphas for this study were 0.84. McDonald's omega (ω) for empathy were 0.82.

Analysis

Utilizing SPSS 25.0, descriptive analyses and Pearson correlations were conducted. Expectation-Maximization (EM) was used to effectively handle the missing data.⁴⁴ Mplus 8.0 was used to construct a structural equation model to analyze the relationship between student-teacher relationship and empathy, and the mediating role of emotional intelligence. A chi-square test, comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), and standardized root mean residual (SRMR) were provided to evaluate the model's fit. CFI > 0.90, TLI > 0.90, RMSEA < 0.08, and SRMR < 0.10 represent the model is acceptable.⁴⁵

Results

Descriptive Statistics and Correlations

Table 1 presents the means, standard deviations, correlations and the results of the independent sample *t*-test for all variables over time. Correlation analysis showed that student-teacher relationship, emotional intelligence and empathy were significantly correlated in both boys and girls. In addition, results from the independent sample *t*-test indicated that the empathy level of girls was significantly higher than that of boys.

Table 1 Means (M), Standard Deviations (SD), and Bivariate Correlations of Key Study Variables

Variable	1	2	3
1. Student-teacher relationship	1	0.36***	0.26***
2. Emotional intelligence	0.38***	1	0.35***
3. Empathy	0.25***	0.36***	1
M ± SD (boys)	68.66 ± 10.08	121.01 ± 15.88	92.01 ± 11.23
M ± SD (girls)	68.09 ± 9.35	123.06 ± 12.62	95.28 ± 11.62
P (boys and girls)	0.53	0.13	0.002**

Notes: Correlations in top of diagonal are for girls, in bottom for boys. ** $p < 0.01$, *** $p < 0.001$.

Measurement Model

The measurement model for 12 latent variables was tested: fantasy, empathic concern, perspective taking, personal distress, identify emotions, express emotions, understand emotions, manage emotions, intimacy, supportive, conflicting and satisfaction. This model revealed a good fit for the data, $\chi^2 (48) = 3.37$, CFI = 0.94, TLI = 0.92, RMSEA = 0.71, SRMR = 0.49. This result showed that all indicators had statistically significant standardized factor loadings on the latent variables (p 's < 0.001), that is, all of them were well represented by the latent variables. This provides a good premise for our next structural model construction.

Structural Model

Firstly, after controlling for child age, structural model (see Figure 1) was estimated in all children, modelling student-teacher relationship as an independent variable, emotional intelligence as mediators and empathy as outcome variables. The result showed good fit to the data: $\chi^2 (50) = 3.81$, CFI = 0.93, TLI = 0.91, RMSEA = 0.07, SRMR = 0.05. Results revealed that student-teacher relationship positively predicted emotional intelligence and children's empathy respectively ($\beta = 0.55$, $p < 0.001$, 95% CI = (0.43, 0.63); $\beta = 0.32$, $p < 0.001$, 95% CI = (0.15, 0.45); emotional intelligence positively predicted children's empathy ($\beta = 0.49$, $p < 0.001$, 95% CI = (0.35, 0.63). Moreover, the indirect effects of emotional intelligence between student-teacher relationship and children's empathy were significant (indirect effects = 0.27, $p < 0.001$, 95% CI = (0.17, 0.37). The bootstrap estimation procedure (with 1000 bootstrapping samples) was adopted to test the mediating effects. The 95% CI of the path did not include zero, indicating that the mediating effects above was significant.

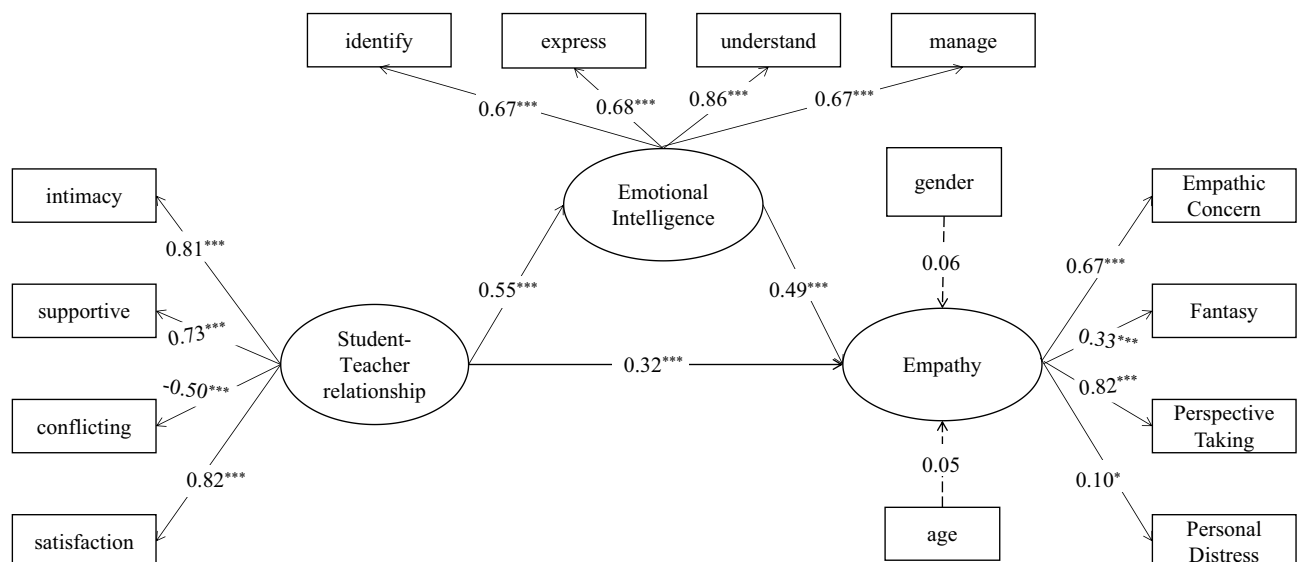


Figure 1 The model to evaluate the impact of student-teacher relationship on empathy and the mediating role of emotional intelligence in all children, after controlling for gender and children's age.

Notes: All the coefficients are standardized estimates. * $p < 0.05$, *** $p < 0.001$.

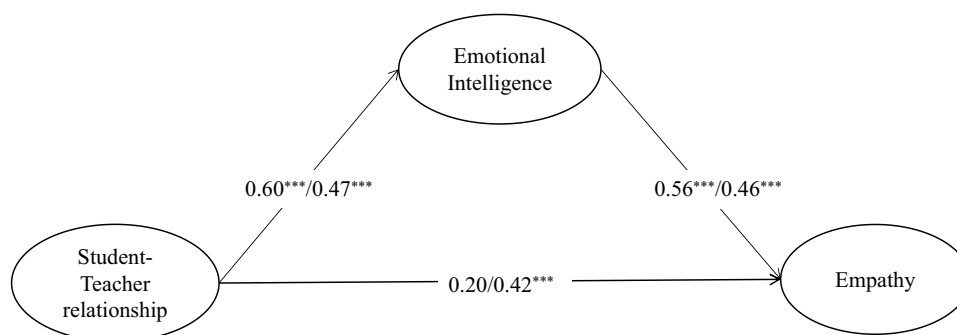


Figure 2 The model to evaluate the impact of student-teacher relationship on empathy and the mediating role of emotional intelligence in boys and in girls, after controlling for children's age. The path coefficient of boys is in front and that of girls is behind. The control variables were not shown here to simplify the representation of the model. **Notes:** All the coefficients are standardized estimates. *** $p < 0.001$.

Second, we also established a structural mediation model in boys and girls respectively. For boys, the model (see Figure 2) was a good fit to the data, $\chi^2(49) = 2.99$; CFI = 0.92; TLI = 0.90; RMSEA = 0.07; SRMR = 0.06. Results revealed that student-teacher relationship positively predicted emotional intelligence ($\beta = 0.60$, $p < 0.001$, 95% CI = (0.47, 0.72)), but insignificantly predicted boy's empathy ($\beta = 0.20$, $p > 0.05$, 95% CI = (-0.02, 0.40)). In addition, emotional intelligence positively predicted boy's empathy ($\beta = 0.56$, $p < 0.001$, 95% CI = (0.37, 0.73)). Moreover, the indirect effects of emotional intelligence between student-teacher relationship and boy's empathy were significant (indirect effects = 0.34, $p < 0.001$, 95% CI = (0.37, 0.73)). For girls, the model (see Figure 2) was a good fit to the data, $\chi^2(48) = 1.89$; CFI = 0.95; TLI = 0.93; RMSEA = 0.06; SRMR = 0.05. Results revealed that student-teacher relationship positively predicted emotional intelligence and girl's empathy respectively ($\beta = 0.47$, $p < 0.001$, 95% CI = (0.28, 0.62); $\beta = 0.46$, $p < 0.001$, 95% CI = (0.19, 0.60)). Moreover, emotional intelligence positively predicted girl's empathy ($\beta = 0.42$, $p < 0.001$, 95% CI = (0.26, 0.67)). The indirect effects of emotional intelligence between student-teacher relationship and girl's empathy were significant (indirect effects = 0.22, $p < 0.01$, 95% CI = (0.37, 0.73)). The bootstrap estimation procedure (with 1000 bootstrapping samples) was adopted to test the mediating effects in boys and girls. The 95% CI of these paths did not include zero, indicating that the mediating effects above were significant.

Discussion

This study is the first to explore the influence of student-teacher relationship on empathy and its internal mechanism in school-age children under the background of Chinese culture. The results showed that the teacher-student relationship could only directly improve the empathy of girls at school age. In addition, we found that emotional intelligence mediates the relationship between teacher-student relationship and empathy in both boys and girls. This finding extends existing research to more clearly describe the different effects of student-teacher relationship on empathy among boys and girls at school age. In addition, our findings may add to the existing literature by providing a more accurate overview by examining the mediating role of emotional intelligence in the relationship between student-teacher relationship and empathy.

Student-Teacher Relationship and School-Age Children's Empathy

This study found that student-teacher relationship positively predicted girl's empathy, which was consistent with previous studies.^{17,28} That is, a positive student-teacher relationship can promote the development of school-age children's empathy. Our results are consistent with previous studies that positive and supportive student-teacher relationships tend to bring warmth and security to children, enabling them to bravely explore other's emotional and behavioral changes, acquire good social emotional skills, and exhibit more empathic behaviors when others fall into negative emotions.²⁴ In addition, in the school environment, children can often obtain teachers' guidance in benign communication and interaction with teachers,¹⁶ including the ability to identify and understand others' emotions and behaviors, and the ability to correctly respond to others' emotions, which promotes the development of their empathy ability. Therefore,

for school-age children (especially girls), having a positive student-teacher relationship is an effective way to cultivate and improve girl's empathy ability.

Besides, our results also found that the student-teacher relationship only directly positively predicted empathy in girls. Consistent with our previous hypothesis, the impact of the student-teacher relationship on empathy is different for boys and girls. The possible reasons for this are as follows: Firstly, teachers treat boys and girls differently in Chinese culture.²⁷ Compared with boys, girls are more likely to establish a positive, warm and closer student-teacher relationship with teachers,²⁶ which may directly promote the development of girls' empathy ability. In addition, boys and girls are affected differently by external circumstances. Specifically, compared with boys, girls are more easily influenced by external relationships.⁴⁶ Girls pay more attention to the development of emotional communication and relationship with others and are more easily affected by interpersonal relationships. Therefore, when girls are in a warm and positive student-teacher relationship for a long time, they may acquire more interpersonal skills through friendly interactions with teachers, and their empathic abilities develop more rapidly.

The Mediating Role of Emotional Intelligence

Our findings suggested that student-teacher relationship affected school-age children's empathy through emotional intelligence both in boys and girls. This result supports the previous hypothesis and verifies the Person-context interaction theories.³¹ External environmental factors can promote the development of individual ability by influencing individual internal factors, that is, school-age children's positive student-teacher relationship can promote the development of their emotional intelligence and then promote the development of children's empathy ability. This finding supports Goleman's (1998) view that children learn from interactions and reactions with adults how to manage their emotions and internalize them into their own unique emotional processing patterns. In addition, our result also supports and expands Mayer and Salovey's (1997) view that individuals with high emotional intelligence, who are able to recognize and understand their own emotions, internalize and transfer this ability. Our results revealed the mechanism underlying the relationship between student-teacher relationship and school-age children's empathy. Children, both boys and girls, can learn to accurately identify and understand their emotions and effectively manage their emotions according to teachers' timely feedback and guidance in the benign interaction with teachers, thus promoting the development of emotional intelligence. Furthermore, children who can recognize and understand their own emotions tend to understand others' emotions effectively, respond to others' emotions correctly and show more empathic behaviors. In conclusion, positive student-teacher relationships can improve school-age children's emotional intelligence and further promote the development of empathy, which suggests that improving the quality of student-teacher relationship in the school environment and consciously cultivating children's emotional intelligence is an effective way to promote the development of their empathic ability.

Limitations and Future Research Directions

Several limitations should be considered when evaluating the findings presented in this research. Firstly, this study adopts a cross-sectional study design, which is difficult to explain the causal relationship between variables, and fails to reveal the longitudinal impact of children's student-teacher relationship on emotional intelligence and empathy. Therefore, it is necessary to use a longitudinal study design in the future to further explore the longitudinal effects of student-teacher relationship on empathy in school-age children. Second, although previous studies have shown that school-age children and physiological structures related to the feeling ability gradually mature, therefore, this study chose the age range for school-age children, ages 8 to 11, but not yet to other ages of children's empathy, future research can further expand the age range of participants and investigate the influencing factors and underlying mechanisms of empathy in children at various ages. Finally, all measures in this study were based on children's self-reports, and the significance of the relationships may have been overstated due to source bias. The use of multiple data collection methods in further studies would be of great value.

Despite the above limitations, this study has several necessities and innovations. Firstly, this study reveals the relationship between school-age children's student-teacher relationship and empathy in boys and girls, and further reveals the mediating role of children's emotional intelligence between student-teacher relationship and empathy, providing first-hand empirical evidence for the current research on children's empathy. In addition, from the perspective of positive psychology, this study examines the

influence of external environment (student-teacher relationship) and internal positive factors (emotional intelligence) on empathy of school-age children, providing a potential effective way to cultivate and promote empathy of school-age children. Finally, this study has generated important implications to cultivate and improve the empathy ability of school-age children. School psychologists can train teachers to teach school teachers skills such as listening to and caring for children's emotions, praising children for empathizing with others' emotions and behaviors, and establishing positive student-teacher relationships with children to promote the development of children's empathy. Moreover, school psychologists and teachers can pay close attention to the development of children's emotional intelligence, and provide targeted guidance, give full play to the positive role of "external" and "internal" two positive factors to promote the development of school-age children's empathy.

Conclusion

Findings from the current study provide some initial evidence suggesting that student-teacher relationships in Chinese culture not only promote the development of empathy in school-age children, but may also affect empathy in different ways in boys and girls. Specifically, the student-teacher relationship can not only directly promote the development of girls' empathy ability, but also indirectly improve girls' empathy ability by improving their emotional intelligence. In contrast, the student-teacher relationship can only improve the development of the boy's ability to empathize by improving his emotional intelligence. The results of this study provide suggestions for the intervention to improve the empathy ability of school-age boys and girls, namely, paying attention to and cultivating the emotional intelligence of school-age children is an effective way to improve their empathy ability.

Data Sharing Statement

The dataset analyzed during the current study is available from the corresponding author on reasonable request.

Ethical Approval

All procedures performed in this study involving human participants were in accordance with the ethical standards of Zhejiang Normal University and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent

All participants in the study provided informed consent.

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Disclosure

The authors report no conflicts of interest in this work.

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