

The Influence of Parent-child Relationship on Prosocial Risk-taking Behavior in Adolescents: Understanding the Chain Mediating Role of Perceived Social Support and Psychological Capital

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Abstract: *To explore the influence mechanism of parent-child relationship, perceived social support and psychological capital on adolescents' prosocial risk-taking behavior. The parent-child intimacy scale, prosocial risk-taking behavior scale, perceptive social support scale and psychological capital questionnaire were used to investigate 556 middle school students. The results showed that parent-child relationship was positively correlated with prosocial risk-taking behavior. Perceptive social support and positive psychological capital play a chain mediating role between parent-child relationship and prosocial risk-taking behavior. This study explores the mechanism of parent-child relationship and prosocial risk-taking behavior of adolescents, and the results of this study can provide intervention guidance for promoting the occurrence of prosocial risk-taking behavior of adolescents.*

Keywords: Adolescent prosocial risk-taking behavior, Parent-child relationship, Perceived social support, Psychological capital.

1. Introduction

In the movie "Article 20," which will be released in early 2024, a high school student comes to the aid of someone being bullied on campus, only to find himself in court and in trouble. Kathy et al. call this kind of behavior, which involves some unknown Risk while helping others, Prosocial Risk Taking PSRT. This kind of behavior is characterized by both prosocial and risk-taking, but it shows more prosocial risk taking than negative risk-taking [1]. Therefore, it is defined as positive risk-taking behavior [2]. The generation of prosocial risk-taking behavior not only depends on individual personality characteristics and physiological mechanism of adolescents, but also is influenced by multiple factors such as society, family and culture. DO et al., from the perspective of neurobiology, found that the completion of the development of the reward-seeking brain area and the slow development of the prefrontal brain area related to cognitive control lead to high sensory seeking and immature self-control among adolescents, who are the population with a high incidence of prosocial risk-taking behaviors [2].

Prosocial risk-taking behavior is closely related to the external environment. Families are important shapers of adolescents' personality and behavioral tendencies. Family system theory points out that according to family system theory, the more complete the function of family system, the healthier the physical and mental development of adolescents, which will motivate individuals to be willing to intervene and take certain risks when witnessing the victimization of others, and thus exhibit more prosocial behaviors [3]. A supportive and open family environment can enhance adolescents' confidence and ability to help others and take responsibility. Living in a warm and harmonious family environment, adolescents are more likely to engage in prosocial risk-taking behaviors [4]. The study found that a high level of parent-child intimacy has a significant impact on prosocial

behavior and risk-taking behavior of children. Under the reasonable guidance and education of parents, teenagers can correctly deal with negative emotions and reduce negative risk-taking behaviors [5]. Thus, they are more likely to make pro-social risk-taking decisions. The higher the degree of parent-child intimacy, the more likely adolescents are to engage in prosocial risk-taking behaviors [6]. Therefore, hypothesis H1: Parent-child relationship may positively predict the incidence of prosocial risk-taking behavior in adolescents.

Adolescents with good parent-child relationships tend to feel more social support in their lives. This psychological activity, in which individuals feel the care, understanding and support from others subjectively in the process of interacting with others, is called perceptual social support [7]. Ma Wenyan et al.'s study found that adolescents who lack social support and lack a certain emotional resonance with society and others are difficult to show altruistic motives and are more inclined to show negative risk-taking behaviors [8]. Based on this, hypothesis H2: Perceived social support may play a mediating role between parent-child relationship and prosocial risk-taking behavior.

Positive psychological capital is a kind of positive psychological force that individuals show in their growth and life. Resource conservation theory proposes that sufficient psychological resources can have a positive impact on individuals and the external environment, which often prompts individuals to show positive behaviors such as helping others, sharing and self-sacrifice [9]. However, the higher the level of parent-child intimacy, the richer the positive psychological capital of adolescents, the more prosocial behaviors they exhibit [10]. Hypothesis H3: Positive psychological capital is the mediating factor between parent-child relationship and prosocial risk-taking behavior.

In families with a high level of parent-child intimacy, adolescents can perceive higher social support and thus affect the amount of psychological capital. Individuals with more psychological capital (high self-efficacy, full of positive expectations, clear goals, self-regulation) have stronger social adaptability. Enabling individuals to pay attention to and experience the plight of others or to have empathic experiences with others, promoting prosocial risk-taking behavior [11]. Therefore, this study constructs a chain mediation model to verify hypothesis H4: Parent-child relationship influences adolescents' prosocial risk-taking through the chain mediation of perceptive social support and psychological capital.

2. Methods

2.1 Objects

A cluster sampling method was adopted to sample senior high school students from 2 ordinary high schools in 2 districts of Shaanxi Province respectively. A total of 556 questionnaires were sent out, and 529 valid questionnaires were obtained, with an effective rate of 95.14%. Among them, there were 275 male students (51.98%), 254 female students (48.02%), 272 senior students and 257 senior students, with an average age of 16.4(SD =0.664) years.

2.2 Research Tools

2.2.1 Parent-Child Relationship Scale

In this study, the parent-child intimacy scale compiled by Buchanan et al. (1991) and revised by Zhang Jintao et al. (2011) was adopted to measure the parent-child relationship of individuals, which contains 9 items [12]. Divided into two dimensions of parent-child relationship and mother-child relationship, a total of 18 questions, representative sample questions such as "How close do you feel with your father/mother?". Adopt a Likert 5-point scale (from "1= very not" to "5= very"). The higher the score, the better the adolescent's perceived parent-child relationship, the Cronbach's α coefficient of the father dimension in this study was 0.944, the Cronbach's α coefficient of the mother dimension was 0.910. Confirmatory factor analysis showed that the model was well fitted: $\chi^2/df=2.480$, CFI=0.955, TLI=0.949, SRMR=0.040, RMSEA=0.053.

2.2.2 Adolescent prosocial Risk-taking Behavior Scale

The Prosocial Risky Behaviors Scale (PRB) revised by Dou Kai et al. (2020) was used to measure prosocial risk-taking tendency [13], with a total of 6 items. Representative sample questions such as "I dare to stand up for my classmates who are being bullied". A Likert 5-point scale (from "1 = never" to "5 = always") is used, with higher scores indicating higher levels of participation in prosocial risk-taking behavior. The Cronbach's α coefficient for this scale in this study was 0.820. Confirmatory factor analysis showed that the model fit was good: $\chi^2/df=3.445$, CFI=0.956, TLI =0.927, SRMR=0.038, RMSEA=0.068.

2.2.3 Comprehending the social support scale

The perceptual-social support Scale (Yan Biobin [14] was adopted. The scale has three dimensions: family support, friend support and support from other important people (teachers, relatives, classmates). Each dimension contains 4 items, totaling 12 items. Likert 7 points were used in the scale, with "1" representing "strongly disagree" and "7" representing "strongly agree". The higher the total score of the subject, the higher the level of perceptive social support. In this study, the Cronbach's α coefficient of the family dimension was 0.856, the Cronbach's α coefficient of the friend dimension was 0.875, and the Cronbach's α coefficient of others (teachers, relatives, classmates) was 0.858. Confirmatory factor analysis showed that the model fit was good: $\chi^2/df=4.212$, CFI=0.958, TLI =0.945, SRMR=0.069, RMSEA=0.078.

2.2.4 Psychological capital questionnaire of adolescent students

The questionnaire of adolescent students' psychological capital compiled by Ye Yidou and Fang Biji [15] is adopted. The questionnaire has four dimensions: confidence, hope, optimism and resilience, in which the hope dimension contains 10 items, the other three dimensions contain 4 items, a total of 22 items, and the 4 items in the confidence dimension are scored in reverse. The questionnaire was scored by Likert six-level scoring method. 1, 2, 3, 4, 5 and 6 points were scored in order from "totally inconsistent, mostly inconsistent, somewhat inconsistent, somewhat consistent, mostly consistent and completely consistent". The higher the score, the stronger the positive psychological capital of students was reflected. In this study, Cronbach's α coefficients for the four dimensions of hope, optimism, confidence and resilience were 0.912, 0.875, 0.817 and 0.838 respectively. Confirmatory factor analysis showed that the model fit was good: $\chi^2/df=2.955$, CFI=0.933, TLI =0.923, SRMR=0.059, RMSEA=0.061.

2.3 Data Analysis

SPSS 26.0 was used to conduct Pearson correlation analysis on the data and test the common method bias. The serial mean interpolation method was used to replace the missing values in the data and eliminate the extreme data, and then all the data were standardized. SPSS macro program PROCESS was used for chain mediation test.

3. Results

3.1 Common Method Deviation Test

The common method bias is tested according to the Harman single factor test. The results showed that there were 10 factors with feature roots greater than 1, and the explanation rate of the first factor variable was 27.062%, far less than the critical value of 40%, indicating that there was no serious common method bias in this study.

3.2 Correlation Analysis

Table 1 lists the Pearson correlation matrix for each variable. Correlation analysis showed that parent-child relationship, perceptive social support, positive psychological capital and prosocial risk-taking behavior were significantly correlated

(Ps < 0.01).

Table 1: Correlation analysis

	Parent-child relationship	perceived social support	Psychological capital	Prosocial risk-taking behavior
Parent-child relationship	1			
perceived social support	440**	1		
Psychological capital	424**	545**	1	
Prosocial risk-taking behavior	440**	545**	515**	1

Note: ** At level 0.01 (double-tailed), the correlation is significant.

3.3 Intermediation Effect Test

The results of correlation analysis show that the significant correlation between the two variables meets the requirements of chain mediation effect test. Model 6 of the SPSS macro program compiled by Hayes was used to test the chain mediation effect. The results showed that parent-child relationship had a significant positive predictive effect on prosocial risk-taking behavior ($\beta=0.18, t=4.83, P<0.001$), and parent-child relationship had a significant positive predictive effect on perceived social support ($\beta=0.64, t=11.26, p<0.001$). Parent-child relationship had a significant positive predictive effect on psychological capital ($\beta=0.23, t=5.79, p<0.001$), and perceived social support had a significant positive predictive effect on psychological capital ($\beta=0.31, t=11.24, p<0.001$). Perceptive social support ($\beta=0.21, t=7.58, P<0.001$) and psychological capital ($\beta=0.25, t=6.23, P<0.001$) had significant positive predictive effects on prosocial risk-taking behavior.

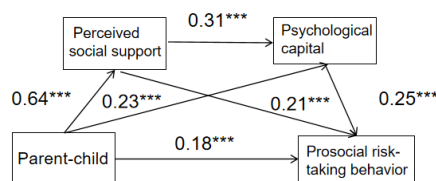


Figure 1: Diagram of the chain mediation model

Table 2: Analysis of chain mediated effect size

	Effect Size	Boot SE	Boot CI	Relative effect
Total effect	0.42	0.04	[0.35 0.50]	
Total indirect effect	0.24	0.03	[0.18 0.30]	57.14%
Path 1:	0.13	0.02	[0.09 0.18]	30.95%
Path 2:	0.06	0.01	[0.03 0.09]	14.29%
Path 3	0.05	0.01	[0.03 0.07]	11.90%

Note: Path 1: Parent-child relationship -> perceived social support -> prosocial risk-taking behavior; Path 2: parent-child relationship -> Psychological capital -> prosocial risk-taking behavior; Path 3: parent-child relationship -> perceived social support -> Psychological capital -> prosocial risk-taking behavior.

The results of Bootstrap test show that the direct effect of parent-child relationship on prosocial risk-taking behavior is significant (effect size =0.18, 95% confidence interval is 0.10~0.25), and the intermediary effect is significant: Path 1: The simple mediating effect of parent-child relationship on prosocial risk-taking behavior through perceived social support, with an effect value of 0.13 and a 95% confidence interval of 0.09~0.18, accounting for 30.95% of the total effect value. Path 2 Parent-child relationship has a simple mediating effect on prosocial risk-taking behavior through psychological capital, with an effect size of 0.06 and a 95% confidence interval of 0.03~0.09, accounting for 14.29% of the total effect size. Path 3 Parent-child relationship through

understanding the chain mediating effect of social support and psychological capital on prosocial risk-taking behavior, the effect size is 0.05, the 95% confidence interval is 0.03~0.07, accounting for 11.9% of the total effect size.

4. Discuss

4.1 Relationship between Parent-child Relationship and Prosocial Risk-taking Behavior

The results of this study show that parent-child relationship significantly positively predicts prosocial risk-taking behavior, verifying hypothesis H1: the higher the degree of parent-child intimacy, the more likely adolescents are to engage in prosocial risk-taking behavior. Specifically, a good parent-child relationship provides adolescents with a stable emotional support system, which not only promotes the occurrence of prosocial behaviors, but also reduces the negative consequences of risk-taking behaviors to a certain extent. This result is consistent with previous studies. Close parent-child relationship usually means that parents have sufficient emotional support and guidance for their children, and such support enhances adolescents' sensitivity and empathy to others' emotions, thus promoting the occurrence of prosocial behaviors [16]. In addition, a good parent-child relationship tends to make adolescents feel more emotionally secure, which helps them to show a higher sense of responsibility and social engagement in the face of risk situations. The closeness of parent-child relationship also affects adolescents' evaluation of the consequences of behaviors. High-quality parent-child relationship enables adolescents to rely on parental guidance in decision-making, helps them weigh the pros and cons of helping behaviors, reduces excessive concern about risks, and thus promotes the emergence of prosocial risk-taking behaviors [17]. Neurobiological studies have also shown that close parent-child relationships contribute to the healthy development of emotional and reward systems in the adolescent brain. During adolescence, high activity in the reward system is often associated with increased risk-taking behavior, but when parent-child bonding is more intense, parental support may improve adolescents' ability to regulate emotions, helping them make more rational and social decisions when seeking rewards [18]. The results suggest that the parent-child relationship has an important positive influence on prosocial risk-taking behavior.

4.2 Understanding the Mediating Effect Analysis of Social Support

It is found that perceptive social support plays a mediating role in the way that parent-child relationship influences prosocial risk-taking behavior. Hypothesis H2 is verified: parent-child relationship influences the occurrence of prosocial risk-taking behavior by influencing adolescents' perception of social support. And the mediating effect of perceptive social support accounts for the largest ratio of the total effect. Perceptive social support is regarded as an important psychological resource to reduce stress. When facing challenges or risks, individuals can provide emotional comfort, information guidance and practical help through perceived social support to effectively relieve psychological burden, thus influencing their decision-making and behavior

[19]. By enhancing adolescents' ability to comprehend the family aspect of social support, the intimacy of parent-child relationship provides them with a sense of emotional security and support network, which makes adolescents more confident and positive when facing external challenges. Willing to accept responsibility and risk for helping others [20]. At the same time, the understanding of social support as an intermediary mechanism plays an important role in adolescents' prosocial risk-taking behavior. Studies have shown that adolescents' ability to perceive social support affects how they evaluate and respond to risks and challenges in social situations. When adolescents feel the emotional support and trust given by parents, friends, or others, they are more likely to exhibit compassionate and helpful behaviors in the face of others' predicaments without worrying about their own safety or consequences [21]. This understanding of the role of social support can help adolescents weigh risks and rewards when engaging in helping behaviors by enhancing individuals' sense of social responsibility and behavioral expectations, thus promoting the occurrence of prosocial risk-taking behaviors.

4.3 Analysis of the Mediating Effect of Positive Psychological Capital

The research shows that positive psychological capital plays a mediating role in the process of parent-child relationship affecting adolescents' prosocial risk-taking behavior. Specifically, when the parent-child relationship is warm and harmonious, adolescents tend to have more positive psychological resources and thus exhibit more prosocial risk-taking behaviors, hypothesis (H3) is verified. This result is consistent with previous research, suggesting that emotional support and care in parent-child relationships provide adolescents with a stable emotional base and psychological resources, which in turn affects their self-efficacy and perception of social situations [22]. Close interaction in the parent-child relationship helps adolescents develop a strong sense of hope and optimism, which is also an important component of positive psychological capital. Optimism and a sense of hope can enhance an individual's ability to cope in complex or uncertain situations. When adolescents feel unconditional support from their families, they are hopeful about the future and believe they can overcome difficulties, which makes them more likely to exhibit prosocial risk-taking behaviors in the face of others who need help. In such situations, teens may take risks to help a classmate who is being bullied or speak up in the face of social injustice because they believe their actions can produce positive change. In addition, the mediating effects of positive psychological capital, such as the fact that adolescents often rely on their own psychological capital to make decisions in the face of peer pressure or group situations. Individuals with strong psychological capital are better able to cope with external pressures and make decisions in line with social norms [23]. Therefore, the closeness and warmth of parent-child relationship enrich the positive psychological resources of adolescents, can effectively improve their decision-making ability in complex social situations, and encourage them to make risky behaviors that benefit others.

4.4 Understand the Chain Mediation Effect Analysis of Social Support and Positive Psychological Capital

The study found that parent-child relationship can affect prosocial risk-taking behavior through the chain mediating effect of perceptive social support and positive psychological capital, and hypothesis H4 was verified. The chain mediating effect of parent-child relationship, perceptive social support and positive psychological capital indicates that parent-child relationship not only directly affects adolescents' prosocial risk-taking behavior, but also indirectly promotes the occurrence of prosocial risk-taking behavior by regulating adolescents' perception of social support and enhancing their psychological capital. Close parent-child relationships provide adolescents with a supportive emotional environment, help them perceive more social support, and by enhancing their positive psychological capital, make them more confident and courageous to take prosocial risk-taking behaviors in the face of social challenges [9]. Specifically, good parent-child interaction can enhance individuals' ability to perceive and comprehend social support, making it easier for them to obtain emotional and material assistance from family and society when facing external challenges. This enhanced sense of social support is further translated into positive psychological capital within individuals, including key elements such as optimism, hope, self-efficacy and resilience [24]. The accumulation of positive psychological capital equips individuals with a powerful psychological shield, encouraging them to take pro-social risk behaviors when necessary, such as doing good deeds and actively participating in public welfare activities.

5. Conclusions

- 1) Parent-child relationship has a significant positive predictive effect on adolescents' prosocial risk-taking behavior;
- 2) In the indirect effect, parent-child relationship can have a positive impact on prosocial risk-taking behavior of adolescents through the independent mediating effect of perceived social support and positive psychological capital, and can also have a positive impact on prosocial risk-taking behavior through the chain mediating effect of perceived social support and positive psychological capital.

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