The Relationship between Paternal Rearing Styles and Pro-Social Behavior of Chinese Lower-Division Undergraduate Students: the Mediating Role of Empathy and Mental Capital

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Abstract. Research on the influencing mechanism between parenting styles and pro-social behavior still needs to be advanced. The purpose of the research is to examine how paternal rearing styles, empathy and psychological capital relate to the pro-social behaviors of Chinese lower-division undergraduate students. Four questionnaires were used to measure 488 Chinese lower-division undergraduate students. These were the Short-form Parenting Style Questionnaire in Chinese (S-EMBU-C), the Pro-Social Behavior Scale (Chinese version), The Interpersonal Response Pointer Scale (Chinese version), and the Positive Psychological Capital Questionnaire. The results found that: (1) Correlations between paternal rearing styles and empathy, psychological capital, and pro-social behavior of Chinese lower-division undergraduate students; (2) The mediating role of empathy and psychological capital between active paternal rearing styles and pro-social behavior was not significant; (3) Empathy and psychological capital mediated significantly between negative paternal rearing styles and pro-social behavior. The study fills gaps in previous research and guides schools and families, making it theoretically and practically significant.

1 Introduction

Pro-social behaviors are those behaviors individuals do that are beneficial to others [1], for example, comforting others, helping others when they are in trouble, and so on. It helps individuals to build a good network [1]. Good interpersonal relationships can increase students' life satisfaction [2], which in turn helps Chinese lower-division undergraduate students better adapt to university life. Batool and others stated that parenting styles affect an individual's pro-social behavior [2].

Parenting style refers to a relatively stable pattern of behavior and attitudes used by parents in raising and educating their children [2]. Previous research has noted that positive parenting styles promote pro-social behavior in individuals [2]. Well-developed empathy and psychological capital also promote pro-social behavior in individuals [3, 4]. The capacity for empathy is the capacity for individuals to comprehend and experience the sentiments of others [3]. Psychological capital refers to the psychological state of individuals as they grow and develop [4]. Li noted that an individual's empathy and psychological capital were related to parenting styles [5].

Parenting styles can be categorized into paternal and maternal parenting styles. Most previous studies have centered on parenting styles, and few scholars have studied paternal rearing styles alone. Fathers play a crucial role in their children's family education. He profoundly affects the mental health and emotional development of his children [6]. Lower-division undergraduate students are a rather unique group. They face many challenges at this stage. They not only need to complete the transition from high school students to college students but also need to adapt to the new learning and living environment.

Good interpersonal relationships can help them complete the transition more smoothly. Consequently, it is essential to research their pro-social behavior. Examining the role of empathy and psychological capital in the relationship between paternal rearing styles and pro-social behaviors can provide further and deeper insights into the role of fathers in their children's lives and their impact on their children's emotional and psychological states. In the research, the author posed two questions: (1) What is the relationship between paternal rearing styles and empathy, psychological capital, and pro-social behaviors of Chinese lower-level undergraduate students? (2) Do empathy and psychological capital serve as chain mediators between paternal rearing styles and pro-social behaviors of Chinese lower-division undergraduates?

2 Methodology

2.1 Research Design and Participants

A convenience sampling method was used to distribute and collect questionnaires from 614 first-year undergraduate students and second-year undergraduate students within universities in four regions of China

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(Henan, Chongqing, Jiangsu, and Beijing). There were 488 (79.479%) valid questionnaires. 180 (36.885%) male and 308 (63.115%) female. Among them, there were 202 (41.393%) first-year undergraduate students and 286 (58.607%) second-year undergraduate students.

2.2 Variables and Instruments

2.2.1 Paternal Rearing Styles

The short-form Parenting Styles Scale (Chinese version) was used in this study to measure paternal rearing styles among Chinese lower-division undergraduate students [7]. It is a four-point Likert scale. The response anchors on it range from 1 (never) to 4 (always). It has 21 questions and consists of three dimensions: emotional warmth (Items 2, 6, 9, 11, 13, 17, 21), rejection (Items 1, 4, 7, 12, 14, 19), and over-protection (Items 3, 5, 8, 10, 15, 16, 18, 20). Item 15 is a reverse-scoring question. The scale was divided into father and mother versions. In this paper, the division of Li was used to categorize paternal rearing styles into active paternal rearing styles (emotional warmth dimension) and negative paternal rearing styles (rejection and over-protection dimension) [8]. Subjects' scores are calculated separately by dimension. Their score on each of the dimensions is the total score for that dimension. Cronbach's α for paternal rearing styles among fathers is 0.70 or higher across all three dimensions of the scale.

2.2.2 Pro-Social Behavior

The pro-social behavior of Chinese lower-division undergraduate students was measured using *the Pro-Social Behavior Scale (Chinese version)*, translated and revised by Yu Kou [9]. It is a five-point Likert scale. Response anchors range from 1 not at all consistent to 5 completely consistent. The scale consists of 26 questions divided into six sub-scales: openness (Items 1, 4, 6, and 14), anonymity (Items 8, 12, 16, 20, and 22), altruism (Items 10, 17, 23, and 25), adherence (Items 3, 7, 11, 19, and 24), emotionality (Items 2, 13, 18, 21, and 26), and urgency (Items 5, 9, and 15). The sum of the sub-scale scores is the total item score. Cronbach's α for the sub-scales were all greater than 0.56. The Cronbach's α for the summary scale is as high as 0.90.

2.2.3 Empathy

The Interpersonal Response Pointer Scale (Chinese version) was used in this study to measure empathy among Chinese lower-division undergraduate students [10]. The English version of the scale was developed by Davies. It was then translated and revised into Chinese by Jingji Wu and others. The scale utilizes a five-point Likert scale. Response anchors range from 1 not at all consistent to 5 completely consistent. It consists of 22 questions with 4 sub-scales: fantasy (Items 3, 5, 10, 12, 17, 20), perspective taking (Items 6, 9, 15, 19, 22), empathy concern (Items 1, 2, 7, 11, 14, 16), and personal distress (Items 4, 8, 13, 18, 21). Items 2, 5, 10, 11, and 14 are reverse-scoring questions. The sum of the 22 entry scores is the total scale score. The more a subject scores, the more empathetic that person is. The Cronbach's α for this scale is 0.78.

2.2.4 Mental Capital

This study used *the Positive Psychological Capital Questionnaire* developed by Zhang and others to measure the psychological capital of Chinese lower-division undergraduate students [11]. The scale consists of 26 questions. It is a seven-point Likert scale. Answer anchors ranged from 1 particularly inconsistent to 7 particularly consistent. The scale is divided into four sub-scales: self-efficacy (Items 1, 3, 5, 7, 9, 11, 13), hope (Items 15, 17, 19, 21, 23, 25), resilience (Items 2, 4, 6, 8, 10, 12, 14), and optimism (Items 16, 18, 20, 22, 24, 26). Items 8, 10, 12, 14, and 25 are reverse-scoring questions. The sum of the subjects' scores on each dimension is the total score. Higher scores indicate higher psychological capital of the subject. The Cronbach's α for the scale is 0.90. The Cronbach's α for each sub-scale is above 0.70.

2.3 Statistical Methodology

SPSS 28.0 was used for data processing and statistical analysis. The SPSS macro program PROCESS was used for chain-mediated effects analysis [12].

3 Results

3.1 Common Method Bias

Because the data came from subjects' self-reports, there may be a common method bias effect [13]. The study used the Harman one-way test to test this effect. It was discovered that 17 factors have eigenvalues higher than 1. The variance explained for the maximum factor was 25.76%, which is less than 40%. Consequently, the research has no significant common method bias [13].

3.2 Descriptive Statistics and Correlation Analysis of Variables

In Table 1, positive correlations were found between positive paternal rearing styles and pro-social behavior, empathy, and psychological capital. There are significant positive correlations between active paternal rearing styles and pro-social behavior and empathy *($p<0.01$)*. Negative paternal rearing styles and empathy have a positive connection between them *($p<0.01$)*. Additionally, the variables of pro-social behavior, psychological capital, and empathy are significantly positively correlated two by two *($p<0.01$)*.

Table 1. Descriptive Statistics and Correlation Analysis of Main Variables

Variable	M	SD	Pro-Social Behavior	Empathy	Mental Capital
Active Paternal Rearing Style	2.585	0.685	0.356**	0.106*	0.389**
Negative Paternal Rearing Styles	1.691	0.419	-0.059	0.150**	-0.052
Pro-Social Behavior	3.548	0.661	—	0.593**	0.630**
Empathy	3.387	0.521		—	0.501**
Mental Capital	4.694	0.791			—

* p<0.05 ** p<0.01

Given that both active paternal rearing styles and negative paternal rearing styles are positively correlated with empathy. It is different from the results of previous studies [14]. To further explore the relationship, the author did the following additional analysis. In Table 2, there are significant positive correlations between paternal active paternal rearing styles and the variables of perspective taking and empathy concern *(p<0.01)*. There are positive correlations between negative paternal rearing styles and the variables of fantasy and personal distress. Among them, there is a significant positive correlation between negative paternal rearing styles and personal distress *(p<0.01)*.

Table 2. Pearson Correlation Analysis of Paternal Rearing Style and Empathy

	Active Paternal Rearing Style	Negative Paternal Rearing Styles
Fantasy	0.057	0.113*
Perspective Taking	0.249**	0.060
Empathy Concern	0.125**	0.084
Personal Distress	-0.063	0.224**

* p<0.05 ** p<0.01

3.3 Hypotheses for a Chain Mediation Model of Paternal Rearing Styles, Pro-Social Behavior, Empathy, and Mental Capital

This study was conducted using PROCESS, a plug-in for SPSS 28.0. Model 6 was established to analyze the data for the mediation effect test. The author used Bootstrap and repeated the sampling process 5000 times with a 95% confidence interval. The independent variables were paternal active rearing styles (X1) and paternal active rearing styles (X2), the dependent variable was pro-social behavior (Y), the first mediator variable was empathy (M1), and the second mediator variable was psychological capital (M2). Among them, gender and grade level were used as control variables. The model obtained is shown in Figure 1.

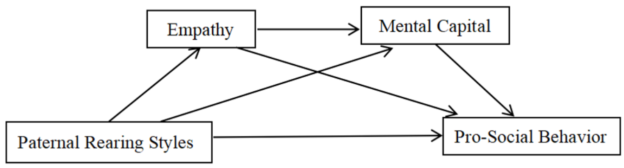

Fig. 1. Hypothesized Chain Mediation Model (Photo/Picture credit: Original).

3.3.1 The Relationship between Active Paternal Rearing Styles, Pro-Social Behavior, Empathy, and Psychological Capital

In Table 3, the mediating effect of empathy and psychological capital between active paternal rearing styles and pro-social behavior were not significant. From the analysis of the specific pathways, only the pathway active paternal rearing styles → psychological capital → pro-social behavior produced significant indirect effects 2 (β=0.436, Bootstrap 95% confidence interval [0.306,0.590]). Therefore, the hypothesis that empathy and psychological capital have a chain mediating role between paternal active paternal rearing styles and pro-social behavior is not valid.

Table 3. Analysis of Intermediate Effect Sizes (Active Paternal Rearing Style)

Effect	β	Boot SE	Boot LLCI	Boot ULCI
Total Effect	1.257	0.153	0.957	1.557
Direct Effect	0.629	0.123	0.388	0.870
Total Indirect Effect	0.628	0.135	0.364	0.894
Indirect Effect 1	0.135	0.082	-0.031	0.295
Indirect Effect 2	0.436	0.071	0.306	0.590
Indirect Effect 3	0.057	0.037	-0.012	0.132

3.3.2 The Relationship between Negative Paternal Rearing Styles, Pro-Social Behavior, Empathy, and Psychological Capital

In Table 4, empathy and psychological capital mediated significantly between negative paternal rearing styles and pro-social behavior. The mediation effect model consists of three paths. Path 1 is the indirect effect 1 from the path of negative paternal rearing styles → interpersonal reactions → pro-social behavior (β=0.171, Bootstrap 95% confidence interval [0.053,0.298]). Path 2 is the indirect effect 2 produced by the paternal negative rearing styles → psychological capital → pro-social behavior (β= -0.163, Bootstrap 95% confidence interval [-0.276, -0.062]). Path 3 is the indirect effect 3 resulting from the path of negative paternal rearing styles → empathy → psychological capital → altruistic behavior (β= -0.094, Bootstrap 95% confidence interval [0.029,0.170]). None of the 95% confidence intervals for the above indirect effects contain 0. This indicates that all three indirect effects reached a significant level.

Thus, the chain mediating role of empathy and psychological capital between negative paternal rearing styles and pro-social behavior was established. The relationship between them is shown in Figure 2.

Table 4. Analysis of Intermediate Effect Sizes (Negative Paternal Rearing Style)

Effect	β	**Boot SE**	**Boot LLCI**	**Boot ULCI**
Total Effect	-0.173	0.132	-0.433	0.086
Direct Effect	-0.276	0.095	-0.464	-0.089
Total Indirect Effect	0.103	0.105	-0.105	0.304
Indirect Effect 1	0.171	0.063	0.053	0.298
Indirect Effect 2	-0.163	0.055	-0.276	-0.062
Indirect Effect 3	0.094	0.035	0.029	0.170

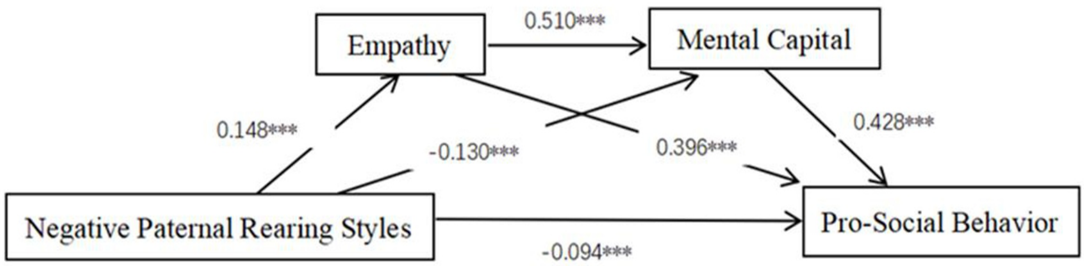

Fig. 2. The Relationship between Negative Paternal Rearing Style, Pro-Social Behavior, Empathy, and Psychological Capital (Photo/Picture credit: Original).

4 Discussion

The findings of the current research supported that paternal active rearing styles positively affected Chinese lower-division undergraduate students' pro-social behavior, empathy, and psychological capital. These agree with the conclusions of earlier research. Thus, warm and supportive paternal rearing styles are more conducive to the growth and development of Chinese adolescents.

Negative correlations between negative paternal rearing styles and pro-social behavior and psychological capital among Chinese lower-division undergraduate students. It is in line with what earlier research has discovered. The reasons may be (1) negative paternal rearing styles cause youths to lack self-confidence and self-esteem. Therefore they are afraid of interacting with others, which in turn inhibits their pro-social behavior. (2) According to Bandura's theory, children are likely to replicate their father's conduct. Undesirable behavioral styles may affect the social skills towards Chinese lower-division undergraduate students, which in turn may hinder the individual's pro-social behavior.

Negative paternal rearing styles were found to be positively correlated with empathy among Chinese lower-division undergraduate students, which contradicts previous studies. Further data analysis showed that negative paternal rearing styles were positively associated with imagined and personal stress among Chinese lower-division undergraduate students. Negative paternal rearing styles can bring pain and stress to adolescents [6]. Imagination can help adolescents relieve stress, for example, imagining good things and so on. Perhaps because they have experienced more pain, it is easier for them to empathize with the negative feelings of others.

This study reveals the relationship between paternal rearing styles and Chinese lower-division undergraduate students' pro-social behavior, empathy, and psychological capital. However, it has shortcomings. For example, the study only explored paternal rearing styles and did not consider the interactive effects of maternal rearing styles on Chinese lower-division undergraduates, or compare the distinct impacts of paternal and maternal rearing styles on them. Additionally, the design of the cross-sectional study prevents the conclusion of causal correlations between variables. Future research should conduct longitudinal study to solve this problem.

5 Conclusion

The study's findings revealed that (1) there was a positive correlation between active paternal rearing styles and pro-social behavior and psychological capital. There was a positive correlation between both active paternal rearing styles and negative paternal rearing styles and empathy. There was a significant positive correlation between pro-social behavior, empathy, and psychological capital. (2) The mediating role of empathy and psychological capital between active paternal rearing styles and pro-social behavior was not significant. (3) Empathy and psychological capital significantly mediated the relation between negative paternal rearing styles and pro-social behavior.

Through this study, the authors further explored the relationship between paternal rearing styles and pro-social behavior. The study bridges the research gap between family education and mental health to a certain extent. It provides new ideas for the state, schools, and families to educate adolescents. It has important theoretical and practical significance. Future research could analyze the differences impacts of paternal rearing styles and maternal rearing styles in more depth. In addition, longitudinal studies should be conducted to clarify causal relationships between variables.

References

1. D. Clark. Pro-Social and Anti-Social Behaviour, London: Routledge.
2. B. Syeda Shahida & L. Christopher Alan. Curr Psychol. **41**, 1997–2011, 2022.
3. D. Matravers. Empathy, Cambridge, UK: Polity Press.
4. F. Luthans, C. M. Youssef & B. J. Avolio. Psychological capital and beyond, Oxford: Oxford University Press.
5. X. Li. The Influence of Parenting Styles on Social-Emotional Competence of Children (Vol. 720), Paris: Atlantis Press SARL.
6. D. Vanchugova. The father's role: an examination of the impact of fathers on problem behaviour in childhood and adolescence, Phd Thesis, Manchester, (2023).
7. J. Jiang., Z.R. Lu., B.J. Jiang. & Y. Xu. Psychol Dev Edu. **26**, 94-99, (2010).
8. Y.Z. Li. Psychol Dev Edu. **34**, 576-585, (2018).
9. Y. Kou., H.F. Hong., C. Tan. & L. Li. Psychol Dev Edu. **01**, 112-117, (2007).
10. F.F. Zhang., Y. Dong., K. Wang., Z.Y. Zhan. & L.F. Xie. Chin J Clin Psychol. **18**, 155-157, (2010).
11. K. Zhang., S. Zhang. & Y.H. Dong. Psychol Behav Res. **8**, 58-64, (2010).
12. A. F. Hayes. J EDUC MEAS. **51**, 335–337, (2013).
13. H. Zhou. & L. R. Long. Prog Psychol Sci. **12**, 942-950, (2004).
14. M. P. Chaparro & J. E. Grusec. Merrill Palmer Quart. **62**, 105–128, (2016).