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The Heterogeneous Impact of Family Social Capital on Students' Development in China

Liang Zhang*, Simei Chen, Fen Lv

School of Economics and Management, Guizhou Normal University, Guiyang, 550025, China
**Corresponding author*

Abstract: *Based on the follow-up data from the "China Education Panel Survey" (CEPS), this study explores the heterogeneous effects of different dimensions of family social capital on students' academic performance and mental health through OLS linear regression analysis. The findings indicate that among the three dimensions of family social capital, network capital significantly impacts academic performance, structural capital alleviates mental health issues, and participatory capital has a bidirectional influence on both academic performance and mental health. These results highlight the directional heterogeneity of the impact of different components of family social capital on students' development. Additionally, control variables related to individual and family characteristics also play a role in influencing student development. The conclusions enrich the understanding of student development from the family perspective and suggest practical measures: the government should address environmental factors, society should prioritize family education, and parents should enhance their educational capabilities to collectively promote high-quality development of students.*

Keywords: *Family Social Capital; Social Network; Participatory Capital; Structural Capital; OLS Linear Regression*

1. Introduction

Research in sociology on social mobility indicates that education is theoretically considered a driving force for social mobility. However, disadvantaged groups face greater challenges in social mobility due to unequal educational opportunities, and this is further exacerbated by intergenerational transmission within families and unequal resource distribution, thereby reshaping patterns of inequality [1]. Adolescents, as the direct subjects affected by educational equity, have always been a focus of societal attention, and related research continues to heat up domestically. Bronfenbrenner emphasized that family, school, and peer groups are the three major significant factors influencing adolescent development [2]. Since the 1960s, scholars have pointed out that family background plays a pivotal role in student development and educational attainment, with its influence potentially surpassing that of schools [3], becoming a core cause of educational and social inequality. This influence stems from significant differences in economic and cultural accumulation, including investments in material resources, money, time, and effort [4]. Individual development encompasses both continuous gradual processes, and family social background facilitates segmented mutations and leaps in adolescents' educational attainment. To further analyze the impact of family background on children's academic performance, scholars have introduced concepts from various disciplinary perspectives, such as educational expectations from the Wisconsin School, parental involvement in family education time investment, and family education styles under trajectory theory, to uncover the underlying complex mechanisms.

This paper examines the impact of family background on student development from the perspective of different dimensions of social capital within the family environment, providing a more comprehensive analysis and in-depth exploration of the multifaceted effects of family social capital on students' academic performance and mental health.

2. Literature Review

Social capital, as a key concept in the sociology of education, has been systematically explored by scholars and is regarded as a reliable, stable, non-institutionalized, and sustainable social relationship network. This network resource is embedded in kinship, organizational, occupational, and

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neighborhood relationships, providing strong support through non-institutionalized network connections and stable behavioral patterns [5]. Scholars have two main perspectives on the classification of social capital: the Bourdieu school focuses on the unequal distribution of social capital and its relationship with social structure, while Coleman emphasizes the cooperation and transmission development within interpersonal networks [6]. Mayer Banks refines the impact of the family microsystem on individuals, defining family social capital as the strength of the relationship between parents and children, measured by parental expectations and involvement [7]. According to the node-centered theory, nodes at the core of a network possess trust, prestige, and participation, leading to the heterogeneity and dynamism of social capital structure. It is evident that network resources are the core elements constituting the hierarchical and complex nature of social structure, and they also exert influence on the development of social capital [8]. Additionally, the neighborhood environment is an entry point affecting educational performance [9]. Through three aspects: the internal social capital sources where individuals first encounter social relationships, such as parental involvement, functional places like schools and good cooperation between parents and schools, and the interaction between social networks, resources, and support systems in the community, they collectively influence the educational attainment of offspring [10]. By enhancing social capital investment, utilizing network resources, and optimizing communication between families, educational expectations can be promoted [11]. Structural capital reveals the total amount of resources an individual can access, with its structural embeddedness characterized by non-emotional connections between individuals and organizations, allowing organizational members to enjoy the unique resources of the organization. Zhou Guangsu and Fan Gang believe that structural social capital can be quantitatively measured by assessing whether respondents are members of specific organizations [12]. Therefore, the measurement of social structural capital can be represented by indicators such as parents' occupational types. This paper considers family involvement as an aspect of family social capital. Specifically, family involvement can be detailed into homework guidance, learning supervision, and communication with children. According to family social capital theory and related research in social psychology, parental expectations, which also profoundly affect the accumulation of family social capital, are an important component of family social capital that influences a series of psychological processes in children.

Developmental psychology's stage theory indicates that there are specific critical periods and sensitive periods in an individual's life cycle, which have a crucial impact on their development. Academic performance, as a reference indicator of individual performance and developmental trajectory, is influenced by the environment and behavioral patterns provided by parents [13]. In the growth of students, non-cognitive abilities encompass aspects such as self-awareness, personality development, and interpersonal relationships [14]. Family background not only directly affects children's non-cognitive abilities but also indirectly, subtly, and enduringly influences academic performance through family education that enhances children's self-awareness. There are significant structural differences in social capital within the educational field, with capital advantages directly reflecting the upper class's significant advantages in resource acquisition and action implementation. Through parents' resource capabilities and participatory actions, such as shaping their academic motivation, learning attitudes, and behavioral habits, they have a positive impact on academic performance and the demand for higher education.

3. Research Design

3.1. Data Source

The data for this study are derived from the "China Education Panel Survey" (CEPS). We meticulously matched and integrated questionnaire data from parents, students, and teachers, which are related to family social capital, to construct a comprehensive dataset as the basis for subsequent analysis. Since this study focuses on the impact of family social capital on student development, we screened and excluded cases with irregular answers or missing information for core variables during the data processing stage. We selected data from 5,928 students in the sample library as the research sample.

3.2. Variable Description

(1) Dependent Variable

The dependent variable in this study is student development, which includes academic performance

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and mental health. Academic performance is measured by the average grade of students in the fall semester of 2014. The other aspect of the dependent variable is the mental health performance of students from 2014 to 2015, calculated as the average score of 10 items, with higher scores indicating poorer mental health conditions. The reliability coefficient α of this mental health scale is 0.86, and it has been used in adolescent mental health research [15].

(2) Independent Variable

This study focuses on family social capital, which includes the influence of the family in social networks, social structure, and social participation: First, network capital is divided into three levels of communication with the outside of the family: home-school communication, parent-teacher meetings, and exchanges between parents. Home-school communication is reflected in the questionnaire by the frequency of parents and teachers initiating contact with each other during the semester; the social network attribute of parent-teacher meetings is shown in the question of whether parents have attended parent-teacher meetings since the beginning of the semester; the measurement of exchanges between parents is reflected in the questionnaire by whether parents know the friends their children often spend time with and the parents of those friends. Second, this paper draws on previous scholars' use of respondents' membership in certain organizations to measure structural capital, which is specifically judged based on parents' occupational status. Finally, the measurement of participation capital includes interactions between parents and children at different levels. This includes parent-child companionship, communication, supervision, and educational expectations. In terms of parent-child companionship, we considered the frequency of parents and children having dinner together, visiting museums, science centers, or zoos together, and going out to watch performances, sports events, or movies together. In terms of parent-child communication, we asked whether parents actively discuss matters related to school, friends, and teachers with their children, as well as the frequency of discussing children's moods, worries, or troubles. In terms of parent-child supervision, we asked about the frequency of parents checking their children's homework and guiding their studies daily. Similar questions in the CEPS student questionnaire are used to measure parents' and children's expectations for education.

(3) Control Variables

Summarizing the influencing factors on student development from existing literature, most studies believe that student personal characteristics and family background affect academic performance and mental health. Considering the references from existing literature and the available internal data from the CFPS, we clearly list the control variables as follows: In terms of student personal characteristics, they include gender, household registration, whether they are an only child, academic pressure, and initial test scores, which are the average grades from the baseline survey. The initial mental health status is the average score of items measuring students' anxiety and depression levels from the baseline survey. When considering family background, we include the following variables: family economic level and the highest educational level of parents.

4. Research Method

This study employs Stata 15 software, with an empirical design aimed at testing the hypothesis of the intrinsic connection between family social capital and student development. When the number of levels of the dependent variable increases and the number of categories exceeds five, the difference between linear regression and ordered discrete regression tends to diminish. Therefore, this paper is based on the OLS (Ordinary Least Squares) model and establishes a regression equation:

$$Y_j=\alpha+\beta_1X_1+\beta_2X_2+\beta_3X_3+\ldots\beta_iX_i+\varepsilon \quad (1)$$

In the equation, Yjrepresents the dependent variable of student development, which includes two variables: academic performance and mental health. X1, X2, X3 respectively represent the core independent variables of network capital, participation capital, and structural capital within the family. Xirepresents the control variables, and $\epsilon\epsilon$ is the error term. To enhance the robustness and credibility of the regression model, we conducted a collinearity diagnosis to assess the level of correlation among the independent variables, as shown in Table 1. Generally, when the Variance Inflation Factor (VIF) exceeds 10, it is considered that there is a serious collinearity problem, and the model needs to be adjusted. The results show that the VIF of all variables is close to 1 (with an average VIF of 1.18), indicating that there is no collinearity problem among the independent variables.

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Table 1: Collinearity Diagnosis of Variables

Variable	VIF	1/VIF
Parent-Child Companionship	1.33	0.750614
Parental Supervision	1.28	0.782671
Parent-Child Communication	1.24	0.808768
Structural Capital	1.10	0.908206
Network Capital	1.09	0.917642
Parental Expectations	1.06	0.945455
Mean VIF	1.18	-

5. Empirical Results and Discussion

Table 2: Regression Results of the Impact of Family Social Capital on Student Development

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Variable	**Academic Performance**	**Mental Health**	**Academic Performance**	**Mental Health**	**Academic Performance**	**Mental Health**
Parental Supervision	-1.753***	-0.063***				
	(-5.77)	(-5.44)				
Communication	3.887***	-0.074***				
	(6.06)	(-3.09)				
Companionship	-0.356	-0.043***				
	(-0.95)	(-3.03)				
Parental Expectations	3.347***	0.017**				
	(15.65)	(2.22)				
Gender	-0.839	-0.006	-1.523**	-0.009	-1.532**	-0.009
	(-1.21)	(-0.21)	(-2.11)	(-0.33)	(-2.12)	(-0.32)
Household Registration	-0.272	0.036**	-0.566	0.031**	-0.540	0.033**
	(-0.67)	(2.52)	(-1.36)	(2.16)	(-1.30)	(2.28)
Only Child	-2.402***	0.009	-2.186***	0.046**	-2.294***	0.042*
	(-3.86)	(0.38)	(-3.44)	(2.02)	(-3.61)	(1.82)
Academic Pressure	13.120***	-0.276***	15.806***	-0.291***	15.831***	-0.291***
	(24.83)	(-14.25)	(31.50)	(-16.18)	(31.61)	(-16.14)
Initial Test Score	-0.039***	-0.000	-0.043***	-0.000	-0.044***	-0.000
	(-2.80)	(-0.66)	(-2.95)	(-0.06)	(-3.02)	(-0.07)
Initial Mental Health	-0.644**	-0.006	-0.727**	-0.007	-0.729**	-0.007
	(-2.01)	(-0.50)	(-2.20)	(-0.61)	(-2.21)	(-0.60)
Parents' Education Level	1.074***	0.007	1.276***	-0.006	1.379***	0.000
	(6.61)	(1.18)	(7.09)	(-0.93)	(8.41)	(0.02)
Parents Living Together	-0.144	0.045	0.124	0.090**	0.060	0.090**
	(-0.12)	(1.05)	(0.10)	(2.09)	(0.05)	(2.10)
Family Economic Level	-1.381**	-0.036*	-1.294**	-0.060***	-1.215**	-0.056***
	(-2.52)	(-1.73)	(-2.31)	(-2.98)	(-2.18)	(-2.82)
Father's Alcohol Abuse	1.973*	-0.088**	2.252**	-0.105***	2.269**	-0.106***
	(1.93)	(-2.25)	(2.15)	(-2.69)	(2.16)	(-2.71)
Parental Conflic	-1.858*	-0.337***	-1.932*	-0.380***	-1.880*	-0.379***
	(-1.85)	(-7.99)	(-1.89)	(-9.07)	(-1.83)	(-9.02)
Structural Capital			0.682	0.058*		
			(0.89)	(1.95)		
Network Capital					-1.519**	-0.024
					(-2.21)	(-0.96)
Intercept	26.196***	3.989***	45.251***	3.845***	46.890***	3.853***
	(6.58)	(25.78)	(11.45)	(25.72)	(11.60)	(25.15)
Sample Size	5,928	5,928	5,928	5,928	5,928	5,928
R-squared	0.283	0.110	0.231	0.096	0.232	0.096
F-test	0	0	0	0	0	0
Adjusted R-squared	0.281	0.108	0.230	0.0946	0.230	0.0941
F-statistic	150.7	44.43	141.5	45.77	143.1	45.44

***p<0.01, **p<0.05,*p<0.1

Table 2 reflects the differences in the impact of family social capital on students' academic

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achievement and mental health development across four dimensions of participation capital: parental supervision, parent-child communication, parent-child companionship, and parental expectations, as well as structural capital and network capital.

Model 1 examines the impact of four aspects of family involvement on students' academic performance. Parent-child communication, parental supervision, and parent-child companionship significantly affect academic performance ($p<0.01$), but the impact of parent-child companionship is not significant. Parent-child communication and parental expectations have a significant positive effect on academic performance, which is consistent with previous research findings. However, parental supervision unexpectedly shows a significant negative effect, which may be related to overly strict or inappropriate supervision methods. The results indicate that in family education, it is more important to build a positive and supportive learning environment.

Model 2 shows that parent-child communication, parental supervision, and parent-child companionship have a significant alleviating effect on mental health ($p<0.01$), while parental expectations have a significant negative impact on mental health. This could be due to the high expectations placing considerable psychological pressure on students. Among these factors, parent-child communication has the most significant promoting effect on both academic performance and mental health, highlighting its key role in family involvement and further validating the importance of good communication in family education.

Models 3 and 4 indicate that family structural capital does not significantly affect students' academic performance but does have a certain alleviating effect on mental health. An increase in structural capital implies higher social status and resource availability for parents, which may not directly improve their children's grades but can reduce psychological stress to some extent.

Models 4 and 5 show that social network capital has a significant positive effect on students' academic performance ($p<0.05$), but its impact on mental health is not significant. Family social network capital, accumulated through interactions between parents and schools or other parents, positively promotes students' academic performance. However, as it is primarily an external form of capital, its direct impact on students' mental health is relatively small.

6. Conclusion and Recommendations

Based on the OLS regression analysis, this study reveals the heterogeneous impacts of family social capital, including family involvement, social networks, and social structure, on students' academic performance and mental health. The specific conclusions are as follows:

6.1. Academic Performance

Family involvement capital and social network capital have a significant positive impact on students' academic performance, while the impact of social structure capital is not significant. Parent-child communication and parental expectations can positively influence students' learning attitudes and academic performance through subtle means; however, the impact of parent-child companionship on performance is not significant, possibly due to its low correlation with subject knowledge mastery. Parental supervision shows a negative impact, reflecting the unprofessionalism of some family education methods and emphasizing the importance of improving family education capabilities.

6.2. Mental Health

Social structure capital can alleviate students' psychological stress to some extent; family involvement capital has a significant positive alleviating effect on mental health. Parent-child communication, parent-child companionship, and parental supervision all help to alleviate students' psychological stress, while excessively high parental expectations have a negative impact on mental health. Parental expectations have a phased effect on students' mental health and academic performance, and excessive expectations may lead to increased psychological stress.

Educational management departments should focus on narrowing the gap in urban and rural educational resources, provide diverse and inclusive educational resources, and formulate differentiated policies to promote educational equity and student mental health. Social organizations should create a supportive educational environment through family education exchange activities and enhance public

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awareness of the importance of family education. Parents need to strengthen home-school cooperation, optimize educational methods, scientifically formulate study plans, and avoid the negative impacts of excessive supervision or expectations, providing positive growth support for students.

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