A Study of the Effects of Parental Educational Expectation on Secondary School Students' Academic Performance: Parent-Child Communication as a Mediator

Longlin Li[1, a], Gang Liu[2, b]

[1]College of Social Development and Public Administration, Northwest Normal University, Lanzhou, China.

[2]Occupational Skill Testing Center, Tulufan Vocational Technical College, Tulufan, China.

[a]2548224660@qq.com; [b]305262045@qq.com

Abstract. Educational expectation perspective of Sewell et al. has made significant contributions to the study of educational attainment, but the theoretical model constructed by Wisconsin of how educational expectations lead to differences in educational attainment needs to be further explored. In this paper, multiple linear regressions and KHB mediated effects decomposition are conducted by using baseline data from the China Education Panel Survey (CEPS) for the 2013-2014 school year. The results show that after controlling for gender, age, family economic status, family cultural capital, parental education and occupation, parental education expectation has a significant positive effect on children's academic performance and parent-child communication. The parent-child communication had a significant positive effect on children's academic performance. The mediation effect decomposition finds that parent-child communication has a partial mediation effect between parental educational expectations and children's academic performance, accounting for 9.89% of the total effect. The study also notes that parental educational expectation, parent-child communication, and academic performance differed by gender and parents' occupation, which should be taken into account in the follow-up process of family education to promote the integration of family education and children's individual development to achieve educational equity.

Keywords: Secondary school student; Parental educational expectation; Academic performance; Parent-child communication; Mediating effect

1. Introduction

According to the report of "China Good Life Survey (2020-2021)", 14.55% of respondents think "children's education" is the most difficult problem for families in 2019, and the figure rapidly increases to 36.19% in 2020. Among those who have difficulties with "children's education", 74.02% intend to spend more on "children's education" in 2021that most people prefer to spend more on education to improve their children's education and knowledge in various aspects, so that their children can eventually achieve excellent academic performance. In practical, the characteristics of social mobility have also changed to a certain extent, manifested by a further shift from a hereditary system to a selection system that focuses on individual ability, and this selection system and criteria have gradually consolidated the central position of school education (Jiang Tianhui, 2010). In the context of the secondary and higher education examination system, students' academic performance in school almost determines the quantity and quality of their educational attainment, and academic performance becomes an important expression of educational attainment. A large number of studies have explored the relationship between educational attainment and educational expectation from Sewell et al.'s perspective of educational expectation, using academic performance as a proxy variable for educational attainment, fully illustrating the finding that educational expectation is an important explanatory variable for educational attainment, and have been consistently evaluated in different empirical tests (Zhou Hao, 2013; Wang Fuqin & Shi Yiwen, 2014; Liu, Baozhong et al. 2014; Fang, Chao & Huang Bin, 2019; Jacob B A, 2010). However, the Wisconsin model constructed by Sewell et al. only pointed out that educational expectation helps promote students' academic development,

and did not explain how educational expectation leads to differences in educational attainment. There is a lack of information on the mechanism between educational expectations and educational attainment.

Among the studies on other influences on students' academic performance or educational attainment, the Coleman Report in the United States and the Plowden Report in the United Kingdom explained most of the variance in student achievement by citing family environment as a major influence, demonstrating the impact of family social capital on children's educational attainment. With particular reference to social capital within the Coleman family, studies by Khattab and other scholars confirmed that frequent parent-child interactions and high educational expectations for children have a significant impact on children's academic performance. However, some scholars have suggested that the impact of parent-child interaction practices on adolescents' academic aspects varies across social contexts and countries. Based on China's specific social characteristics, Fan Jingbo (2019) similarly suggested that the impact of parent-child interaction on adolescents' academic achievement is also positive. Li Zhonglu et al. (2016) used a Chinese family tracking survey to find that parent-child communication and interaction not only affects children's learning attitudes and behaviors, but also can have an indirect effect on their academic achievement or directly on their children's academic achievement.

In light of this, does parent-child communication mediate the relationship between parental educational expectations and their children's academic performance? Few studies have been conducted to prove this idea. In this paper, we will further test Coleman's social capital theory and explore the interrelationships and influencing factors among educational expectations, parent-child communication, and academic performance, while responding to the question of "how educational expectations lead to differences in educational attainment" in Wisconsin's theory. The study also explores the interrelationship between educational expectations, parent-child communication, and academic performance, and their influencing factors, which are useful for the integration of family education and academic performance in the context of "double reduction".

2. Literature Review and Theoretical Hypothesis

In the field of social mobility research, the Blau-Duncan model of status acquisition was proposed as a paradigm for status acquisition research. In the late 1960s, the Wisconsin School, represented by Sewell et al., criticized the Blau-Duncan model (Blau and Duncan, 1967), which failed to incorporate psychological factors into the model. They modified and expanded the Blau-Duncan model by adding reference groups, significant others, and self-concept to construct the "Wisconsin Psychosocial Model of Status Acquisition" (Sewell, 1970). In particular, it pointed out the important role of educational expectations in predicting and influencing children's educational attainment.

Regarding the relationship between educational expectations and educational attainment, a large number of studies have concluded that educational expectation is an important perspective for studying educational attainment and have an important influence and predictive role on educational attainment. For example, Wang Fuqin and Shi Yiwen (2014) studied with college students and concluded that parental educational expectations would transform into educational attainment advantages in school, which would be beneficial to their own academic performance. Pang Weiguo, with the help of PISA experiment, concluded that parental educational expectations have a significant influence on students' academic performance, and in general, there is a positive consistency between parental educational expectations and children's academic performance. The object of this study is junior high school students, and it is worth considering whether parental educational expectations of junior high school students have the same influence on their children's academic performance. Based on previous studies, hypothesis 1 is proposed.

Hypothesis 1: Parental educational expectations have a significant positive effect on children's academic performance.

In the study of the impact of parent-child communication on educational attainment, Coleman's social capital theory understands the effect on academic achievement from two perspectives: "social closure" and "network resources". Among them, the social closure perspective emphasizes the role of parent-child communication on children's academic achievement, which was verified and studied by domestic scholars such as Zhao Yandong and Hong Yanbi (2012). They found that the social capital in the close social structure formed by parents and children themselves can directly benefit children and ultimately promote their academic achievement. Fan Jingbo (2019) also pointed out that moderate and warm academic support from parents (parent-child communication) can promote teenagers' academic achievement. Other scholars have analyzed from a broader parental involvement perspective to show that families influence their academic achievement through parental educational involvement and behavioral support (Li Zhonglu and Qiu Zeqi, 2016; Sui-Chu E H, 1996; Hill N E, 2009). However, based on CEPS 2012 data, Li Jiali (2017) used HLM research to point out that parent-child communication has no significant effect on cognitive ability. This study focuses on the study of the effect on academic performance, which more comprehensively includes the cognitive ability component of students, based on which hypothesis 2 is proposed. In addition, this study concentrates on the parent-child communication to explore the transmission of parental educational expectations on children's academic performance, and needs to focus on the effect of parental educational expectations on parent-child communication.

Hypothesis 2: Parent-child communication has a significant positive effect on children's academic performance.

Hypothesis 3: There is a significant positive effect of parental educational expectations on parent-child communication.

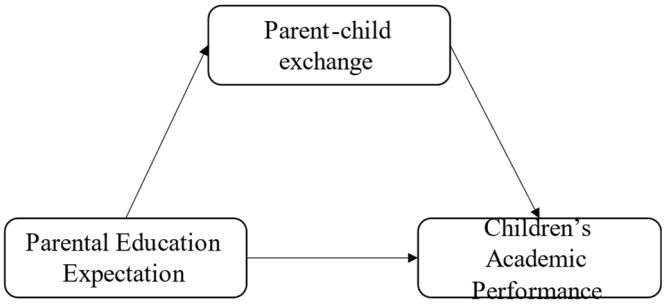

Figure.1 Hypothetical model of parental educational expectations, parent-child communication, and children's academic performance

Sewell et al. pointed out the influence and predictive role of educational expectations on educational attainment, but Alexander, K. L (1979) et al. argued that educational expectations are merely a "proxy variable" following rational consideration about educational attainment and do not directly explain how educational achievement is attained. The different interpretations of the links between educational expectations and educational attainment have made it one of the most important research topics, and the question "What is the pathway between educational expectations and educational attainment?" has been widely discussed. Domestic scholar such as Li Wangyang (2017), examined the effect of adolescents' educational expectations on their academic achievement by using Chinese household tracking survey data and demonstrated the significant positive effect of educational expectations on their word and math abilities by using learning engagement as a mediating variable. Li Shiyuan (2019) used parent-child educational expectation bias as an explanatory mediator with the help of a multilayer linear model to show that educational expectations influence students' academic achievement by affecting their motivation and parental educational commitment. The main reason for discussing this issue is that Sewell et al. only stated that educational expectations contribute to students' academic development, while the Wisconsin model does not explain how educational expectations lead to differences in educational attainment. This paper will

continue to respond to this theoretical confusion by incorporating the results of existing research and proposing Hypothesis 4.

Hypothesis 4: Parent-child communication mediates the relationship between parental educational expectations and children's academic performance.

3. Study Design

3.1 Data Source

The data for this study were obtained from the China Education Panel Survey (CEPS). CEPS uses the school year 2013-2014 as the baseline, and takes two groups of grade one and grade three of junior high school as the starting point. A total of 438 classes in 112 schools were randomly selected for the survey. In this study, the parents' questionnaire and the students' questionnaire were matched and the data was cleaned up, with 17,916 final analysis as valid samples.

3.2 Study Variables

Dependent Variable: Academic Performance. Most of the existing studies use students' standardized academic performance in each subject in the previous year to measure their academic achievement. Considering the complexity of academic performance formation and the diversity of performance, using academic performance only as a proxy for academic performance is rather homogeneous, and this paper uses a more comprehensive variable. The KMO test and Bartlett's test are first conducted for the above five questions, and their values are 0.694 and reach significance at the 0.001 level of significance, indicating suitability for factor analysis. The final academic performance variables are obtained by standardizing the combined scores of each factor.

Independent Variable: Parental Educational Expectation. Parental education expectation is based on the parental questionnaire "What is your expectation of your child’s education ", and the education expectation is transformed into a continuous variable according to the actual number of years of education. The values are assigned as follows: "Don't study now" is assigned as 7 years (first grade of junior high school) and 9 years (third grade of junior high school); "Graduated from junior high school" = 9 years; "Junior college/technical school" =11 years; "vocational high school" =11 years; "high school"=12 years; "university(college)"=15 years; "university (undergraduate) " = 16 years; "Postgraduate" = 19 years; "Doctoral" = 22 years.

Mediating Variable: Parent-Child Interaction. In Epstein's (1990) delineation of parents' involvement in their children's practices, parents' communication with their children about school life and worries is a category of communication. Li Bo (2018), a domestic scholar, also defined parent-child communication as parents' communication with their children about what happened at school, their relationships with classmates and teachers, and their worries and studies. Combining previous studies and the questions measuring parent-child interactions provided by CEPS, to make it more specific, it is: "Do your parents often discuss the following issues with you" in relation to "what happened at school, your relationship with your friends, your relationship with your teachers, your mood and your worries or problems", with the options of never = 1, occasionally = 2, often = 3. The KMO test and Bartlett's test are performed on this group of questions, and the value is 0.813, which is significant at the 0.001 level of significance, indicating that the above questions are highly correlated and suitable for factor analysis, and finally their combined scores are standardized as parent-child communication variables.

Control Variables: Other control variables that may affect the independent and dependent variables and lead to estimation bias are introduced in this paper, and the main control variables in multiple linear regression are divided into two main categories.

The individual level of students includes basic demographic characteristics such as gender, age, household registration, grade level, and whether they are the single child. The family level includes family economic status and cultural capital. Book collection is used to represent the amount of cultural capital held by the family. A large number of studies have proven that family socioeconomic status,

parental occupation, and educational attainment in family background have significant effects on academic achievement (An Guiqing and Yang Yang, 2018; Li Jiali et al, 2016), so it is necessary to control for family economic status, parental occupation, and educational level. The question is asked in the parent questionnaire based on question E19 in the parent questionnaire and question B9 in the student questionnaire. Firstly, the parent questionnaire data is used. When this question is not answered in the parent questionnaire, the student questionnaire data is used, and there are three values to determine the family economic status. Meanwhile, question E8 in the parent questionnaire is used to reflect the parental occupation. By referring to the classification of occupation in the study of educational expectations by Wang Qiying (2019), this study is divided into "higher status occupation " and "lower status occupation". The CEPS also provides a derivative variable of parental education, which compares the education level of the student's father and mother and takes the relatively higher value.

4. Results

4.1 Effects of Parental Educational Expectation, Parent-Child Interaction on Academic Performance

To investigate the direct effects of parental educational expectations and parent-child interaction on academic performance and to further examine the changes under the combined effect of other control variables, the control variables are included in the multiple regression models according to the influence of individual students, families and parents. The variables in Model 1 are only parental educational expectations; Variables in Model 2 include individual characteristics such as gender, age, and grade level; variables related to family are added to Model 3, such as whether or not the single child, family cultural capital represented by family book collection, and family economic situation; Variables related to parents are added to Model 4, mainly in terms of both parental occupation and education; Model 5 mainly discusses the effects arising from parent-child communication, and model 6 discusses the influence of relationship between parental educational expectations and parent-child communication. Table 2 shows the results of multiple linear regression analysis.

Model 1 indicates that parental educational expectation has a significant positive effect on children's academic performance without controlling for other variables. As the student's personal/family/parent-related influencing variables such as gender, age, family economic status, and parental education level are controlled for sequentially in subsequent models 2, 3, 4, and 5, the effect of parental educational expectations on children's academic performance is gradually weakening. However, there is still a significant positive effect, and hypothesis 1 is verified and supported. The goodness of fit of the model further improves (R2: 0.120→0.175→0.223→0.228→0.232), indicating that the effect of parental educational expectations on children's academic performance is influenced by various factors. In Model 5, by incorporating other control variables, the model suggests a significant positive effect of parent-child communication on children's academic performance, which is consistent with previous research. It shows that the more parent-child communication adolescents have with their parents, the higher their academic achievement (Fan Jingbo, 2019; Chen Yiting et al., 2021), and hypothesis 2 is verified and supported. The main explanation is based on Hill's "parent-school-child interaction" theoretical framework and Maslow's hierarchy of needs theory, which suggests that the need for parent-child communication precedes the need for knowledge, and that parent-child communication between parents and children is a prerequisite for adolescents' self-acceptance and emotional stability. Good parent-child communication will help to improve children's academic adaptation and motivation, thus promoting children's academic performance (Fan Jingbo, 2019). The regression coefficient between parental expectations and parent-child communication is 0.472 ($p<0.001$) in Model 6, which also controls for other relevant control variables, verifying the significant positive effect of parental educational expectations on parent-child communication. Hypothesis 3 is verified. It is not difficult to explain that the higher the parental educational expectation, the more parents will pay more attention to their children's education and therefore will

communicate with them in a timelier manner (Zhou Hao, 2008), and the problems that arise will be solved in a timely manner. In this way, it can satisfy their children's needs for emotional stability and self-acceptance and thus promote academic performance.

Table.1 Results of Multiple Linear Regression

Variables /Model	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Mode l6**
	Academic Performance	**Academic Performance**	**Academic Performance**	**Academic Performance**	**Academic Performance**	**Parental educational expectation**
Parental educational expectation	0.110***	0.099***	0.088***	0.084***	0.081***	
	(49.67)	(45.10)	(40.85)	(37.75)	(35.37)	
Gender		-0.282***	-0.283***	-0.285***	-0.281***	-0.077
		(-20.67)	(-21.21)	(-20.83)	(-20.32)	(-1.61)
Age		-0.215***	-0.143***	-0.134***	-0.131***	-0.217***
		(-22.88)	(-15.19)	(-13.82)	(-13.33)	(-6.42)
Grade		0.245***	0.115***	0.099***	0.093***	-0.110
		(10.54)	(4.99)	(4.15)	(3.90)	(-1.33)
Single child（no for reference）			-0.115***	-0.059***	-0.041***	0.129**
			(-8.08)	(-3.83)	(-2.65)	(2.42)
Book collection （rarely for reference）						
2-Less			0.121***	0.119***	0.106***	0.154
			(4.59)	(4.42)	(3.89)	(1.64)
3-General			0.181***	0.166***	0.138***	0.198**
			(8.07)	(7.22)	(5.91)	(2.47)
4-Comparatively more			0.425***	0.375***	0.339***	0.619***
			(17.47)	(14.90)	(13.23)	(7.01)
5-many			0.544***	0.465***	0.422***	0.898***
			(20.05)	(16.23)	(14.50)	(8.98)
Family economic situation（poverty as refence）						
2-Medium			0.125***	0.107***	0.106***	-0.378***
			(7.30)	(6.07)	(5.95)	(-6.18)
3-Affluence			0.180***	0.137***	0.147***	-0.356***
			(5.68)	(4.14)	(4.38)	(-3.08)
Parental occupation （lower for reference）				0.017	0.018	0.075
				(1.01)	(1.03)	(1.26)
Parental education				0.029***	0.025***	0.130***
				(10.53)	(9.12)	(13.60)
Parent-child communication					0.076***	0.472***
					(10.35)	(18.77)
Constant	-1.845***	1.270***	0.244*	-0.097	-0.026	18.415***
	(-48.60)	(9.97)	(1.87)	(-0.70)	(-0.19)	(40.08)
Observations	18,083	17,496	17,443	16,402	16,021	16,166
R-squared	0.120	0.175	0.223	0.228	0.232	0.089

Note: the table reflects the non-standard regression coefficients and the t value is in bracket; *** p<0.01, ** p<0.05, * p<0.1

4.2 The Mediating Role of Parent-Child Communication

The mediating effect model is used to analyze the mechanisms and paths of action between the explanatory and explained variables, and the use of causal stepwise regression to test for mediating effects has been found to have drawbacks in academic research (Wen Zhonglin, 2014). In view of this, in order to analyze the mechanism of the mediating effect of parent-child communication between parental educational expectations and academic performance, the possible mediating effect of parent-child communication will be tested by the KHB mediating effect decomposition (Karlson, Holm & Breen, 2012).

Table 5 reports the results of the KHB mediating effect test. The results indicate that parent-child communication mediates the relationship between parental educational expectations and children's academic performance. Specifically, the total effect coefficient of parental educational expectations on children's academic performance is 0.109 ($p < 0.001$), with a direct effect coefficient of 0.098 ($p < 0.001$) and an indirect effect coefficient of 0.011 ($p < 0.001$) mediated by parent-child communication, accounting for 9.89% of the total effect. Table 4 again demonstrates the significant positive relationship between parental educational expectations and children's academic performance, and that the former has an effect on children's academic performance through parent-child communication, and the above test results support and verify hypothesis 4 of this study.

The logic of the mediating role of parent-child communication can be based on the Self-determination theory (STD) developed by American scholars Deci and Ryan as a possible explanation. Parents' pursuit of their children's good academic performance leads them to pay more attention to communication with their children, and to guide and encourage them in ways that give them more space for development, so that their children's needs for relationships, competence, and autonomy can be met, which in turn leads to improvement of self-determination and greater success in school (Roeser, 1982).

Table 2. KHB Mediating Effect of Parent-Child Communication between Parental Educational Expectations and Academic Performance

Academic Performance	Coef.	Std.Err.	z	P>z	[95%Conf.	Interval]
Total effect	0.109	0.002	49.570	0.000	0.105	0.114
Direct effect	0.098	0.002	43.680	0.000	0.094	0.103
Indirect effect	0.011	0.001	17.840	0.000	0.010	0.012

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