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THE ROLE OF SOCIAL CAPITAL AT HOME AND IN SCHOOL IN ACADEMIC ACHIEVEMENT: THE CASE OF SOUTH KOREA

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ABSTRACT

Using data from the Korean Educational Longitudinal Study of 2005-2007, the current study investigated the role of family and school social capital in students' academic achievement in South Korea. Results showed that while some forms of family and school social capital were associated with increased math achievement, the effect of family social capital was greater than that of school social capital. Results also suggested that similar to parents who play a key role in shaping social capital at home, teachers may play an important role in building ecological school social capital such as collective school norms, which was found to affect students' academic achievement. In addition, results found some interaction effects between family social capital and school social capital. Specifically, collective school norms were found to compensate the deficiency of parental involvement in school, while student-teacher relationships and academic emphasis had boosting effects with parental educational expectation on students' academic achievement. Features of Korean education related to the distinctive role of family and school social capital in students' academic achievement and policy implications were discussed.

TABLE OF CONTENTS

LIST OF TABLES

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Chapter 1
Introduction

Over the past few decades, there has been growing body of research on social capital and its relationship to educational outcomes (e.g., educational achievement, attainment, aspiration) (Dika & Singh, 2002; Parcel, Dufur & Zito, 2010). This growing interest may be attributed to that educational researchers and policy makers consider social capital a solution to a persistent educational and social problem because of its positive influence on young people (Byun, Meece, Irvin, & Hutchins, 2012; Coleman, 1988; Crosone, 2004; Sun, 1999). Given that children's education mostly occurs centering on family, most prior research has identified social capital in the family context and examined its effects on educational outcomes (Dika & Signh, 2002; Ferguson, 2006; Parcel, Dufur, & Zito, 2010). School is another important social institution of education and is more malleable than family, but relatively limited research has examined social capital that exists within schools and its relationship with educational outcomes (Dika & Signh, 2002).

In addition, a series of indicators measuring school social capital has mostly been derived in parallel with those of family social capital, rather than capturing distinct ecological features as a community in which students are embedded (Dufur, Parcel, & Troutman, 2013). In other words, school social capital should reflect collective inherence such as prevailing norms and ethos among members of a school community to deeply understand the nature and process of social capital in broad social contexts (Coleman, 1988; Nahapiet & Ghoshal, 1998; Putnam, 1993). Furthermore, with a few exceptions (e.g., Bassani, 2006; Lee & Shouse, 2011; Park, Byun, & Kim, 2011), most prior research on social capital has mainly focused on Western context, especially U.S. Given that social capital is fundamentally culturally embedded (Ream, 2005),

extending research interest to contexts that differ from U.S. may contribute to expanding and generalizing how social capital shapes and influences education (Ferguson, 2006; Park, 2008). Thus, more international contexts remain to be studied.

In this study, I address this issue by studying social capital in South Korea (hereafter, Korea). Korea is well known for its intense educational obsession, called "education fever" (Seth, 2002). Based on the existence of education fever, it is reasonable to expect that social capital in Korean families may play a central role in improving educational outcomes. Also, due to the Korean egalitarian education approach, through which all schools across the nation are controlled by the central government, Korean schools have small variation in terms of school finance, teacher quality, and curriculum (Byun, Schofer, & Kim, 2012; S. Kim & Lee, 2003). Given that all Korean schools are assumed to have a similar level of financial and human capital, school social capital may be a main channel by which schools affect students' educational outcomes.

Therefore, building on previous literature that is mainly conducted in the Western education context, this study examines the role of family and school social capital in students' academic achievement in Korea, using data from the Korean Educational Longitudinal Study of 2005-2007. Specifically, the current study addresses the following research questions: (1) Do family and school social capital have effects on children's academic achievement? (2) Which type of social capital has greater effects on children's academic achievement between family and school social capital? (3) Is there any interaction effect between family social capital and school social capital on children's academic achievement?

Chapter 2

Literature Review

2.1 Definition of Social Capital

Over the last century, the concept of social capital has been defined in various ways (Schaefer-McDaniel, 2004; Schuller, 2001). In 1916, the term of social capital was used to refer to the influence of social cohesion in community on rural education (Hanifan, 1916). Later in the 1960s, Jacobs (1961) used the concept of social capital to address the development of neighborhoods and belonging in the urban area. A decade later, Loury (1977) defined the concept as a set of resources that inhere in relationships within family and social organizations in community that influence people's cognitive and social development.

Then, in the 1980s, the term of social capital became actively used in educational research after theoretical developments by French sociologist Pierre Bourdieu (1986) and American sociologist James Coleman (1988) (Portes, 2000). In his book, "The Forms of Capital (1986)," Bourdieu proposed three distinct sources of capital such as economic, cultural, and social capital and presented interaction with one another to influence social reproduction. He argued that social capital plays a role in maintaining and reproducing social class by providing advantages of a social network for the dominant class (Lin, 1999).

On the other hand, from the perspective of structural-functionalism, Coleman maintained the beneficial attributes of social capital that facilitates individual or collective action in the three forms— (1) trust, obligation and expectation, (2) information channels, and (3) collective social norms and sanctions that promote the common good (Coleman, 1988). He particularly emphasized the positive role of closure among people in social structure, arguing that a lack of social connectedness makes it hard to attain resources of social capital. In keeping with Colman's

notion of social capital that encourages to cooperate for mutual benefits through trust and norms, Robert Putnam (1993) expanded the concept of social capital to valuable properties of broad communities such as cities and nations, what has been called collective social capital. In accordance with the previous concept of Colman and Putnam, economists Nahapiet and Ghosal (1998) conceptualized three dimensions of social capital including structural (i.e., network ties and configuration), relational (i.e., trust and obligation), and cognitive dimensions (i.e., shared vision and value). Later, Lin (1999) expanded the concept with a more individualistic approach defining social capital as the investment in social network with expected returns.

Despite numerous definitions, researchers have agreed that social capital derives from people's social relations, and that it works to influence one's life in various ways, including well-being and human development (Bassani, 2006; Coleman, 1988; Lin, 2001; Parcel & Dufur, 2001; Putnam, 2000). In education literature, the approach of Coleman and his predecessors, which assumes positive influences of social capital on outcomes, has been regarded as mainstream (Dika & Singh, 2002; Dufur et al., 2013). The current study follows this tradition by focusing on social capital stemming from two primary sources—family and school—and its effects on potential human capital (i.e., students' academic achievement).

2.2 Family Social Capital

Children retain family social capital through the relationships among family members as well as family structural features that may determine the opportunity of the social interactions within family (Smith, Beaulieu, & Israel, 1992). In this regard, Coleman (1988) measured family social capital with indicators of family's features such as presence of two parents in the home, number of sibling, parental educational expectation, frequency of discussions with parents about

study, and intergenerational closure. Using those variables, he found that higher family social capital was significantly related to the decreased likelihood of school dropout (Coleman, 1988).

Subsequent educational research has mainly employed Colman's approach of his original work by adopting family structure and parent-child interaction variables as indicators of family social capital (Dika & Singh, 2002). Those family social capital indicators such as number of sibling (Smith et al., 1992; Sun, 1999), family structure (Pong, 1998), parents' educational expectation (Muller & Ellison, 2001; Israel, Beaulieu, & Hartless, 2001), and intergenerational closure (i.e., close relationship with parents of children's friends) (Smith et al., 1992; Valenzuela & Dornbusch, 1994) have been repeatedly used to measure family social capital and become major indicators for research on social capital within family (Dika & Singh, 2002).

Adding on to such traditional indicators, much research has revealed that various types of parental involvement in terms of educational supports on children's lives in home and schools are important indicators of family social capital. At home, parents may involve in children's educational lives through helping with homework (Furstenberg & Hughes, 1995), advising study progress and future occupation and monitoring children's locations (Dyk & Wilson, 1999), establishing certain routines for daily life (White & Glick, 2000), and sending outside school activities like private tutoring (Park et al., 2011). Also, prior research revealed that indicators of parental involvement in schools such as frequency of attending school meetings and voluntary activities (Carbonaro, 1998; Furstenberg & Hughes, 1995) and contacting with teachers (Lopez, 1996) are significantly associated with educational outcomes.

Some prior research elaborates two dimensions of social capital in family: structural and process (Byun et al., 2012; Israel & Beaulieu, 2004). Structural social capital refers to characteristics of family which determine and affect opportunities for parent-children interaction, while process social capital forms through specific interactions between family members. For example, Byun et al. (2012) used such indicators as number of siblings and two-parent family for

structural family social capital, while using parents' educational expectation and discussion with parents for process family social capital.

Drawing on prior research, this study attempts to measure family social capital through the two dimensions. For structural family social capital, indicators such as number of sibling, two-parent family structure, are included. For process family social capital, parents' educational expectation, relationship with other parents, school- and home-related parental involvements are used.

2.3 School Social Capital

Outside the home, school is another important social context in students' lives, as they spend a substantial amount of their time in schools (Virtanen, Ervasti, Oksanen, Kivimaki, & Vahtera, 2013). In this regard, several studies have extended the concept of social capital to the school contexts. According to a recent study, school social capital is defined as "interpersonal investments between students and schools that can facilitate positive outcomes" (Dufur, Parcel & Troutman, 2013, p. 4). These interpersonal investments in schools are not only based on a typical relationship where students and parents build with school teachers (Dufur et al., 2013), but also on any communal environment stemmed from structures and functions of schools (Lopez, 1996).

Along with the definition, previous research has suggested various indicators to measure school social capital. For example, students attending Catholic schools may possess more social capital in the form of social bonds with members of school community because they have greater commonality in norms related to foster academic achievement than students in public schools (Coleman, 1988; Morgan & Todd, 2009). Highlighting the significant effects of parental involvement on schools and positive school environments, Parcel and Dufur (2001) also

measured overall school environments (i.e., school social problems, physical environment, level of teacher's caring, etc.) and student-teacher and student-counselor ratios.

Moreover, in terms of school climate, collective norms among teachers are considered another significant indicator of social capital in schools (Dufur et al., 2013; Fletcher, Bonell, & Hargreaves, 2008). The collective norms that stem from the high level of trust, shared vision, and collaboration among school community members promote students' school involvements and learning engagements (Brewster & Bowen, 2004) and reduce the level of behavioral delinquency (Dufur, Parcel, & McKune, 2008; Hoffmann & Dufur, 2008). In addition, given that school can create certain norms and standards for students and their families through their policies, practices, and philosophies (Steinberg, Elmen, & Mounts, 1989), the extent to which the school emphasizes academic learning is considered an important indicator of school social capital (Goddard, Sweetland, & Hoy, 2000).

Israel and Beaulieu (2004) further developed the concept of school social capital by suggesting its key features at different dimensions. They included variables of school size and resources and school composition of enrolled students as proxies for the structural attributes of school social capital. They also suggested the interactive attributes which are captured by parental involvement and student-teacher relationships. Finally, in accordance with Coleman and Putnam's conceptualization as collective capital, they added ecological attributes such as school climates and norms estimated by the level of emphasis on academic and rating of school social problems (Israel & Beaulieu, 2004).

Based on previous research and Israel and Beaulieu (2004)'s dimension, this paper selects indicators for school social capital including the structural attributes (i.e. teacher-student ratio, and school SES), the interactive attributes (i.e. teacher-student relationship and work-related relationship among teachers) and the ecological attributes (i.e. academic emphasis and

collective school norms) to test the effect of school social capital on students' academic achievement.

2.4 Effects of Social Capital on Educational Outcomes

There have been numerous educational studies to use the concept of social capital since both of sociologists Bourdieu and Coleman initially conceptualized social capital based on explanations of educational outcomes. Bourdieu (1986) used unequal academic achievement to explain how social capital contributes to reproduction of class. Coleman (1988) adopted academic attainment such as school dropout to show how social capital influences an increase of human capital. Empirical educational studies following those two theoretical traditions employed the concept of social capital to find its effect on a variety of educational outcomes such as attainment (i.e., graduation, college enrollment), psychosocial factors (i.e., aspiration, engagement), and academic achievement (i.e., grade, test scores) (Dika & Singh, 2002).

Most prior literature that investigated the relationship between social capital and educational attainment found the positive effects of social capital. Dropout rates are positively related to the number of siblings (Israel et al., 2001) but negatively associated with parental expectations, parent monitoring, parental communication with school and involvement in other activities (Israel et al., 1996; Teachman, Paasch, & Carver, 1996; White & Glick, 2000). In addition, high school graduation and college enrollment are positively associated with social capital such as family structure, parental expectation, parent-teen interaction (Furstenberg & Hughes, 1995), number of friends known by parent, and parental involvement in the school (Furstenberg & Hughes, 1995).

Similarly, educational aspirations are positively associated with social capital, including parents' and teachers' expectations (Byun et al., 2012; Muller & Ellison, 2001), parental school

involvement (Smith-Maddox, 1999), discussion with parents about education (Byun et al., 2012; Muller & Ellison, 2001), and peer group values (Muller & Ellison, 2001). Qian & Blair (1999) also found a negative relationship between educational aspirations and large family size, and nontraditional family structure. In addition, truancy is negatively related to parental school involvement, monitoring, and discussion (McNeal, 1999), and class cutting is negatively associated with parent-teen discussion, and peer group values (Muller & Ellison, 2001).

Previous literature on social capital and academic achievement shows mixed findings. Overall, achievements such as grade/GPA and test scores of math, science, and reading are negatively associated with large family size and nontraditional family structure (Sun, 1999), but are positively related to parent monitoring (Sun, 1999), parental school involvement (Carbonaro, 1999; Morgan & Sorensen, 1999; Pong, 1999), and parental educational expectation (Carbonaro, 1998; Sun, 1998), and parent-teen discussion (Israel el al., 2001; Lopez, 1996). Meanwhile, some researchers found that parental involvement and monitoring has either no effect or a negative effect on academic achievement (Desimone, 1999; Domina, 2005; McNeal, 1999; EL Nokali, Bachman, & Votruba-Drazal, 2010). In his recent study, for example, McNeal (2015) argues that the inconsistent results of previous research on social capital (specifically parental involvement in his paper) and academic achievement is due to the fact that the broader social contexts like schools moderate the effect of social capital on student performance from the ecological perspective. Furthermore, he suggests that a study of social capital and academic achievement should consider the various ecological characteristics of the school (McNeal, 2015).

In a similar vein, social capital is variously formed through a multifaceted interplay not only between distinct dimensions within a group such as the structural and interactive social capital, but also between groups such as family and school (Bassani, 2006; Byun et al., 2012; Israel et al., 2004). Putman (2001) argues that social capital can be bridged by individuals from one group to another group, given that the individuals are embedded in multiple groups. For

social capital related to students' educational outcomes, the bridging mainly occurs between primary group (typically the family) and secondary (e.g., school, the community groups) groups that the student belongs to (Bassani, 2006).

2.5 Interaction Effects of Social Capital

Through this overlap between primary and secondary groups, three interactive effects between groups are expected to occur: boosting, compensating and threshold effect (Bassani, 2006; Coleman, 1988; Crosnoe, 2004; Parcel & Dufur, 2001; Parcel, Dufur, & Zito, 2010). The boosting effect means that various types of capital such as human and social capital from both family and school work together to promote academic outcomes when a student has high levels of social capital in the two groups. For example, Parcel and Dufure (2001) found that the effects of maternal mental ability on academic achievement were enhanced when students received greater level of caring by teachers. Accordingly, Crosnoe (2004) revealed that strong bonds between teachers and students in schools increased the effect of a close relationship between children and parents on academic achievement. In addition, Byun et al. (2012) suggested that two-parent family structure and the level of parental education boosted together the extent of rural students' educational aspirations.

Another interaction effect is a threshold effect or ceiling-floor effect (Parcel, Dufur, & Zito, 2010). Effects that show either boosting or hindering (inversely boosting) students' educational outcomes may reach a threshold when they are interacted. In other words, the interaction effects of two variables which separately show to promote the outcome variable have more modest effects than the additive models would suggest. For example, Durfur and Parcel (2001) found that the negative effects of both maternal work hour and school social problems on academic achievement became smaller than the additive model would imply when the two effects

were combined. Also, the positive effect of measured maternal mental ability reaches a threshold on math score when there are more skillful teachers in the school (Durfur & Parcel, 2001).

Last but not least, the compensating effect (or substituting resources) occurs when high levels of social capital in one group compensates for low levels of capital in the other group. For example, Coleman (1988) argued that a negative influence with limited social capital in the family may be reduced by attending schools with a high level of social capital, although he did not use the certain term for the compensating effect. Similarly, Kim and Schneider (2005) found that parental involvement in school programs has the compensating effect for the negative effect of the low level of parental education on college enrollment. Hoffman and Dufur (2008) found that high-quality schools may substitute (or compensate) for poor parental attachment and low parental involvement in school. Crosnoe (2004) additionally found that the higher level of bond between students and teachers at school can offset the negative influence by the deficiency of social capital caused by student-parent emotional distance.

These effects are quite important not only for understanding how social capital works on educational outcomes, but also for suggesting policy implications regarding educational inequality. On the one hand, given that family income inequality has increasingly resulted in shapely differentiated investments on social capital between the advantaged and disadvantaged groups (Bianchi, Cohen, Raley, & Nomaguchi, 2004; Haveman, Sandefur, Wolfe, &Voyer, 2004), pervasive boosting effects of schools may exacerbate educational inequality. On the other hand, when family social capital decreases, school social capital becomes relatively more important in educational outcomes (Domina, 2005). In this case, favorable school social capital may offset or mitigate unfavorable conditions of family social capital. Thus, compensating and threshold effects can provide helpful insights into how family and school social capital might compensate or mitigate educational inequality for one another (Parcel et al., 2010).

However, few previous studies investigated these interaction effects between family and

school social capital in terms of educational inequality (Bassani, 2007; Parcel et al., 2010). This study attempts to look at the effect of both family and school social capital on Korean students' academic achievement and then to test potential interaction effects of these two types of social capital. The study finally discusses issues related to educational inequality in the Korean educational context.

2.6 Social Capital and Education in Korea

Since the economic crisis in the late 1990s, Korean society has been facing a variety of challenges that have caused concerns related to social inequality. The economy has become a competitive market-oriented system, which has led to the breakdown of the middle class and, in turn has accelerated social polarization (Sin, 2004). Conventional family values have collapsed through family disorganization and a trend of severe low fertility, which resulted in the deterioration of functional social bonds within families and communities that had been expected to play a role in a fundamental social safety net (Kim, 2000). Korean society, also, has been moving sharply toward a multicultural society because of the huge influx of people from developing countries in southern and Middle East Asia, which has generated tensions between various groups and classes (Hwang & Kim, 2013).

These broad social circumstances have led to much research in the field of education to investigate the mechanism of educational inequality and to prepare countermeasures (Lee & Kim, 2007). Specifically, some research has explored the issues of educational inequality by adopting the concept of social capital and its role in educational outcomes. For example, Lee (2001) found that the types of family social capital— parental expectation, parental networks, and parent-child interactions— varied across the social classes, which contributed to different levels of academic performance depending on SES. In addition, Baek and Kim (2007) suggested that household

income and parental education were significantly associated with the quality of family social capital, including parental interests in a child's study and the extent of trust between family members. Lee and Lee (2009) revealed that parental education was positively related to building a desirable relationship between parents and children, and argued that social capital within a family was determined by family SES.

Although school social capital in Korea has been less studied than family social capital, some research has suggested how we measure school social capital and its effect on students' education. First of all, peers were a significant source of social capital in schools, which influenced students' development of cognitive and affective domains (Lee, 2001; Lee & Kim, 2007). In addition, teachers were considered another main source of school social capital because students can benefit in terms of educational resources or psychological supports through good relationships with them (Choi, Ko, & Hwang, 2009). Accordingly, focusing on the importance of good relationships with teachers and peers, Goo (2000) suggested that their effects were more influential for students who suffered from a lack of family social capital during adolescence than for those who possessed sufficient family social capital.

However, compared to research focusing on interpersonal features among actors within schools, the research that investigated ecological features as school social capital was sparse. Nevertheless it is important to consider ecological features of school, such as trust, collaboration, ethic of care, and collective norms among members, because they can closely involve the concept of social capital themselves (T. Kim & H. Kim, 2008). Therefore, the current study attempts to reveal the effects of social capital that derived from family as well as school including both network and ecological features. It then suggests implications of social capital in the Korean education context with reference to educational inequality.

Chapter 3

Data and Methods

3.1 Data

The current study used nationally representative data for middle school students from the Korea Education Longitudinal Study (KELS) conducted by the Korean Educational Development Institute (KEDI), which is an educational research agency funded by the Korean government. KELS is one of the most recent comprehensive longitudinal surveys, planned to study from 2005 to 2023, to examine trajectories of students' educational developments, career paths, and social mobility, and to test educational policies and school effects (Y. Kim et al., 2006; Park et al., 2011). The KELS sample adopted a two-stage proportional stratified sampling approach. During the first stage, middle schools were randomly selected within each of four strata of regions depending on the population sizes (i.e., a capital city [Seoul], metropolitan cities, small cities, and rural towns). Then, 50 students (or all if less than 50 students in a school) in 7th grade were sampled within selected schools. In the base year, 2005, a total of 6,908 7th graders in 150 schools across the country were sampled. Respondents in the baseline were followed every year. Of the initial 6,908 students, 6,568 (approximately 95%) were resurveyed in the third year (2007). By the third year, KELS also collected data from achievement tests in major subjects, which are regarded as the most important subjects for the national college entrance examination, including Korean, Math and English. The standardized test scores across surveys allow the examination of the effects of social capital in family and school on academic achievement. In addition to the survey of students, KELS also collected data on students' families, teachers, and school principals to gather a variety of information associated with students' education as well as their lives. For the current study, I included only those respondents who participated in both the baseline and

2007 survey in order to examine the effect of social capital on academic achievement between 2005 and 2007. Thus, the final sample was reduced to 6,511 out of 6,908 total sample size.

3.2 Measures

3.2.1 Family Social Capital

Based on prior literature, this study included two-parent family and number of siblings for the structural dimension of family social capital. The variable of two-parent family structure was measured by the students' response about whom they were living with at the time of the survey. I created the dichotomized variable 1 for students who live with two parents and 0 for other students. The number of siblings also was based on the students' question of how many brothers and sisters lived together at the same house. I created a continuous variable, with the exclusion of outliers (responded having 12 siblings, 0.03%). For the interactive attributes of family social capital, I included parents' educational expectation, school- and home- related parental involvement, and parents' relationship with other parents. The parents' educational expectation was based on question that asked "How far in school would you expect your child to go?" The original responses were coded as follows: 1 = middle school graduation; 2 = high school graduation; 3 = complete a two-year school; 4 = graduate from college level school; 5 = obtain a master's degree; 6 = obtain a PhD or other advanced degree; 7 = don't know. I excluded the "don't know" responses, then transformed the responses into years of schooling (e.g., 1 = 9, 2 = 12; 6 = 21). Furthermore, in order to separately estimate social capital generated by parental contribution in students' lives, I created three distinct variables by conducting a principal component factor analysis (PCA) with varimax rotation. I selected 13 items that in part capture different dimensions of family social capital on the basis of categorical domains provided by

KELS. The detailed descriptions and original scales of those 13 items are shown in Table 3-1. Using 12 items out of the selected 13 (one item was not included in extracted three main factors), the principal component factor analysis resulted in three notable factors that I named as follows: (1) parental involvement in home; (2) parental involvement in school; (3) and parents' relationships with other parents of children's friends. The PCA results and corresponding loading are presented in Appendix A. Based on PCA results, I constructed three independent variables that are standardized composite scores, then included those variables in regression models to predict math achievement.

Table 3-1. Selected Items and the Original Scale for a part of Family Social Capital

Short Description	Full Description and the Original Scale	Mean (SD)
Participate in parents association	During this school year, have you joined in parents association in school? (0 = No, 1 = Yes)	0.18 (0.38)
Participate in school meetings	During this school year, have you participated in parents association meetings in school? (0 = No, 1 = Yes)	0.18 (0.38)
Participate in school activities	During this school year, have you participated in parents association activities in school? (0 = No, 1 = Yes)	0.14 (0.34)
Participate in voluntary activities	During this school year, have you participated in Voluntary activities in school? (0 = No, 1 = Yes)	0.09 (0.29)
Participate in other organizations	During this school year, have you participation in other organizations outside school? (e.g. religious organizations, community organizations) (0 = No, 1 = Yes)	0.21 (0.40)
Check whether child has finished homework	How much do you disagree with the following statement: "I check whether my 7th grader has completed all homework"? (1 = strongly disagree, 2 = disagree, 3 = neither disagree nor agree, 4 = agree, 5 = strongly agree)	2.51 (1.53)
Talk to child about grades	How much do you agree or disagree with the following statement: "I talk to my 7th grader about grades"? (1 = strongly disagree, 2 = disagree, 3 = neither disagree nor agree, 4 = agree, 5 = strongly agree)	3.92 (0.88)
Know where child is when he/she is not at home or school	How much do you agree or disagree with the following statement: "I know where my 7th grader is when he/she is not at home or in school"? (1 = strongly disagree, 2 =	3.87 (1.07)

	disagree, 3 = neither disagree nor agree, 4 = agree, 5 = strongly agree)	
Establish curfews for returning from school	How much do you agree or disagree with the following statement: "I enforce curfews for my 7th grader on school nights"? (1 = strongly disagree, 2 = disagree, 3 = neither disagree nor agree, 4 = agree, 5 = strongly agree)	3.37(1.52)
Share information with other parents	During the last one year, how many times parents of your 7th grader's friends provided information about school and teacher for you? (0 = Never, 1 = one or two times, 2 = three or four times, 4 = over 5 times)	0.96(0.94)
Receive a favor from other parents	During the last one year, how many times did you receive a favor from other parents? (0 = Never, 1 = one or two times, 2 = three or four times, 4 = over 5 times)	1.03(1.05)
Give a favor for other parents	During the last one year, how many times did you give a favor for other parents? (0 = Never, 1 = one or two times, 2 = three or four times, 4 = over 5 times)	0.96(0.83)
Other parents help activities in school	During the last one year, how many times did other parents help your children for activities in school? (e.g., studying, field trips) (0 = Never, 1 = one or two times, 2 = three or four times, 4 = over 5 times)	0.93(0.76)

3.2.2 School Social Capital

For structural dimensions of school social capital, this study included a teacher-student ratio and an average household income in schools that represent the socioeconomic status of schools. Using the data from the school survey, I created the teacher-student ratio variable as a continuous variable by dividing the number of students by the number of teachers in each school. Similar to the dynamic between sibling number and family social capital, a higher ratio of students to teachers may lead students to have less opportunity to acquire social capital, such as affection and educational resources, from teachers in schools. In addition, from the parent survey, I constructed a continuous variable at the school level that indicates school SES by aggregating each household income to the nested schools, assuming that students attending an

affluent school may have more social capital than those attending a poor school due to the fact that they are more likely to make ties with more advantaged others through the schools such as peer groups and other adults (Hoffman & Dufur, 2008).

Furthermore, this study included relationships between students and teachers at an individual level, and relationships among teachers at a school level as interactive attributes. Also, I included variables for academic emphasis and collective norms at a school level as ecological social capital. First, given that the cognitive relationship is more influential on an individual than observed relationships and social structures (i.e., frequency to get along with and physical distance) (Freeman, 1992; Kumbasar, Romney, & Batchelder, 1994), the relationship between a student and teachers was based on six Likert-scale items, each with five points, which asked students how much they agree or disagree (i.e., 1 = strongly disagree, 5 = strongly agree) with following statements in order to measure their perceptions about teachers: (1) "Teachers make an effort to help students"; (2) "Teachers are willing to help with students' assignments"; (3) "Teachers are persistent in explaining contents until students understand"; (4) "Teachers are interested in all students' academic achievements"; (5) "Teachers are fair in giving students a chance to express opinions"; (6) "Teachers encourage students to perform better." Because those six items were clustered around only one component when running a factor analysis, I constructed a standardized composite index to indicate that the greater value means that a student feels closer relationships with teachers. Note that the variable of relationship between a student and teachers is the only variable at individual level among school social capital variables. This is because a student may gain advantages through the direct relationships with teachers rather than through a certain characteristic of school. Thus, if it was aggregated at school level, much useful information would be lost (Croninger & Lee, 2001; Hwang & Kim, 2013).

In addition, I included working relationships among teachers and the collective school norms by extracting two separate factors from eight items based on the teacher survey. The eight

items were selected on the basis of the collaboration domain denoted by KELS. The detailed descriptions, their original scales and means and SD of the eight items are presented in Table 3-2. The PCA results in two meaningful factors that I referred to as relationships among teachers and the collective school norms. The results of factors and corresponding loadings are shown in Appendix B. Then, based on extracted factor scores, which are standardized composite, I constructed two school level independent variables by averaging each teacher's score into nested schools in order to find whether students have different levels of social capital depending on schools they are attending. Note, as shown in the descriptions of items, in this study, the variable of relationships among teachers mainly focuses on interactions related to their official works, rather than personal relationships like a sense of intimacy among them. Lastly, I included the extent to which schools emphasize academic achievement as another ecological school social capital based on a five-point Likert scale question asking teachers how much agree or disagree (i.e., 0 = strongly disagree, 5 = strongly agree) with the statement: "In your school, teachers highly emphasis on students' academic achievement." Similar to previous school level variables, this variable also was aggregated into each nested school.

Table 3-2. Selected Items and the Original Scale for a part of School Social Capital

Short Description	Full Description and the Original Scale	Mean(SD)
Academic issues	How often do you discuss with your colleagues about students' academic issues in your school? (1 = almost never, 2 = rarely; 3 = sometimes; 4 = often ; 5 = very often)	4.21 (0.83)
Students' behaviors and attitudes	How often do you discuss with your colleagues about students' behaviors and attitudes in class? (1 = almost never, 2 = rarely; 3 = sometimes; 4 = often ; 5 = very often)	4.49(0.67)
Class contents and assignment	How often do you discuss with your colleagues about class contents and assignments? (1 = almost never, 2 = rarely; 3 = sometimes; 4 = often ; 5 = very often)	3.38 (0.98)

Students' attendance	How often do you discuss with your colleagues about students' attendance? (1 = almost never, 2 = rarely; 3 = sometimes; 4 = often ; 5 = very often)	3.58 (1.08)
Problematic students	How often do you discuss with your colleagues about problematic students? (1 = almost never, 2 = rarely; 3 = sometimes; 4 = often ; 5 = very often)	4.26 (0.84)
Help each other	How much do you agree or disagree with the following statement: "In the current school, I can easily get help from colleagues about educational activities and works." (1 = strongly disagree, 2 = disagree, 3 = neither disagree nor agree, 4 = agree, 5 = strongly agree)	3.74 (0.77)
Share a common visions and belief	How much do you agree or disagree with the following statement: "In the current school, all teachers share common visions and beliefs about education and schooling." (1 = strongly disagree, 2 = disagree, 3 = neither disagree nor agree, 4 = agree, 5 = strongly agree)	3.62 (0.79)
Collaborate with colleagues	How much do you agree or disagree with the following statement: "In the current school, teachers collaborate with other colleagues very well." (1 = strongly disagree, 2 = disagree, 3 = neither disagree nor agree, 4 = agree, 5 = strongly agree)	3.74 (0.76)

3.2.3 Control Variables

This study included a set of control variables associated with a demographic characteristic and features of family and schools including gender, household income, parental education level, type of school and previous math score. Household income was reported from parent survey and transformed by the logarithm function to resemble a normal distribution. Parental education was also based on the parent survey on the higher of the mother's and father's education attainment, and was transformed to years of education (i.e., middle school graduation = 9; PhD graduation = 21). I constructed two dichotomous variables for students' gender (0 = male; 1 = female) and for type of school (0 = public school; 1 = private school). Finally, this study included a math achievement score of baseline year (2005) to address the causal relationship between social capitals and academic achievement.

3.3 Analytic Strategies

To address the research questions, I first completed the preliminary descriptive analyses. Then I conducted ordinary least squares (OLS) regression analyses to systematically examine the relationships between social capital and math achievement. Specifically, I estimated the six models. In Model 1, I included only a set of control variables to predict math score in 2007. In Model 2 and 3, I separately tested the effects of family and school social capital on math score without control variables. The full equations for Model 1, 2, and 3 are as follows:

$$Model\ 1:\ Math\ 2007 = \beta_{01} + \beta_1 * X_c + \varepsilon$$

$$Model\ 2:\ Math\ 2007 = \beta_{02} + \beta_2 * X_{family} + \varepsilon$$

$$Model\ 3:\ Math\ 2007 = \beta_{03} + \beta_3 * X_{school} + \varepsilon$$

where Math 2007 represents the standardized math score in 2007 as the dependent variable, and $\beta_0, X_c, X_{family}, and\ X_{school}$ stand for the intercept, the vectors for control variables, family social capital, and school social capital separately, and ε indicates the residuals.

Next, in Model 4, I included control and family social capital variables together in order to estimate whether the effects of family social capital held even after controlling for previous math score, demographic feature and other characteristics of family and schools. Then in Model 5, I added school social capital variables in Model 4 to determine which sources of social capital were more influential on math score. The full equations for Model 4 and 5 are as follows:

$$Model\ 4:\ Math\ 2007 = \beta_{04} + \beta_{11} * X_c + \beta_{21} * X_{family} + \varepsilon$$

$$Model\ 5:\ Math\ 2007 = \beta_{05} + \beta_{12} * X_c + \beta_{22} * X_{family} + \beta_{31} * X_{school} + \varepsilon$$

Finally, in Model 6, a series of interaction terms between each kind of family and school social capital were included to explore the interaction effects such as a boosting, compensating and threshold effects between family and school social capital on math score. I included

combinations of family and school capital variables that were significant in Model 5. This final analysis could be specified as follows:

$$Model\ 6: Math\ 2007 = \beta_{06} + \beta_{13} * X_c + \beta_{23} * X_{family} + \beta_{32} * X_{school} + \beta_4 * X_{interactions} + \varepsilon$$

where $X_{interactions}$ indicates the overall interaction terms between the family and school social capital variables.

In addition, due to the fact that students nested within sampled schools, I used the *cluster* option in Stata 13 to generate robust standard errors to conform to the violation of independent errors assumption (Rogers, 1993).

3.4 Missing Variables

To ensure the maximum use of the secondary data, all the missing data in the current study were treated with a multiple imputation technique. Using State 13 software package, I generated five imputed data sets, then averaged the coefficients and standard errors across the five data sets in the OLS regression models (Graham, 2009). Specific rate of missing cases was presented in the descriptive results in Table 6.

Chapter 4

Results

4.1 Descriptive Results

Table 4-1 reports the descriptive statistics for all the variables included in the analyses after multiple imputations. To briefly describe the results, the overall standardized math score was increased from 301.48 to 510.49 between 2005 and 2007. In terms of students' general backgrounds, the student participants disclosed that their parents had an average education of around 15 years, indicating slightly less than a four-year college education. In terms of gender and school type, 47 percent were female, 19 percent were attending private schools, and 81 percent were attending public schools.

In terms of family social capital, on average, 89 percent of the 6,511 students lived with two parents, and student participants had slightly more than one sibling (M = 1.28). In addition, their parents had a high degree of expectation for their children's education (M = 17.34), indicating the completion of a four-year college diploma. Three family social capital variables—such as relationship with other parents, parental involvement at home, and parental involvement in school— are composite indices with a mean of 0 and a standard deviation of 1. Thus, it is meaningful to look at the original descriptions of the items presented in Table 3-1 to understand these standardized variables. As expected, given the cultural importance placed on education by Korean parents, the means of items concerning parental involvement taking place in the home mostly display above the average value (over 3 out of 5).

On the other hand, the mean of each item for parental involvement in school is less than 0.2 (which has a dichotomous value: 0 = No, 1 = Yes), highlighting a remarkably low level of parental involvement in school activities, compared to approximately over 70 percent of parental

involvement levels in U.S. (Child Trends, 2013). This finding is consistent with previous research which suggested that the Korean standardized education system may reduce direct parental involvement in schooling and, instead, increase indirect involvement in alternative ways, such as shadow education (Park et al., 2011). The mean of each item related to relationship with other parents, which consists of a 0 to 4 range, is close to 1 (one or two times frequency in one year), showing an extremely low level of mutually beneficial exchange among Korean parents. The pattern may be explained by emerging social concerns about conventional social value within communities, which is able to enhance collective social capital, has severely collapsed for during last few decades (Kim, 2000; Sin, 2004). These two types of family social capital, which are consistently emphasized in Western studies, tend to prevail less in a Korean educational context.

In terms of school social capital, the average ratio of teachers to students is 19 with great variation among schools suggested by a standard deviation. In addition, compared to the standard deviation of family household income (M = 5.68, SD = 0.6), the standard deviation of the school SES (M = 5.69, SD = 0.23), which was constructed by aggregating each household income to the nested schools, is quietly shrunk. This may imply that Korean schools are less segregated by students' economic backgrounds. The mean of academic emphasis at school level is near the average (M = 3.58). Similarly, each of the items, which construct a composite index of students' perception about their relationships with teachers (ranging from 1 to 5), is moderately close to the average. Most of the items constructing a composite index for work-related relationships among teachers, which have a range of 1 to 5, are close to 4 (often discuss with colleagues about their teaching contents and disciplines). This implies Korean school teachers perceived on average that they have fairly good relationships with their colleagues and work well together within schools, resulting in a higher level of school social capital. Finally, the means of collective norms, which consist of a range of 1 to 5, are near 3.5, indicating Korean schools have a moderate level of collective norms as a form of school social capital.

Table 3. Descriptive Statistics (Multiple Imputed, unweighted)

Variables	Obs.	Mean	Std. Dev.	Min	Max	Imputed%
Dependent variable						
Math score in 2007	6511	510.49	63.06	366.25	732.23	1.20
Independent variables						
Family social capital						
Structural attributes						
Two-parent family	6511	0.89	0.30	0	1	4.20
Number of sibling	6511	1.28	0.83	0	9	0.00
Interactive attributes						
Parents' educational expectation	6511	17.34	2.30	9	23.80	3.80
Relationship with other parents	6511	0.00	1.42	-4.30	6.71	1.70
Parental involvement in home	6511	0.00	1.38	-6.05	4.15	5.00
Parental involvement in school	6511	0.00	1.65	-4.49	5.04	5.30
School social capital						
Structural attributes						
Teacher-student ratio	6511	19.00	4.47	3.00	25.23	0.00
Average household income in school (logged)	6511	5.69	0.23	4.77	6.38	0.00
Interactive attributes						
Teacher-student relationship	6511	0.00	1.79	-5.95	4.19	1.70
Working Relationships among teachers	6511	-0.03	0.54	-1.64	0.96	0.00
Ecological attributes						
Academic emphasis	6511	3.58	0.29	2.77	4.43	0.00
Collective norms	6511	0.00	0.51	-2.12	1.54	0.00
Control Variables						
Previous math score in 2005	6511	301.48	65.70	121.63	525.84	1.30
Parental education	6511	15.35	2.50	7	21.43	2.00
School type (1= private school)	6511	0.19	0.39	0	1	0.00
Female	6511	0.47	0.49	0	1	0.00
Household income (logged)	6511	5.68	0.60	2.30	8.00	9.40

4.2 OLS Regression Results

Table 4-2 shows the results of OLS regression analysis that predicted math scores in 2007 by family, school social capital and other background variables. As addressed previously, Model 1 shows the relationships between math scores in 2007 and only control variables. Results

suggest that, as expected, previous math scores and parental education level are significantly associated with math scores in 2007. Students from wealthy families had a higher level of achievement than those from poorer families. Attending private schools is positively associated with higher math scores, and scores of female students are not significantly different from those of male peers, controlling for other variables.

Model 2 and 3 include family and school social capital variables, respectively. In general, family social capital (Model 2) explains approximately 10 percent of the variance in math achievement in 2007 and school social capital additionally accounts for approximately 6 percent of the variance. These results suggest that in Korea, family social capital may have more of an influence than school social capital on students' educational achievement. This findings are consistent with those in U.S. literature which have consistently found that family effects are much greater than school effects on students' education. For example, Coleman (1966) argued that educational outcomes were mostly attributed to family backgrounds (around 90 percent), while school effects accounted for near 10 percent.

In Model 2, relationships between family social capital and math achievement show similar results to those found in Western literature. Specifically, students who lived with a two-parent family hold an advantage than those who come from other family structures. In addition, higher parental educational expectation and involvement at home and school are positively associated with increased math scores. Increased number of siblings is associated with lower math achievement. However, the parental relationship with other parents representing, which is one of the important family social capital indicators in Western literature (Coleman, 1999; Smith et al, 1992; Valenzuela & Dornbusch, 1994), shows non-significant association with math achievement in Korea.

In Model 3, results suggest that attending a high SES school and students' close relationships with their teachers are statistically positively associated with higher math

achievement. In addition, two ecological forms of school social capital, academic emphasis and collective norms at school level are significantly related to improvements in math achievement, implying that students benefit from those forms of social capital by being a member of the schools. However, work-related cooperation among teachers is not significantly related students' math achievements.

Model 4 adds family social capital to Model 1, showing to what extent family social capital affects math achievement when students' backgrounds are taken into account. Controlling student and family backgrounds considerably reduces the association of family social capital with math achievement. Two-parent family structure and number of siblings are no longer significantly associated with math achievement. The coefficient of parents' educational expectation reduced by half from 5.78 in model 2 to 2.09 in model 4. Similarly, over half of the association between math achievement and parental involvement in homes decreased from 4.10 to 1.04. The coefficient size of parental involvement in school is also substantially reduced from 3.72 to 1.70. Nevertheless, parents' educational expectation and parental involvement in home and in school still remain statistically significant even after controlling the backgrounds. Furthermore, two variables for parental involvement both at home and school were standardized to have means of 0 and standard deviations of 1; comparison between two types of parental involvement suggests that parents' participation in school activities are more associated with increased math scores than parental involvement at home. In addition, compared to model 1, there are considerable reductions in the coefficients of household income and parental education level in Model 4. This result indicates that family social capital mediates the relationship between family SES and children's academic achievement.

In Model 5, the school social capital variables are included in Model 4. The results suggest that the coefficient of school SES, which is aggregated by each household income at school level, remains significant although it significantly decreased from 53.48 in model 3 to

20.33 in Model 5. However, the relationship between students and teachers is no longer significantly associated with math achievement in Model 5. The coefficient of academic emphasis is slightly reduced from 12.53 in Model 3 to 9.06 in Model 5. Collective school norms remain significant in Model 5.

Although the association of household income is no longer significant in Model 5, it does not imply that school social capital may mediate the relationships between family SES and academic achievement. This is because the school SES indicator, which is aggregated by each household income, causes family SES to be considerably decreased in Model 5. An additional analysis using all variables in Model 5 except school SES shows that the coefficient of family SES ($\beta = 3.382$) does not substantially change compared to its coefficient ($\beta = 3.689$) in Model 4 (Appendix D). This result suggests that school social capital, except school SES, is associated with academic achievement independent of family backgrounds.

Finally, as mentioned earlier, after testing all combinations of each variable for family social capital by every school social capital variable, Model 6 introduces only three statistically significant interaction terms. The result suggests school social capital can play a role in moderating the effects of family social capital on academic achievement. Specifically, results indicate that students, whose parents' educational expectations are high, benefit an extra boosting effect on math achievement when they attend schools that highly emphasize academic achievement (shown in Figure 1). Moreover, the effects of parental educational expectation on math achievement are boosted if students have close relationships with their teachers (shown in Figure 2). On the other hand, high collective school norms compensate for the disadvantages of low level parental involvement in school. This suggests that variations of students' math achievement considerably vary depending on the extent to which their parents are involved in school activities when positive collective norms do not exist in schools. On the other hand, influences of parental involvement on students' academic achievement become restricted if

schools have a high level of positive collective norms among members. Figure 3 shows that in schools with a low level of collective norms, the gradient of math achievement is steeply increased with a higher level of parental involvement. On the other hand, in schools with a high collective norms, the gradient of math achievement is almost flat, implying there are no variations in math achievement caused by parental involvement. Any threshold effects between family and school social capital are not detected in the results.

Table 4-1. Estimated Coefficient of OLS Regression Model Predicting Math Score in 2007

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Control Variables						
Previous math score in 2005	0.508***			0.484***	0.475***	0.479***
	(0.017)			(0.017)	(0.016)	(0.016)
Parental education	1.639 ***			1.275***	1.098*	0.990*
	(0.346)			(0.346)	(0.346)	(0.368)
School type (1=private school)	9.413*			9.019*	6.302	5.912
	(3.600)			(3.480)	(3.694)	(3.827)
Female	-1.516			-0.661	-0.130	-0.388
	(1.918)			(1.903)	(1.855)	(1.870)
Household income (logged)	6.786***			3.689*	1.429	1.923
	(1.504)			(1.665)	(1.488)	(1.606)
Family social capital						
Two-parent family		18.432***		4.781	5.324*	5.140*
		(2.570)		(2.536)	(2.523)	(2.579)
Number of sibling		-2.98**		0.029	0.050	-0.754
		(0.889)		(0.795)	(0.790)	(0.871)
Parents' educational expectation		5.781***		2.096***	2.102***	-5.799
		(0.380)		(0.319)	(0.312)	(3.360)
Relationship with other parents		-0.135		-0.813	-0.845	-0.626
		(0.572)		(0.444)	(0.455)	(0.460)
Parental involvement in home		4.102***		1.045*	0.923	0.785
		(0.573)		(0.520)	(0.522)	(0.562)
Parental involvement in school		3.721***		1.705**	1.688**	1.719**
		(0.558)		(0.494)	(0.488)	(0.495)
School social capital						
Teacher-student ratio			0.596		-0.180	-0.228
			(0.410)		(0.309)	(0.312)
Average household income in school(logged)			53.487***		20.337*	20.752*
			(9.514)		(7.448)	(7.292)

Teacher-student relationship			2.690***		0.756	-5.693
			(0.426)		(0.416)	(3.120)
Working relationships among teachers			-6.126		-4.903	-4.884
			(3.604)		(3.076)	(3.228)
Academic emphasis			12.537*		9.064	-28.863
			(5.640)		(5.013)	(15.835)
Collective norms			6.160*		5.122*	4.735*
			(2.833)		(2.365)	(2.364)
Interaction						
Parental involvement in school × Collective norms						-1.643*
						(0.708)
Parents' educational expectation × Teacher-student relationship						0.376*
						(0.177)
Parents' educational expectation × Academic emphasis						2.206*
						(0.929)
Constant	292.229***	397.506***	149.575**	281.638***	154.585***	288.339***
	(9.603)	(6.500)	(53.736)	(10.391)	(41.916)	(65.396)
N	6511	6511	6511	6511	6511	6511
R^2	0.330	0.098	0.062	0.340	0.349	0.351

Notes: Robust standard errors in parentheses

*$p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

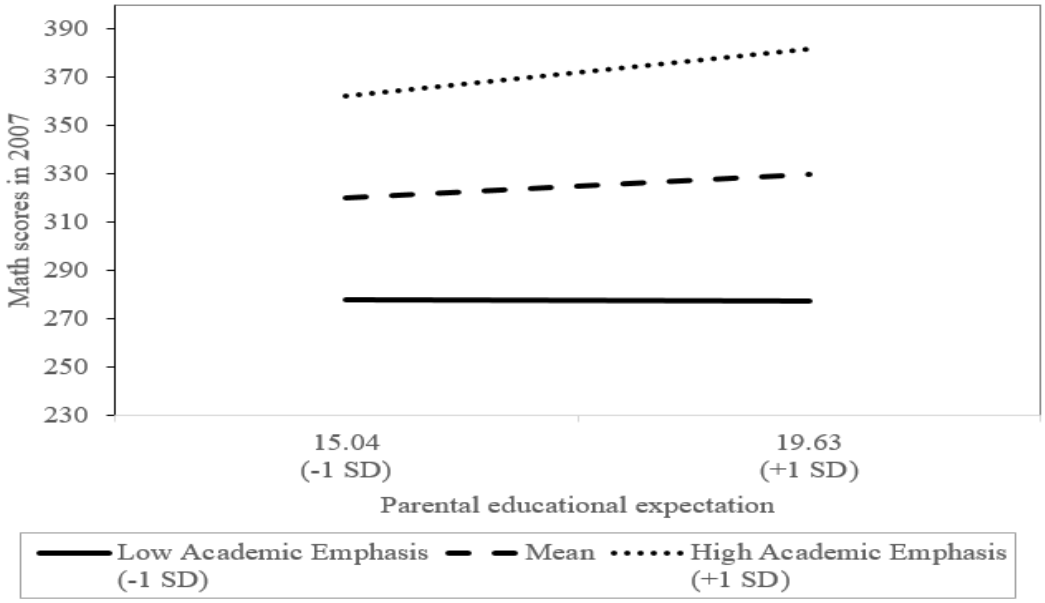

Figure 1. Interaction effects between parents' educational expectation and academic emphasis on math achievement.

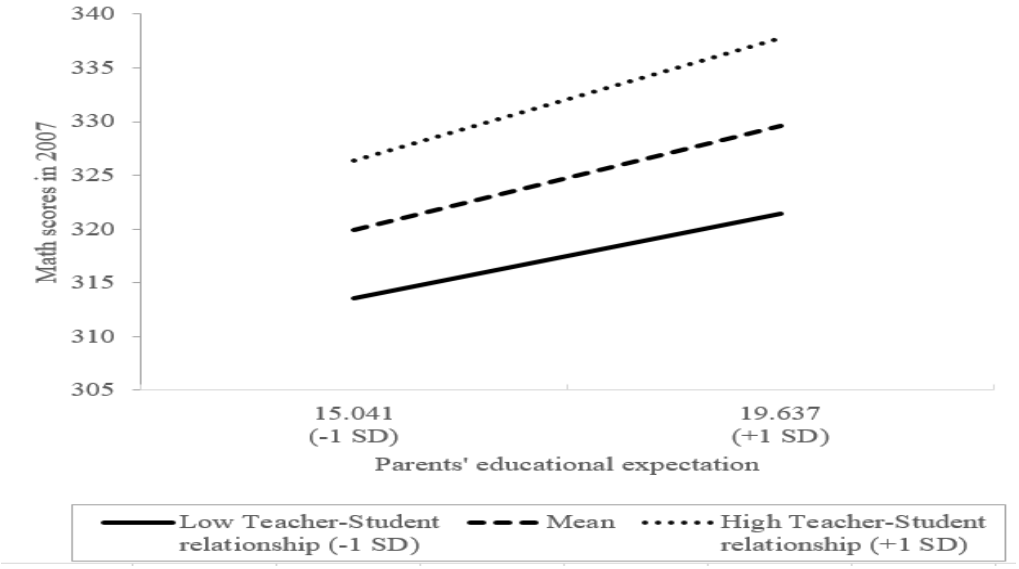

Figure 2. Interaction effects between parents' educational expectation and teacher-student relationships on math achievement.

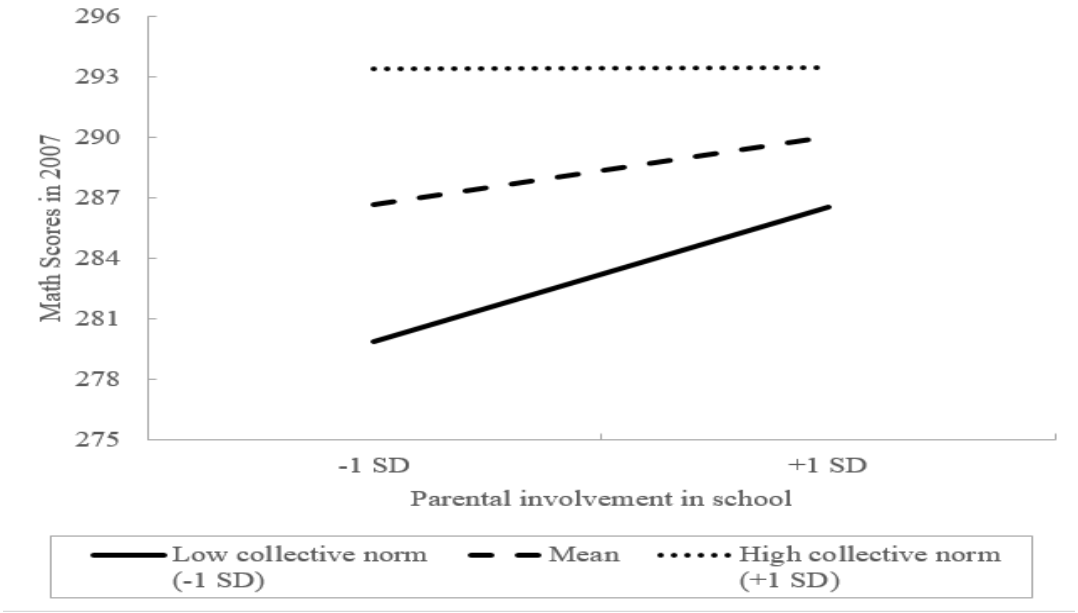

Figure 3. Interaction effects between parental involvement in school and collective norms on math achievement.

Chapter 5

Discussion

5.1 Discussion of key findings

The current study investigated how family social capital and school social capital were related to the academic achievement of Korean middle-school students, and whether and how the two types of social capital interacted with one another. First of all, not all but some forms of family social capital and school social capital were significantly associated with increased math achievement, even after controlling for student and school backgrounds. Although the overall effect size of school social capital was relatively smaller than that of family social capital, school social capital existed as a substantial factor to determine students' academic achievement. In addition, the empirical analysis showed that family social capital considerably mediated the relationships between parental financial and human capital and academic achievement, while indicators of school social capital, excluding school SES, were independently associated with academic achievement from family backgrounds. This discrepancy may be because the "key adults" in schools with whom students interact for the potential benefits are teachers, whereas parents are the key adults at home (Parcel & Dufur, 2002, p. 885).

By showing the significant effects of interactive and ecological school social capital, this study suggested that teachers may play a role in building school social capital by establishing relationships among themselves within schools. This is consistent with previous literature suggesting that, in schools, teachers analogously substitute the roles of parents who are mainly in

charge of shaping family social capital, as well as the extent of human and financial capital, at home (Parcel & Dufur, 2002, Parcel, Dufur, & Zito, 2010). It is noteworthy that students' academic achievement is related to the teachers' relationships with other colleagues rather than students' personal ties with teachers. These relationships engender a positive psychological school climate, such as mutual trust, solidarity and fellowships, which, in turn, indirectly affects students through fostering collective school norms as a form of school social capital. Based on previous research on social capital showing that children benefit from the social ties which their parents have with others, such as neighbors, colleagues, and school personnel (Crosnoe, 2004; Dufur et al., 2008; Parcel & Dufur, 2001), this study expands the prior literature by suggesting that students similarly benefit from social connections that teachers have in schools.

Furthermore, given that these ecological forms of social capital in schools are mainly generated by teachers, the results shed light on how teachers collectively and indirectly affect students' education in schools through constructing positive social capital at the school level. This result may be an additional explanation adding on previous studies suggesting that teachers' characteristics on their human capital — teachers' teaching experience, educational level and certification status, etc. — significantly determine the quality of schools (Darling-Hammond, 2000; Darling-Hammond & Youngs, 2002). However, contrary to expectation, work-related cooperation among teachers is not significantly associated with students' math achievement, and even shows a negative association. Although work-related cooperation and collective norms enhance each other (see Appendix C showing highly correlated relationship between two variables), it is more reasonable to understand that school social capital may be engendered by collective norms such as mutual trust, inclination toward reciprocity and shared vision rather than working relationships among teachers in Korean schools. This result underpins previous literature

suggesting that the concerted norms and trust between group members facilitated collective social capital (Coleman, 1988; Nahapiet & Ghoshal, 1998; Putnam, 2000).

Moreover, this study found a compensating effect between collective school norms and parental involvement in school, which suggests that a high level of collective norms in school may offset the disadvantages stemming from the deficiency of parental involvement in school, or vice versa (Domina, 2005). Given that parental involvement in school tends to be correlated with family SES, including educational attainments of parents and household income in Korean educational setting (see Appendix C), this finding suggests that school may play a role in reducing educational gaps across family backgrounds when schools play a role as close-knit and supportive communities. This is in line with previous Korean research on school effects that reduce educational inequality by showing that the communal climate of a school is strongly associated with a more equal distribution of academic achievements between students. Furthermore, S. Kim (2007) demonstrated that the academic pressure climate of a school is not only related with a high average level of student achievement, but also can close academic gaps caused by parental influence. However, the current study also found that the influence of parental educational expectation were amplified by student-teacher relationships and the level of academic emphasis in schools. Similar to parental involvement in school, parental educational expectation also is correlated highly with family SES indicators, which means that those features of school may aggravate the educational inequality. Thus, this study suggests a twofold role for schools in terms of educational inequality: compensating and boosting effects.

In addition, the present study found some different patterns of effects of family and school social capital on academic achievement, reflecting distinct features of the Korean educational context. First of all, contrary to the collective school norms, the work-related

relationships among teachers was not associated with academic achievement; although teachers responded they had many opportunities to discuss their teaching and discipline within schools. In Korean schools, knowledge-sharing and discussions about work tend to occur during official meetings in school rather than through personal interactions among teachers because of the bureaucratic institutional culture (Lee, Ryu, & Yoon, 2001). However, according to survey data for Korean secondary school teachers, more than half of the teachers (66.2%) perceived that training seminars, conferences, and regular meetings in schools were not helpful for them to develop their teaching and discipline skills (Joo, 2007, p. 215). Similarly, young teachers felt pressured to participate in frequent compulsory meetings in schools, which led to stress and less time for class preparation (Gil, 2005). The fact that teachers' discussions are based on official meetings may be associated with inefficiency of communication among teachers, which, in turn, results in the non-significance of work-related relationships on academic achievement. However, more comprehensive research is needed to better understand the relationship between teachers' working relationships and students' academic achievement. Taken together, the findings suggest that the patterns and effects of school social capital vary depending on structural features of the educational system. This extends prior research, suggesting that social capital is fundamentally embedded in broad cultural and structural contexts (Israel et al, 2001; Ream, 2005).

In addition, this study found that effects of social capital in Korean families on educational outcomes also distinctively existed from those in western literature. Western literature on social capital mostly suggested that parental closure significantly forms social capital to affect young adult by imposing effective communal norms and building the trustworthiness that allows the obligations and expectations within a community (Coleman, 1988; Putnam, 1993; Smith et al., 1992; Valenzuela & Dornbusch, 1994). However, in this study, the parents'

relationships with other parents did not function as social capital to enhance children's academic achievement at all. One possible reason may be related to the current social context in Korea. As mentioned earlier, Korean society has undergone substantial changes since the economic crisis in the late 1990s. One of the remarkable and concerned social changes is the rapid breakdown of community, which has been empirically proved and blamed for recent increased social issues such as suicide, domestic violence and child abuse in Korea (Lee, 2004). Given that Korean students live physically close to each other around schools on account of the most common residence type (49.6% people are living in apartment houses in 2014) (Korean Ministry of Land, Infrastructure and Transport, 2014) and the random assignment of students to public and private schools within residential districts (Park et al., 2011), the collapse of conventional community value may be one potential explanation for the low level of interaction between parents and the insignificance of parental closure to shape family social capital in the Korean context (Joo, 2007). Instead, facing decrease of interactions among parents based on communal value, Korean parents have established a new type of network among them based on the nature of business transactions to pursue a specific objective such as gaining information about private tutoring or cram schools for their children (Park et al., 2011). This may indicate that in Korea, relationships among parents may form unique social capital different from that explained by parental closure in western literature. In sum, the findings suggest that understanding and interpreting the relationships between social capital and educational outcomes should take into account the broad social and cultural contexts in where families and schools are located.

5.2 Policy Implications

This study has several implications for policy makers and educators who are particularly interested in the role of schools in improving educational outcomes. Although much evidence suggests that family influences are more consequential than those of schools (Coleman et al., 1966; Parcel et al., 2010), the solution for the low student achievement has been to "fix" schools through educational policies (Dufur et al., 2013, p. 18). However, compared to concerns about school finances and human capital, the existence of social capital in schools and its effects on educational outcomes have been overlooked in the discourses about how to fix schools. Therefore, policy makers and educators need to acknowledge the influence of school social capital on academic achievement, and ascertain what and how social capital in schools is related to students' educational outcomes in the given contexts around the schools.

In addition, this study suggested that the collective norms within schools, which are based on trust, shared visions, and cooperative attitudes among teachers, are significantly associated with increased academic achievement. Thus, policy makers and educators need to find ways to encourage collective norms while working as a form of school social capital among teachers. For example, in Korea, the current year-based teacher evaluation— which grades teachers relatively in four ratings and gives teachers incentives (i.e., greater bonus and additional points for promotion) or penalties (i.e., retraining and compulsory transfer) depending on ratings— may substantially promote conflicting and competitive relationships among teachers in schools (Ahn, Choi, Park, & Kim, 2014), which may in turn negatively affect school social capital. From the perspective of the egalitarian education approach, the policy of rotated assignments for teachers to different schools every four years, which causes on average 20

percent of teachers' transfers in each schools, may also discourage the building of school social capital (Joo & Song, 2005).

Finally, this study found that although there was a very low level of parental involvement in schools in Korea, an increase of parental involvement in schools can enhance students' educational outcomes (Epstein & Sheldon, 2002). Thus, policy makers and educators need to take into account how to facilitate parental involvement. Considering the low level of parental interactions with other parents and their involvement in schools, Sheldon (2002) found that if parents have more dense relationships with other parents whose children attend the same school, the parents are more likely to become involved in schools, even controlling for psychological factors such as parental beliefs and efficacy. In this regard, extending opportunities to encourage interactions among parents, such as setting up a phone chain among families or assigning classroom projects that require collaboration among families with children in the same classroom, may help to increase parental involvements in schools, as well as build more relationships among parents.

5.3 Limitations

There are several limitations of the present study that should be addressed. First, the math scores in KELS, which this study selected to examine the level of educational outcomes, are not likely to represent the exact levels of academic achievement. Other subjects, such as Korean and English, considered important for college entrance exams, may show different results. Also, social adjustment is another important educational goal of schooling and it may have different associations with social capital at home and schools from that of math scores. Beyond this current

study, which found effects of family and school social capital and their interaction effects on academic achievement, future research should examine potential effects of social capital on various other educational outcomes.

Another limitation is that the present study considered limited indicators of social capital at home and schools. Due to the insufficient information on the data, this study did not include other important sources to shape social capital that previous literature suggested. For example, students' relationships with friends and peer culture would be significant forms of social capital in school and influence educational outcomes (J. Lee, 2001; J. Lee & K. Kim, 2007). Peer effect is particularly important for adolescents because it is more influential on their cognitive and behavioral developments than parents and teachers (Muller & Ellison, 2001). Future studies should include indicators related to peer groups to determine whether or how they are associated with educational outcomes and whether they have interaction effects with other types of social capital.

Finally, although I interpret the absence of parents' relationships with other parents and its ineffectiveness on academic achievement as a decrease of parental closure in Korea, the evidence of this study is insufficient because this study does not take into consideration social capital at a community level (Putnam, 2000). Thus, the parents' relationships with other parents, in which the present study is interested, is limited to the relationships with only the parents of their children's school friends, rather than possible social closure in real-world relationships such as neighbors, social organizations, and religious memberships in communities. Future research need to find how community social capital is associated with students' educational outcomes and interacted with other social capitals in the current Korean educational contexts.

Appendix A. Factor Analysis for a part of Family Social Capital

Short Description of items	Parental involvement in home	Parents' relationship with other parents	Parental involvement in school
Join parents association	0.509	-0.012	0.007
Participate in parents association meetings	0.520	-0.019	0.005
Participate in parents association activities	0.523	0.001	-0.015
Participate in voluntary activities	0.405	0.027	-0.014
Participate in other organizations	0.177	0.064	0.075
Check whether child has finished homework	-0.021	-0.001	0.435
Talk to child about grades	-0.004	0.018	0.523
Know where child is when he/she is not at home or school	0.009	0.006	0.525
Establish curfews for returning from school	-0.001	-0.025	0.502
Share information with other parents	0.014	0.469	0.038
Receive a favor from other parents	0.008	0.552	0.008
Give a favor for other parents	-0.024	0.532	-0.006
Other parents help activities in school	-0.013	0.431	-0.053
Eigenvalue	3.046	1.976	1.794
% of Variance	2.852	2.045	1.919

Appendix B. Factor Analysis for a part of School Social Capital

Short Description of items	Relationships among teachers	Collective school norms
Academic issues	0.471	0.041
Students' behaviors and attitudes	0.470	-0.021
Class contents and assignment	0.379	0.034
Students' attendance	0.458	-0.037
Problematic students	0.450	-0.012
Help each other	0.030	0.556
Share a common visions and belief	-0.015	0.601
Collaborate with colleagues	-0.014	0.570
Eigenvalue	3.714	1.589
% of Variance	3.040	2.263

Appendix C. Correlation among Variables

	Math score in 2007	Two-parent family	Number of sibling	Parents' educational expectation	Relationship with other parents	Parental involvement in home	Parental involvement in school	Teacher-student ratio	School SES	Teacher-student relationship	Working relationships among teachers	Academic emphasis	Collective norm	Math score in 2005	Female	Household income (logged)	School type	Parental education
Math score in 2007	1																	
Two-parent family	0.14	1.00																
Number of sibling	-0.06	0.05	1.00															
Parents' educational expectation	0.26	0.14	-0.06	1.00														
Relationship with other parents	0.02	0.02	-0.01	0.05	1.00													
Parental involvement in home	0.16	0.12	-0.10	0.20	0.03	1.00												
Parental involvement in school	0.16	0.12	-0.02	0.16	0.09	0.14	1.00											
Teacher-student ratio	0.13	0.09	-0.14	0.10	0.01	0.11	-0.02	1.00										
School SES	0.22	0.14	-0.10	0.15	0.02	0.14	0.06	0.56	1.00									
Teacher-student relationship	0.08	0.01	0.00	0.06	0.02	0.06	0.05	-0.02	0.00	1.00								
Working relationships among teachers	0.01	0.01	-0.05	0.01	0.01	0.02	0.01	0.22	0.11	0.03	1.00							
Academic emphasis	0.10	0.01	0.00	0.02	0.02	0.01	0.03	-0.07	0.16	0.04	0.04	1.00						
Collective norm	0.02	-0.01	0.01	-0.02	0.01	-0.01	0.01	-0.14	-0.08	0.03	0.42	0.17	1.00					
Math score in 2005	0.56	0.14	-0.09	0.29	0.05	0.19	0.16	0.19	0.23	0.09	0.06	0.04	0.00	1.00				
Female	-0.03	0.00	0.04	-0.09	-0.02	-0.02	-0.04	0.03	-0.06	-0.01	0.05	0.01	0.03	-0.01	1.00			
Household income (logged)	0.22	0.39	-0.07	0.27	0.04	0.19	0.18	0.22	0.39	0.01	0.05	0.06	-0.03	0.24	-0.03	1.00		
School type	0.06	0.03	0.01	0.02	0.00	0.01	0.02	-0.01	0.05	-0.02	-0.29	0.25	-0.19	0.01	-0.05	0.02	1.00	
Parental education	0.21	0.15	-0.10	0.23	0.03	0.17	0.13	0.19	0.26	0.03	0.05	0.02	0.00	0.22	-0.01	0.36	-0.01	1.00

Appendix D. Additional Analysis Using Variables in Model 5 except School SES

	Model 5-2
Control Variables	
Previous math score in 2005	0.480***
	(0.016)
Parental education	1.227***
	(0.343)
School type (1=private school)	6.167
	(3.600)
Female	-0.790
	(1.894)
Household income (logged)	3.382*
	(1.602)
Family social capital	
Two-parent family	4.978
	(2.538)
Number of sibling	0.035
	(0.796)
Parents' educational expectation	2.086***
	(0.315)
Relationship with other parents	-0.862
	(0.450)
Parental involvement in home	0.968
	(0.523)
Parental involvement in school	1.706**
	(0.497)
School social capital	
Teacher-student ratio	0.353
	(0.261)
Average household income in school(logged)	-
Teacher-student relationship	0.744
	(0.414)
Working relationships among teachers	-5.000
	(3.140)
Academic emphasis	12.045*
	(5.389)
Collective norms	4.800*
	(2.312)
Constant	236.552. ***
	(23.459)
N	6511
R^2	0.346

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