

UC Berkeley

UC Berkeley Electronic Theses and Dissertations

Title

Longitudinal Effects of Parent School-Based Involvement on Child and School Outcomes

Permalink

<https://escholarship.org/uc/item/6k04s0wd>

Author

Park, Si Ra

Publication Date

2013

Peer reviewed|Thesis/dissertation

Longitudinal Effects of Parent School-Based Involvement on Child and School Outcomes

By

Si Ra Park

A dissertation submitted in partial satisfaction of the

requirements for the degree of

Doctor of Philosophy in

Education

in the

Graduate Division

of the

University of California, Berkeley

Committee in charge:

Professor Susan D. Holloway, chair

Professor Sophia Rabe-Hesketh

Associate Professor Susan I. Stone

Fall 2013

Abstract

Longitudinal Effects of Parent School-Based Involvement on Child and School Outcomes

by

Si Ra Park

Doctor of Philosophy in Education

University of California, Berkeley

Professor Susan D. Holloway, Chair

Parental school-based involvement (school PI) has been widely embedded in federal law and policy as a main target for school reform and educational equality. However, previous scholarship hasn't reached the consensus about the effectiveness of parent involvement in school-sponsored activities. Considering that federal, state-level education policy has put huge efforts and resources to promote parents' active school participation, there is an imperative need to investigate whether school PI is truly beneficial to child development. Furthermore, prior researchers revealed that the influence of PI on student achievement varies by social class (Desimone, 1999). Some have questioned the way existing school PI practices reinforce inequality and disadvantage for poor parents. Thus, the current study aimed to examine the relative impact on child and school-level outcomes of three types of school PI – involvement directed at their own child (private good PI), involvement to improve the school as a whole (public good PI), and involvement in parent networks (parent network), across SES groups.

The key finding is that school PI brought diverse benefits for educational outcomes, but the payoff of school PI varies considerably by child's grade, types of school PI, outcomes of interest, and family/school SES. Children whose parents got highly involved in private good PI reported rapid growth rates in math and reading achievement so that they significantly outperformed their peers at the end of elementary years. Children whose parents actively participated in public good activities and formed social networks with other parents reported higher math, but not reading, achievement at each grade, but no growth pattern over time. In addition, children whose parents reported high levels of involvement in all three types of school PI were rated socially better-adjusted and well-behaved by their teachers at each grade. Regarding school-level benefits, schools where a large numbers of parents were involved in three types of school PI were likely to report higher school-level achievement and more supportive school climate than their counterparts.

Notably, the positive relations of school PI to educational outcomes were moderated by family and school SES. Students' from high SES families obtained more benefits from their parents'

participation in public good and private good PI activities than did students from low SES families. Similarly, high-SES schools were more likely to improve their school climate when high percentage of parents in schools was engaged with public good PI activities. However, school-mean private good PI and network worked more favorably for low-SES schools.

Table of Contents

Introduction.....	1
Review of Literature	2
Parents School-Based Involvement: Beyond a Traditional View.....	3
Theories of Parent School-Based Involvement	7
A Main Theoretical Framework for the Current Research: Social Capital Theory	8
The influences of Parent School-based involvement on Child and School Outcomes....	16
Methodological Shortcomings in Existing Research on Parental Involvement.....	21
The Current Study: Research Goals and Questions	23
Research Goals	23
Conceptual Model.....	25
Research Questions and Hypotheses	26
Methodology.....	27
Data Set.....	27
Missing Data.....	28
Measures	29
Analytic Techniques	32
Results.....	37
Descriptive Statistics.....	37
Developing Multilevel Models of Individual Academic and Social Development	42
Developing Multilevel Models of School Achievement and Climate	49
Discussion.....	54
RQ1. The Relation of Parent School-Based Involvement to Academic Achievement:	

Is it Effective or Not?	55
RQ2. The Relation of Parent School-Based Involvement to Social Development: A New Rationale to Encourage It	58
RQ3. The Relation of Parent School-Based Involvement to School Achievement and Climate: Uncovering Hidden, but Significant, Benefits of school PI.....	60
RQ4. The Moderating Effect of SES in the Relationship between Parent School-Based Involvement and Educational Outcomes: A policy for Whom?	61
The Efficacy of Parent School-Based Involvement: “Does It Deserve the Faith that Education Policy Has Invested in It?	64
Limitations	65
Contributions.....	67
Implications for Policy Makers and Practitioners.....	68
References	71
Appendices.....	78

List of Figures

Figure 1: The Conceptual Model of School PI as Sources of Social Capital	13
Figure 2: Potential Pathways of Relations of School PI to Child/School Outcomes.....	17
Figure 3: The Organizational Dynamics of Improving Student Engagement	20
Figure 4: Conceptual Model of the Current Study	25
Figure 5: Path Diagrams for Estimating Growth Curve Models	35
Figure 6: Effect of Time-varying Public Good PI on Growth in Child Math Achievement from Kindergarten to 5 th grade.....	44
Figure 7: Effect of Time-Varying Private Good PI on Growth in Child Math Achievement from Kindergarten to 5 th grade.....	45
Figure 8: Effect of Time-Varying Private Good PI on Growth in Child Reading Achievement from Kindergarten to 5 th grade	47
Figure 9: Effect of Time-Varying Public Good PI on Growth in Child Problem Behavior from Kindergarten to 5 th grade.....	48

List of Tables

Table 1: Conceptualization of Three Parent School-Based Involvement.....	6
Table 2: Definition of Social Capital	11
Table 3: Descriptive Statistics for the Study Participants.....	38
Table 4: Descriptive Statistics of Family and School SES	39
Table 5: Means and Standard Deviation of Time-Varying Variables	40
Table 6: Correlations between Study Variables.....	41
Table 7: Multilevel Models for Changes in Child Math and Reading Achievement	51
Table 8: Multilevel Models for Changes in Child Problem behavior and Social skills	52
Table 9: Multilevel Models for School Academics and Climate.....	53

Acknowledgements

Looking back the past five years, the road to Ph.D degree was a rocky one. I had to face numerous hurdles and difficulties as a mother of two young children and an international student. Without both intellectual and emotional support, I would not be able to make it this far. I have been so very fortunate to have been surrounded by extraordinary faculty, peers, friends and family throughout my graduate school experience.

First, I truly appreciate my academic advisors. Professor Sophia Rabe-Hesketh fostered an ever-increasing love of statistics. Her faith in my abilities encouraged me to believe that I was capable of conducting highly advanced statistical analyses. I will carry the gift of your knowledge with me throughout my career. I would also like to thank Professor Susan I. Stone for her willingness and insightful comments throughout the dissertation process. In particular, by incorporating her school-level perspectives into my dissertation research, I could make stronger arguments. The wisdom and dedication offered by her supported me through the entire project. Most of all, I was blessed to work under the direction of Susan Holloway, my dissertation chair. From the first day of the graduate school to this moment, she believed in me and the importance of my work, and always demanded my best work, even if that meant being available and giving advice at all hours of the day, including nights and weekends. Her sense of humor and sensitivity to other culture has been invaluable and deeply appreciated throughout my graduate education. Her superb mentoring has made me a productive researcher. In addition, Susan has taken the time to understand my personal matters and provides me with the guidance and support regarding my work-life balance. I feel fortunate to have had the opportunity to work with Susan. I hope to continue learning from her in the future.

My friends and fellow graduate students have also been an incredible source of support. I would like to thank Marie Le and Michele Jonas whose friendship and encouragement throughout our graduate experience have been a great source of support. I would also like to thank Min Chen for her endless counseling and support for job search. Elisa Sato has been a vital source of encouragement at the last year of my degree. She has always been supportive and attentive to my interest, engaging me in honing my skills further. I am also deeply grateful to Korean Graduate Student Groups for the inspiration and steadfast belief in my ability to finish, in spite of the challenges of being international students at Berkeley. In particular, Jaran shin, Yekang Ko, Kihyun Ryoo, and Minjeong Jeon make the dissertation road an easier journey. There are so many others – Susan Holloway’s research groups, Sophia Rabe-Hesketh’s research groups, and the many students who shared my path. I am thankful for their insightful comments and peer support.

I have also had a tremendous amount of support from my own family. Thank you to my husband, Moo Ryong Jeong, for his inspiring insights, constant encouragement, and unwavering support- not just for this project but for all of them over the years. In particular, his technical support and statistical tutoring helped me to save tremendous amount of time and energy throughout the process of obtaining my graduate degree. Thank you to my amazing sons, Hoyeon and Ian Jeong, for all the joy you bring me, for understanding all those times when mom needed to write and for always choosing “to be kind.” You are my wonders. I thank you for

giving me direction, support, and incredible happiness in my life. Lastly, but not least, my parents, Nohoon Park and Youngah Kim, have been an incredible support throughout my life, always encouraging me to pursue my dreams regardless of the challenges and supporting me along the way. I am so grateful to my parents for laying the foundation which I was able to be who I am. Your example as both amazing individuals and parents has and will continue to direct my life. This study is dedicated to them who have been greatly involved in every phase of my life — thank you.

Introduction

Parents' involvement in their children's education has long been believed to promote a range of positive child outcomes, including higher academic achievement, higher engagement in schoolwork, and lower dropout rates (Hill & Tyson, 2009; Lee & Bowen, 2006; Fan & Chen, 2001). There are provisions to strengthen ties between families and schools in major pieces of federal legislation, including the *Goals 2000: Educate America Act*, the *No Child Left Behind Act*, and *Race to the Top Fund*. On a state level, several states grant parents an allotment of leave time from work to attend necessary educational conferences or activities at their child's schools (e.g., *Family School Partnership Act in California*, *School Conference and Activity Leave in Illinois*). Since implementation of these policies, the percentage of parents reported involvement at their children's school sites has risen significantly, including attendance at a school event and volunteering (Child Trend, 2010).

Despite the popularity of school-based parental involvement (school PI) in education policies, the evidence regarding its effectiveness is uneven. While many cross-sectional studies have found that school PI is positively associated with academic achievement (Galindo & Sheldon, 2011; Pomerantz et al., 2007; Suizzo & Stapleton, 2007; Yan & Lin, 2005), a recent meta-analysis found that the effect size of parent attendance in school function was not impressive, compared with that of parental expectations or parental shared book-reading (Jeynes, 2005; Yamamoto & Holloway, 2010). Furthermore, recent longitudinal studies have failed to find a causal link between school PI and achievement, net of earlier achievement (Domina, 2005; El Nokali et al., 2010).

The questions regarding the effectiveness of school PI is further complicated by the findings that certain types of school PI are more prevalent and beneficial for children from higher SES families compared to those from lower SES families (Cooper, 2010; Lareau 2003). Given that a fundamental goal of PI policy is to close the class-based achievement gap (Epstein, 2005), potential heterogeneity in the causal effects of school PI has profound implications for education policy. If this is the case, the policy could actually play a role in widening, rather than narrowing, educational gaps.

The questions, then, emerge: given these inconclusive findings, is school PI an effective means to promote positive child development? And for whom the school PI-child development relation is the most meaningful? It must be asked if the efforts and resources that have been dedicated to promote school PI are well-spent. Using data from Early Childhood Longitudinal Studies-Kindergarten Cohort (ECLS-K), the goal of this study is to address questions about school PI that are crucial to establishing its efficacy.

Instead of simply investigating the concurrent association between school PI and academic achievement, this study extends previous literature on the effectiveness of school PI by addressing the following four factors: (a) Based on theoretical accounts, I distinguish among three separate types of school PI – involvement directed at their own child, involvement to improve the school as a whole, and involvement in parent networks– and examine the degree to which each type of school PI predict positive child development during the elementary years. (b) Since little is known about student outcomes other than global indicators of academic

achievement, my study will examine a broader array of academic and social behavioral outcomes. (c) Because we know very little about the effects of school PI at the school level, I will examine whether average school-wide achievement and climate benefit when a greater percentage of parents are involved in school events. And (d) given particular concern for the study is the potential SES differences in the relationships between school PI and educational rewards, I will investigate whether the effects of school PI on child and school outcomes depend on family and school-wide average SES levels.

Regarding methodology, this study will adopt longitudinal analyses to test the efficacy of school PI more rigorously. A major challenge in parent involvement research is to ascertain whether parent involvement itself is actually effective or whether parents who are more involved in their children's schooling share commonalities in key characteristics (El Nokali et al., 2010). A cross-sectional comparison of parent involvement and child outcomes has been known to be susceptible to bias associated with any unobserved parent characteristics. By comparing multiple data points from an individual, in contrast, longitudinal analyses allow researchers to net out the selection bias. Given the main goal of the current study is to examine the effectiveness of school PI, the use of longitudinal analyses would be beneficial to ascertain the causal link between school PI and educational outcomes.

The results of my study will assist future policy directions by providing specific evidence about the overall efficacy about school PI and the type of school PI that is most likely to boost children's academic and social development, particularly those living in low SES households. This will be beneficial to clearly establish the types of school PI that increases or decrease social inequalities. This study will also contribute to a deeper insight into the ways that parent efforts may affect not just their own child's achievement but also that of other children in the school, a process that is currently not well understood.

Review of Literature

In order to understand the relation between school PI and children's academic/social development and school-wide achievement/climate, I will first define three different types of school PI that are identified in the literature on parent involvement. Next, I will review various theories to explain the possible mechanism by which school PI promote both positive child development and school improvement. Particular attention will be paid to 'social capital theory' as a guiding theoretical framework to explaining the link between school PI and educational outcomes. In addition, I will review "cultural capital theory" to understand how the ultimate benefits of school PI depend on the cultural fit or match between schools and families. Lastly, I will review prior studies which examined the relationship between school PI and child academic/social development and school-wide achievement/climate improvement. The goals of this review are to understand: (1) three different types of school PI (i.e., public good PI, private good PI, and parent network); (2) unique and overlapping benefits of those three types of PI; and (3) the way that school PI may ameliorate or aggravate educational inequalities across different SES groups.

Parent School-Based Involvement: Beyond a Traditional View

Joyce Epstein (1987) developed a typology with six dimensions of parent involvement that is most widely used when designing parent involvement initiatives and interventions: parenting, communicating with the school, volunteering at the school, facilitating children's learning at home, participating in decision-making at the school, and collaborating within the community to improve the education system. Epstein's framework raises critical points in parent involvement research. Unlike developmental psychologists who focus on individual parents' investment in their child's schooling and its role in shaping learning processes (e.g., Grolnick & Slowiaczek, 1994), Epstein has shown the possibilities of engaging parents in a variety of school settings and emphasized overlapping spheres of home, school and community influences. These six categories are often operationalized in terms of two basic dimensions: participation at home and at the school site. Majority of studies on parent involvement adopted this dichotomous framework because of its concrete and parsimonious feature (Pomerantz et al., 2007).

The focus of the current study solely lies in the aspects of parent involvement at the school site (school PI), such as communicating with the school, volunteering at the school, and participating in decision-making at the school. The reasons why this study focuses on school PI are due to (1) tremendous state and federal-level efforts and resources dedicated to promote school PI over the last two decades; (2) mixed and inconsistent findings about the efficacy of school PI; and (3) the necessity to extend the current narrow conceptualization of school PI. Specifically, the last point needs our instant attention to initiate the discussion about the efficacy of school PI. A sophisticated way of defining the concept would be a first step to better understand the nature of school PI and broaden our perspective on its' effects on diverse outcomes.

Generally, school PI, or family-school partnership, has been defined as 'collaborations among families, teachers, and schools to help students succeed in school' (Hill and Tyson, 2009, p.169). In major education policy document, school PI is defined as "*the participation of parents in regular, two-way, and meaningful communication involving student academic learning and other school activities*" (No Child Left Behind Act, 2002, §9101). These definitions tend to describe school PI as a parent's academic support of his own child through active communication between an individual parent and a teacher. However, they are narrowly-focused and need a major extension in two important ways. One is to consider school PI as a school-wide phenomenon that can contribute to school improvement and the other is to include the salient role of parent-to-parent communication at school sites.

First, I conceptualize school PI as an individual parent's involvement in the school for the purpose of benefiting his or her own child and as an opportunity to bring shared benefits to the school community (Bolivar & Chrispeels, 2011; Warren et al., 2009). Unlike parents' involvement at home sites which mostly gears toward their own children's learning, school PI has a potential to bring shared benefits to the school community. In Warren et al.'s (2009)'s qualitative study, an actively involved Latino mother, Silvia Gonzalez, whose son receives special education, shared her experience of volunteering at school sites. Her initial involvement revolved only around her son's needs. After joining in a Parent Mentor Program, however, she moved from understanding her involvement in individual terms to a more public one. She

proudly states “[I want to] make a difference in a child’s life – not just my own but in someone else’s child....that’s what parent involvement is – helping other children, not just your own” (p. 2232). This example illustrates the unique characteristics of school PI as an opportunity to help all children in the same school to thrive.

Economists consider this common benefit for school community as a public-good aspect of school PI (Public good PI), where one parent’s efforts may provide spillover benefits to another family at the same school (McMillan, 2000; Walsh, 2010). Participation in activities that improve school quality or provide resources with schools, such as volunteering, being a PTA member, fundraising, can be considered to be involvement for public good. This type of school PI emphasizes the possibility that parents can participate in schools as school-community members who can contribute to promote all children’s wellbeing in a school. In contrast, the private-good aspects of school PI (Private good PI) are often used as strategies individual families use and have only private returns to the family involved, such as attending a parent-teacher conference, back-to-school night, or an open-house, although these activities could have indirect effects on the school by improving school climate, teacher morale or parents’ sense of community.

Cucchiara & Horvat (2009) named an aspect of school PI similar to public good PI as a collectivistic approach to parent involvement. Through extensive observations and interviews in two elementary schools, they found that parents tended to lie on a continuum of parent involvement from individualistic to collectivistic orientations. Involved parents with a collectivistic approach were more likely to view their efforts as helping their own children but at the same time, they were committed to securing resources or advantages for the school as a whole. While they varied somewhat in the motivation to get involved, parents endorsing collectivistic approach to school PI generally expressed a commitment to the wellbeing of all children, which in turn made them channel their efforts toward all students in the school. This collectivistic PI resulted in enriching all children in schools.

The public-good PI is likely to be distinctive in several ways. First, public good PI can make a notable and unique contribution to raise school-wide achievement and quality through the creation of common benefits for the school community. There exists empirical evidence that supports the school-wide benefits of public good PI. For example, “collective parental pressure” on the school through parents’ participation in PTA meetings or parental monitoring of the school, positively influences school quality and performance, even after taking into account differences across schools or school districts on parental and community characteristics (McMillan, 2000). Parents’ volunteer efforts in a classroom raise the instructional quality for other students as well as their own children (Jimenez & Sawada, 1999). Similarly, a quasi-experimental study found that first graders in the treatment group (with parent volunteer input) outperformed their peers in the comparison group (without parent volunteer input) on post measures of language skills. It is noteworthy that children in the treatment group benefited regardless of their parents’ participation in volunteering (DeCusati & Johnson, 2004).

The second feature of public good PI is that relatively few parents become engaged in public-good PI, compared with private good PI. Parents choose a variety of types and levels of school PI, depending on their interest, beliefs, resources, and availability (Hoover-Dempsey &

Sandler, 1997). According to national statistics, 80% of parents of elementary students attended a parent-teacher conference, 89% of parents participated in a school event, but only 43% of parents worked for PTA (National Center for Education Statistics, 2007). Data about the frequency of school PI appears to resemble a pyramid with the majority of parents participating in smaller ways at the bottom (e.g., attending parent-teacher conference), a sizeable group active in larger projects in the middle (e.g., fundraising for school), and then a relatively small group most active at the top (e.g., being a parent advisory board member). Indeed, it is unlikely that all parents are willing or able to become key school leaders.

Third, these limited numbers of active public good PI participants are mostly from high-SES households. According to an analysis of National Household Education Survey: 2007 (Park & Holloway, 2013), there were significant SES differences in the amount of school PI, but no SES differences exist in the amount of home PI. Similarly, Shumow and Miller (2001) found that parents who graduated from college were more likely to be involved in the PTA than were parents who had graduated from high school only. However, parents who graduated from college did not differ significantly from parents with less education in the amount of homework assistance at home. These findings match well with the common notion/observation of PTA as an institution of white, stay-at-home mothers with a middle-class life style.

It is also notable that there is considerable variation among schools in the level of public good PI. For instance, Sui-Chu and Willms (1996) included two types of school PI in their analyses –school communication (i.e., parent contacts school and school contacts parents), and school participation (i.e., volunteering and PTO membership). For the school communication activities (which corresponds to private good PI), over 90 percent of the variation was within schools (i.e., there was variability across parents within a school) and only about 3-7 percent of the variation was between schools. In contrast, for parents' school participation (which corresponds to public-good PI), 77.4 percent of the variation was within school and 22.6 percent was between schools. This finding indicates that schools were relatively uniform in the average level of private-good PI, but differed substantially in their levels of public good PI. The main factor to explain this between-school variation in public good PI was the school-mean SES. In high SES schools, parents' participation in PTA and volunteering was higher than in low SES schools.

These previous findings suggest that it is necessary for education researchers to differentiate public good PI from private good PI. The distinction between public good and private good PI is of import because the two embody distinct ways that parents become involved in school sites, with distinct effects on children and schools. However, the majority of prior research has ignored the differences in public good and private good PI and conceptualized school PI as a single construct by combining parents' participation in all types of school PI. This approach makes it difficult to take into account the unique nature and contribution of different types of school PI.

A third type of parent involvement – the formation of social networks among parents – has also been overlooked in debates about school PI (Ream & Parady, 2008). In Epstein's framework, parent communication with their child's teacher is one of the main domains of parental involvement at school sites. As I mentioned before, the essence of parent involvement in

NCLB is to promote a two-way, frequent communication between parents and schools. At the same time, parents also communicate with other parents in their child’s class/school. In contrast with other school-initiated types of school PI, parent-to-parent communication can be characterized as an informal, flexible, and parent-initiated type of school PI.

Through parent-to-parent communication, parents build meaningful social networks with other parents, which become a critical source of support that enhances children’s achievement (Sheldon, 2002). The importance of parent network lies in its role as an information channel. Networking with other parents provides feedback on effective parenting strategies as well as access to crucial information about school policies, teachers and peers, tests and curriculum (Carbonaro, 1998). Thus, parents without a school-based social network may have comparatively limited resources to help their children’s schooling, because they must rely on their own educational background and information the school provides explicitly. Using interview data, Useem (1990) found that parents who were the most integrated into school-based social networks were the most knowledgeable about curriculum and math-placement processes. These mothers actively used their social networks to learn about school policies and procedures concerning students’ placement in math classes and then use this information to influence the placement of their own children in middle school. The role of this parent network is more likely to become critical in higher grades when parents face complicated and consequential decisions regarding their children’s curriculum and course selection. In addition, previous research found that parent network plays a critical role in curbing problem behaviors through mutual monitoring and social control (Carbonaro, 1998). Despite its importance in child academics and behaviors, the role of parent network in school PI has been rarely examined.

Table 1. Conceptualization of Three Parent School-Based Involvement

Construct	Definition	Format	Example	Measure
Public Good PI	Parent’s involvement in school activities provides spill-over benefits to another family at the same school	School-sponsored	Parents’ participation in volunteering, fundraising, PTA meeting	Whether parents participate in each of the activities
Private Good PI	Parent’s involvement in school activities only brings private returns to the family involved	School-sponsored	Parents’ participation in parent-teacher conference, back-to-school night, open house	Whether parents participate in each of the activities
Parent Network	Regular contact or chat (personal, electronic, and phone) with parents in their children’s school	Parent-initiated	Parents’ participation in formal, informal meetings with other parents (e.g., support group, morning talk)	The size of the network by calculating the number of other parents in regular contacts

In sum, the current study extends the existing literature on school PI by conceptualizing it as a multidimensional construct, consisting of three distinctive sub-constructs -- involvement directed at their own child (private good PI), involvement to improve the school as a whole (public good PI), and involvement in parent networks (parent network). This new conceptualization is useful to examine the unique nature of each type of school PI and to uncover diverse benefits of school PI. It is important to consider how parents in school community can exert a serious influence on not only their own children, but also school practices, climate, and policies, which may, in turn, have a positive effect on the educational outcomes of the entire student body. One goal of my study is to initiate this line of inquiry.

Theories on Parent School-Based Involvement

In the previous literature, several theoretical frameworks have been used to guide parent involvement research. Regarding the importance of family-school partnership, the ecological theory provides a perspective to explain the beneficial link between family and school spheres (Bronfenbrenner 1986). It emphasizes how children develop within a unique set of transactions among the major settings of their lives. Specially, it has incorporated models of parent involvement to reflect how its value is in part dependent on the school context (Eccles & Harold, 1993). Following these theoretical developments, children are expected to learn more when their family and school contexts work with and in support of each other in stable, open, reciprocal ways, while they are expected to have problems when these two contexts are disconnected. From this point of view, what matters are not just resources or risks in one context, but also the connections between school and family contexts (Epstein 2005). However, this framework lacks the explanation about the specific mechanisms by which the family-school partnership produces positive values to children of involved parents.

With regard to the pathways explaining beneficial influences of school PI, possible mechanisms linking school PI to individual children's 'academic' achievement have been well established (Pomerantz et al., 2007). Developmental psychologists have proposed the skill development model and the motivation model. According to the skill development model, when parents are involved at school, they may provide the skill-related resources for their children, such as language capabilities, problem solving, or regulating the learning process. As a way that school PI may enhance such skills among children, scholars suggest that school PI gives parents an opportunity to gain useful information about how and what children are learning in school which enable them to scaffold their children's learning process (Epstein, 1987). Even when parents' participation in school activities fails to provide such skills, it is still beneficial because teachers tend to give the children of involved parents more attention towards developing their skills (Becker & Epstein, 1982; Dearing et al., 2008). The gist of the skill development model is to conceptualize the link between school PI and academic achievement as a transmission and augmentation of skills that can be used within academic settings.

On the other hand, Grolnick and Slowiaczek (1994) linked parent involvement and academic achievement through a motivational mechanism (e.g., academic competence, self-efficacy, and a sense of control over academic success or failure). When parents are involved in their children's school activities, children tend to view schools as valuable. Over time, the

internalization of the value of academic achievement drives them to engage with school work with intrinsic rather than extrinsic motivation. Positive perception of academic competence is another mediating path between school PI and academic achievement. Parental involvement at school sites can make children more familiar with school tasks, which may lead children to evaluate themselves as competent in the academic area. Numerous empirical studies support the validity of motivational model (see Pomerantz et al., 2007 for review).

Both the skill development and motivation models contribute to illuminate the possible mechanism between school PI and academic achievement. However, their explanation is limited to the academic side of individual child development. A broader framework is necessary in order to understand the mechanism by which school PI facilitates positive social development. Also, these two models focus on individual students' learning processes and the role of their parents' school involvement in shaping these. This individual approach neglects the possibility that parents involvement at school level contribute to create school-wide benefits, such as improvement in school climate or school-wide achievement.

A Main Theoretical Framework for the Current Research: Social Capital Theory

As a main theoretical framework, this study draws on social capital theory. Social capital theory provides a comprehensive, broad framework to illuminate the presence and nuances of potential mechanisms where school PI makes contributions to both child and school development. Since interest in the concept was initiated by the work of Coleman (1988), social capital has gained an increasing popularity in educational research (Dika & Singh, 2002). Specially, as Coleman's theoretical development has its origins in the explanation of the relations between parents' social capital and educational attainment, the concept has captured the attention from PI researchers. It is being used to explain the different levels of academic performance of children raised in immigrant vs. native families (Hao & Bonstead-Bruns, 1994), the role of parent network to monitor their children's behavior (McNeal, 1999), parents' different uses of school involvement practices based on SES (Horvat et al., 2003), and immigrant parents' disadvantage in acquiring social capital and its effects on their children's academic (Kao & Rutherford, 2007).

Definition of social capital. The most frequent usage of social capital in the context of PI research is to refer to the 'supportive relationships between parents and children' in order to promote positive behavior and attitudes of children for their successful performance in school (Pong et al., 2005). This tendency primarily results from the initial way Coleman defines the social capital and tests its benefit. According to Coleman, "*Social capital is defined by its function. It is not a single entity but a variety of different entities, with two elements in common: they all consist of some aspect of social structures and they facilitate certain actions of actors – whether persons or corporate actors -- within the structure*" (Coleman, 1988, p. 98).

Coleman emphasizes that valuable capital can exist within the structure of relations between and among actors. Wherever interpersonal and communal social ties exist for the accumulation and exchange of resources, social capital is also at work. Social capital is reflected in the individual capability to obtain scarce resources by virtue of their membership within social structure. In his discussion of the role of social capital within the family in a child's intellectual

development, Coleman (1988) examines if social capital, in the form of both parents in the home, of a greater number of siblings, and of higher expectations by parents for the child's education, predicts academic achievement. In his initial work, social capital in a family is defined by the resources that children may access through close and supportive parent-child relationships.

Coleman (1988) argues that social capital has distinctive characteristics that make it differentiated from other types of capital. Family background cannot be summarized as a single term. Rather, it is separated into three distinct types comprised by financial, human, and social capital. Financial capital represents economic resources that one can utilize to support education (i.e., family wealth or income). Human capital reflects the skills and capabilities that make parents able to act in desirable ways (i.e., parent education). In contrast, compared with other types of capital, social capital is less tangible as it exists in the relationships between people, such as parent-child relationships. He suggests that a child's actions are not shaped simply by the financial and human resources possessed by his or her parents. Instead, it is the presence of social capital that actually activates the utility of other capital available to them. For instance, high family income alone is not enough to be relevant to child's educational success. It can be activated by social capital embodied in close parent-child relations and the time and effort parents spend with the child. Thus, social capital serves as the medium through which children access their parent's financial and human capital (Portes, 1998).

Coleman's perspective on social capital is intuitive to understand how the close relationship between parent and child as a form of social capital can be transformed into a valuable source for child development. Throughout, his analysis of social capital have been grounded on relationships among actors (i.e., parent-child relationship) within a social structure (i.e., family). Thus, his conceptualization of social capital provides a useful theoretical framework to understand parent's involvement within a home site and its' effects on his or her children's development. However, it may not be relevant to explain the nature and effects of school PI which is created and exists in the relationship linking two separate social spheres—the family and school. Later, other sociologists and political scientists introduce two interesting conceptual twists for Coleman's initial framework of social capital. Understanding these conceptual extensions would be beneficial for the current research to study the nature and effects of school PI.

The first conceptual stretch was to differentiate two types of social capital. Sociologist refers Coleman's social capital as “**bonding**” or “**internal**” forms of social capital (Adler & Kwon, 2002; Putnam, 2000), as his focus is primarily on the internal relations among actors within collectivities. In contrast, another type of social capital is named as “**bridging**” or “**external**” forms of social capital. This view focuses primarily on social capital as a resource that inheres in the social network tying a focal actor to other actors in a different social setting. Bourdieu (1985) defines social capital as “*The aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition*” (p. 248). From this point of view, the actions of an individual actor can be great facilitated by their direct and indirect links to other actors in social networks and social capital exists in the “external” or “bridging” relations a parent maintains with other actors (Burt, 2000).

Applying this distinction between bonding and bridging social capital to the concept of PI, home-based PI refers to bonding social capital, an intra-family connection between parents and children useful in promoting child development. It includes the time and attention parents spend in interaction with children and in monitoring their activities and promoting child well-being. In contrast, social connections that parents have with others, such as neighbors, other parents, teachers and school personnel, illustrate bridging social capital. The stronger the connections are, the greater are the resources to which children have access. The notion that parental connections with schools provide an important source of bridging social capital is one that previous PI research has rarely paid attention to.

On the other hand, some sociologists start to recognize the possibility that the two types of linkages – bridging and bonding ties—coexist in the concept of social capital (Adler & Kwon, 2002; Loury 1992) and take a middle ground on this issue. In research on social capital, scholars have tended to define social capital as either a bridging or a bonding type of ties. The neutral view makes more sense to conceptualize school PI because whether social capital is based on bonding or bridging ties is, to a large extent, a matter of perspective or a unit of analysis. Moreover, two types of social capital may not be mutually exclusive (Adler & Kwon, 2002). For example, parents' relations with other parents are bridging social capital to parents from a focal family's perspective, while the same relations can become bonding social capital from a school's perspective. Similarly, parents' connection with teachers can be considered as a bridging (to a family) and bonding capital (to a school) depending of a unit of analysis. The crucial point is that the capacity of school PI typically depends on a function of both linkages and children benefit from both types of social capital.

The second stretch is introduced by political scientists who recognize the *collective* characteristics of the social capital. The original works of the social capital by Coleman and Bourdieu centered on individuals as the unit of analysis. With some significant variations, both scholars focused on the benefits accruing to individuals or families by virtue of their ties with others. However, Putnam (1993) conceptualized social capital as “*features of social organizations, such as networks, norms, and trust, that facilitate action and cooperation for mutual benefit.*” By equating social capital with a feature of communities, he made possible to consider the “stock” of social capital possessed by communities and the consequent structural effects on community development. In his book, Putnam (2000) lamented the rapidly declining level of membership in PTA of U.S. schools as a sign of decreasing national stock of social capital. Similarly, Portes (2000), in his article “*The Two Meaning of Social Capital,*” emphasized social capital can become a structural property of large aggregates (i.e., school, or nation) as well as individual property. The transition of the concept from an individual asset to a community resource has been less explicitly theorized in PI research.

Table 2 summarizes the intellectual changes around the definition of social capital. Given that school PI can be served as bonding and bridging tie according to the unit of analysis, this study draws on the definition of Adler & Kwon's work (2002) which takes a neutral view on external and internal ties. Social capital means “*the good will available to individuals or groups. Its source lies in the structure and content of the actor's social relations. Its effects flow from the information, influence, and solidarity it makes available to the actor.*” (p.23) In addition, this

study incorporates a community feature of social capital proposed by Putman (1993) to explain collective benefits of school PI.

Table 2. Definition of social capital

Definition	Features
<ul style="list-style-type: none"> • Coleman (1988) <i>“Social capital is defined by its function. It is not a single entity but a variety of different entities, with two elements in common: they all consist of some aspect of social structures and they facilitate certain actions of actors – whether persons or corporate actors -- within the structure” (p. 98)</i> 	<ul style="list-style-type: none"> -Bonding/Internal ties -Individual assets
<ul style="list-style-type: none"> • Bourdieu (1985) <i>“The aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition” (p.248)</i> • Portes (1998) <i>“The ability of actors to secure benefits by virtue of membership in social networks or other social structures” (p.6)</i> 	<ul style="list-style-type: none"> -Bridging/External ties -Individual assets
<ul style="list-style-type: none"> • Loury (1992) <i>“Naturally occurring social relationships among persons which promote or assist the acquisition of skills and traits valued in the market place” (p.100)</i> • Adler & Kwon (2002) <i>“The good will available to individuals or groups. Its source lies in the structure and content of the actor’s social relations. Its effects flow from the information, influence, and solidarity it makes available to the actor” (p.23)</i> 	<ul style="list-style-type: none"> -Both bridging/external and bonding/internal ties -Individual assets
<ul style="list-style-type: none"> • Putnam (1993) <i>“Features of social organizations, such as networks, norms, and trust, that facilitate action and cooperation for mutual benefit ” (p.35)</i> 	<ul style="list-style-type: none"> -Bonding/Internal ties -Community assets

Sources of Social Capital. Then, by what mechanism can school PI as social capital produce benefits to individual actors (i.e., children of involved parents) and collectivities (i.e., school)? Figure 1 illustrates the main mechanism. In this study, social capital is defined as “*the good will others have toward individuals or groups*” (Adler & Kwon, 2002: p.23). So, it is those others, not parents themselves, who act as a provider of the resources. If goodwill is the

substance of social capital, social capital becomes available to actors as function of their location in the structure of their social relations. The relationships inside a school are shaped by the constant interplay of the parents, children, teachers, and school personnel. Through participation in school activities, parents can build meaningful social structure inside and outside school, each rooted in different types of relations (e.g., parent-child, parent-parent, parent-teacher, and parent-school personnel relations). Parents obtain the social capital from all these relationships in the form of trust, sympathy, closeness, obligations, and norms for reciprocity (Portes, 2000).

Social capital's sources are derived from three components – opportunity, motivation and ability. An actor without opportunities to build network ties to others, without the motivation to contribute, or without the requisite ability would not be a source of social capital (Adler & Kwon, 2002). A lack of any of the three factors will undermine social capital generation.

First, opportunity as a source of social capital represents diverse activities that allow parents to build meaningful social relationships with other actors in schools. Traditionally, a school offers parents many involvement activities, such as parent-teacher conference, back-to-school night, volunteering and PTA meeting. Participation in these activities provides opportunities to obtain social capital for parents. In addition to school-sponsored types of opportunity, social capital in the school can be facilitated by informal types of opportunities, such as the formation of parent network. Parents build strong ties with other parents in a school to guarantee observation of effective norms. Sociologists called this network as 'intergenerational closure,' a type of social structure within a community that binds children and their parents together in an enclosed network. A system with a high degree of closure requires a complex structure that connects parents to parents of peers as well as parents to their own child. The dense network connection between the parents of school peers primarily work as "*a set of social relations that enables the reciprocal monitoring of children by the parents of peers, thereby increasing adherence to behavioral norms that are presumed to affect school performance*" (Hovat et al., 2003, p135).

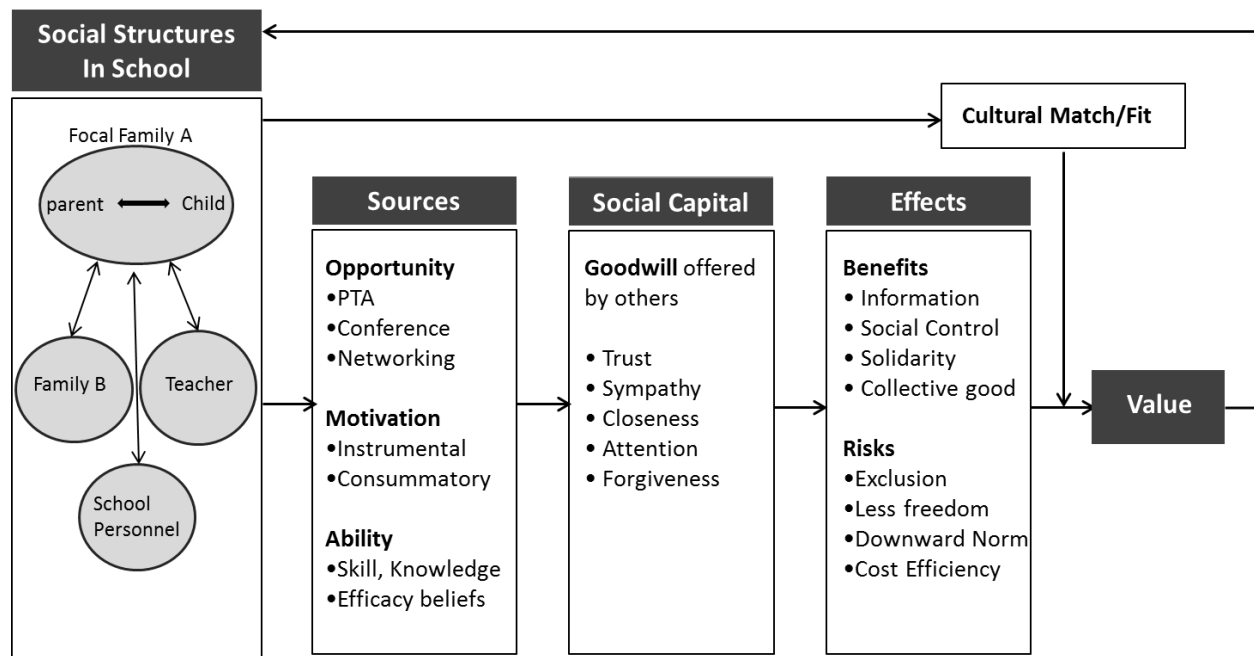
Given that the total amount of social capital depends on the opportunity created by the number of social contacts, creating more opportunities for social interaction is crucial to produce social capital. However, schools and parents need to do more than merely encourage social interactions among parents, teachers, and school personnel. Building social capital requires not only establishing more social ties but also nurturing motivation and providing resources (Lesser, 2000). Specially, the share of capital they receive depends on their contacts' motivation. To characterize the motivation of donors in relations, Portes (1998) distinguishes between instrumental versus consummatory motivations. The instrumental motivation model assumes that all actors are motivated by their self-interest. Actors are seen as cultivating and exploiting social capital to advance their goals and career (Adler & Kwon, 2002).

However, social capital is sometimes motivated by a less instrumental nature, such as a group identity, and collective actions (Portes, 1998; Putnam, 1993). This type of motivation transforms individuals from self-seeking and egocentric agents with little sense of obligation to others into a member of a community with shared interests and a commitment to the common good (Adler & Kwon, 2002). It is the source of social capital that leads wealthy parents to anonymously endow schools; parents to dedicate their time and energy to PTA or school board

activities. Identification with one’s own group or community can be a powerful motivational source. Coleman refers to this form as “zeal” and defines them as an effective antidote to free-riding by others in collective movements (Coleman, 1990). The consummatory motivation is based on deeply internalized norms, engendered through socialization in childhood or through experience later in life by the experience of a shared destiny with others (Portes, 1998). Keeping these distinctions of motivation in mind is important to conceptualize school PI into a multidimensional concept.

Ability as a source of social capital means the competencies and resources at the nodes of the social relationships. Lin (1999) argues that if social capital is the resource provided by an actor’s network of ties, its magnitude depends on the resources made available to the actor at the other nodes of this network. In parent involvement literature, the importance of actual skills and knowledge parents own has been emphasized as a critical determining factor of school PI. In addition to actual ability, Hoover-Dempsey and Sander (1997) argue that parents’ perception of their capabilities to help their children’s schooling also works as a critical source of parent involvement. Thus, parents’ ability to create rewards from social relationship includes their perception of their own ability.

Figure 1. The Conceptual Model of School PI as Sources of Social Capital



Benefits and Risks of Social Capital. Once social interactions between actors are translated into social capital, its’ effects flow from the information, social control, influence and solidarity such capital makes available (Adler & Kwon, 2002). The first of social capital’s direct benefits is information. Social capital engendered by parent’s participation at school can become a valuable resource through ‘*information channel*’ to directly affect their child’s achievement.

Parents' participation in school activities provides an opportunity to obtain information around school matters, which, in turn, makes them better equipped to assist their children (Lee & Bowen, 2006). For instance, by attending parent-teacher conference, parents can be exposed to information about their child's strengths and weaknesses, the ways to augment children's learning at home, and the location of academic resources (e.g., books, study aids, enrichment program). Interactions with other parents can also help parents gain access to beneficial information about parenting skills or educational resources available.

The second kind of benefit of social capital is '*Influence, control, and power.*' Power benefits allow the focal actors to get things done and achieve their goal. Some parents who are active participants in school activities tend to accrue relatively more power and play a leadership role, which in turn gives them or their children an advantage. This case displays a possibility that even when social capital is beneficial to a focal actor, it might have negative consequences to others or the aggregates. With regard to control as a benefit of social capital, the role of social control as a means to curb problem behavior has attracted attentions from researchers. Social control occurs when families and schools work together to promote appropriate behaviors that can be effectively communicated to students at both home and school (Hill et al., 2004). When children receive similar messages about appropriate behavior across settings, the messages become salient, reduce knowledge gaps about expectation, and prevent behavior problem. Parent involvement in the PTA was conceptualized as a key mechanism in prosocial development because of the mutual monitoring that extended parent networks allow (McNeal, 1999). Forming parent networks with the parents of the child's peers also increases opportunity for extra sources of social constraint on the child's behavior.

'*Solidarity*' constitutes a third kind of benefit of social capital. Strong social norms and trust, associated with a high degree of closure of the social network, encourage a strong feeling of solidarity, which in turn encourage compliance with rules and mutual consensus about the common goal. Parents' active participation in schools helps to build solidarity between parents, teachers, and administrators. Schools having greater solidarity based on relational trust between parents and schools tend to work together toward their common goal. According to Coleman (1988), the low dropout rates among Catholic school students represent these solidarity benefits of closure and trust. For the broader aggregate, the positive effects associated with a collective actor's internal solidarity include increases in school-wide academic achievement and improvement at the school climate.

Likewise, social capital can bring multi-level effects; it not only its benefit to individual actors, but also it brings benefits to broader aggregates of which they are a part. Sociologists argue that unlike financial/human capital which is ordinarily a private good, social capital has '*the public good benefits*' (Adler & Kwon, 2002; Portes, 2000; Putnam 1993). In the case of social capital, the person or the group of people who invest effort to generate social capital often is not a primary recipient of benefits, which leads to underinvestment or free-riders in this regard. Instead, the benefits of social capital have the potential to be enjoyed by the community as a whole (Bolivar & Chrispeel, 2011). This public good aspect of social capital can exist and be maintained through the formation of norms and sanctions within a community that promote common good over self-interest. Parent participation in volunteering, fundraising, or the PTA can produce public good in the school community, such as better instructional quality, more

financial resources, teachers with higher qualifications, all of which contribute to increase overall school achievement. It is highly likely that improvement in overall school climate exerts a positive influence on all students enrolled in the same school.

These benefits of social capital are accompanied by costs and risks. We need to understand better the downsides of social capital both for the focal actor and for others. The previous research on social capital strongly emphasizes its positive consequences. It may reflect our bias to see good things emerging out of sociability (Portes, 2000). Although the current study also focuses on beneficial sides of social capital, it would benefit from a more systematic assessment of risks as well. Recent studies have identified at least four negative consequences of social capital: exclusion of outsiders, excess claims on group members/ restrictions on individual freedoms, downward leveling norms, and cost efficiency (Adler & Kwon, 2002; Dika & Singh, 2002; Portes, 2000).

The first risk of social capital is that the same social relations that bring benefit to members of a group enable it to prevent access to outsiders. For example, McGrath and Kuriloff (1999) found that upper middle-class mothers in a suburban school tended to exclude other parents and pursued tracking schemes that were intended to benefit their children, often at the expense of other children. Second, social relationships or close networks may over-embed the actor in the relationships, which necessarily creates demands for conformity and restrict personal freedoms. Rumbaut (1977) found that high levels of family solidarity among recent immigrant students are negatively related to educational outcomes. He explains “*family ties bind, but sometimes these bonds constrain rather than facilitate particular outcomes*” (Rumbaut, 1977, p.39). Third, bounded solidarity and trust provide great resources to group members, but they can have exactly the opposite effect. While it can be the source of public good, it can also lead to public “bad” (Portes, 1998). Mafia families or gang members offer examples of how tight network solidarity can be turned into less desirable ends. Lastly, building social capital demands considerable investment in establishing and maintain relationships. Given that expensive investment, social capital investment may not be cost efficient in certain situations. For example, Brent (2000) claims that increased reliance on volunteer use in public schools might place additional demands on the time of school personnel and engender significant opportunity costs. The time that principals and teachers devote to managing volunteers cannot be used for other, perhaps more productive programs. All these downsides of social capital must also be kept in mind.

Moderators. The ultimate value of a given form of social capital also depends on more contextual factors. According to Krackhardt and Hanson (1993), what matters is the fit, whether the goal and norms of a focal actor are in sync with those of a broader organization. The fit or match between the network features that contribute to social capital and the organization’s objectives is critical to understanding the value of that social capital. These factors have recently moved to the foreground of much social capital research (Burt, 2000).

In educational research, family SES differences have been studied as a main moderator of the relationship of parents’ social capital on their children’s outcomes. Several qualitative studies highlight how differences in family-school connections across socioeconomic strata drive academic disparities (Lareau, 2003; Hovatt et al., 2003). This line of research has demonstrated

that low SES parents experience more disagreements, misunderstandings, and discontinuities with school personnel about the best ways to support their children's education. In contrast, not only are parents from more socioeconomically advantaged backgrounds more likely to have similar goals and approaches to their children's success with school personnel, they are better able to capitalize on these relations to get their children ahead because of their greater stock of human capital (i.e., higher education level, higher social standing).

Bourdieu proposed "cultural capital theory" to emphasize structural constraints and unequal access to capital individuals have or are able to obtain based on class, gender and race (Bourdieu, 1985). Specifically, cultural capital theory presents the match or mismatch between an individual's culture and the culture of the larger society as one source of inequality in access to resources (Lareau, 2003). '*Habitus*' is the term he uses to explain this match/mismatch. *Habitus* is a system of disposure to act and think in a certain way, including acquired tastes and preferences, inclination toward authority, and modes of communication (Reed-Danahay, 2005). Those whose *habitus* matches that of the field or institution in which they are positioned are advantaged. The advantage conferred by this match is called 'cultural capital.'

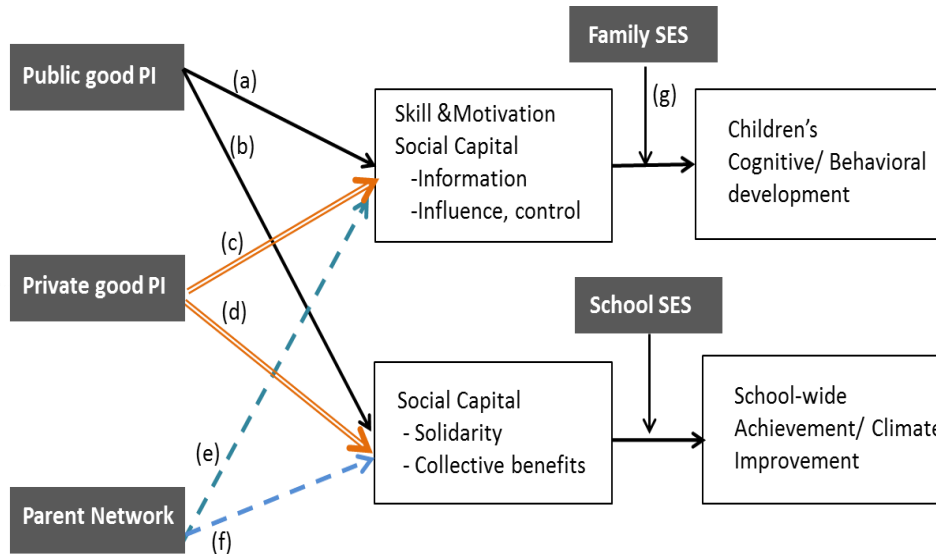
Lareau (1987) utilized Bourdieu's notion of cultural capital and contextualized it directly to parents' different ability to benefit from educational systems. Under this framework, schools represent and reproduce middle- or upper-class values and forms of communication. One reason schools embody those values is because teachers typically come from predominantly middle- or upper-class backgrounds. Teachers are able to communicate effectively with middle-class parents who share similar educational beliefs and practices, whereas they experience difficulty relating to parents who come from different cultures or who possess different sets of "habitus." Because of this cultural match between home and family sphere, middle-class parents are more likely to become successfully involved in school activities. As a result, middle class parents are privileged within the school system, and their children benefit from parent involvement by getting more positive attention from teachers, accessing more challenging curriculum and placement, or gaining other academic resources (Hovat et al., 2003). The bias toward middle-class values puts working-class students and parents at a distinct disadvantage because they may experience difficulties adapting to the dominant culture of the school. The cultural capital theory provides a useful framework to explain how the match/mismatch between family and school and subsequent differences in the pattern of school PI leads to the reproduction of educational inequality among SES groups.

The Influences of Parent School-based Involvement on Child and School Outcomes

There has been an overwhelming amount of evidence in the literature that supports a positive relationship between parent home-based involvement (i.e., shared book reading, discussion about school matters) and academic achievement. However, findings about the influence of parent school-based involvement are mixed as well as scarce. As even studies focusing on school PI mostly used it as an umbrella term including all types of parents' participation in school activities, it is difficult to review the effects of public good PI and private good PI separately. Despite this difficulty, this section tries to give extensive reviews on previous

studies about the effect of the three types of school PI on child and school outcomes. Figure 2 presents all potential pathways of relationships for the review.

Figure 2. Potential Pathways of Relations of School PI to Child/School Outcomes



Pathway (a): Influences of Public Good PI on Child Development. Meta-analyses and recent reviews of the literature indicate that school PI is positively associated with child achievement (Dearing, Kreider & Weiss, 2008; Fan & Chen, 2001; Jeynes, 2005; Pomerantz, Moorman & Litwack, 2007; Xu et al., 2010). However, these studies make no distinction between public good and private good PI and find that school PI, *in general*, has a positive association with academic achievement. There exist few studies that solely focus on parents' participation in public good PI and its' effect on child development and their findings are inconsistent.

According to DeCusati and Johnson (2004), first graders whose parents volunteered in the classroom were, in general, better at reading and literacy skills than were those students whose parents did not participate. As a potential explanation of the result, they found that parents who volunteered more than other parents appeared to enjoy reading to their children at home, and also read more at home with their children. Learning about classroom goals and how to complement them at home seem to be important benefits of parent volunteering at the first-grade level.

In contrast, some studies found that public good PI had no or negligible relationships with academics. Indeed, simply attending in a PTA meeting or volunteering in the classroom may not be enough to enhance children's academic achievement. For instance, Okpala et al., (2001) found that the number of parental volunteering hours was not statistically significant in explaining child math achievement. And in two recent longitudinal studies (Domina, 2005; El

Nokali et al., 2010), participation in PTA meeting or school events has no association with children's math and reading scores, net of prior achievement. But it should be noted that these two longitudinal studies found out a significantly negative link between public good PI and children's problem behaviors. Similarly, several prior researchers also found that parent's participation in PTA or volunteering is the strongest predictor of less problem behavior and greater prosocial development (Fan & Chen, 2001; McNeal, 1999; Sheldon & Epstein, 2002).

Pathway (b): Influences of Public Good PI on School Improvement. In educational research, the effect of parent involvement has routinely been analyzed and discussed at an individual level. However, social capital theory suggests a possibility that school PI as a school-wide phenomenon holds critical importance. Although parental school involvement may be a less effective means of promoting individual achievement than we thought, there are other legitimate reasons and benefits for bringing parents to school that transcend individual achievement considerations, namely, parents' desire and ability to influence school-wide climate, policy, and achievement.

Comer and Haynes (1991) found that through parental involvement in organizations such as the PTA, parents have been able to influence the development of school policies and the hiring and the firing of school personnel. Similarly, McMillan (2000) found that parent's participation in PTA raises school-wide test scores in public schools. Walsh (2008) found that a 10 percent increase in the share of parents in a PTA raises the probability that the principal frequently observes and evaluates all teachers by about 6 percent which in turn lead to school-wide improvement in the quality of instruction. In a quasi-experiment study (DeCusati & Johnson, 2004), researchers randomly assigned 56 kindergarten children to either the treatment group with parent volunteer or the comparison group without parent volunteer during small-group language enrichment. On the post measure of word recognition tests, children in the treatment group outperformed the comparison group children regardless of their parents' participation in volunteering.

However, Brent (2000) found that based on his analyses of state-administered reading and math scores, there is no statistically significant relationship between school-wide reading/math scores and school-aggregated volunteer levels. However, he found that that public good PI can be beneficial for whole schools by improving family-school relations. In his interviews with parents, teachers, and school administrators, 68% of the principals strongly agree that volunteer use in classrooms and schools is beneficial to improve family-school relations. At the same time, parent volunteers noted that volunteering increased their understanding of how school operates and also their respect for teachers and school administrators. We can expect that such close family-school relations work as a stepping stone to build a positive school climate.

Pathway (c): Influences of Private Good PI on Child Development. Previous studies, including meta-analyses, found that parents' contact with schools consistently have negative associations with academic and behavioral outcomes (Desimone, 1999; Fan & Chen, 2001; Jeynes, 2005, 2007; McNeal 1999; Sui-Chu & Willms, 1996). This negative finding is not a surprise, because it is the one area on which recent studies have reached a consensus. As a potential explanation of this negative association, researchers argued that parents may become increasingly involved in an effort to be proactive when their children experience academic and

behavioral difficulties. This explanation has been termed ‘the reactive hypothesis’ (Epstein, 1988, McNeal, 2012). The reactive hypothesis claims that any negative relationship between PI and academic achievement stems from parent’s heightened level of involvement strategy in the face of their children’s struggle in schools. For instance, McNeal (1999) found that parents’ visiting classrooms and talking to teachers were negatively related to academic achievement and concluded that these particular PI practices may be used reactively by parents.

Given that the PI indicators used to propose this hypothesis include whether parents attended a parent-teacher conference, spoke to a teacher or counselor, and visited the child’s classes, reactive involvement may be particularly relevant to private good PI. According to Shi-Chu and Willms (1996), parents of children with learning and behavioral problems tend to participate less in school events and have fewer discussions about school activities with their children, but are more likely to have contact with school staff about their children’s progress. This finding indicates that children’s academic and behavioral difficulties lead to a considerable amount of the communication between schools and parents

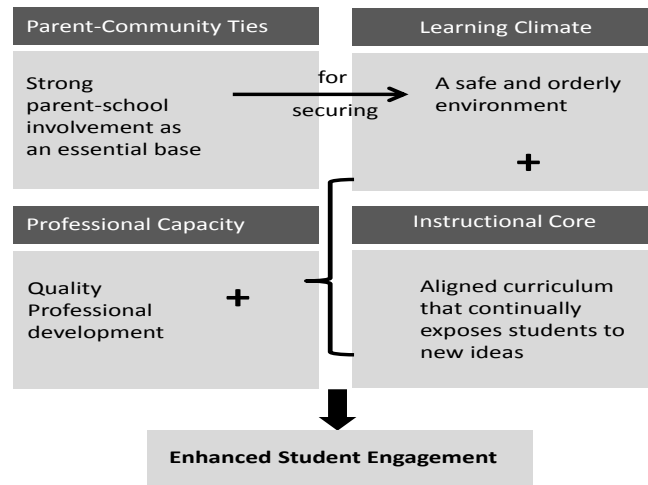
However, all these studies rely on the reactive hypothesis as an explanation, but do not empirically investigate the validity of that speculation. Recent research by McNeal (2012) used a 3-panel, cross-lagged regression model to investigate this claim empirically. His analyses provide no empirical evidence to support the reactive hypothesis. In fact, the study reveals that reduced achievement and increased truancy are not met with greater levels of parental involvement, but rather with reduced levels of parent involvement. McNeal concluded that the phenomenon of parent involvement being associated with lower levels of achievement cannot be explained by claiming parents become more involved once their children struggle academically. Rather, previous cross-sectional estimates of the effect of involvement are biased, since they neglect the cross-cutting influence of prior performance. However, the focal families of McNeal’s study are ones with adolescents. Given the dearth of consistent empirical evidence on validity of reactive hypothesis in early schoolings, a study of elementary families using a longitudinal analysis is necessary to test the hypothesis.

Pathway (d): Influences of Private Good PI on School Improvement. The most extensive research in this regard has been done by Bryk and his colleagues (2010). Their study aimed to identify core elements in the organization of schools that affect their capacity to improve student learning in hundreds urban Chicago public elementary schools over a period of seven years. Strong parent-school tie is one of five essential supports for school improvement in urban, low-income areas (i.e., school leadership, professional capacity, student-centered learning climate, and instructional guidance). ‘Parent-school ties’ are measured by the extent to which parents are involved in the school – how regularly parents pick up report cards, attend parent-teacher conferences, attend school events and other activities which indicate the features of private-good PI. The composite is based on teacher survey reports and aggregated to the school level.

Manifest in their research is that strong parent-school ties created a core resource for maintaining safety and order within the school community. Of special note, parent involvement is the strongest correlate of school safety and order ($r = .58$) and highly correlated with a student centered learning climate ($r = .51$). When this sense of security in school community was combined with an engaging, student-centered curriculum, low-performing urban elementary

schools yielded an overall school environment conducive to student learning (see Figure 3). As a result, Bryk and his colleagues found that schools strong on parent involvement were four times more likely to improve in reading and ten times more likely to improve in math than their counterparts.

Figure 3. The organizational dynamics of improving student engagement.



*Horizontal arrow denotes implied causal connection; Plus sign implied subsystem interconnections.

*From Bryk, A. S., Sebring, P. B., Allensworth, E., Luppescu, S., & Easton, J. Q. (2010). *Organizing Schools for Improvement: Lessons from Chicago*. Chicago: The University of Chicago Press, p. 108

Pathway (e): Influences of Parent Network on Child Development. Compared with public good and private good PI, the effect of parent network has been relatively less studied. Previous studies on parent network show that its positive influences on child development are significant and wide-ranging. Students whose parents form a broad network with other parents are more likely to have better academic achievement (Morgan & Todd, 2009) and placement in higher level of math classes (Useem, 1992) than do students with low levels of parent network. Besides academic benefits, parent networks are conducive to protect their children from being involving in problem behaviors. By enabling reciprocal monitoring of children, the network helps parents to detect any sign of behavioral problems their child might be having and increase adherence to behavioral norms. In her article with the eye-catching title ‘*A little help from my friend’s parent,*’ Carbonaro (1998) found out that students of parents with a wider network with other parents were less likely to report truancy and dropout by the 12th grade.

Pathway (F): Influences of Parent Network on School Improvement. Formation of a parent network helps parents build meaningful relationships with other parents around the school which can result in a greater sense of a collective community. Jackson and Cooper (1989) argued that parents’ social networks have the potential to act collectively to build the strength of the local school community and work cooperatively to improve the education of their children through school-wide participation and decision making. Similarly, schools that have higher

levels of relationships and trust among participants have been shown to have a greater capacity to reform schools (Bryk & Schneider, 2002). Goddard (2003) measured school-level social capital by relational networks that connect parents in school and found that 4th grade students' odds of passing state-mandated mathematics and writing assessments are modestly increased in urban schools characterized by high levels of social capital. These findings show that parents work in collaboration with one another to influence overall school achievement and quality. The process by which parent networks brings benefits to the whole school is similar to the process by which public good PI creates common benefit for the school community.

Pathway (G): Moderating effects of family/school SES in all pathways. Previous studies found that the beneficial influences of school PI partly depend on family SES background. Specially, public good PI is a prevalent and beneficial form of involvement for children from economically advantaged families (Brent, 2000; Crosnoe and Cooper, 2010; Lareau 2003). Lareau (2003) argued that school PI is more advantageous for students from high SES families because of greater knowledge about the structure and content of the education system and greater confidence in approaching teachers that high SES parents possess.

Similarly, Lareau and her colleagues suggest that the formation of parent networks also works favorably for children from high SES families (Hovat, Weininger, & Lareau, 2003; Lareau, 2003). They found that the formation of parent network with their children's parents is primarily a middle-class phenomenon, while in case of working-class families the network is predominantly shaped by strong kinship ties. Also, their interviews with parents revealed that middle-class parents are far more likely to react collectively with other parents in the network when an issue arises in school. They tend to form social networks and include professionals in their networks to mobilize information, expertise and authority.

However, other researchers present contrasting views that school PI is particularly beneficial for children who face exceptional barriers to achievement. Tang, Dering and Weiss (2011) argue that if school PI promotes learning skills and positive attitudes toward learning, then children who lack these skills and attitudes might benefit the most from involvement. In a series of empirical studies (Dearing, Kreider, Simpkins, & Weiss, 2006; Dearing & Tang, 2010; Tang, Dearing, & Weiss, 2011), they found a strong evidence to support their argument. Similarly, Domina (2005) found that parents' participation in PTA and volunteering was more important for socioeconomically disadvantaged students. He argued that as family social capital declines, school resources become more important in increasing child achievement. When low-SES parents maintain a strong partnership with schools, this partnership may supplement the low level of family social capital and be more important for children for whom there has been reduced capital at home. On the other hand, Lee and Bowen (2006) showed that parental expectations benefit children from high SES families more than children from low SES families, but school PI is beneficial for both groups equally. These mixed findings indicate a reason to study this issue further.

Methodological Shortcomings in Existing Research on Parental School-Based Involvement

A shortcoming of previous research on school PI to date is the dearth of longitudinal data examining the links between school PI and educational outcomes over time. Because of

methodological constraints or data limitations, existing empirical work on school PI has been limited primarily to cross-sectional studies. More studies titled ‘a longitudinal study’ have been published, but most of them typically measure variables at only two time-points and demonstrate links over time between prior family involvement and child achievement later by using a path analysis (i.e., Englund et al., 2004). Studies limited to two time points extend cross-sectional work. However, they are less ideal if the goal of the study is to examine developmental patterns of stability and change over time. In contrast, growth modeling technique enables us to (1) precisely model individual growth trajectories, (2) determine the rates of change in development of skills and knowledge, (3) examine between-family differences in patterns of stability and change, and (4) simultaneously investigate within-family associations among time-varying constructs (Singer & Willet, 2003). Given that parental influences on academic and social development are cumulative, it would be beneficial to build a model that allows a researcher to examine effects of parent involvement over time.

Furthermore, a longitudinal design with multi-wave data enables researchers to build stronger causal inferences about links between parental practices and child outcomes. A major challenge in parent involvement research is to ascertain whether parent involvement itself is actually effective or whether parents who are more involved in children’s schooling share commonalities in key characteristics, such as in their beliefs about parenting, education, and SES (El Nokali et al., 2010). A simple cross-sectional comparison of parent involvement and child outcomes would be biased because of unobserved variables (Rabe-Hesketh & Skrondal, 2008). Even though numerous controls are included in the analyses, it is impossible for a researcher to control for all parents’ characteristics related with child outcomes. Thus, unobserved parents’ characteristics may have contributed to the observed associations in cross-sectional studies. In contrast, within-individual analyses using a longitudinal dataset to follow the same parents over time would be useful to net out any unobserved parent characteristics that are fixed over time. Although within-family estimates are not a panacea for potential sources of bias (e.g., within-family estimates may be biased by reciprocal causation or time-varying omitted variables), they are useful to deal with bias associated with potentially omitted variables that are time invariant.

Recently, studies have been published using growth curve modeling technique to examine the longitudinal links between school PI and educational outcomes during elementary grades. For example, Hong and Ho (2006) measured school PI at the initial time point of the study and investigated the relations of initial parent involvement to later growth of skills. However, school PI itself is a time-varying factor. Previous research shows that parents’ involvement itself and its effects on their children’s outcomes tend to change over time. Thus, measuring PI at multiple time points enable researchers to investigate dynamic relationships between PI and child development over time. Dearing and her colleagues (2006) investigated the effects of yearly changes in school PI on children’s reading development trajectories during the elementary years, and found that increases in parent’s involvement were associated with improvement in reading achievement for low-income, elementary students. However, this study collected data from low-income mothers who participated in early intervention program so that it is hard to generalize their findings to a boarder population. Using a nationally representative dataset, El Nokali et al (2010) found that changes in parent involvement have no association with academic development, but a positive association with social development. However, their

indicator of parent involvement combines both home-based and school-based activities, which makes it difficult to differentiate the unique contribution of school PI to child development.

Surprisingly, no previous longitudinal research on school PI has incorporated school-level data. Because education systems have a hierarchical structure (students nested within schools) and parent participation in school activities occurs in the context of school organization, researchers must include both student and school characteristics to correctly estimate the effect of school PI (Bryk & Raudenbush, 1988). Yet researchers studying school PI rarely posit an explicit model of individual development growth and for how features of parent behaviors inside school contexts affect this growth. An adequate approach to questions of this sort requires a three-level growth model that enables to combine the features of modeling (1) individual growth over time, (2) relationship between parents' participation in school activities and growth, (3) controlling for family characteristics and organizational structure of schools.

Another shortcoming of previous work on parent involvement is its heavy reliance on children's self-reports as indicators of school, parent and their own behaviors. This creates a common method variance problem due to the use of a single reporter, which may cause an exaggeration of true relations between parenting and child outcomes (Pleck, 2010). In the proposed study, I address above mentioned three methodological limitations by both analyzing a multi-wave longitudinal dataset with growth curve modeling and using combined reports from children, parents, and teachers to correctly measure parenting practices, child behavior, and achievement.

The Current Study: Research Goals and Questions

Research Goals

As part of national education reform efforts, parents' active participation in school activities (school PI) has garnered attention as a potential mechanism to promote positive child development. However, surprisingly little has been concluded about the nature, scope, and efficacy of parents' participation in schools. Furthermore, existing research has produced inconsistent findings about the effectiveness of school PI. Drawing on social capital theory, the current study aims to address questions about school PI that are crucial to establishing its efficacy.

The purposes of the study are fourfold. First, I expand the current conceptualization of school PI in educational research. I propose that the current conceptualization of school PI can be divided into the public good and private good aspects. Certain types of school PI (e.g., participating in fundraising or PTA) lead to spill-over effects for the whole school community, whereas other types of school PI (e.g., attending a parent-teacher conference or back-to-school night) result in private rewards for the parents' own children. Although the distinction between the private and public good nature of school PI has not yet been made in educational research, studies from economists revealed that two dimensions of school PI represent distinct effects on child and school outcomes (i.e., McMillan, 2000; Walsh, 2008). In addition, I propose that the formation of parent networks with other parents is also a less-studied, but significant, dimension of school PI. Throughout this paper, school PI is conceptualized as a multidimensional concept,

consisting of three types of PI -- public good PI, private good PI, and parent network. Unlike previous studies that have collapsed the distinct elements of parental involvement into a single composite, the current study will examine the aforementioned sub-constructs of school PI separately and distinguish the potential benefits of each type. Thus the findings of this study may be used to craft parent involvement policy and intervention programs with greater specificity and accuracy.

The second purpose of the study is to investigate the benefits of school PI for a greater diversity of educational outcomes. Previous research on school PI extensively focused on the link between school PI and child academic advantages. It is necessary to link school PI to multiple facets of children's lives, such as their problem behavior, self-control and interpersonal skills. In addition, although school PI means parents' behaviors that happen in the context of schools, its' relationship with school-level outcomes has rarely been discussed. We need to better understand if the benefits of school PI are not just limited to child academic development, but extend to promote child social development and school-wide achievement/climate. Moreover, by differentiating three types of school PI, this study can find the most beneficial type of school PI to predict each outcome (i.e., child academic/social development, and school-wide achievement/climate). Thus, the current study expands our knowledge on the benefit of school PI by proving more rigorous analysis to figure out what school PI is beneficial for and to show if there are other benefits of school PI other than individual academic achievement.

Third, the current study aims to provide new insights into the effects of parental school involvement by examining how its effects on developmental trajectories vary across the primary and upper-elementary grades. The literature of the field has highlighted the dynamic nature of school PI, emphasizing how involvement and its effects vary over time. This study will extend previous research that has focused on concurrent correlations between parent involvement and child outcomes in different grades. Growth modeling is preferable in this regard, because it allows the researcher to estimate individual patterns of stability and change, associations among time-varying constructs, and fixed family and school differences in these patterns (Rabe-Hesketh & Skrondal, 2008). Moreover, this study will benefit from the use of longitudinal analyses to test more rigorously the idea that school PI is the driver, rather than simply a correlate, of student outcomes.

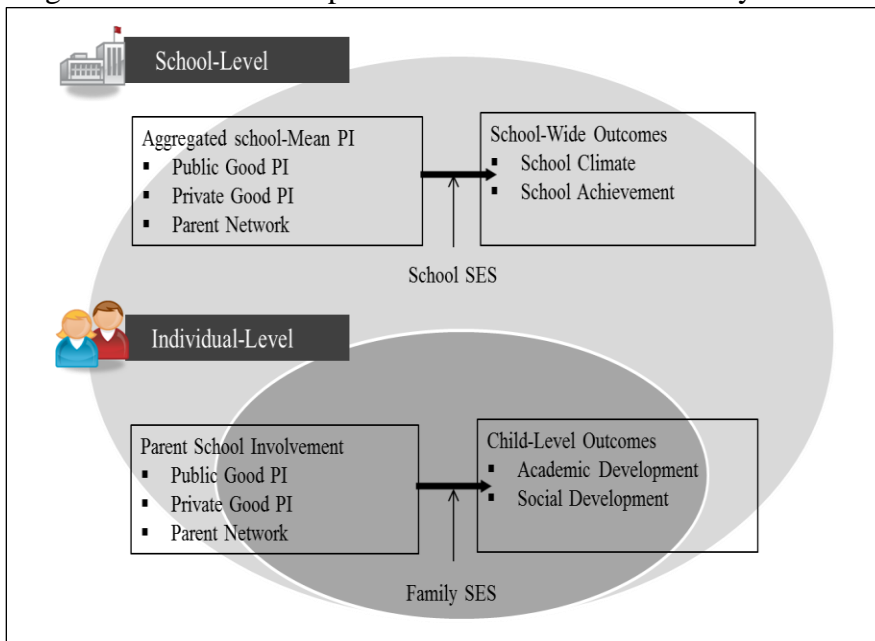
Lastly, I focus on the salient role of the level of family and school SES in moderating the relationship between school PI and educational outcomes. Previous research provides mixed findings on this issue. Lareau's work (1987, 2003) has suggested that school PI is more strongly associated with positive child development for children whose families are well-off, compared with children whose families are relatively poor. However, other scholars found that school PI is equally or more beneficial for socioeconomically disadvantaged students (Dearing et al., 2006; Domina, 2005; Lee and Bowen, 2006). These mixed and inconsistent findings about SES-based differences in the effects of school PI require more rigorous research to test the relationship. If school PI gives an additional boost for high SES students, PI policy may play a role in widening educational gaps. Oppositely, if school PI brings more advantage for low SES students, it helps to close the gap between high and low-SES students through redistributing social capital. Thus, we need more clarity regarding the extent that school PI increases social inequalities or, conversely, benefits all children.

Conceptual Model

Figure 5 illustrates the conceptual model used to test the main study objectives. As families were nested within schools, this study built two models. The first is an individual model where I test the way parents' involvement in schools affects their own children's academic and social development, controlling for family and school characteristics. The aforementioned three types of PI--public good PI, private good PI, and parent network—were included in the model to investigate their influence on child academic and social development. I also examine the moderating effects of family SES on the relationship between school PI and child development. Student academic development was measured by math and reading assessments, and social development was measured by teacher's report of problem behavior and positive social skills. All of these main variables at individual level were measured at multiple times during elementary years (Kindergarten, 1st, 3rd, and 5th).

The school-level model considers how three types of school mean PI relate to school-wide achievement and school climate, controlling for school factors. In addition, it tests the moderating effects of school SES on the relationship between school-mean PI and school outcomes. In order to measure school-level parent involvement, this study calculated school-mean PI by aggregating PI scores of families within a school. School-level outcomes included school-wide achievement and school climate reported by school administrators. All of these main variables at the school level were measured at multiple times during the elementary years (Kindergarten, 1st, 3rd, and 5th).

Figure 4. Overall Conceptual Model of the Current Study



Research Questions and Hypotheses

The first research question examines the extent that the three types of school PI (public good PI, private good PI, and parent network) are related to children's math and reading scores across Kindergarten, first, third and fifth grade. It is hypothesized that the three types of school PI will have relationships of varying magnitude with academic achievement and growth. Based on the literature review, the influence of public good PI on individual children's academics will be weak or negligible, as public good PI has been shown to mainly benefit the school community as a whole (McMillan, 2000; Walsh, 2008). In contrast, private good PI is expected to affect child achievement more strongly, as this type of school PI is geared toward increasing the academic achievement of individual children (Walsh, 2008). It is difficult to hypothesize the direction of influence between private good PI and outcomes because previous findings have been inconsistent. Given that some research found parents tend to increase their contact with teachers in response to their children's struggles in academics (McNeal 1999; El Nokali et al., 2010), I expect that the association may turn out to be negative. Based on the limited literature (e.g., Morgan & Todd, 2009; Useem, 1992), I expect that parent network will have a positive association with child academics.

With regard to changes over time, it is hypothesized that the relationship between the three types of school PI and math and reading growth will become stronger as children get older. As children move into higher grades, the school system becomes more complicated and parental guidance regarding choosing classes, interacting with teachers, or negotiating the setting may be more important. In addition, one previous study found that children's academic motivation tends to sharply decline at the end of elementary years (Wigfield et al., 2006). Given that school PI has been shown to be a strong motivational source (Grolnick & Slowiaczek, 1994), children may benefit more from parent's active participation in school activities as they move into higher grades.

The second set of questions examines to what extent the three types of school PI (public good PI, private good PI, and parent network) are related to children's problem behaviors, and social skills across kindergarten, first, third and fifth grade. Previous longitudinal studies found parent involvement (measured by a composite of public good and private good PI indicators) has a positive association with child social skills during elementary grades (e.g., Domina, 2005; El Nokali, 2010). Thus, it is expected that both public good and private good PI will prevent problem behaviors and promote positive social skills. In addition, social capital theorists have argued that a form of closure, in which parents connect with the parents of their children's peers, works as a 'social control' which facilitates reciprocal monitoring of children's behavior (Carbonaro, 1998; Coleman, 1988; McNeal, 1999). Therefore, it is hypothesized that parent network will be positively related with both indicators of social development. To the extent of my knowledge, no previous research has investigated whether the relationship between school PI and child social development varies as a function of age. My expectation is that school PI becomes less useful in promoting social adjustment for children as they age because they are more likely to be influenced by schools and peers than by their families (Dufur et al., 2007).

The third research question examines to what extent the three types of school-mean school PI are related to the school climate and school-wide academic achievement across

kindergarten, first, third and fifth grade. According to social capital theory, parent's participation in PTA, volunteering, fundraising can create common resources for the community. It is hypothesized that school-mean public good PI will be the most powerful predictor of school improvement by raising instruction quality, creating better school climate, and bringing financial resources to schools (Putnam, 2000; Sheldon et al., 2010; Walsh 2010). Based on a limited literature, I assume that school-mean parent network will exert positive influences on school-level outcomes through group solidarity (Adler & Kwon, 2002; Bryk & Schneider, 2002). However, I expect that school-mean private good will have a weaker association with school improvement than with the other two types of school PI.

The last set of research questions addresses whether children from high SES families benefit more from school PI than do children from low SES families or vice versa. Based on the Lareau's influential qualitative study (2003), I expect that socioeconomically advantaged parents are more likely to be involved in public and private good activities at their children's school and form extensive networks with other parents in schools. In addition, I expect that the school PI of socioeconomically advantaged parents lends more advantage to their children's education than their lower SES counterparts because of their greater knowledge of the education system, greater economic and human resources, and more extensive social network. Similarly, for the school-level model, it is hypothesized that high SES schools will benefit more from school-wide parent involvement than low SES school. For example, considerable funds from donations or fundraising collected in high SES schools are often used to support more enrichment courses, curriculum supplement, or teacher development which leads to better school-wide achievement and learning climate (Parcel et al., 2010; Rutter & Maughn, 2002).

Methodology

Data Set

This study uses data from the Early Childhood Longitudinal Study–Kindergarten cohort, a study conducted by the National Center for Education Statistics (NCES) that examines U.S. children's academic and behavioral development between kindergarten and fifth grade. Detailed descriptions of the ECLS-K sample design and data collection can be found on the ECLS-K website (<http://nces.ed.gov/ecls>). The first wave of ECLS-K was collected in the fall of 1998 when children entered kindergarten. Participating students were assessed on six occasions: fall of kindergarten, spring of kindergarten, fall of first grade (for a random subsample of students), spring of first grade, spring of third grade, and spring of fifth grade.

In conducting ECLS-K, NCES used a multistage probability sampling design to select a cohort of students that was nationally representative of students entering kindergarten in the 1998-99 school years. The ECLS-K sampling was split into three nested stages. First, the NCES randomly selected approximately 100 primary sampling units that were geographic areas consisting of counties. Second, within these primary sampling units, the NCES randomly sampled approximately 1,000 schools that contained a kindergarten, with public and private schools selected from separate sampling frames. Third, an average of about 23 children per school were then randomly sampled within these schools. Once children for the sample were

identified and recruited, data collection proceeded at various stages. The base year study recruited a cohort of 21,409 students in about 800 public and 200 private schools that was nationally representative of students entering kindergarten in the 1998-1999 school years. Of the 21,409 students originally recruited for the study, 15,449 were followed through fifth grade.

The field supervisor contacted the school coordinator to schedule dates for direct child assessment, to verify parent consent procedures, and to identify the teacher of each child. During the pre-assessment contact for the following waves, the field supervisor also collected information for sampled children who were no longer in the school, identified students' regular or special education teacher, and reviewed parental consent status (NCES, 2001). After obtaining consent from schools and parents, trained-assessors administered direct child assessments in schools, and conducted parent/guardian interviews by telephone. The same procedure was followed in each round of data collection. The data in ECLS-K consist of information about the children's families, classrooms, schools, and neighborhoods.

The ECLS-K offers exceptional opportunities for the current study; it is (1) a nationally representative dataset; (2) the first and the most extensive longitudinal study which followed a cohort of children over elementary years; (3) the multifaceted data collected across the years allow me to study how various child, home, and school factors at various points in the child's life relate to cognitive and social development; (4) particularly strong and rich in its coverage of items pertaining to parental involvement at school activities, children' academic and social development, and the quality of the school environment.

Missing Data

NCES took major steps to minimize attrition and preserve the representativeness of the sample over time. ECLS-K methodological reports provide detailed information on the data collection procedures (Tourangeau et al., 2005). Despite these efforts, some data were missing in the ECLS dataset both at Level 1 (within child) and at Level 2 (between child), with the most substantial missing in Level 3 (between-school). In detail, rates of missing data were generally less than 4% for the demographic and child/parents characteristics. But for school factors, there was a small amount of missing data on school-level achievement (for approximately 6% to 13% of weighted cases, depending on wave), and more substantial data missing on the school-level percentage of students eligible for free or reduced price lunch at individual occasions (for approximately 14% to 22% of weighted cases, depending on wave).

Several strategies were used to make use of all legitimate, available information without imputing values or excluding cases. First, as listwise deletion and pairwise deletion can result in biased parameter estimates, the current study utilized full-information Maximum Likelihood estimation, which has been found to be efficient for incomplete data. Rabe-Hesketh and Skrondal (2008) recommend that any child contributing one or more waves of outcome score can be included in the analyses and contributed the within-person estimation. Given that students did not have to be assessed at all data points to be included in the analysis, the growth curve modeling used in this analysis makes efficient use of unbalanced data.

Second, by specifying the control variables as time invariant and fixing these to the average of the available values across the five waves of data collection, any student who had survey data from one or more waves was able to have an empirically based value for these variables. Following this decision, only 1% of students lacked data on a student-level control variable, and 12% of students lacked data on a school-level control variable. Preliminary analyses indicated that students' family SES was highly correlated across five measurement occasions ($r = .84 \sim .95$). Thus, for the interest of model parsimony and avoidance of missing cases, a single, time-invariant composite for family SES was created. In addition, preliminary analyses indicated that school-wide poverty level was moderately to highly related across five measurement occasions ($r = .64 \sim .80$). As with child SES, a single time-invariant latent composite for school concentration of poverty was created. This approach resulted in the inclusion of more than 90% of the ECLS-K participants who were followed through fifth grade.

Measures

Appendix B and C present detailed descriptions of all the variables used in individual- and school-level models, including types of variables, numbers of items, reporters, and description in ECLS-K. Parents reported the extent of their participation in the three types of school PI (public-good PI, private-good PI, and parent network). School administrators reported school-wide achievement and climate. Teachers rated each student's problem behaviors and social skills.

Time. Time was specified as the child's grade through kindergarten to 5th grade. Kindergarten was coded as 0 and other grade levels (i.e., 1st, 3rd, and 5th grade) were coded as the corresponding number. Thus, the intercept in the hypothesized individual growth trajectory represents the students' "*Initial*" outcome status in the spring of kindergarten. This study used spring assessments of each grade. Thus among 7 waves of data (fall/spring of K, fall/spring of 1st, spring of 3rd, spring of 5th), analyses will be limited to 4 waves of data: Wave 2 (spring of kindergarten), Wave 4 (spring of 1st grade), Wave 5 (spring of 3rd grade), and Wave 6 (spring of 5th grade).

Parent School-based Involvement. Parents were asked to rate their degree of involvement in their children's schooling on 7 items in spring of K, 1st, 3rd, and 5th grade. Based on existing theories, three dimensions of parental school involvement were considered: *public good PI*, *private good PI*, and *parent network*. Composites were formed to create indicators of involvement for public and private good by summing the raw scores of 6 dichotomous items (1= yes, 0= no) in each factor. For the public good PI composite, parents' report on their participation in PTA meetings, volunteering, and fundraising was used. At each grade, the inter-item reliability of public good PI was moderate to good (i.e., Cronbach's alpha ranged from .59 to .65). For the private good PI composite, parents' report on their attendance in parent-teacher conferences, open-house, back-to-school night, and school events was used. The internal consistency of involvement for private goods was good across grades (i.e., Cronbach's alpha ranged from .65 to .72). The third factor, parent network, was represented by a single item. It was measured by parents' report on the number of parents in their child's classroom they regularly talk with in person or on the phone.

Math and Reading Achievement. Direct assessment in this study is represented by each child's Item Response Theory (IRT) scale scores on individually administered reading and math assessments in the spring of K, 1st, 3rd, and 5th grade. In each subject area, children took the assessments in 2 stages. The first stage was uniform across all children. In this stage, children received a 12- to 20-item routing test. Their performance on the routing items guided whether they took the low-, medium, or high difficulty version of the second stage. This measurement approach maximized measurement accuracy and minimized the length of the assessments. This adaptive process yielded a vertical scale useful for comparing achievement over time. Item response theory (IRT) was used to calculate the predicted probability of each item being answered correctly by each student. As a result, the overall IRT scores represents the predicted number of items test takers would have answered correctly at each measurement point if all questions from the first- and second-stage tests had been administered. These scores are comparable across students within a wave and also across waves, enabling comparison of children's performance over time.

Over the study period, the mathematics areas included five content strands (number sense, properties, and operations; measurement; geometry and spatial sense; data analysis; statistics; probability, patterns, algebra, and functions), although the proportion of items varies across grade levels. Measures of math-related abilities are organized around nine proficiency levels, where mastery of later skills assumes success in prerequisite skill areas. The levels are labeled as follows: (1) count, number and shape; (2) relative size; (3) ordinality and sequence; (4) add and subtract; (5) multiply and divide; (6) place value; (7) rate and measurement; (8) fractions; and (9) area and volume. For each, proficiency probability scores are provided. These scores are IRT-based estimates of a student's likelihood of mastering a given skill area at each measurement occasions. The reliabilities across four waves of data ranged from .92 to .94.

The reading test assessed basic reading skills (familiarity with print, recognition of letters, recognition of phonemes, and decoding), vocabulary, and six types of reading comprehension skills (initial understanding, developing interpretation, personal reflection and response, developing a critical stance, and evaluating complex syntax). A greater proportion of difficult items targeting reading comprehension was included at later grade levels than at earlier grade levels to avoid ceiling effects and capture age-appropriate skills. Over the four waves, the reliability estimates ranged from .87 to .96. And validity evidence included high correlations with other standardized measures of reading and lower correlations with mathematics and science measures during field testing (Tourangeau et al., 2005).

Problem Behavior. As part of a self-administered questionnaire, K–5th grade Teachers rated individual students about externalizing and internalizing behavioral problem category. The teacher indicated the frequency of occurrence during the school year with 1 indicating “never,” 2 “sometimes,” 3 “often,” and 4 “very often.” The scale scores are the mean ratings on the items included in the scale. The Externalizing Problem Behavior Scale includes 6 items assessing the frequency with which the students argues, fights, gets angry, acts impulsively, disturbs ongoing activities, and talks during quiet study time (Cronbach's alpha ranged .79 to .92). The Internalizing Problem Behavior consists of 4 items addressing the child's anxiety, loneliness, low self-esteem, and sadness. Higher values on these scales indicate more problem behaviors (Cronbach's alpha ranged between .81 and .89 across waves).

Positive Social Skills. The teacher Social Rating Scale (SRS) asked k-5th grade teachers to report how often students exhibited certain social skills. These scales were adapted from the Social Skills Rating System (Gresham & Elliott, 1990). Teachers rated individual students as part of a self-administered questionnaire. For each behavioral category, the teacher indicated the frequency of occurrence during the school year with 1 indicating “never,” 2 “sometimes,” 3 “often,” and 4 “very often.” Two scales capture positive aspects of children’s social development: Self-Control and Interpersonal Skills. The Self-Control Scale has 4 items that indicate the child’s ability to control behavior by respecting the property rights of others, ability to control temper, accept peer ideas for group activities, and respond appropriately to peer pressure. The Interpersonal Skills Scale has 5 items rate the child’s skills in forming and maintaining friendships; getting along with people who are different; comforting or helping other children; expressing feelings, ideas, and opinions in positive ways; and showing sensitivity to the feelings of others. Higher scores on the Self-Control, and Interpersonal Skills scales indicate more appropriate, well-adjusted social behavior. Cronbach’s alpha for these 2 measures are high across waves (between .79 and .92 for all scales).

School Climate. School administrators were asked to rate their perception of school climate with a set of 4 questions through K to 5th grade level. They reported on whether overcrowding and teacher turnover was a problem at this school, the community the school served was supportive of its goals and activities, and school staff members generally had school spirit. A five-point Likert scale was used for all of the items (1= strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree, 5= strongly agree). After reverse-coding of overcrowd and teacher turnover problem question, a composite was created by summing the raw scores of all 4 relevant items (Cronbach’s alpha ranged from .63 and .71). The higher scores indicate better school climate.

School-Level Achievement. School-level achievement scores were not available in the ECLS-K dataset. Instead, this study used school administrators’ report on the average student academic performance in their school as an indicator of school-level achievement each year. It was measured by an open question that asked what percentage of students had reading/verbal skills and math/quantitative skills at or above grade-level on national tests.

Child and Family Characteristics. Child and Family demographic information was collected through parent surveys at the base-year interview. All control variables were treated as time-invariant. Dummy variables included whether families use non-English at home (coded as 0) or English at home (coded as 1), and whether the child lived in a two-biological parent family (coded as 0) or single/step parent family (coded as 1). Family SES is a continuous measure, which is a composite variable computed by ECLS-K. The components used to create the variable include (a) father/male and mother/female guardian’s education; (b) father/male and mother/female guardian’s occupational prestige, based on the 1989 General Social survey (Davis, Smith, & Hodge, 1991); and (c) household income. The five variables are standardized with a mean of 0 and a standard deviation of 1. The composite variable ranges from -4.75 to 2.75.

School Characteristics. Three time-invariant variables were used as school-level controls. School administrators completed questionnaires reporting on the school size, and percentage of

minority students. Additionally, the percentage of students in the school who were eligible to receive free or reduced price lunch was reported. This is a metric commonly used in the U.S. to capture the economic composition of schools.

Analytic techniques

The current study considers the possibility that school PI may affect both individual child-level and school-level outcomes; an involved parent may promote her own children's academic/social development, but may also contribute to induce better school-wide achievement/climate. Thus, I built two separate models of school PI that estimates both effects.

Individual Academic and Social Development Model. First, *individual-level models* were built using a three-level Growth Curve Modeling (GCM). The central interest in the current study lies in the growth in knowledge and skills of individual students and the influences of school PI which chiefly takes place in the organizational settings of schools on growth over time. An adequate approach to measure 'changes in skills' and assess 'multilevel effects' requires a three-level growth curve modeling (Bryk & Raudenbush, 1988). The three-level model provides a comprehensive framework (1) for examining the stability and change in individual academic/social development, (2) for investigating how parental involvement and children's background influence the shape of their developmental curves, and (3) further for exploring how aspects of organizational context may have differential effects on the students' development within it.

As ECLS-K data have repeated measurement occasions for students and parents (clusters) who are clustered in schools (super-clusters), three-level growth models were used. Analyses were estimated with Level 1 as occasions (i.e., within-individual effects), Level 2 as families (i.e., between-family and within-school effects), and Level 3 as schools (i.e., between-school effects). Three-level growth curve models also partition the outcome variance into between- and within-school and within-student portions, allowing for more accurate standard error estimates to account for students being nested within schools (Rabe-Hesketh & Skrondal, 2008). Growth curve models were fitted by maximum likelihood using Stata's xtmixed. Likelihood ratio tests were used to compare nested models.

Unconditional Growth Model:

$$\text{Level 1: } Y_{tij} = \pi_{0ij} + \pi_{1ij}(\text{grade}_t) + \pi_{2ij}(\text{grade}_t^2) + \varepsilon_{tij}$$

$$\text{Level 2: } \pi_{0ij} = \beta_{00j} + r_{0ij}$$

$$\pi_{1ij} = \beta_{10j} + r_{1ij}$$

$$\pi_{2ij} = \beta_{20j}$$

$$\text{Level 3: } \beta_{00j} = \gamma_{000} + u_{00j}$$

$$\beta_{10j} = \gamma_{100}$$

$$\beta_{20j} = \gamma_{200}$$

The unconditional growth models were estimated first to examine the average growth and variability in growth for each of the four individual development outcomes, without substantive

predictors. In the present study, four repeated measures of individual math/reading scores (Spring of K, 1st, 3rd, 5th) and four repeated measures of problem behavior/positive social skills (Spring of K, 1st, 3rd, 5th) were modeled. Preliminary inspection of empirical growth plots as a function of grade suggested the growth patterns were not linear. One of the most common extensions of the linear growth model is to add power terms of the time variable. For the current study, a quadratic growth specification was the most appropriate for representing the individual growth trajectories in math/reading achievement, and externalizing/internalizing problem behavior. Thus the multilevel model for change was expressed in terms of both grade and quadratic terms of grade. Y_{tij} represents child i in school j 's outcome scores at time t ; π_{0ij} represents the performance of child i in school j at the initial assessment; π_{1ij} represents the linear slope or initial yearly growth rate of child i in school j between kindergarten and 5th grade; π_{2ij} captures acceleration/deceleration in growth trajectory; and ε_{tij} represents the time-specific error of child i in school j at time t .

Next, conditional growth models were estimated with predictors. All time-varying and time-invariant covariates were entered into the models. Time-varying variables include those that may change over time and that are measured at multiple time points, whereas time-invariant predictors do not change over time. For example, this study treated family SES, family use of non-English language at home, and school size as time-invariant by using their base-year value. In contrast, I used parents' report on their participation in school activities every wave, making these variables time-varying. Time-varying predictors predicted '*time-specific*' or '*contemporaneous*' value of outcomes, whereas time-invariant predictors predicted the intercept (i.e., initial performance) and slope (i.e., growth over time) parameters. The main effects of the time-varying predictors (three types of school PI) are included in the level-1 equation. The three subscripts on the school PI variables signify their time-varying nature.

Conditional Growth Model:

$$\begin{aligned} \text{Level 1: } Y_{tij} = & \pi_{0ij} + \pi_{1ij}(\text{grade})_{tij} + \pi_{2ij}(\text{grade}^2)_{tij} + \\ & \pi_{3ij}(\text{publicPI})_{tij} + \pi_{4ij}(\text{Private PI})_{tij} + \pi_{5ij}(\text{Network})_{tij} + \\ & \pi_{6ij}(\text{PublicPI})(\text{grade})_{tij} + \pi_{7ij}(\text{PrivatePI})(\text{grade})_{tij} + \\ & \pi_{8ij}(\text{Network})(\text{grade})_{tij} + \varepsilon_{tij} \end{aligned}$$

Here, π_{0ij} represents the performance of child i in school j at the initial assessment, when the three PI variables equal zero; π_{1ij} represents the initial linear slope or the yearly growth rate of child i in school j ; π_{2ij} captures acceleration/deceleration in growth; π_{3ij} , π_{4ij} and π_{5ij} represent the effects of time-varying school PI – public good PI, private good PI, and parent network -- on the contemporaneous performance of child i in school j at time t (K, 1st, 3rd, 5th), controlling for other variables. π_{6ij} , π_{7ij} and π_{8ij} are interactions between school PI and grade, indicating if any relationship between growth rate and school PI exists; and ε_{tij} represents the time-specific error of child i in school j at time t .

$$\begin{aligned} \text{Level 2: } \pi_{0ij} = & \beta_{00j} + \beta_{01j}(\text{Family SES})_{ij} \dots + \beta_{0pj}(X_{0pj}) + r_{0ij} \\ \pi_{1ij} = & \beta_{10j} + \beta_{11j}(\text{Family SES})_{ij} \dots + \beta_{1pj}(X_{1pj}) + r_{1ij} \end{aligned}$$

$$\begin{aligned}
\pi_{2ij} &= \beta_{20j} \\
\pi_{3ij} &= \beta_{30j} + \beta_{31j} (\text{Family SES})_{ij} \\
\pi_{4ij} &= \beta_{40j} + \beta_{41j} (\text{Family SES})_{ij} \\
\pi_{5ij} &= \beta_{50j} + \beta_{51j} (\text{Family SES})_{ij} \\
\pi_{6ij} &= \beta_{60j} \\
\pi_{7ij} &= \beta_{70j} \\
\pi_{8ij} &= \beta_{80j}
\end{aligned}$$

The Level-2 model represents variation in growth parameters among children from different families within the same school. It also adds controls for child and family characteristics. Regarding the effect of time, it is recommended to allow only the lower-order terms of the polynomial terms to vary randomly between subjects (Rabe-Hesketh & Skrondal, 2008). Thus the quadratic term was treated as fixed. Cross-level interaction terms between the three types of school PI and family SES were included in the level-2 model to test whether the relations between the school PI variables and children's outcomes depend on family SES.

β_{00j} represents the mean intercept or average outcome scores within school j at the initial assessment when the covariates are zero; β_{0pj} represents the strength and the direction of association between the family level predictor X_{0pj} and outcomes of students in school j at the initial assessment; β_{10j} represents the mean linear slope or the rate of growth of students in school j ; β_{1pj} represents the influences of family level predictor X_{1pj} on linear growth rates of students in school j during 6 years of elementary education; and r_{ij} represents school j 's deviation from the reading score predicted by the model. Except β_{00j} , all other parameters in the level-2 model were treated as fixed. β_{31j} , β_{41j} , and β_{51j} indicate the interaction effects between the three school PI variables and family SES.

$$\begin{aligned}
\text{Level 3: } \beta_{00j} &= \gamma_{000} \dots + \gamma_{00p}(W_{00p}) + u_{00j} \\
\beta_{10j} &= \gamma_{100} \\
\beta_{20j} &= \gamma_{200} \\
\beta_{30j} &= \gamma_{300} \quad \beta_{31j} = \gamma_{310} \\
\beta_{40j} &= \gamma_{400} \quad \beta_{41j} = \gamma_{410} \\
\beta_{50j} &= \gamma_{500} \quad \beta_{51j} = \gamma_{510} \\
\beta_{60j} &= \gamma_{600} \\
\beta_{70j} &= \gamma_{700} \\
\beta_{80j} &= \gamma_{800}
\end{aligned}$$

The Level-3 model represents variation across schools. It adds controls for school-level factors to determine the associations between school characteristics and the outcome variables, net of the other covariates. γ_{000} represents the population mean outcomes scores at the initial assessment across schools when the covariates are zero; γ_{00p} represents the strength and the direction of association between school-level predictor variables W_{00p} and mean initial outcome

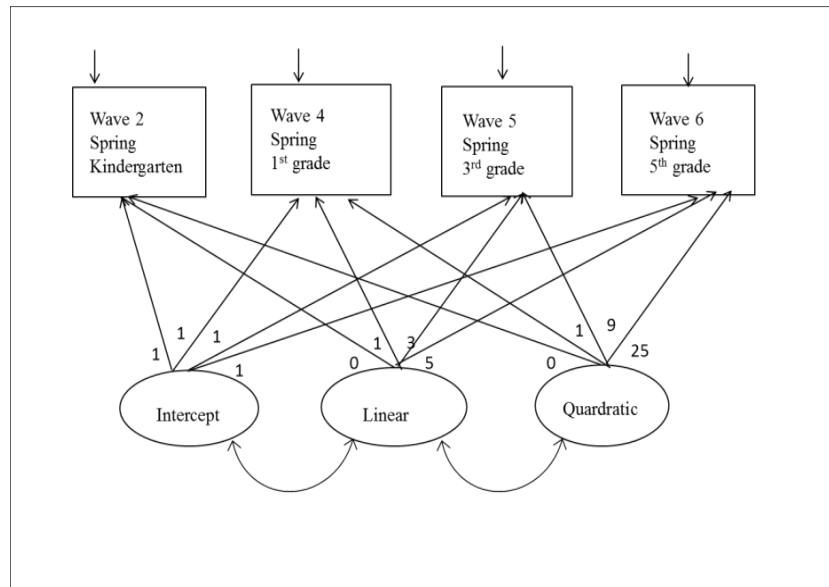
scores across schools; γ_{100} represents the mean initial growth rate across schools. Except the intercept (γ_{000}), all other parameters at level 3 are treated as fixed. u_{00j} equals overall deviation across schools from the outcome score predicted by the model.

For easier interpretation, the three-level formulation can be rewritten as a reduced form with variables of interest and model assumptions.

$$\begin{aligned}
 Y_{tij} = & \beta_0 + \beta_1(\text{grade})_{tij} + \beta_2(\text{grade})_{tij}^2 + \beta_3(\text{Public})_{tij} + \beta_4(\text{Private})_{tij} + \beta_5(\text{Network})_{tij} \\
 & + \beta_6(\text{Public})(\text{grade})_{tij} + \beta_7(\text{Private})(\text{grade})_{tij} + \beta_8(\text{Network})(\text{grade})_{tij} \\
 & + \beta_9(\text{Public})(\text{FamilySES})_{ij} + \beta_{10}(\text{Private})(\text{FamilySES})_{ij} + \beta_{11}(\text{Network})(\text{FamilySES})_{ij} \\
 & + \beta_{12}(\text{FamilySES})_{ij} + \beta_p(\text{Family controls})_{ij} + \beta_q(\text{School controls})_j \\
 & + \zeta_{0j}^{(3)} + \zeta_{0ij}^{(2)} + \zeta_{1ij}^{(2)}(\text{grade})_{tij} + \epsilon_{tij}
 \end{aligned}$$

$$\zeta_{0i}^{(2)}, \zeta_{1i}^{(2)} | X \sim MVN_2 \left[\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} \psi_{11} & \psi_{21} \\ \psi_{12} & \psi_{22} \end{pmatrix} \right], \zeta_{0j}^{(3)} | X \sim N(0, \psi^{(3)}), \epsilon_{tij} | X, \zeta_{0j}^{(3)}, \zeta_{0ij}^{(2)}, \zeta_{1ij}^{(2)} \sim N(0, \theta)$$

Figure 5. Path Diagrams for Estimating Growth Curve Models



School-level Achievement and Climate Model. In order to investigate whether a group of involved parents can raise the school-wide achievement and climate, *school-level models* were estimated using two-level Hierarchical Linear Modeling (HLM). There exist two major differences in school-level models from individual-level models. First, unlike the individual-level models, the unit of analysis is a school, not an individual, and the models have two-levels, time point nested in schools. Second, school-level models were unable to use growth curve modeling because two outcome variables – school achievement and climate – did not change significantly over time. Based on preliminary analysis, this score presented slight differences across waves, but no growth patterns over time. Similarly, school climate scores also displayed

no growth pattern over time. Thus, HLM was used to model the relationships between school-mean PI and two school-level outcomes measured at multiple time points.

In school-level modeling, unit of analysis was a school, not an individual. Thus, after each parent's report on school PI was aggregated to school-level scores, models were built to investigate how time-varying school-mean PI is associated with changes in school achievement and climate during the elementary years. This design results in a two-level HLM with school-mean PI and school outcomes at each wave (K, 1, 3, 5th) nested within schools.

The level 1 model is written as:

$$\text{Level 1: } Y_{tj} = \beta_{0j} + \beta_{1j}(\overline{Public})_{tj} + \beta_{2j}(\overline{Private})_{tj} + \beta_{3j}(\overline{Network})_{tj} + \epsilon_{tj}$$

$$\epsilon_{tj}|X \sim N(0, \theta)$$

Where school achievement in a particular year (t) for a particular school (j) is modeled as a function of a school-specific intercept (β_{0j}), and the time-specific effects of school mean public good PI (β_{1j}), private good PI (β_{2j}), and parent network (β_{3j}); and ϵ_{ij} represents the within-school error term that contributes to the variance unexplained by the covariates. The intercept represents each school's average level of achievement/climate when all three school-mean PI variables equal zero, while the coefficients on the level-1 test whether changes in school-mean PI promote changes in school achievement/climate.

Level 2:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{SchoolPov})_j + \gamma_{0p}(\text{School Controls})_j + \mu_{0j}, \mu_{0j} \sim N(0, \psi)$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11}(\text{SchoolPov})_j$$

$$\beta_{2j} = \gamma_{20} + \gamma_{21}(\text{SchoolPov})_j$$

$$\beta_{3j} = \gamma_{30} + \gamma_{31}(\text{SchoolPov})_j$$

Turning to the between-school level, school characteristics, including school poverty, percentage of minority students, and school size, are included to explain between-school variability in school outcomes at level 2. The first equation is for the school-specific intercept β_{0j} from the Level 1 equation. It is modeled as a function of grand mean outcome scores of the sample (γ_{00}), school poverty (γ_{01}), and other school level covariates (γ_{0p}). μ_{0j} represents the between-school error term in the equation. The subsequent three equations indicate that the within-school parameters – β_{1j} , β_{2j} , and β_{3j} – are treated as fixed effects. γ_{21} , γ_{31} , and γ_{21} indicate the interaction effects between school-mean PI and school poverty.

For easier interpretation, the two-level formulation can be rewritten as a reduced form.

$$Y_{tj} = \beta_0 + \beta_1(\overline{Public})_{tj} + \beta_2(\overline{Private})_{tj} + \beta_3(\overline{Network})_{tj} +$$

$$+ \beta_4(\overline{Public})(\text{SchoolPov})_j + \beta_5(\overline{Private})(\text{SchoolPov})_j + \beta_6(\overline{Network})(\text{SchoolPov})_j$$

$$+ \beta_8(\text{SchoolPov})_j + \beta_p(\text{School Controls})_j + \mu_j + \epsilon_{tj}$$

$$\epsilon_{tj}|X, \sim N(0, \theta) \quad \mu_j \sim N(0, \psi)$$

Results

Descriptive Statistics

Descriptive statistics regarding the sample and outcomes are listed in Table 3. Male comprised 52% of the current sample and 54% of the children were non-Hispanic White. Both public good and private good PI scores reached their peak at third grade and after then slightly decreased at fifth grade, whereas parent network sizes continued to increase over the elementary years. Regarding individual outcome variables math and reading achievement scores improved across elementary school, as did teachers' rating on problem behavior and positive social skills. School administrators' reports on their school-level achievement and climate displayed slight changes across study waves, but not a growth pattern. It is noticeable that there were stark SES differences in the three types of school PI at both the family and school levels. The higher family/school SES was, the more involved parents got in school-related activities. The SES differences were noticeable in outcome measures as well (see Table 4).

Table 5 represents descriptive statistics on how time-varying continuous variables vary at within- and between-level. Among individual-level variables, the three types of school PI variables vary more between individual than within individuals, indicating that parent tend to remain their level of school PI over time. Students' academic scores in math and reading vary more within individuals, whereas students' social scores vary more between individuals. Regarding school-level variables, the three types of school-mean PI vary more between schools rather than within schools over time. School-wide achievement varies more between schools, whereas school climate varies more within schools.

Correlations among study variables at the kindergarten period (base year) are presented in Table 6. Because of the longitudinal nature of the ECLS-K dataset, all possible correlation tables across four waves of data are unable to be presented here. Based on preliminary analyses, the overall magnitude and direction of relationships among variables were consistent across waves. Thus, correlations at the base year alone were used to present an overall sense of the relationships among variables. As evidenced in the table 2, there was a general baseline relationship between the three types of school PI and the outcomes. Notable correlations are (1) the three types of school PI are highly interrelated; (2) school PI variables were highly correlated with family and school SES; (3) among the three types of school PI, private good PI had the strongest association with individual math and reading scores; (4) school-mean public good PI had the strongest association with school-level achievement and climate.

Table 3. Descriptive Statistics for Study Participants

	Kindergarten		1st grade		3rd grade		5th grade	
	M or %	(SD)	M	(SD)	M	(SD)	M	(SD)
Family/School Characteristics								
Male	51.47							
White	54.20							
Black	17.03							
Latino	18.09							
Asian	2.89							
Family SES	-0.08	(0.76)						
% of Non-English at home	12.43							
% of Living at single-parent family	37.65							
% of Free/Reduced Lunch	55.92							
% of Minority students	61.26							
School Enrollment Size	1456.84							
Parent Involvement								
PI for public good	1.43	(1.01)	1.62	(1.02)	1.68	(1.02)	1.63	(1.00)
PI for private good	2.24	(0.87)	2.42	(0.80)	2.56	(0.72)	2.50	(0.75)
Parental Network	2.25	(3.00)	2.71	(3.38)	3.07	(3.87)	3.27	(3.91)
Individual Outcomes								
Math achievement	25.90	(9.09)	61.26	(18.09)	98.72	(24.71)	123.68	(24.79)
Reading achievement	35.21	(10.19)	77.35	(23.87)	126.66	(28.04)	150.09	(26.39)
Problem Behavior	3.17	(0.92)	3.23	(0.93)	3.30	(0.92)	3.26	(0.90)
Positive social skills	6.03	(1.17)	6.28	(1.19)	6.30	(1.20)	6.32	(1.17)
School Outcomes								
School climate	15.79	(2.16)	15.71	(2.13)	16.21	(2.13)	16.26	(2.19)
School Achievement	64.35	(22.71)	64.35	(23.03)	65.79	(22.25)	66.64	(22.29)

Table 4. Descriptive Statistics of Family/School SES and Key Study Variables (5th grade data only)

	FAMILY SES					
	20 th percentile M (SD)	40 th percentile M (SD)	60 th percentile M (SD)	80 th percentile M(SD)	100 th percentile M (SD)	F-value
OUTCOMES						
Math achievement	107.04 (25.35)	118.23 (23.78)	123.67 (22.08)	129.30 (21.35)	138.07 (19.06)	559.86***
Reading achievement	130.29 (25.65)	143.93 (24.54)	150.62 (23.27)	157.21 (21.83)	166.43 (20.10)	713.23***
Problem behavior	3.46 (0.95)	3.37 (0.90)	3.29 (0.93)	3.19 (0.87)	3.07 (0.80)	59.07***
Positive social skills	6.02 (1.22)	6.18 (1.17)	6.29 (1.18)	6.44 (1.12)	6.57 (1.08)	66.25***
PARENT INVOLVEMENT						
Public good PI	1.13 (0.95)	1.41 (0.96)	1.57 (0.98)	1.82 (0.96)	2.03 (0.92)	265.85***
Private good PI	2.03 (0.96)	2.38 (0.77)	2.51 (0.72)	2.66 (0.59)	2.77 (0.50)	311.54***
Parental network	2.00 (3.06)	2.56 (3.34)	3.06 (3.70)	3.86 (4.12)	4.69 (4.41)	142.06***
	SCHOOL POVERTY					
OUTCOMES						
School Climate	15.40 (2.35)	15.92 (2.22)	16.23 (2.15)	16.50 (2.01)	16.82 (1.99)	129.63***
School Achievement	54.08 (23.58)	62.84 (21.44)	65.43 (20.60)	71.41 (19.95)	77.98 (17.62)	258.34***
PARENT INVOLVEMENT						
School-mean public good PI	1.19 (0.51)	1.25 (0.59)	1.45 (0.50)	1.48 (0.50)	1.65 (0.51)	223.00***
School-mean private good PI	2.15 (0.50)	2.15 (0.57)	2.34 (0.48)	2.45 (0.43)	2.59 (0.39)	296.38***
School-meal parental network	2.11 (1.47)	2.13 (1.80)	2.18 (1.49)	2.75 (1.71)	3.23 (1.97)	161.35***

Table 5. Mean and standard deviation of time-varying variables

Individual-level Variables														
	Public PI		Private PI		Network		Reading		Math		Problem		Social	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Overall	1.57	1.02	2.41	0.81	2.75	3.51	93.11	46.31	73.64	38.44	3.23	0.92	6.21	1.19
Between		0.87		0.70		2.74		29.16		24.62		0.80		1.01
Within		0.55		0.47		2.16		38.50		31.40		0.56		0.72

School-level Variables										
	Public PI		Private PI		Parent Network		Achievement		Climate	
	M	SD	M	SD	M	SD	M	SD	M	SD
Overall	1.56	0.57	2.39	0.48	2.71	1.93	65.39	22.20	15.98	2.17
Between		0.64		0.60		1.67		20.35		1.78
Within		0.35		0.31		1.22		12.30		1.47

Table 6. Correlations between Study Variables (N=15,409)

Individual-Level Variables								
Variable	1	2	3	4	5	6	7	8
1. Public Good PI	-							
2. Private Good PI	.37***	-						
3. Parent Network	.34***	.23**	-					
4. Math Achievement	.19**	.22**	.15**	-				
5. Reading Achievement	.22**	.24**	.17**	.72***	-			
6. Problem Behavior	-.10**	-.09*	-.09*	-.24**	-.25*	-		
7. Social Skills	.10**	.09**	.08**	.21**	.24**	-.67*	-	
8. Family SES	.31***	.33***	.24**	.44***	.47***	-.17**	.17**	-

School-Level Variables							
Variable	1	2	3	4	5	6	7
1. School-Mean Public Good PI	-						
2. School-Mean Private Good PI	.41***	-					
3. School-Mean Parent Network	.37***	.35***	-				
4. School Achievement	.25**	.24**	.24**	-			
5. School Climate	.18**	.13**	.16**	.30***	-		
6. School Poverty	-.30***	-.43***	-.31***	-.50***	-.28***	-	
7. % of Minority Students	-.19**	-.31**	-.31***	-.40***	-.23**	.64***	-

Note. Because of longitudinal nature of ECLS-K, this correlation table was made with the base-year sample only.

* $p < .05$ ** $p < .01$ *** $p < .001$

Developing Multilevel Models of Individual Academic and Social Development

Individual growth modeling techniques were used to analyze the longitudinal data. This study utilized three-level growth curve modeling because of the nested data structure -- students with multiple assessments nested within schools. The multilevel model for change allowed me to address simultaneously on the followings; (a) the Level 1 (within-person) question focused on individual change over time in academic/social development, (b) the Level 2 (between-family and within-school) question focused on how these individual changes vary across families, and (c) the Level 3 (between-school) question focused on how these individual changes vary across schools. To develop an appropriate Level 1 model to describe the growth of individual children, we first examined the empirical growth trajectories for all children over time. After exploring a wide range of possibilities, we found that the best fitting Level 1 specification included both linear and quadratic components.

One advantage of the individual growth modeling approach is that it allowed us to examine the effects of time-invariant predictors as well as time-varying predictors. In this study, all family and school-level control variables were used as time-invariant predictors (i.e., family SES, non-English speaking family, school SES, school size). In contrast, as the three types of PI variables took on different values at each measurement occasion, they were treated as time-varying predictors and included in the Level 1 model (within-person model). Thus, potential predictors were grouped into three categories: (a) priority predictors (public good PI, private good PI, and parent network) in Level 1, (b) family-level controls (family SES, parents' marital status, and non-English speaking household measured at the base-year of the study) in Level 2, and (c) school-level controls (school poverty, percentage of minority students in the school, and school enrollment size measured at the base-year of the study) in Level 3.

I fit a series of models investigating the role of school PI variables in promoting children's academic and social development. I began with Model 1 by estimating unconditional growth models, which investigated variability in the intercepts and slopes of the trajectories for the outcomes variables, without any predictor. Model 2 expands on the unconditional growth model by investigating the effects of three types of school PI variables (priority predictors) on academic and social development. Model 3 allows evaluation of these associations, while controlling for the effects of family and school-level factors. In addition, interaction terms between family SES and the three types of school PI variable were included to test the potential moderating effects of family SES on the relationship between school PI and child academic/social development.

Math Achievement Trajectories. Table 7 displays estimates for the fitted multilevel growth models for change obtained in these analyses. To begin with math achievement, the unconditional growth model, labeled Model1 in the table 8, indicated that as expected, a quadratic specification of math achievement as a function of grade best described math development over time. On average, children scored 35.92 at Kindergarten math assessment. Their math achievement trajectories displayed a curvilinear pattern; it tended to increase with grade ($\hat{\beta}_1 = 26.14$, $p < .001$), but at a decelerating rate ($\hat{\beta}_2 = -1.76$, $p < .001$). The variance components for both initial status and rates of change are statistically significant, suggesting that

it is reasonable to explore the effects of family and school-specific predictors on developmental growth. In Model 2, I examined the influences of the three school PI variables on math achievement without any covariate, and in Model 3 with all family and school controls. The models were compared using likelihood ratio tests. For each successive model, the decrease in the deviance statistic was significant at $p < .001$, indicating that Model 3 provided the best fit of all the models.

In Model 3, the main effects of the three school PI variables displays that time-varying public good PI ($\hat{\beta}_3 = 0.34, p < .001$) and parent network ($\hat{\beta}_4 = 0.12, p < .001$) had significant positive associations with contemporaneous values of math achievement, while time-varying private good PI had no association with contemporaneous values of math achievement. Regarding the interaction effects between the three school PI variables and grade, only private-good PI had a significant interaction with grade ($\hat{\beta}_5 = 0.21, p < .001$), indicating that the effect of private good PI on math achievement got stronger as children moved into higher grades.

In an effort to interpret the meaning of these parameters, a graphical representation is used. Due to the time-varying nature of the school PI variables, it is impossible to assign one value of school PI to each parent. Rather, parents would represent different patterns of temporal variation in parent involvement corresponding to alternative patterns of involvement and un-involvement. Parents can take on one of many different patterns of involvement across kindergarten, first, third and fifth grade. For example, some parents could be consistently uninvolved (0-0-0-0 pattern of school PI over time) or involved (3-3-3-3 pattern). Other parents could display gradual increases in their school PI (0-1-2-3 pattern), or decreases (3-2-1-0 pattern). As a result, time-varying school PI variables include information about individual parents' PI status at each measurement occasion, which leads to them have a time subscript in equations (e.g., *public PI_{ij}*).

The time-varying nature of school PI makes it extremely challenging to visually represent its effect on math trajectories. For easier representation, I chose to present just four continuous trajectories (0-0-0-0 vs. 1-1-1-1 vs. 2-2-2-2 vs. 3-3-3-3 patterns), rather than considering all possible patterns reflecting the wide variety of time-related transition for school PI, and contrast two extreme cases. One group of parents ('high' or a 3-3-3-3 pattern group) is ones who consistently participated in all kinds of school activities over elementary years. The other group of parent ('low' or a 0-0-0-0 pattern group) is one who consistently did not participated in any of school activities over elementary years. Displaying only two trajectories has advantages of reducing clusters and highlighting the most extreme contrasts possible. Furthermore, this decision sounds logical, considering that descriptive analysis indicates that within-parent variability in school PI variables was lower than between-parent variability. So we may assume that there exist many parents who tend to participate in their children's school activities in a consistent manner over time. Further descriptive statistics show that 24% (for public good PI) and 71% (for private good) of parents fall into the 'high' group, while 23% (for public good PI) and 8 % (for private good) of parents fall into the 'low' group.

Figure 6 displays the results of fitted multilevel models for the mean math trajectory that include a time-varying influence of public good PI; the top trajectory labeled as "high" describes

a math trajectory of children whose parents are consistently involved with all public good activities (a 3-3-3-3 pattern group); the bottom trajectory, labeled as “low” describes a math trajectory of children whose parents are consistently uninvolved (a 0-0-0-0 pattern group). Because the model includes only the main effect of public good PI, the two fitted trajectories are constrained to be parallel and the gap between trajectories will be identical, at $\hat{\beta}_3$ ($=0.34, p<.001$), the parameter associated with public good PI. As a result, children whose parents were consistently involved in all types of public good activities (e.g., PTA, volunteering, fundraising) tended to achieve higher math scores at each assessment point (K, 1st, 3rd, 5th) than children whose parents were consistently uninvolved.

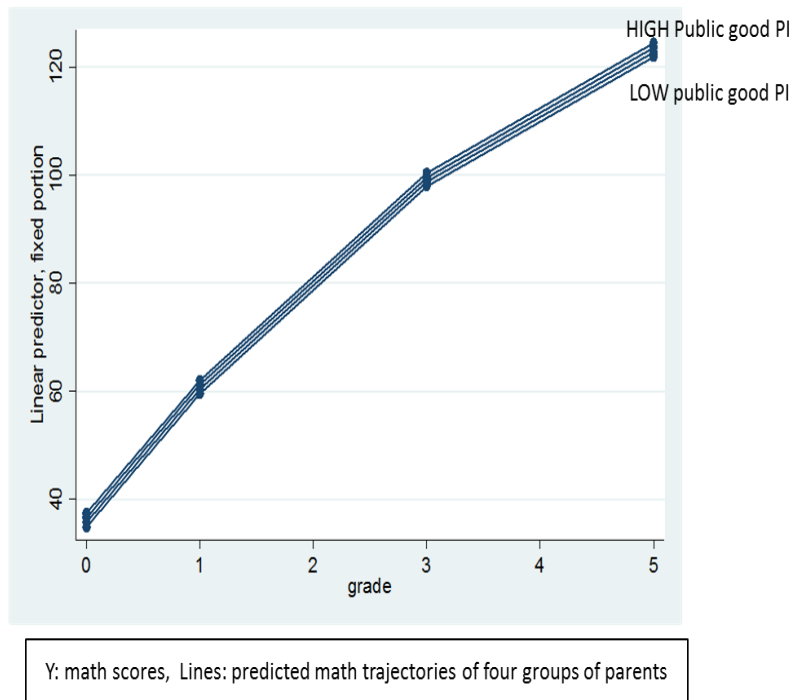


Figure 6. Effect of time-varying public good PI on growth in child math achievement from kindergarten to 5th grade. High Private good PI = estimated outcome scores of parents who consistently participated in all kinds of private good activities. Low Private Good PI = estimated outcome scores of parents who consistently participated in none of private good activities.

The influence of parent network can be explained in a similar way. As the time-varying parent network had only a significant main effect on math achievement, trajectories between groups are parallel and the gap between trajectories will be identical, at $\hat{\beta}_5$ ($=0.12, p<.001$), the parameter associated with public network. Thus when parents actively formed social networks with other parents in schools, their children tended to report higher math achievement at each assessment.

Figure 7 displays the results of fitted multilevel models for the mean math trajectory that includes a time-varying influence of private good PI. Because of the significant interaction effect between private good PI and grade on the math trajectory, the two fitted trajectories are not parallel anymore. In contrast, the influence of private good PI got stronger in later grades. Figure 8 intuitively presents this finding; there was no difference in math scores between high- and low-private good PI groups until children were in first grade. But, after the first grade, achievement gaps between groups started to grow, and at the end of the elementary years, children whose parents were consistently involved in private good-related activities ('high' group) reported higher reading scores than children whose parents were consistently uninvolved ('low' group). Although these trajectories were drawn setting all other control variables to 0 which is not realistic, they are helpful to get a sense of the meaning of each coefficient intuitively.

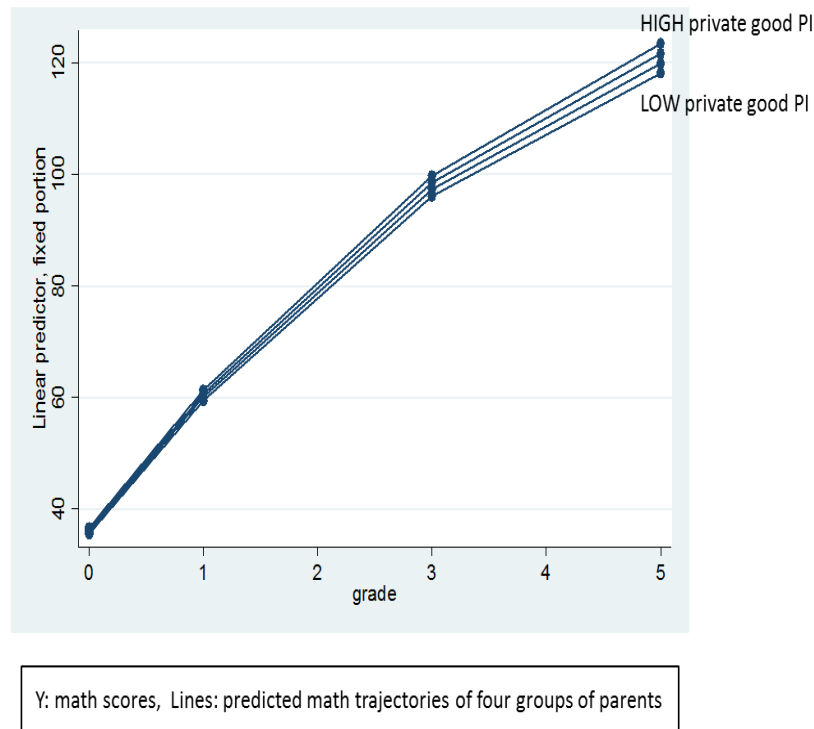


Figure 7. Effect of time-varying private good PI on growth in child math achievement from kindergarten to 5th grade. High Private good PI = estimated outcome scores of parents who consistently participated in all kinds of private good activities. Low Private Good PI = estimated outcome scores of parents who consistently participated in none of private good activities.

Regarding interaction effects between school PI variables and family SES, public good PI ($\hat{\beta}_9 = 0.27, p < .001$) and private good PI ($\hat{\beta}_{10} = 0.41, p < .001$) displayed significant, positive interactions with family SES. This result indicates that the academic benefits school PI bring to children vary according to family SES, and children from high SES families benefit more from their parents' public good and private good PI than do children from low SES families.

These few trajectories presented in Figure 7 and 8 are not the only ones implied by the model, but mean trajectories for specific covariate values. Person specific residuals suggest the existence of many other discontinuous trajectories, each with its own intercept and slope. Level 1 variance components represent unexplained variation in within-individual scores. Level 2 variance components quantify the amount of unpredicted variation in the individual growth parameters of initial status (intercept) and rate of change (slope). Level 3 variance components indicate unpredicted variation in school-level initial status. The variance components of the unconditional growth model can be used as benchmarks to compare successive models. As seen in Table 8, Models 2 and 3 lead to successive reductions in all variance components when compared with the unconditional growth model. Specially, in Model 2, after adding three types of school PI variables and their interaction with grade (in Model2), variances at Level 1 (within-person) and Level 2 (between-person) were substantially reduced. In Model 3, the inclusion of school-level controls reduced Level 3 (between-school) variances. Significant and positive correlation between intercepts and slopes ($r = .73$) suggested that children with initially higher math scores relative to their peers increased these scores more rapidly over time.

Reading Achievement Trajectories. Table 7 also displays estimates of fitted multilevel growth models for reading trajectories obtained in these analyses. As for the math trajectories, the reading trajectories were curved. On average, children's reading achievement at kindergarten was 44.50. The reading scores tended to increase with grade ($\hat{\beta}_1 = 35.06$, $p < .001$), but at a decelerating rate ($\hat{\beta}_2 = -2.97$, $p < .001$). Comparisons between successive models revealed a significant change in the deviance statistics at $p < .001$, indicating that Model 3 provided the best fit of all the models.

Model 3 shows that time-varying private good PI had a significant, but negative, association with contemporaneous reading scores ($\hat{\beta}_4 = -0.51$, $p < .001$), and a positive association with reading growth ($\hat{\beta}_7 = 0.40$, $p < .001$). This result indicates that children of parents who highly involved in private good activities tended to score lower in reading at each assessment. However, as the influence of private good PI on reading scores got stronger at later grades, children of highly involved parents could catch up and finally surpass their peers at the end of elementary years. Figure 9 illustrates this long-term relationship between private good PI and reading achievement.

No interaction between the three school PIs and family SES was significant. Variance components in the reading achievement models display similar patterns that we found in math model. One notable difference is that correlation between intercepts and slopes was positive, but the strength of the relationship was smaller ($r = .43$) in reading than in math ($r = .73$), suggesting that long-term changes in reading achievement is more malleable than those in math.

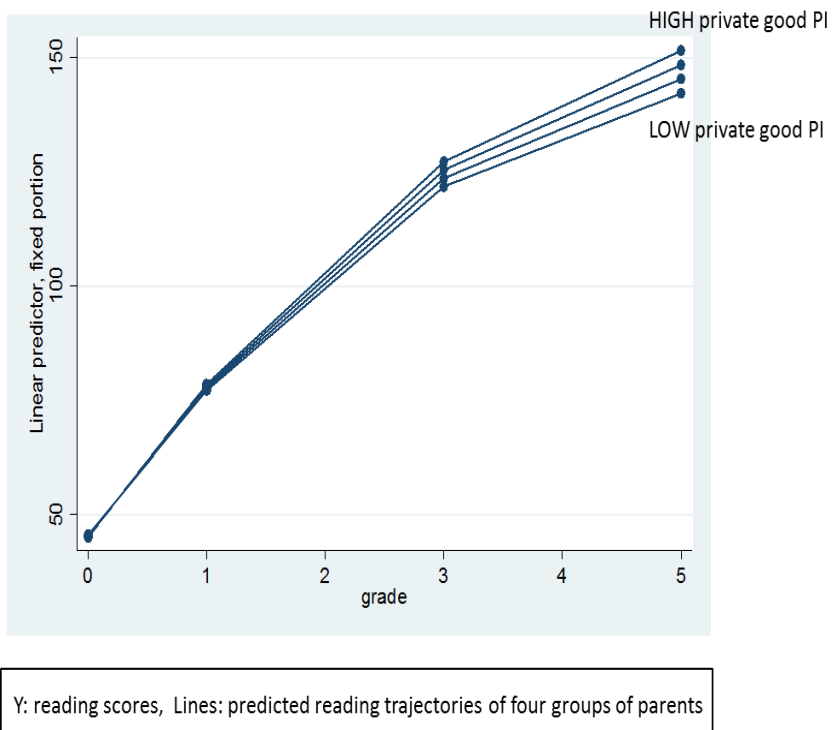


Figure 8. Effect of time-varying private good PI on growth in child reading achievement from kindergarten to 5th grade. High Private good PI = estimated outcome scores of parents who consistently participated in all kinds of private good activities. Low Private Good PI = estimated outcome scores of parents who consistently participated in none of private good activities.

Problem Behavior Trajectories. This part of analysis examined the impact of the three types of school PI on teacher’s assessments of two social development indicators – problem behaviors and positive social skills. The steps of model building in social development were identical with those in academic development; I began with an unconditional growth model, expanded it by including the main effects of the three types of school PI variables, and interactions between the three school PI variables and grade. Lastly, interactions between the three school PI variables and family SES, and family-and school-level characteristics were added as control variables.

Table 8 displays estimates of fitted multilevel growth models for change obtained in these analyses. Mean problem behavior trajectories were curved. Children’s problem behavior tended to increase with grade ($\hat{\beta}_1 = 0.10, p < .001$), but at a decelerating rate ($\hat{\beta}_2 = -0.02, p < .001$). This growth was statistically significant, but not large, compared with academic growth because of the nature of social skills scales. The fit of each model presented in Table 9 was evaluated with the goodness-of-fit index. For each successive model, the decrease in the deviance statistic was significant at $p < .001$, indicating that Model 3 provided the best fit of all the models.

Regarding the main effects of the three school PI variables, in Model 3 time-varying public good PI ($\hat{\beta}_3 = -0.03, p < .001$), private good PI ($\hat{\beta}_4 = -0.01, p < .001$) and parent

network ($\hat{\beta}_5 = -0.01, p < .001$) had significantly negative effects on children’s contemporaneous problem behavior. It suggests that parents’ participation in various activities in school sites could play a protective role preventing children engaging in problem behaviors. No interactions between the three school PI variables and grade were significant, indicating that the protective influence of the three school PI variables on student problem behavior did not change over time. In addition, none of interaction terms between the three types school PI variables and family SES was significant, suggesting that the benefits of school PI for social development were equally important for all SES groups.

Figure 9 displays the mean trajectories implicated by the fitted multilevel models for the problem behavior that shows the effect of public good PI. As the three types of school PI had similar patterns of influence on problem behavior, instead of presenting all three graphs, I chose to present the most significant relationship—the influence of public good PI on problem behavior. Children of parents who were consistently involved in all public good activities reported less problem behavior across kindergarten, 1st, 3rd, and 5th grade than children of parents who were consistently uninvolved. Due to no interaction with grade, the gap between groups ($\hat{\beta}_3 = -0.03$) remained the same over time.

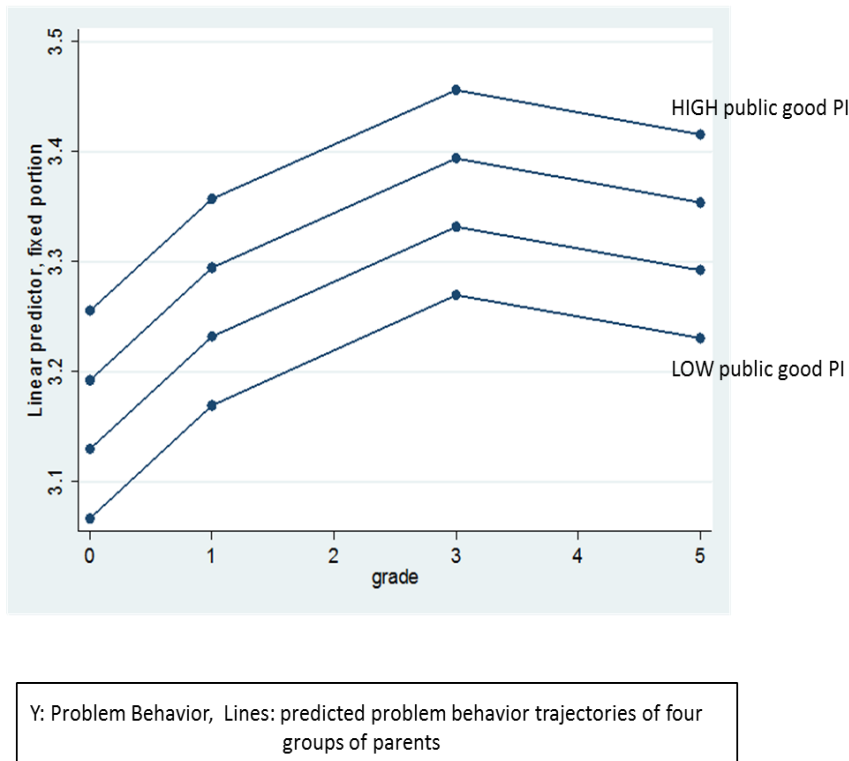


Figure 9. Effect of time-varying public good PI on growth in child problem behavior from kindergarten to 5th grade. High Private good PI = estimated outcome scores of parents who consistently participated in all kinds of private good activities. Low Private Good PI = estimated outcome scores of parents who consistently participated in none of private good activities.

Regarding the random effects part, the variances in the sequential models decreased gradually after adding variables. Variance components of problem behavior models represented two different patterns from those of academic models. First, the covariance between intercept and slope variance was negative ($r = -0.24$), suggesting that children who reported higher level of problem behaviors at kindergarten relative to their peers tend to display lower rates of growth in problem behaviors over time. Second, in the behavior models, the Level 1 intercept variances were larger than Level 2 intercept variances, indicating that more variability in problem behaviors was explained by between-person differences.

Social Skills Trajectories. Table 8 displays estimates of fitted multilevel growth models for change obtained in these analyses. The mean developmental trajectory of positive social skills was curvilinear in shape, as the slope terms in Model 1 suggest (for grade, $\hat{\beta}_1 = 0.14$, $p < .001$; for grade², $\hat{\beta}_2 = -0.02$, $p < .001$). It increased over time, but at a decelerated rate. Based on significant decreases in the deviance statistic ($p < .001$), Model 3 is the best fitting model.

Overall, the social skill model displayed similar results that we saw in the problem behavior model, except the direction of relationships. Model 3 shows that all three school PI variables had significantly positive associations with time-specific values of positive social skills (for public good PI, $\hat{\beta}_3 = 0.05$, $p < .001$; for private good PI, $\hat{\beta}_4 = 0.04$, $p < .001$; for parental network, $\hat{\beta}_5 = 0.01$, $p < .001$). However, none of school PI variables interacted with the time variable (grade), indicating the positive influences of school PI on social skills stayed the same over time. In addition, no interaction term between the three types of school PI variables and family SES was significant.

Developing Multilevel Models of School Achievement and Climate

The second section presents a series of models that examine the effects of school-mean PI on two school-level outcomes. Given that school-level achievement and climate displayed no growth pattern over time, two-level Hierarchical Linear Modeling (HLM) was utilized to accommodate the nested data structure (i.e., multiple reports nested within each school). Potential predictors were grouped into two categories: (a) priority predictors (school-mean public good PI, school-mean private good PI, and school-mean parent network), and (b) school-level controls (school poverty, percentage of minority students in the school, and school enrollment size). The analysis began with a null model (Model 1). Model 2 expanded the null model to evaluate the relations of the three school-mean PIs to school-level achievement and climate. Model 3 tested the relations, net of the effects of school-level controls. In addition, interactions between three school-mean PIs and school poverty were included in the final model.

School Achievement Model. Table 9 displays estimates of fitted multilevel models for school-wide achievement. In Model 1, school administrators, on average, reported that 61.78 percent of students in their schools met the national math/reading standard. Significant within- and between-school variations exist in the mean school achievement, which justify the necessity of using HLM analysis. The intraclass correlation was 0.71, indicating that 71 percent of the total variation in school-wide achievement was between schools. Based on model-fit statistics (deviances), Model 3 is the best fitting model.

In the Model 3, the two types of school-mean PI had positive associations with school-wide achievement (for school-mean public good PI, $\hat{\beta}_1 = 0.61, p < .05$; for parent network, $\hat{\beta}_3 = 0.81, p < .001$). School-mean private good PI had a significant association with school achievement in Model 3, but after adding school controls, it lost its significance. Instead, there was a positive interaction between school-mean private good PI and school poverty ($\hat{\beta}_5 = 0.03, p < .01$), indicating the effects of school-mean private good PI on school achievement were stronger for school with high concentration of poverty. It is noticeable that the intercept in the Model 3 reached unexpectedly high numbers. This is because in Model 3, which included all school-level controls, the intercept represents the average school-wide percentage of students meeting national standards when all other controls equal zero. In this study, zero value of school poverty and percentage of minority mean that the school is socio-economically advantaged (0% of students eligible for free or reduced lunch and 0% of minority students in a school). Thus the school achievement intercept in Model 3 was 75.32, a score much higher than the population average in Model 1 (61.78). Regarding random effects, adding study variables reduced Level 1 (within-school) and 2 (between-school) variances. Specially, inclusion of school-level controls substantially reduced Level 2 variances.

School Climate Model. Table 10 displays estimates of fitted multilevel models for school climate. In Model 1, school administrators, on average, rated their school climate 15.83 out of 20 in the scale. Significant within- and between-school variations exist in the mean school climate, which justify the necessity of using HLM analysis. The intraclass correlation was 0.55, indicating that 55 percent of the total variation in school climate was between schools. In other words, each school not only experienced changing levels of climate from year to year, but also displayed a distinctive school climate compared with other schools. Based on model-fit statistics (comparison of deviances), Model 3 is the best fitting model.

In model 3, the best-fitting model, all three types of school-mean PI were positively associated with school climate (for school-mean public good PI $\hat{\beta}_1 = 0.12, p < .001$; for school-mean private good PI $\hat{\beta}_2 = 0.21, p < .01$; for school-mean parent network $\hat{\beta}_3 = 0.12, p < .001$). Two interaction terms were statistically significant; one is the interaction between school-mean public good PI and school poverty ($\hat{\beta}_4 = -0.01, p < .01$); the other between school-mean parent network and school poverty ($\hat{\beta}_6 = 0.01, p < .01$), indicating that the influence of school-mean public good PI on school climate was stronger for school with low concentration of poverty, while that of school-mean parent network was favorable for schools with high concentration of poverty.

Table 7. Fitted Multilevel Models for Changes in Child Math and Reading Achievement

	Math			Reading		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Fixed Effects						
Intercept	35.92***	34.90***	37.58***	44.50***	44.92***	48.36***
Grade	26.14***	25.54***	26.06***	35.06***	34.25***	34.59***
Grade ²	-1.76***	-1.81***	-1.82***	-2.97***	-3.02***	-2.97***
Public Good PI		0.62***	0.34***		0.47***	0.17
Public Good PI × Grade		0.03	-0.04		0.21***	0.08
Public Good PI × FamilySES			0.27**			0.20
Private Good PI		0.13	0.04		-0.25**	-0.51***
Private Good PI × Grade		0.29***	0.21***		0.54***	0.40***
Private Good PI × FamilySES			0.41***			0.26
Parent Network		0.11***	0.12***		0.05	0.06
Parent Network × Grade		0.01	0.01		0.03**	0.01
Parent Network × FamilySES			-0.02			0.01
Family SES			3.67***			5.16***
Single Parent Family			-1.65***			-2.50***
Non-English at Home			-2.90***			-3.39***
School Poverty			-0.02***			-0.05***
Percentage of Minority			-0.77***			-0.08
School Size			0.45**			0.40
Random Effects (SD)						
Level 1	10.81***	8.59***	8.55***	13.35***	11.43***	11.23***
Level 2 Intercept	13.69***	9.67***	9.24***	15.50***	12.33***	11.73***
Level 2 Slope of Grade		3.24***	3.04***		3.82***	3.23***
Level 2 Correlation		.73***	.73***		0.47***	.47***
Level 3	7.93***	5.91***	3.48***	9.74***	9.19***	4.38***
Model fit statistics						
2 log-likelihood	-237301.8	-212916.7	-131724.4	-243785.7	-218909.8	-136660.3

Note. Model 1 is an unconditional growth model. Model 2 adds the main effect of three types of school PI as well as school PI×grade interaction effects. Model 3 added family and school-level covariates. * $p < .05$ ** $p < .01$ *** $p < .001$

Table 8. Fitted Multilevel Models for Changes in Child Problem Behavior and Social Skills

	Problem Behaviors			Social Skills		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Fixed Effects						
Intercept	3.18***	3.31***	3.18***	6.05***	5.80***	6.00***
Grade	0.10***	0.13***	0.16***	0.14***	0.12***	34.59***
Grade ²	-0.02***	-0.01***	-0.02***	-0.02***	-0.01***	-2.97***
Public good PI		-0.05***	-0.03***		0.07***	0.05***
Public good PI × Grade		-0.00	-0.00		0.00	0.00
Public good PI × FamilySES			0.27			0.00
Private good PI		-0.02**	-0.01**		0.05***	0.04***
Private good PI × Grade		-0.00	-0.00		0.00	0.00
Private good PI × FamilySES			0.00			0.00
Parent network		-0.01***	-0.01***		0.01***	0.01***
Parent network × Grade		0.01	-0.00		-0.01***	0.01
Parent network × FamilySES			-0.01			0.00
Family SES			-0.09***			0.11***
Single Parent Family			0.29***			-0.31***
Non-English at Home			-0.17***			0.09***
School Poverty			0.01**			-0.01**
Percentage of Minority			-0.01			-0.01
School Size			-0.02**			0.03*
Random Effects (SD)						
Level 1	0.70***	0.68***	0.68***	0.91***	0.89***	0.88***
Level 2 Intercept	0.56***	0.56***	0.55***	0.70***	0.69***	0.69***
Slope of Grade		0.07***	0.07***		0.09***	0.09***
Correlation		-0.23***	-0.24***		-0.19***	-0.21***
Level3	0.21***	0.20***	0.13***	0.30***	0.26***	0.19***
Model fit statistics						
2 log-likelihood	-64795.8	-58066.7	-37322.4	-76541.7	-68655.8	-44140.3

Note. Model 1 is an unconditional growth model. Model 2 adds the main effect of three types of school PI as well as school PI×grade interaction effects. Model 3 added family and school-level covariates. **p* < .05 ***p* < .01 ****p* < .001

Table 9. Fitted Multilevel Models for School Academics and Climate

	School Academics			School Climate		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Fixed Effects						
Intercept	61.78***	56.28***	75.32***	15.83***	15.11***	16.71***
Public good PI		0.88***	0.61*		0.12***	0.12**
Public good PI × Sch_poverty			0.00			-0.01**
Private good PI		1.30***	0.41		0.13***	0.11*
Private good PI × Sch_poverty			0.03**			0.00
Parent network		0.56***	0.81***		0.08***	0.12***
Parent network × Sch_poverty			0.00			0.01**
School Poverty			-0.27***			-0.11***
Percentage of Minority			-3.25***			-0.14***
School Size			0.30			-0.35***
Random Effects (SD)						
Level 1	12.31***	12.16***	12.16***	1.48***	1.46***	1.46***
Level 2	19.36***	18.96***	14.58***	1.67***	1.66***	1.47***
Model fit statistics						
-2 log-likelihood	-144843.8	-143045.7	-104308.4	-77803.7	-76709.8	-56799.3

Note. Model 1 is an unconditional growth model. Model 2 adds the main effect of three types of school-mean PI. Model 3 added school-mean PI×school poverty interaction effects and school-level covariates. * $p < .05$ ** $p < .01$ *** $p < .001$

Discussion

Parental school-based involvement (school PI) has been widely embedded in federal law and policy as a main target for school reform and educational equality. The importance of school PI is emphasized at all ages, specially the elementary years. However, previous scholarship hasn't reached the consensus about the effectiveness of parent involvement in school-sponsored activities, such as participating in PTA meeting, attending a school/class event, and volunteering at school. Specially, recent longitudinal studies found that school PI had a negligible or no association with their children's academic achievement, net of previous achievement (Domina, 2005; El Nokali et al., 2010). Considering that federal, state-level education policy has put huge efforts and resources to promote parents' active school participation, there is an imperative need to investigate whether school PI is truly beneficial to child development. Furthermore, prior researchers revealed that the influence of PI on student achievement varies by social class (Desimone, 1999). Some have questioned the way existing school PI practices reinforce inequality and disadvantage for poor parents.

The current study aims to examine the effectiveness of school PI by unpacking its concept, benefits, and implications, specially, for socioeconomically disadvantaged students. Using the ECLS-K dataset, I examined the relative impact of three types of school PI – involvement directed at their own child (private good PI), involvement to improve the school as a whole (public good PI), and involvement in parent networks (parent network). As educational outcomes, this study examined a broader array of academic and social behavioral outcomes. In addition, because of the dearth of research findings on the effects of school PI on the school-level outcomes, I examined whether whole schools benefit when a greater percentage of parents are involved in school events. And finally, I investigated whether family and school SES moderate the effects of three types of school PI on educational outcomes. Unlike the previous literature's reliance on cross-sectional designs, this study aimed to meet the high demand for longitudinal studies to examine the dynamic relationships of school PI to child development and school improvement over time. By addressing these issues, the current analyses conducted fills important gaps in our understanding of school PI and its efficacy.

The key finding is that school PI brought diverse benefits for educational outcomes, but the payoff of school PI varies considerably by child's grade, types of school PI, outcomes of interest, and family/school SES. With regard to academic development, children whose parents got highly involved in private good PI (i.e., parent-teacher conference, back-to-school night and school events) reported rapid growth rates in math and reading achievement so that they significantly outperformed their peers at the end of elementary years. Children whose parents actively participated in public good activities (i.e., volunteering, PTA membership, and fundraising) and formed social networks with other parents reported higher math, but not reading, achievement at each grade, but no growth pattern over time.

With regard to social development, children whose parents reported high levels of involvement in all three types of school PI (private good PI, public good PI, and parent network) were rated socially better-adjusted and well-behaved by their teachers at each grade, compared with their peers. This gap tended to remain same over the elementary years.

Regarding school-level benefits, schools where a large numbers of parents were involved in three types of school PI were likely to report higher school-level achievement and more supportive school climate than their counterparts. Among three types of school PI, school-mean parent network had the strongest association with both school-level outcomes.

What is notable is that the positive relations of school PI to educational outcomes were moderated by family and school SES. Students' from high SES families obtained more benefits from their parents' participation in public good and private good PI activities than did students from low SES families. Similarly, high-SES schools were more likely to improve their school climate when high percentage of parents in schools was engaged with public good PI activities. However, school-mean private good PI and network worked more favorably for low-SES schools.

In the following sections, I will discuss and interpret more specific findings of the current study and attempt to situate them in the extant literature. In addition, I will also discuss the limitations and contributions of the study and implications for policy makers and practitioners.

RQ1. The Relation of Parent School-based Involvement to Academic Achievement: Is It Effective or Not?

My first research question was to ask to what extent three types of school PI (public good PI, private good PI, and parent network) were related to children's math and reading scores across kindergarten, first, third and fifth grade. Overall, parents' greater involvement in a variety of school-based activities was largely effective to promote child academic achievement. Specifically, as expected from the theoretical review, involvement geared toward their own children (private good PI) appeared to be the most effective to raise academic achievement among three types of school PI. And the influence of private good PI on math and reading achievement turned out to get stronger as children moved into higher grades. With regard to academic subjects, three types of school PI displayed more influences on math, rather than reading achievement.

To begin with math achievement, children having parents who were actively involved in public good PI and formed networks with other parents reported higher math skills at each grade. On the other hand, children having parents who were actively involved in private good PI achieved similar level of math scores with children having parents who are less involved at the kindergarten assessment. However, as they moved up grades, children of parents actively engaged in private good PI surpassed their counterparts and achieved higher reading scores at the end of elementary schools.

In contrast, for reading achievement, only private good involvement displayed significant relations with initial status and growth. Regarding the magnitude and direction of relationships, children whose parents were highly involved in private good PI started with lower level of reading skills at kindergarten, but caught up their peers soon and eventually achieved higher reading scores at the end of elementary years.

This finding raises several critical points in parent involvement research. First, it highlights the benefit of using longitudinal analyses in parent involvement research. The results analyzing multiple reports from an individual show us that the relation between parent involvement and academic achievement varies as a function of the child's grade. Specially, this study found out that the influence of private good PI gets more critical in raising reading achievement as children get older. However, if a researcher analyzes same data only with kindergarten samples, he or she would find negative association between private good PI and reading achievement. Conversely, if she chooses only 5th grade sample to analyze, she might detect positive association between private good PI and reading achievement. By adopting longitudinal data with more than two waves and appropriate analytic skills, the current study was able to find the changing within-family effects of school PI on child academic development over time.

Then, the question arises: why the school PI-academic relation becomes stronger in their elementary grades? Potential answers to the question lie in theoretical frameworks to explaining parent involvement. Based on the skill development model (Epstein, 1987), school PI works as a mechanism to enhance parents' skills to help their children's learning. As children move into higher grades, parents' need more knowledge on curriculum and skills to support their children's learning at school. When parents' participate in parent-teacher conference or open house, they are able to have more opportunities to acquire these skills. In addition, the proponents of motivational model (Grolnick & Slowiaczek, 1994) argue that parents' participation in schools play a role in motivating their children to learn. Given that prior research found that students' motivation starts to decrease sharply from 5th grade (Wigfield et al., 2006), the importance of school as a motivation booster gets critical at this age. Most importantly, private good PI had cumulative effects on math and reading scores over elementary years. Social capital theory suggest that the impact of social capital on youth is thought to be cumulative (Parcel & Menaghan, 1994; Wright et al., 2001). Indeed, simply going to PTA meeting or participating in school events may not be enough to ensure school achievement at initial schooling. However the accumulation of information on schooling/curriculum and strong, trustful relationships with teachers built through parents' active school participation may result in gradual increases in their children's academic benefits in the long run.

The second noticeable finding of this study is that school PI exerted a greater influence on math achievement, rather than reading. Three types of school PI were positively associated with the time-specific performance and growth in math achievement but not those in reading achievement. Reading achievement were only associated with private good PI. As a potential reason of the stronger influence of school PI on math, parents' varying ability to scaffold their children's math learning at home might play a role. For example, a study of parent-child interactions with elementary math homework found that significant variation in the ability of mothers to help their children's math (Hyde et al., 2006). Some parents were excellent math teachers and others displayed deficiencies in their basic math concepts, so that children face inequities in the parental resources available to them for math learning. The researchers argued that family-school partnership may be one way that these inequalities in children's math experiences can be addressed. The significant association between school PI and math this study found supports Hyde's argument. When parents participate in volunteering, parent-teacher conference, or back-to-school night, they can have opportunities to acquire valuable resources

and skills to scaffold their children's math learning. Thus children of parents actively involved in school activities can get more advantages in their math learning than their counterparts.

One puzzling result of this study is the negative relations of private good PI to reading scores. As a potential explanation of this, prior research tends to rely on 'reactive hypothesis' (McNeal, 2012). That is, when children are experiencing difficulties in school, their parents are more likely to schedule meetings with teachers and to become involved. In contrast, when children are succeeding in school, their parents tend to relax their involvement in school. It seems sensible to use 'reactive hypothesis' to explain the current finding of negative relation between '*private good PI*' and '*reading scores in early grades*' in two regards. First, the reactive involvement is particularly relevant to the forms of "private good PI" which includes parent's attendance to parent-teacher conference and speaking to a teacher or counselor. Furthermore, parents tend to use more reactive involvement for reading, rather than math, during early elementary years. According to classroom observation studies (e.g., Pianta, Belsky, Houts, Morrison, & the NICHD ECCRN, 2007), curriculum and instruction heavily targets reading and literacy skills in early grades and teachers attempt to elicit more parental involvement among parents of struggling readers in those elementary years. Due to this substantive focus on reading in kindergarten and first grade instruction, parents may tend to become more involved when their children are struggling in reading. Some previous research found the same negative association between parents' contact with school and reading achievement in elementary years (Desimone, 1999; El Nokali, et al., 2010; Fan, 2001).

Even though this study found significant associations between school PI and academic development, the magnitude of significance was lower than expected. Moreover, depending on types of school PI and subjects, no association was also detected (e.g., no association between public good PI and reading scores). This finding appears somewhat opposite to long-held public beliefs on the benefit of school PI. However, it should be noted that this study solely focused on parental involvement in '*school-based activities*.' Based on recent meta-analyses (Jeynes, 2005; 2007), school PI has been found to be a less effective to enhance academic achievement than other forms of involvement. Specifically, Jeynes (2005) found that parental expectations and aspirations are the most effective forms of parent involvement ($d = .58$), and the next is parental shared reading ($d = .43$). In contrast, most of school-based involvement indicators represent lower association with academics (i.e., for PTA membership, $d = .21$). Thus, the weak or null association between school PI and academics found in this study should not be over-interpreted as all types of parent involvement is fruitless to enhance child academic achievement.

In addition, outcome measures used in this study may also be responsible for the lack or weak associations found in this study. According to previous research, the effect of parent involvement is more sensitive to teacher-evaluated scales (i.e., GPA) than standardized test scores. For example, Fan & Chen (2001) examined 25 studies of parent involvement and found that average correlations between parent involvement and children's grades (GPA) tended to be moderate in size ($r = .39$), but correlations between involvement and standardized test scores were much lower ($r = .20$). Given that the current study used standardized scores to measure academic performance, the relations between these two factors may turn out to be weak or null.

RQ2. The Relation of Parent School-based Involvement to Social Development: A New Rationale to Encourage It

The second research question of this study was to examine to what extent three types of school PI (public good PI, private good PI, and parent network) were related to children's social development across kindergarten, first, third and fifth grade. As measures of social development, this study used two indicators -- problem behaviors (i.e., externalizing and internalizing problems) and positive social skills (i.e., self-control and interpersonal skills). The addition of social development measures would be beneficial to think about multiple dimensions of child development that school PI might influence. Moreover, these two social scales were assessed by each child's teachers. By using multiple data sources for assessing study variables, the results of this study would avoid errors from common variance shared by same reporters, and increase our confidence in the findings about the possible contributions of school PI variables.

Strong associations were detected between three types of school PI and two indicators of social development at each grade. Children benefited from all three types of school PI in their social development. This strong relation of school PI to social outcomes represents that positive social development is another benefit that family-school partnership can bring. Influenced by Epstein's typology of parental involvement, researchers tended to consider multiple dimensions of parents' activities as examples of parental involvement. By contrast, analyses of the implication of parent involvement have been narrowly focused on children's cognitive and academic achievement. This study addresses this deficit through a study of the influence of school PI on child social development.

Because of the dearth of research on this issue, the mechanism by which school PI is conducive to promote child social development is less developed as well. Based on social capital theory, three benefits from social capital – social control, social expectation, and insider information – can work as mechanisms for creating behavioral benefits (Coleman, 1988; Portes, 2002). First, when parents attend PTA meetings, or volunteer in school, they develop close relationships with their children's teachers and the parents of their children's classmates which facilitate to monitor children's behavior as a social control. Second, actively involved parents may be more likely to communicate with school personnel about appropriate behaviors in class. It makes parents become more informed about rules and behavioral expectations from schools and subsequently reinforce more positive behaviors at home. In addition, parental involvement gives parents an access to insider information. When children have problems at school, involved parents learn about these problems earlier and figure out more about available and effective solutions.

Another possible explanation to the link between school PI and positive social behavior pertains to the beneficial effect of positive teacher-child relationships that school PI might engender. Previous research suggests that positive teacher-child relationships are proximal phenomena that predict low level of internalizing and externalizing behaviors (O'Connor et al., 2011), and promote social skills in elementary schools (Valeski & Stipek, 2001). Then, as a catalyst to the positive teacher-child relationships, parent's active participation in school activities has been known to have a great potential. There is an evidence that children having parents who are more involved in their schools tend to have better relationships with their

teachers than children having parents who are less involved (Izzo et al., 1999). Using a longitudinal analysis, Dearing and his colleagues (2008) confirmed the pathways among school PI, teacher-child relationship, and prosocial behaviors; increases in school PI are related with improvements in teacher-child relationships, and, in turn, these improvements in teacher-child relationships predicted improvements in children's attitudes toward school.

In contrast, some scholars argued that the relationship between school PI and prosocial behavior may be an artifact of how the social behavior was assessed, regardless of the real behaviors. Because the measure of two social scales was based on teacher's reports, they may reflect teachers' perceptions of the focal children's behavior rather than actual behavior displayed. Rimm-Kaufman & Pianta (1999) found that teachers tend to view highly involved parents as being more educationally supportive of children. This tendency may lead teachers to rate the social behaviors of children of involvement parents more positively than children of minimally involved parents. Thus, the current study might not be free from a potential bias that results from using teachers' perceptions to assess children's social skills. However I believe that the advantages of having independent measures of teacher's report of children's social behavior outweigh the potential bias.

The finding of strong association between school PI and social development during elementary years holds critical importance in PI research. First, this study shows that parents' involvement in school activities can play a protective role in child social development. Majority of previous research on parenting and social development has focused on the role of parent-child relation dynamics (i.e., closeness, conflict), parenting styles (i.e., authoritarian vs. authoritative parenting), or parents' mental health (i.e., depression, anxiety) in promoting or hurting children's social competence (i.e., Robl et al., 2012; Karriker-jaffe et al.2012). The connection between school PI and child behavior has been rarely investigated. This study represents potential benefits of parent-school partnership or parent-parent network can work as a great source of social control to promote positive social development.

In addition, previous research on the association between school PI and social development has been exclusively done with adolescent samples (see Hill et al., 2004). The current study found that school PI has a significant influence on young children's behavior as well. These behavioral improvements that are associated with parent involvement at earlier grades can hold long-term implications because poor social adjustment at young ages can impair well-being into adolescent and adulthood (Bub, McCartney & Willett, 2007; Entwistle et al., 2005; Hawkins et al., 2005). Moreover, children' pro-social behaviors at earlier grade may translate into future academic engagement and school success in the long run. For example, Bowen and his colleagues (2012) demonstrated that parents' expectations of their children's school behavior at elementary grades had a significantly positive influence on their math and reading scores approximately 3 years later. Thus, the protective role of school PI in social development may provide a new rationale to encourage parents to actively get engaged with activities at school-sites.

With regard to the changing influences of school PI on children's social development, this study couldn't found that the magnitude of the relationship changed over time. The strong relationship between school PI and positive social behaviors existed at each grade, but unlike

academic development models, this relationship doesn't increase as children move into higher grades. One possible explanation to this finding is that children's social development itself is a quite stable construct over time. According to the descriptive statistics, for two indicators of social development, between-child variances are higher than within-child variances, indicating that children who started their schooling with a strong social skills tended to be rated as socially strong until the end of elementary years, or vice versa. Thus, it is plausible that children's social development during elementary years is less likely to vary as a function of age.

RQ3. The Relation of Parent School-based Involvement to School-Wide Achievement and Climate: Uncovering Hidden, but Significant, Benefits of School PI

The third research question was to examine to what extent three types of school-mean PI are related to the school-wide achievement and climate across kindergarten, first, third, and fifth grade. Despite the well-established link between school PI and individual academic achievement, little is known if this link holds the same significance for school-level models. The influences of school PI have been routinely analyzed in an individual-level, and school-level benefits have been largely overlooked. Thus, this study used data from schools to consider the way parents as a group brings a shared benefit to school communities.

Overall, I found that efforts to create parent-school or parent-parent ties had beneficial effects on a school community as a whole. With regard to school-wide achievement, schools characterized by high levels of parents' participation in PTA, volunteering, fundraising, and social networking were more likely than other schools to have higher percentages of students meeting the national standard in math and reading achievement. In many ways, this finding is not surprising. When parents volunteer in school, they enrich the overall learning environment, supplement teachers' time and efforts, and affect the academic norms and standards for all children in the school which eventually contribute to raise school-wide achievement (Brown, 1995). In addition, when parents have frequent, mutual, and open communications with other parents, social relationships have the potential to help students' academic success by transmitting academically beneficial information and expectations (Goddard, 2003).

The notable influence of school-mean public good PI and parent network was not limited to school-wide achievement; they were also conducive to create a better school climate. This study found that when high percentage of parents within a school get involved in school activities, that school reported a better climate, as represented in school administrators' perception of leadership support, having a spirit of collaboration, less teacher turn-over, and no overcrowding. This is consistent with previous works that emphasized the role of school PI to create a student learning-supportive school climate. For example, schools with active PTA members tend to be more responsive to parents' desires regarding the curriculum, instruction, and teacher quality (McMillan, 2000). Thus, a greater degree of parents' participation in PTA can facilitate parents' ability to influence school climate and thereby create an environment to support students' opportunities to learn. Bryk et al. (2010) found that parental involvement at school sites contributes to promote safe, and orderly school environment and to introduce challenging math concept into the school's curriculum. Given that at the heart of an excellent

school is a school climate that is defined by excellent teaching, high-quality leadership, motivated staff and students, , and a sense of community (Parker et al., 2011), the current finding of school PI's contribution to create a better school climate is of great importance.

These findings indicate that some phenomena of school PI bring spill-over benefits to the people inside the social structure, and engender apparent '*public goods*' for the whole community. The beneficial effects of public goods created by school PI can also be interpreted as '*a contextual effect.*' That is, individual child's academic achievement may not only depend on whether his or her own parents participated, but also on the average level of participation of all parents at the school. Even students of parents with low levels of school PI can benefit if the whole school community is involved in creating a better school and all students in their school receive increased opportunities for higher achievement (Sui-chu & Willms, 1996). For further research, it would be encouraging to find the possibility that school-mean PI could be beneficial for individual children's achievement, regardless of whether their own parents are involved in creating that social capital.

Lastly, it is worth mentioning that school-level variables of interest in the current study—three types of school-mean PI, school-level achievement, and school climate—appear to be strongly interconnected. Schools characterized as high level of PI create a more positive school climate where students could be exposed to a safe, orderly environment and a positive instructional support. Students in these schools, then, have greater opportunities for learning and make gains in math and reading learning. In this relational cycle, strong parent involvement in a school plays an initiating role creating '*a core resource*' for maintaining supportive environment within the school community and enhancing school learning experiences. This result may substantiate a long-standing, but not yet studied, notion about the benefit of school PI: improving parents' participation in school activities is central to school reform.

RQ4. The Moderating Effect of SES in the Relationship Between Parent School-based Involvement and Educational Outcomes: A policy for Whom?

The fourth research question was to examine if the SES level of families and schools moderate the relationship between school PI and educational outcomes. While Lareau's influential qualitative study (2003) describes the way school PI give advantages to students from high-SES families, recent quantitative studies found that school PI matters more for low-SES students (Dearing et al., 2006; Domina, 2005), or is equally important for high and low-SES students (Lee & Bowen, 2006) . Given that the federal education policy targets parent involvement as a main way to ameliorate achievement gap between SES groups, it has critical importance to examine if there is any evidence that children from high SES families benefit more from school PI than do children from low SES families.

Results from Individual-level Models. The current findings of positive influence of school PI on child's academic and social development support Coleman's (1988) original hypothesis that parent involvement as social capital plays a role in facilitating favorable child development. However, I found that school PI does not offer the same prospects to all students. Rather, for some groups, school PI works more favorably. First, with regard to the amount of school PI, high SES families were more likely to participate in public good related

activities and form close social networks with other parents than low SES families did. For instance, the mean public good PI of high SES families (upper 25% in SES scales) was 2.03 at the 5th grade, whereas that of low SES parents (lower 75% in SES scales) was 1.13. And the SES differences in public good PI were statistically significant ($F=265.85$, $p<.001$). These findings indicate that high SES parents were dominantly involved in their children's schools.

Second, I found that family SES play a critical role in distributing different levels of rewards from the school PI to families. A series of interaction analyses suggest that the same amount of school PI yielded more favorable results for high SES students than for low SES students. What is noticeable is that traditional school-initiated involvement opportunities turned out to give boosting effects for high SES students in academics. My analysis showed that when parents actively participated in public good and private good PI, children tended to report higher math and reading achievement. But high SES student could benefit more from this schoolPI-academics relation.

This result is consistent with recent theoretical and empirical work that points to the possibility that the involvement efforts of middle-class parents may meet with greater educational rewards than the involvement efforts of poor and minority parents (Cucchiarra & Hovatt, 2009; Desimone, 1999; Lareau, 2003). As explanations for this phenomenon, scholars often focus on the structural and psychological barriers faced by poor parents (Hoover-Dempsey & Sandler, 1997). Although many poor parents want to be involved in their children's education, the financial and time constraints that poverty brings may limit their involvement (Cooper, 2010). Moreover, poor parents may be less optimistic about their children's educational chances and less confident about intervening on behalf of their children (Crosnoe, Mistry & Elder, 2002), which likely decreases their motivation to become involved and benefits gained from their school participation. In contrast, high SES parents possess greater knowledge about the structure and content of the educational system and greater confidence in approaching teachers than do low-SES parents. SES differences in parent's ability, beliefs, and motivation related to education are thus an important way in which social class is transmitted between generations.

In addition, schools may discourage low SES parent's active participation in school activities if they have negative perceptions about poor parents' attitudes and values or their children's academic potential (Lareau, 2003). Greenwood and Hickman (1991) found that teachers and administrators with low behavioral and educational expectation of poor parents were less likely to encourage the participation of poor parents. This cultural mismatch in education-related attitudes and values between low SES families and teachers can work as a possible mechanism by which school PI brings less advantage to low-SES.

Given that the main goal of educational policies is to understand inequalities in education and to design legislature or interventions that yield more equal educational opportunities for all students, the SES-based heterogeneity in the causal effects of school PI has profound implications for the current policy (Domina, 2005). Educational policy emphasizes the role of school PI as a tool for generating educational equity. Indeed, equity is the stated goal of NCLB's requirements for parent involvement (Epstein, 2005). School PI-oriented educational policies are designed to moderate high-SES families' home advantage by redistributing social and cultural

capital. Disappointedly, the current study found that school PI provided greater returns to the involvement of high-SES parents. If it is true, a policy aiming to increase school PI may actually play a role widening educational gaps between high- and low-SES students and could have major consequences for harming educational equity. This may present one risk of school PI as social capital. It seems likely that there can be risks as well as benefits social capital can engender, if school PI brings about clique, prevent outsider's access, gives beneficial opportunities only to involved, or makes some people feel unwelcomed. There has been a paucity of empirical evidence on the risks of school PI.

However, I want to emphasize that the findings of this study do not suggest that school PI is unimportant for poor families and current policy efforts are unsuccessful. Rather, they suggest that the school PI programs may *unintentionally* target middle-class parents. Parents' participation in PTA meeting and fundraising requires substantial amount of time, money and energy commitment that low-SES parents often lack. Given that school contexts and systems, in general, are more likely to elicit the involvement of educated, middle-class parents, the policy efforts to support school PI may produce unexpected advantageous results for them (Cooper, 2010). Thus, deliberate policy efforts are necessary to take into account the unique challenges and barriers low-SES parents face when involving in their children's school.

Results from the School-Level Models. Regarding school-level analyses, the results revealed that benefits of school PI to all in a school were also dependent of school SES. The results were mixed; school-mean public good PI brought more benefit for schools serving low concentrations of poor students (high-SES schools). However, school-mean private good PI and social networking as a group-level attribute were found to be a critical source of increasing the capacity of low-SES schools to create a better school climate and to raise overall school achievement. Unlike individual-level models, school-level models displayed that low-SES schools can benefit more from their parents' participation in private good activities and network. This is an encouraging finding as school PI has a great potential to improve schools, especially schools serving high concentration of low-income students.

The positive role of parent network in creating better schools, especially in low-SES schools, is notable in the current study. The main effect of parent network was the strongest predictor to promote a school climate, and the interaction effect between parent network and school SES to predict a better school climate was significantly positive. This result is consistent with previous studies. For example, a recent longitudinal study of parent involvement in Head Start programs supports the importance of social network in the disadvantaged community (Chang et al., 2009). They found that participation in Head Start program was largely beneficial for the whole group. In particular, low-income African American families benefited most from attending socialization meetings and joining support groups. Similarly, a review study about practical strategies for increasing parent involvement and school success in urban elementary schools proposed that the most effective approach to ensure school reform in inner-city area is the use of '*indigenous resources*' which refer to use parent-oriented supports within the family and community settings, such as parent support groups or networking (Abdul-Adil & Framer, 2006).

However, this finding is somewhat conflicting with the view of social capital theory about the role of parent network in low-income community. Proponents of social capital theory warn that dense social networks in certain community may emphasize norms and values that impede school success or promote illegal or socially undesirable behavior (Kao & Rutherford, 2007; Portes, 2000). For instance, Morgan and Todd (2009) suggested that students who are poor urban minorities may actually be harmed by their parent's high involvement in parent network when the norms and values of the network do not encourage high levels of achievement. However, the finding of this study shows that the norms, beliefs, and expectations highlighted in low SES parent networks may focus on achieving high grades or behave better, and play a beneficial role to create a better school.

In addition, this study pointed to an important role of school-wide participation in private good PI in reducing learning inequality across schools. When higher percentage of parents in schools attended in parent-teacher conference, open-house or back-to-school night, those schools reported higher percentage of students meeting the national standard in math and reading. And these improvements were more likely to occur in schools where the level of socioeconomic resources was lower. This result supports long-held efforts of education policy and practices about school improvement in low-income, urban communities: recommending local schools to invite, connect, and communicate with their parents whom they are intended to serve is central to urban school reform (Bryk et al., 2008). Not all schools serving predominantly low-income students are alike. For some, the tasks of improvement may be much more possible than anyone has acknowledged to date. This study suggests that reconnecting to families and supporting them in their education of their children would be an essential resource for the needed improvements in schools serving for low-income families.

The Efficacy of Parent School-based Involvement: “Does It Deserve the Faith that Educational Policy Has Invested in it?”

In conclusion, I believe that school PI deserves the public faith. The results of this study provide strong empirical evidence about the effectiveness of school PI and support the rationale of current federal- and state-level education policy's focus on school PI. By framing school PI as a multidimensional concept, I found that each type of school PI made unique and overlapping contributions on diverse child and school outcomes.

In details, parents' participation in private good PI was found to be the most effective way for enhancing their children's math and reading achievement. In contrast, parents' participation in public good PI had a weak or no relation with academics, which is consistent with findings of some previous research (i.e., Domina, 2005). However, public good PI displayed other beneficial side; due to its' spill-over effect for the others in the same school, public good PI was found to be effective to create a better school community. The distinction of private- and public-good PI enabled me to find that some aspects of school PI had a unique benefit to building a great school community which has been rarely investigated in educational research.

In addition, this study found that the size of parent network in a school was the most powerful predictor to promote school-wide achievement and a school climate. Parent-initiated connection with other parents may have a greater potential to facilitate parents' efforts for building a better school than do traditional school-initiated types of involvement. Given that historically, ideal parent role has been considered to support what teachers and schools were doing, the significance of parent-network as one dimension of school PI holds critical importance. It suggests that in a discussion about efficacy of school PI, the contribution of parent-initiated forms of school PI should be considered as well. Lastly, all three types of school PI had implications for children's social development. They were found to be effective to enhance positive social skills and prevent problem behaviors.

However, on the more troublesome side, this research has also found that the efficacy of school PI got complicated by its' additional advantage for students from high SES families. Ironically, students who needed most benefits from school PI lacked the essential support from school PI, whereas students from more advantaged families could achieve measurable benefits through even moderate level of school PI. This finding seems to undermine the efficacy of school PI. Considering traditional rationale for increasing school PI is to ameliorate educational gaps between SES groups, this finding is discouraging. However, it does not necessarily mean that school PI, in general, would not be effective. Rather, it may underscore the need that educational policies designed to promote positive child development require consideration of the SES population targeted.

Most importantly, school-data analyses revealed that some types of school PI were more effective for schools serving for low-income students. As a group trait, school-wide parent's participation in school events and networking played a promising role in creating a better school community. This result supports the current policy direction for the urban, low-income school reform, which recommends schools to reach out parents and to be a center of the community.

Limitations

Although the present study offers many advantages with its conceptual extension and longitudinal data analysis, several limitations should be noted. First, most of this study's limitations relate to the use of a secondary data set, resulting in analyses being limited by the available variables. Large dataset such as the ECLS-K permit multivariate investigations of important issues. However, the breadth of such databases can limit the depth of information on any specific variables of interest. The ECLS-K dataset did not include information on parents' assessments of the quality of their school involvement, or diverse types of parent involvement practices. This restriction in the range of PI items significantly limits a more in-depth understanding of what type of PI is the most helpful. With regard to outcome variables, this study was unable to examine gains in such constructs as higher level thinking, competence, or motivation, which are sometimes the focus of education, rather than content learning. Additionally, although the ECLS-K began with a representative sample of students and their schools, some students moved and could not be located, thus eliminating them from the data collection by fifth grade. These factors affect the representativeness of analytic sample for this study.

Second, a further study is needed to address the “quality” of school PI, not just quantity. This study just focused on the frequency of parent’s visit to school sites, measured by dichotomized items that assessed whether parents participated in various school-sponsored activities. Parent involvement may be more complex than what is actually being measured in this study. While the quantity measures the behavior of participating, the quality is also an important component that should also be investigated. As parent ratings of their involvement at school were simply parent reports of what they did, how they did activities should be measured as well. For instance, Park and Holloway (2013) found that African American parents are more likely to participate in school activities when they are dissatisfied with schools. In this case, “*more might not be always better*” in parent involvement. Thus, future research may need to extend its scope beyond whether parents attend school events and examine how parents interact with teachers and school personnel.

Similarly, Future research should more carefully consider the idea of the positive versus negative parent network for educational outcomes. This study found the powerful role of parent network in promoting child development and school improvement. In this study, parent network was measured based on number of parents in the school with whom parents regularly communicate. However, previous research indicated that social network among parents is most useful for outcomes if parents share similar values of any particular trait. No all ties are equally conducive to all outcomes, and some network ties can even be negative. For instance, if a parent knows all of her or his child’s friend’s parents, but does not discuss their children’s school lives, the parent network will likely have a lesser effect than if she or he discusses school projects and educational goals. Thus, future researchers must collect data on how parents in closed networks interact with one another and also gather information on parents’ values.

Third, Previous research argued that the amount and effect of parent involvement tends to decrease as children move into middle, high schools. As for my knowledge, this assumption has been rarely tested with longitudinal datasets. Most of studies compared the amount of school PI across different age groups and concluded that the level of parent involvement declines with child’s age. In order to find the true changes and stability patterns in PI across elementary and secondary schools, a researcher should adopt a longitudinal study design that follows an individual over time. Even though the current study examined the within-individual change and stability in the frequency and effects of school PI, its focus was limited to elementary years. Further research is needed to understand whether school PI that occur when students are in elementary school decreases or increases after the transition to middle schools and pays off as students move into middle school, high school, and beyond.

Last but not least, the positive relations of school PI to educational outcomes this study found cannot be interpreted as a causal one. A longitudinal research has been highly appreciated because of the possibility that it could represent the relationship between changing characteristics of individual and individual outcomes on the other. However, just because a study used longitudinal data and the associated statistical models does not guarantee that the link between two time-varying variables is causal. Establishing the direction of the relationships is more difficult. Although the link may start from predictors to outcomes, it may also run the opposite way. In this case, the link is susceptible to issues of reciprocal causation. While longitudinal data can help understand the issue of temporal changes, the use of time-varying predictor can cause

the issue of reciprocal causation so that a research do not naively assume that longitudinal data alone will resolve the concern. Singer and Willet (2003) recommended two ways to address this problem. First, a researcher must use theory as a guide to determine whether his inferences are clouded by reciprocal causation. The second way is to link prior status on a predictor with current status on an outcome. If data allow, this can be done by recoding time-varying predictors so that their values in each record refer to a previous point in chronological time. A further research can conduct a 1-year time-lagged analysis which enables to examine the effect of parent involvement at year 1 on the child outcomes in the following year.

Contributions

Despite these limitations, an important contribution of this study is that it strengthens the empirical basis for supporting school PI in the educational practices and policy. Although significant government efforts are currently directed at encouraging parents to participate in their children's schooling, research findings about the effectiveness of school PI are inconsistent. Using methodological, conceptual advances, I found that three types of school PI uniquely and significantly predicted positive child and school outcomes. These results assist future policy directions by providing specific evidence about the type of parent involvement that is most likely to boost children's achievement and behavioral engagement, particularly those living in low SES households. In addition, this study provides further evidence that school PI can play a role in building a better school.

Methodological advances of using a sophisticated longitudinal design give a greater confidence about the findings of this study. A longitudinal dataset (ECLS-K) permits me to test more rigorously the idea that parent involvement is the driver, rather than simply a correlate, for development of educational outcomes. Moreover, the current finding of cumulative influences of school PI on cognitive development clearly shows the benefits of using "growth curve modeling technique" in parent involvement research. The central area of interest in educational research is to understand the growth in knowledge and skill of individual students and the factors that influence that growth. As a critical influencing factor, this study focused on parents' participation in school which chiefly takes place in the organizational settings of schools. The use of 'three-level growth curve modeling' allowed me to capture "true growth" in student development and school PI's longitudinal influences on that growth, controlling potential confounding family and school factors. Given that existing PI research has rarely utilized an explicit model of individual growth and how features of school PI affect this growth concurrently and cumulatively, the findings of this study can fill the gap in the literature.

In addition to methodological advances, this study expanded current framework of conceptualizing school PI. Existing research often used omnibus measures or any single type of school PI to understand how school PI shapes children's development. However, the aggregation of separate measures leads to use an all-encompassing term and makes it difficult to interpret the unique effects of each particular school PI measure. In contrast, this study drew on social capital theory and recent economist's view to broaden the conceptualization of school PI into activities including involvement directed at their own child, involvement to improve the school as a whole, and involvement in parent networks. This approach moved beyond a relatively narrow view of school PI and explored the unique characteristics of three school PI practices. As a result, this

study demonstrates that it is meaningful to conceptualize school PI separately across three types. I found that private good PI was beneficial for individual academic development, whereas public good PI was beneficial for individual social development and school improvement. Most of all, the formation of parent network displayed the strongest influence on school-level outcomes.

The conceptual extension in school PI itself naturally led me to consider its effects on diverse outcomes, not just individual students' achievement. For instance, an attention to public good nature of school PI made me take into account the ways that parent efforts may affect the whole school community. In addition, a consideration of benefits from utilizing parent network as a social control resulted in including its social/behavioral implications for child development. This study contributes to the ongoing literature by providing a useful counterpoint to discussion of effective school PI that narrowly emphasizes its influence on test scores.

Implications for Policy Makers and Practitioners

First, this study urge policy makers to expand the narrow definition of school PI in two important ways. In major education policy document, school PI is defined as “*the participation of parents in regular, two-way, and meaningful communication involving student academic learning and other school activities*” (No Child Left Behind Act, 2002, §9101). This definition is limiting and requires major extension. Instead of just focusing on school PI as a parent's academic support of his own child or the partnership between an individual parent and a teacher, policy makers should keep in mind the possibility that school PI can exert collective influences on the school community. In addition, the formation of social networks among parents is one critical component of school PI. Incorporation of these two overlooked types of school PI informs us that policy efforts that solely focus on promoting communication between family and school may be misguided. In addition, it might be misleading that policy efforts are designed to solely focus on promoting children's academic achievement. This study showed that school PI is consequential for social as well as academic outcomes, and school-wide as well as individual development. Thus, future policy efforts may pay dividends in diverse types of benefits, other than academics, that school PI can engender.

Furthermore, the overwhelming effects of family SES on school PI have an important policy implication. Although most parents report that they want to be partners in their children's education, only some parents, particularly those with more resources, remain involved in their children's education across the grades. Specially, this study found that most of school PI turned out to give boosting effects for students from high SES families. Rather than interpreting this result as a reason against school PI, however, I suggest that major policy attention should be paid to how to tailor school PI programs to the needs and obstacles of low-SES populations. In reality, although the parental involvement provision of No Child Left Behind (NCLB) aims to promote family-school connections as a means of reducing social and economic disparities in learning, guidelines for increasing the involvement of low SES families are still vague (Epstein, 2005).

The real starting point would be to increase the amount of school PI among low SES populations. A lack of time, energy, and access often constrains low-SES parents' attempts at school involvement. For these parents, policy efforts designed to promote home-school connections need to better address the obstacles that deter school-based involvement among poor

families. For example, schools may need to help cover expenses associated with parental involvement activities such as transportation and child care to enable all parents to participate in school-related meetings. Considering that an inflexible work schedule is one of the barriers to involvement among low-SES families (Lee & Bowen, 2006), a law is needed to protect parents' right to participate in their child's school activities. For example, the family-school partnership act is a California law that allows parents or guardians to take time off from work to participate in field trips, volunteering and school-sponsored events, if they give reasonable notice to their supervisor. Currently, 17 other states adopt the similar act, in the name of 'School Visitation Rights Act' or 'School Conference and Activity Leave.' Yet, the law has not been publicized well.

In line with addressing those structural constraints, it is important to consider psychological constraints as well. According to a highly influential model about parent involvement decision making by Hoover-Dempsey and Sandler (1997), invitations from teachers and schools is one of the crucial factors for parents to get involved in their children's schools. Subsequent empirical research confirms that to create a school environment where parents feel welcomed and valued by educators is the strongest predictor of parent involvement decision, especially for low-SES population (Deslandes & Bertrand, 2005; Green et al., 2007; Park & Holloway, 2013). In order for parents to perceive their children's school is welcoming, scholars suggest that implementation of high-quality outreach programs is necessary. Specially, research suggests that providing information on how schools function, how to support learning, and how to access educational resources encourages low-SES parents to get involved in their children's education (Christenson & Sheridan, 2001; Simon, 2004). Thus, strengthening connections between schools and families through outreach programs is an effective way to promote parent involvement, especially among low-SES populations.

Most importantly, instead of the current policy's focus on enhancing traditional school-initiated forms of school PI, the formation of parent network should be strongly encouraged, especially in a poor, urban community. Current school policy encourages parents to join the PTA, provide merchandise for the bake sale, and show up at times specified by the school, such as back-to-school night. The common feature of these activities is that a school takes a leadership role and parents follow the direction or guideline that a school provides (Zellman & Waterman, 1998). In this context, parents are often recognized as an 'audience, helper, spectator, or fundraiser.' However, parents may have different perceptions of parent involvement. According to Lawson's (2003) study with parents of urban elementary school students, educators often used a "school-centric" definition that involved parents supported teacher's needs and school-defined goals, such as volunteering in classrooms, and attending conferences, and helping with homework. Conversely, parents endorsed a "community-centric" view of involvement, in which parents viewed school as a community-serving institution and their role as an involved parent was to support all children's development and to protect children from the negative influences of the neighborhood. .

There exist successful cases that schools recognized the importance of community-centric approach to school PI. The overarching goal these schools had was to bring parents into the school, to work as an equal partner with parents, and to facilitate a sense of community responsible for its children's education. These schools opened their doors and held barbeque parties, multicultural nights, community sing-along and so on. For instance, an elementary

school serving mainly Latino and Hmong families in Saint Paul, Minnesota conducts “Second Cup of Coffee,” a monthly open social gathering for parents to talk to other parents about testing, homework, and other schooling matters (for details about the case, http://www.csos.jhu.edu/p2000/PPP/2009/samplers_index.htm). After implementing this program, the school reported better achievement and less attendance problems. These examples represent that with a strong network among parents, even schools in the most challenging communities can make progress in student’s success in school.

Lastly, given that increases in school PI were associated with higher growth rates in reading and math performances, implications for practice include the need for schools to view school PI over the long term. Schools put an effort to ideally create a school environment that increases parents’ participation in schools activities and helps to sustain that involvement across elementary school years.

References

- Abdul-Adil, J. K., & Farmer, A. D. (2006). Inner-city African American parental involvement in elementary schools: Getting beyond urban legends of apathy. *School Psychology Quarterly, 21*, 1-12.
- Adler, P. S., & Kwon, S. (2002). Social capital: Prospects for a new concept. *Academy of Management Review, 27*, 17-40.
- Aikens, N. L., & Barbarin, O. (2008). Socioeconomic differences in reading trajectories: The contribution of family, neighborhood, and school contexts. *Journal of Educational Psychology, 100*, 235-251.
- Auerbach, S. (2007). From moral supporters to struggling advocates: Reconceptualizing parent roles in education through the experience of working-class families of color. *Urban Education, 42*(3), 250-283.
- Becker, H. J., & Epstein, J. L. (1982). Parent involvement: A survey of teacher practices. *The elementary School Journal, 83*, 85-102.
- Bolivar, J. M., & Chrispeels, J. H. (2011). Enhancing parent leadership through building social and intellectual capital. *American Educational Research Journal, 48*, 4-38.
- Bourdieu, P. (1985). The forms of capital. In J. G. Richardson (Ed.), *Handbook of Theory and Research for the Sociology of Education* (pp. 241-258). New York: Greenwood.
- Bourdieu, P., & Wacquant, L. J. D. (1992). *An Invitation to Reflexive Sociology*. Chicago: University of Chicago Press.
- Bowen, G. L., Hopson, L. M., Rose, R. A., & Glennie, E. J. (2012). Students' perceived parental school behavior expectations and their academic performance: A longitudinal analysis. *Family Relations, 61*, 175-191.
- Brent, B. O. (2000). Do schools really need more volunteers? *Educational Policy, 14*, 494-510.
- Bronfenbrenner, U. (1986). Ecology of the family as a context for human development: Research perspectives, *Developmental Psychology, 22*(6), 723-742.
- Bryk, A. S., & Raudenbush, S. W. (1988). Toward a more appropriate conceptualization of research on school effects: A three-level hierarchical linear model. *American Journal of Education, 97*, 65-108.
- Bryk, A. S., & Schneider, B. L. (2002). *Trust in schools: A core resource for improvement*. New York: Russell Sage Foundation.
- Bryk, A. S., Sebring, P. B., Allensworth, E., Luppescu, S., & Easton, J. Q. (2010). *Organizing Schools for Improvement: Lessons from Chicago*. Chicago: The University of Chicago Press.
- Bub, K. L., McCartney, K., & Willett, J. B. (2007). Behavior problem trajectories and first-grade cognitive ability and achievement skills: A latent growth curve analysis. *Journal of Educational Psychology, 99*, 653-670.
- Burt, R. S. (2000). The network structure of social capital. *Research in Organizational Behavior, 22*, 345-423.
- Carbonaro, W. J. (1998). A little help from my friend's parents: Intergenerational closure and educational outcomes. *Sociology of Education, 71*, 295-313.
- Chang, M., Park, B., & Kim, S. (2009). Parenting classes, parenting behavior, and child cognitive development in early head start: A longitudinal model. *The School Community Journal, 19*, 155-178.
- Child Trends (2010). *Parent Involvement in Schools*. Retrieved from www.childtrendsdatabank.org/?q=node/186

- Christenson, S. L., & Sheridan, S. M. (2001). *Schools and Families: Creating essential connections for learning*. New York: The Guilford Press.
- Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology*, 94, 95-120.
- Coleman, J. S. (1990). *Foundations of Social Theory*. Cambridge, MA: Harvard University Press.
- Comer, J. P., & Haynes, N. M. (1991). Parent involvement in schools: An ecological approach. *The Elementary School Journal*, 91, 271-277.
- Cooper, C. E. (2010). Family poverty, school-based parental involvement, and policy-focused protective factors in kindergarten. *Early Childhood Research Quarterly*, 25, 480-492.
- Cooper, C. E., Crosnoe, R., Suizzo, A. M., & Pituch, K. A. (2010). Poverty, race, and parental involvement during the transition to elementary school. *Journal of Family Issues*, 31, 859-883.
- Crosnoe, R., Mistry, R. S., & Elder, G. H. (2002). Economic disadvantage, family dynamics, and adolescent enrollment in higher education. *Journal of Marriage and Family*, 64, 690-702.
- Crosnoe, R., & Cooper, C. E. (2010). Economically disadvantaged children's transitions into elementary school: Linking family and school contexts to inform policy. *American Educational Research Journal*, 47, 258-297.
- Cucchiara, M. B., & Horvat, E. M. (2009). Perils and promises: Middle-class parental involvement in urban schools. *American Educational Research Journal*, 46, 974-1004.
- Dearing, E., Kreider, H., Simpkins, S., & Weiss, H. B. (2006). Family involvement in school and low-income children's literacy: longitudinal associations between and within families. *Journal of Educational Psychology*, 98 (4), 653-664.
- Dearing, E., Kreider, H., & Weiss, H. B. (2008). Increased family involvement in school predicts improved child-teacher relationships and feeling about school for low-income children. *Marriage and Family Review*, 43, 226-254.
- Dearing, E., & Tang, S. (2010). The home learning environment and achievement during childhood. In S. L. Christenson, & A. L. Reschly (Eds.), *Handbook of school-family partnership* (pp. 131-157). New York, NY: Routledge.
- De Carvalho, M. E. (2001). *Rethinking Family-School Relations*. New Jersey: Lawrence Erlbaum Associates.
- Decusati, C. L. P., & Johnson, J. E. (2004). Parents as classroom volunteers and kindergarten students' emergent reading skills. *The Journal of Educational Research*, 97, 235-247.
- Desimone, L. (1999). Linking parent involvement with student achievement: Do race and income matter? *Journal of Educational Research*, 93, 11-30.
- Deslandes, R., & Bertrand, R. (2005). Motivation of parent involvement in secondary-level schooling. *The Journal of Educational Research*, 98, 164-175.
- Dika, S. L., & Singh, K. (2002). Applications of social capital in educational literature: A critical synthesis. *Review of Educational Research*, 72, 31-60.
- Domina, T. (2005). Leveling the home advantage: Assessing the effectiveness of parental involvement in elementary school. *Sociology of Education*, 78, 233-249.
- Duncan, G. J., Magnuson, K. A., & Ludwig, J. (2004). The endogeneity problem in developmental studies. *Research in Human Development*, 1&2, 59-80.
- Durfur, M. J., Parcel, T. L., & Mckune, B. A. (2007). Capital and context: Using social capital at home and at school to predict child social adjustment. *Journal of Health and Social Behavior*, 49, 146-161.

- Eccles, J. S., & Harold, R. D. (1993). Parent-school involvement during the early adolescent years. *Teachers College Record*, *94*, 568-587.
- El Nokali, N. E., Bachman, H. J., & Votruba-Drzal, E. (2010). Parent involvement and children's academic and social development in elementary school. *Child Development*, *81* (5), 988-1005.
- Englund, M. M., Luckner, A. E., Whaley, G. J. L., & Egeland, B. (2004). Children's achievement in early elementary school: Longitudinal effects of parental involvement, expectations, and quality of assistance. *Journal of Educational Psychology*, *96*, 723-730.
- Entwisle, D. R., & Alexander, K. L. (1996). Family type and children's growth in reading and math over the primary grades. *Journal of marriage & the Family*, *58*, 341-355.
- Epstein, J. L. (1995). Family/school/community partnerships: Caring for the children we share. *Phi Delta Kappa*, *76*, 701-712.
- Epstein, J. L. (2005). Attainable goals? The spirit and letter of the No Child Left Behind Act on parental involvement. *Sociology of Education*, *78*, 179-182.
- Epstein, J. L. (1987). Toward a theory of family-school connections: Teacher practices and parent involvement. In Klaus, H., Franz-Xaver, K., & Friedrich, L. (Eds.). *Prevention and intervention in childhood and adolescence* (pp. 121-136). Oxford, England: Walter De Gruyter.
- Falbo, G., Lein, L., & Amador, N. A. (2001). Parental involvement during the transition to high school. *Journal of Adolescent Research*, *16*, 511-529.
- Fan, X. T. (2001). Parental involvement and students' academic achievement: growth modeling analysis. *Journal experimental Education*, *70*, 27-61.
- Fan, X. T., & Chen, M. (2001). Parental involvement and students' academic achievement: A meta-analysis. *Educational Psychology Review*, *13*, 1-22.
- Galindo, C., & Sheldon, S. B. (2011). School and home connections and children's kindergarten achievement gains: The mediating role of family involvement. *Early Childhood Research Quarterly*, *27*, 90-103.
- Goddard, R. D. (2003). The impact of schools on teacher beliefs, influence, and student achievement: The role of collective efficacy. In J. Raths & A. McAninch (Eds.), *Advances in teacher education* (Vol.6), pp.183–204. Westport, CT: Information Age Publishing.
- Green, C. L., Walker, J. M. T., Hoover-Dempsey, K. V., & Sandler, H. M. (2007). Parents' motivations for involvement in children's education: An empirical test of a theoretical model of parental involvement. *Journal of Educational Psychology*, *99*(3), 532-544.
- Greenwood, G. E., & Hickman, C. W. (1991). Research and practice in parent involvement: Implications for teacher education. *The Elementary School Journal*, *91*, 79-288.
- Grolnick, W. S., & Slowiaczek, M. L. (1994). Parents' involvement in children's schooling: A multidimensional conceptualization and motivational model. *Child Development*, *65*(1), 237-252.
- Hao, L., & Bonstead-Bruns, M. (1998). Parent-child differences in educational expectations and the academic achievement of immigrant and native students. *Sociology of Education*, *71*, 175–198.
- Henderson, A. T., & Mapp, K. L. (2002). *A new wave of evidence: The impact of school, family, and community connections on student achievement*. Austin, TX: National center for Family and Community Connections with Schools.

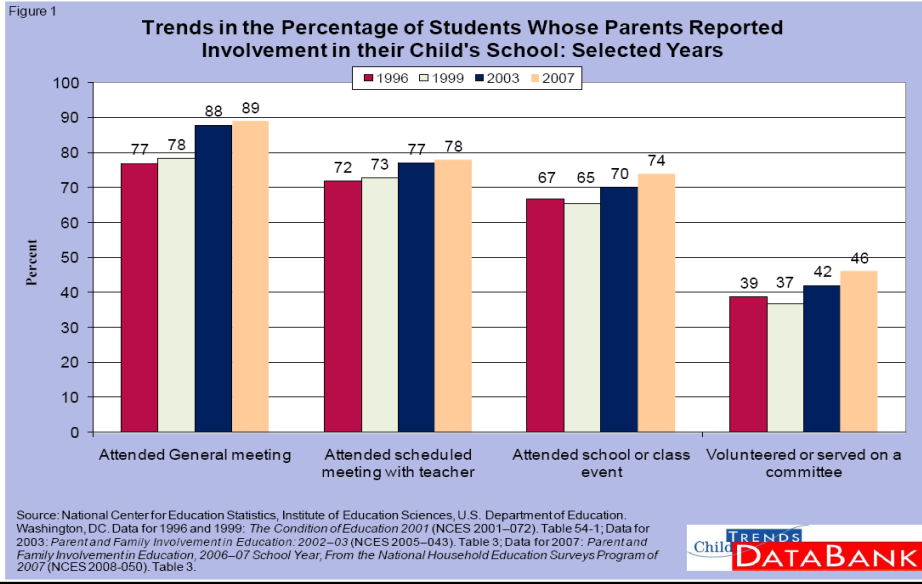
- Henry, K. L., Cavanagh, T. M., & Oetting, E. R. (2011). Perceived parental investment in school as a mediator of the relationship between socio-economic indicators and educational outcomes in Rural America. *Journal of Youth and Adolescence, 40*, 1164-1177.
- Hill, N. E., & Craft, S. A. (2003). Parent-school involvement and school performance: Mediated pathways among socioeconomically comparable African-American and Euro-American families. *Journal of Educational Psychology, 95*, 78-83.
- Hill, N. E., Castellino, D. R., Lansford, J. E., Nowlin, P., Dodge, K. A., Bates, J. E., & Pettite, G. (2004). Parent academic involvement as related to school behavior, achievement and aspirations: Demographic variations across adolescence. *Child Development, 75*(5), 1491-1509.
- Hill, N. E. & Chao, R. K. (2009). *Families, schools, and the adolescent: connecting research, policy, and practice*. New York: Teachers College Press.
- Hill, N. E., & Tyson, D. F. (2009). Parental involvement in middle school: A meta-analytic assessment of the strategies that promote achievement. *Developmental Psychology, 45*, 740-763.
- Hong, S., & Ho., H. (2006). Direct and indirect longitudinal effects of parental involvement on student achievement: Second-order latent growth modeling across ethnic groups. *Journal of Educational Psychology, 97*, 32-42.
- Horvat, E. M., Weininger, E. B., & Lareau, A. (2003). From social ties to social capital: Class differences in the relations between schools and parent networks. *American Educational Research Journal, 40*, 319-351.
- Izzo, C. V., Weissberg, R. P., Kaspro, W. J., & Fendrich, M. (1999). A longitudinal assessment of teacher perceptions of parent involvement in children's education and school performance. *American Journal of Community Psychology, 27*, 817-839.
- Jeynes, W. (2005). A meta-analysis of the relation of parental involvement to urban elementary school student academic achievement. *Urban Education, 40*, 237-269.
- Jeynes, W. (2007). The relationship between parental involvement and urban secondary school student academic achievement: A meta-analysis. *Urban Education, 42*, 82-110.
- Jimenez, E., & Sawada, Y. (1999). Do community-managed schools work? An evaluation of El Salvador's EDUCO program. *World Bank Economic Review, 13*, 415-441.
- Kao, G., & Rutherford, L. T. (2007). Does social capital still matter? Immigrant minority disadvantage in school-specific social capital and its effects on academic achievement. *Sociological Perspective, 50*, 27-52.
- Krackhardt, D., & Hanson, J. R. (1993). Informal networks: The company behind the chart. *Harvard Business Review, 71*, 104-111.
- Lareau, A. (2001). Linking Bourdieu's concept of capital to the broader field: The case of family-school relationships. In B. J. Biddle (Ed.), *Social class, poverty and education: Policy and practice* (pp. 77-100). New York: Routledge/Falmer.
- Lareau, A. (2003). *Unequal childhoods: Class, race, and family life*. Berkeley, California: University of California Press.
- Larson, R., & Richards, M. H. (1995). *Divergent realities: The emotional lives of mothers, fathers and adolescents*. New York: Basic Books.
- Lawson, M. A. (2003). School-family relations in context: Parent and teacher perceptions of parent involvement. *Urban Education, 38*, 77-133.

- Lee, J. S., & Bowen, N. K. (2006). Parent involvement, cultural capital, and the achievement gap among elementary school children. *American Educational Research Journal*, 43(2), 193-218.
- Lesser, E. L. (2000). Leveraging social capital in organizations. In E. L. Lesser (Ed.), *Knowledge and Social Capital: Foundations and Applications*. Boston: Butterworth-Heinemann.
- Lin, N. (1999). Social networks and status attainment. *Annual Review of Sociology*, 25, 467-487.
- Loury, G. (1992). The economics of discrimination: Getting to the core of the problem. *Harvard Journal for African American Public Policy*, 1, 91-110.
- Mattingly, D. J., Prislin, R., McKenzie, T. L., Rodriguez, J. L., & Kayzar, B. (2002). Evaluating evaluations: The case of parent involvement programs. *Review of Educational Research*, 72, 549-576.
- McGrath, D. J., & Kuriloff, P. J. (1999). "They're going to tear the doors off this place": Upper-middle-class parent school involvement and the educational opportunities of other people's children. *Educational Policy*, 13, 603-629.
- McMillan, R. (2000). Competition, parental involvement, and public school performance. In *National tax association proceedings* (pp. 150-155).
- McNeal, R. B. (1999). Parental involvement as social capital: Differential effectiveness on science achievement, truancy, and dropping out. *Social Forces*, 78, 117-144.
- McNeal, R. B. (2012). Checking in or checking out? Investigating the parent involvement reactive hypothesis. *The Journal of Educational Research*, 105, 79-89.
- Morgan, S. L., & Sorensen, A. B. (1999). Parental networks, social closure, and mathematics learning: A test of Coleman's social capital explanation of school effects. *American sociological Review*, 64, 661-681.
- Morgan, S. L., & Todd, J. (2009). Intergenerational Closure and Academic Achievement in High School: A New Evaluation of Coleman's Conjecture. *Sociology of Education*, 82(3), 267-285.
- Okapala, C. O., Okapala, A. O., & Smith, F. E. (2001). Parental involvement, instructional expenditures, family socioeconomic attributes, and student achievement. *The Journal of Educational Research*, 95, 110-115.
- Park, S., & Holloway, S. D. (2013). No Parent Left Behind: Predicting Parental Involvement in Adolescents' Education within a Socio-demographically Diverse Population. *The Journal of Educational Research*, 106 (2), 105-119.
- Pleck, J. H. (2010). Revised conceptualization and theoretical linkages with child outcomes. In M. E. Lamb (Ed.), *The role of the father in child development* (5th ed., pp. 58-93). New York: Wiley.
- Pomerantz, E. M., Moorman, E. A., & Litwack, S. D. (2007). The how, whom, and why of parents' involvement in children's academic lives: More is not always better. *Review of Educational Research*, 77(3), 373-410.
- Pong, S., Hao, L., & Gardner, E. (2005). The roles of parenting styles and social capital in the school performance of immigrant Asian and Hispanic adolescents. *Social Science Quarterly*, 86, 928-950.
- Portes, A. (1998). Social capital: Its origins and applications in modern sociology. *Annual Review of Sociology*, 24, 1-24.
- Portes, A. (2000). The two meaning of social capital. *Sociological Forum*, 15, 1-12.
- Portes, A., & Landolt, P. (1996). The downside of social capital. *The American Prospect*, 94(26), 18-21.

- Putnam, R. D. (1993). *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton, NJ: Princeton University Press.
- Putnam, R. D. (2000). *Bowling Alone: The Collapse and Revival of American Community*. New York: Simon and Schuster.
- Rabe-Hesketh, S., & Skrondal, A. (2008). *Multilevel and longitudinal modeling using Stata* (2nd Ed.). College station, TX: Stata Press.
- Rasbash, J. (2005). Cross-classified and multiple membership models. *In encyclopedia of Statistics in Behavioral Science*, ed. B. Everitt and D. Howell, 441-450. London: Wiley.
- Ream, R. K., & Palardy, G. J. (2008). Reexamining social class differences in the availability and the educational utility of parental social capital. *American Educational Research Journal*, 45, 238-273.
- Reed-Danahay, D. (2005). *Locating Bourdieu*. Bloomington: Indiana University press.
- Reese, L., & Gallimore, R. (2000). Immigrant Latinos' cultural model of literacy development: An evolving perspective on home-school discontinuities. *American Journal of Education*, 108(2), 103-134.
- Rumbaut, R. G. (1997). Ties that bind: Immigration and immigrant families. In A. Booth., A. C. Crouter., & N. S. Landale (Eds.), *Immigration and the family: Research and policy on U.S. immigrants* (pp. 3-46). Lawrence Erlbaum Associates.
- Seginer, R. (2006). Parents' educational involvement: A developmental ecology perspective. *Parenting: Science and Practice*, 6, 1-48.
- Sheldon, S. B. (2002). Parents' social networks and beliefs as predictors of parent involvement. *Elementary School Journal*, 102, 301-316.
- Sheldon, S. B., & Epstein, J. L. (2002). Improving student behavior and school discipline with family and community involvement. *Education and Urban Society*, 35, 4-26.
- Shumow, L., & Miller, J. D. (2001). Parents' at-home and at-school academic involvement with young adolescents. *The Journal of Early Adolescence*, 21, 68-91.
- Simon, B. S. (2004). High school outreach and family involvement. *Social Psychology of Education*, 7(2), 185-209.
- Singer, J. D., and Willett, J. B. (2003). *Applied Longitudinal Data Analysis: Modeling Change and Event Occurrence*. Oxford: Oxford University Press.
- Spera, C. (2005). A review of the relationship among parenting practices, parenting styles and adolescent school achievement. *Educational Psychology Review*, 17(2), 125-146.
- Stevenson, D. L., & Baker, D. P. (1987). The family-school relation and the child's school performance. *Child Development*, 58(5), 1348-1357.
- Sui-Chu, E. H., & Willms, J. D. (1996). Effects of parental involvement on eighth-grade achievement. *Sociology of Education*, 69, 126-141.
- Schulting, A. B., Malone, P. S., & Dodge, K. A. (2005). The effect of school-based kindergarten transition policies and practices on child academic outcomes. *Developmental Psychology*, 41, 860-871.
- Suizzo, M., & Stapleton, L. M. (2007). Home based parental involvement in young children's education: Examining the effects of maternal education across U. S. ethnic groups. *Educational Psychology*, 27(4), 533-556.
- Tan, S., Dearing, E., & Weiss, H. B. (2011). Spanish-speaking Mexican American families' involvement in school-based activities and their children's literacy: The implications of having teachers who speak Spanish and English. *Early Childhood Research Quarterly*, 89, 176-199.

- Tourangeau, K., Le, T., & Nord, C. (2005). *Early Childhood Longitudinal Study, Kindergarten class of 1998-99 fifth-grade methodological report* (NCES2006037). Washington, DC: National Center for Education statistics.
- U.S. Department of Education. (2004). Parental Involvement: title 1, Part A. <http://www.ed.gov/programs/titleipara/parentinvguid.doc>
- U.S. Department of Education. (2009). Race to the top fund. <http://www2.ed.gov/programs/racetothetop/index.html>.
- Useem, E. L. (1992). Middle schools and math groups: Parents' involvement in children's placement. *Sociology of Education*, 65, 263-279.
- Walsh, P. (2008). Are Involved Parents Providing Public Goods or Private Goods? *Public Finance Review*, 36(6), 678-705.
- Walsh, P. (2010). Is parental involvement lower at larger schools? *Economics of Education Review*, 29 (6), 959-970.
- Warren, M., Hong, S., Rubin, C. L., & Uy, P. S. (2009). Beyond the Bake Sale: A Community-Based Relational Approach to Parent Engagement in Schools. *Teachers College Record*, 111, 2209-2254.
- Wigfield, A., Eccles, J. S., Schiefele, U., Roeser, R., & Davis-Kean, P. (2006). Development of Achievement Motivation. In N. Eisenberg (Ed.), *Handbook of child psychology*, vol. 3 (6th ed.). Hoboken, NJ: John Wiley&Sons.
- Xu, M., Kushner Benson, S. N., Mudrey-Camino, R., & Steiner, R. P. (2010). The relationship between parental involvement, self-regulated learning, and reading achievement of fifth graders: A path analysis using the ECLS-K database. *Social Psychology of Education*, 13 237-269.
- Yamamoto, Y., & Holloway, S. D. (2010). Parental expectations and children's academic performance in sociocultural context. *Educational Psychology Review*, 22, 189-214.
- Yan, W., & Lin, Q. (2005). Parent involvement and mathematics achievement: Contrast across racial and ethnic groups. *The Journal of Educational Research*, 99(2), 116-127.
- Zellman, G. L., & Waterman, J. M. (1998). Understanding the impact of parent school involvement on children's educational outcomes. *The Journal of Educational Research*, 91, 370-380.

Appendix A. Trends in parent school-based involvement form 1996-2007



Appendix B. Types and Description of Study Variables for Individual-level analysis

	Variables	Type	Reporter	Item ^b	Item Description
Predictor	PI for public good	Composite ($\alpha=.59-.65$) ^a	Parent	P(2/4/5/6)ATTENP P(2/4/5/6)VOLUNT P(2/4/5/6)FUNDERS	[Since the beginning of this school year, have you or other adults in your household.....] Attended a meeting of a PTA, PTO or Parent-Teacher-Student Organization? Volunteered at the school or served on a committee? Participated in fundraising for (child)'s school?
	PI for private good	Composite ($\alpha=.65-.72$)	Parent	P(2/4/5/6)PARGRP P(2/4/5/6)ATTENB P(2/4/5/6)ATTENS	Gone to a regular parent-teacher conference or meeting with (child)'s teacher? Attended an open house or a back-to-school night? Attended a school or class event, such as a play, sports event, or science fair?
	Parent Network	Continuous	Parent	P(2/4/5/6)PCLASS	How many parents in (child)'s class do you talk with regularly, either in person or on the phone?
Outcomes	Math	Continuous	Child (Test)	C(2/4/5/6)R4MSCL	IRT score
	Reading	Continuous	Child (Test)	C(2/4/5/6)R4RSCL	IRT score
	Problem behavior	Composite ($\alpha=.79-.92$)	Teacher	T(2/4/5/6)INTERN T(2/4/5/6)EXTERN	A composite of 6 externalizing problem behavior items (i.e., students argues, fights, get angry, acts impulsively, disturbs ongoing activities, talks during quiet study time) and 4 internalizing problem behavior items (i.e., anxiety, loneliness, low self-esteem, sadness)
	Social skills	Composite ($\alpha=.81-.89$)	Teacher	T(2/4/5/6)CONTRO T(2/4/5/6)INTERP	A composite of 4 self-control items (i.e., temper control, acceptance of peer idea, responsiveness to peer pressure, respect for others) and 5 interpersonal skill items (i.e., getting along with/ helping/comforting other children, express feelings in positive ways, sensitive to the other's feeling)
Family Control	Family SES	Continuous	Parent	W(K/1/3/5)SESL	A composite of family income, parental education and occupation
	Parent Type	Dummy	Parent	P(K/1/3/5)HPARNT	Two biological parents =0 (reference group) / single or step parents = 1
	Mom's employment	Dummy	Parent	P(K/1/3/5)HMEMP	Working mom 0 (reference group) / Stay-at-home mom = 1
	English at home	Dummy	Screening	C1SCREEN	Speaking English at home =0(reference group)/Non-English at home=1
School Control	School SES	Continuous	School administrator	S(2/4/5/6)FLCH_I	% of free or reduced lunch eligible students
	% of minority	Continuous	School administrator	S(2/4/5/6)MINOR	Percentage of minority students at school Less than 10 / 10 to less than 25 / 25 to less than 50 / 50 to less than 75 / 75 or more
	School size	Continuous	School administrator	S(2/4/5/6)ENRLS	Total school enrollment 0-149 students / 150-299 students / 300-499 students /500-749 students / 750 and above

Appendix C. Types and Description of Study Variables for School-level Analysis

	Variables	Type	Reporter	Item ^b	Item Description
Predictor	School-mean PI for public good	Composite	Parent	P(2/4/5/6)ATTENP P(2/4/5/6)VOLUNT P(2/4/5/6)FUNDRS	School mean scores of parent involvement for public good
	School-mean PI for private good	Composite	Parent	P(2/4/5/6)PARGRP P(2/4/5/6)ATTENB P(2/4/5/6)ATTENS	School mean scores of parent involvement for private good
	School-mean Parent Network	Continuous	Parent	P(2/4/5/6)PCLASS	School mean scores of parent involvement for parent network good
Outcomes	School achievement	Continuous	School Administrator	S(2/4/5/6)PCTRD	Based on recent standardized tests, approximately what percent of (K~8) grade students currently enrolled in this school tested at or above grade level on math/reading skills?
	School climate	Composite ^a ($\alpha=.63\sim.71$)	School Administrator	S(2/4/5/6)PCTRD S(2/4/5/6)PCTRD S(2/4/5/6)PCTRD S(2/4/5/6)PCTRD	[Indicate how much you agree or disagree with the following statements...] Overcrowding is a problem at this school. Teacher turnover is a problem at this school. Staff members in this school generally have school spirit. The community served by school is supportive of its goals
School Control	School SES	Continuous	School administrator	S(2/4/5/6)FLCH_I	% of free or reduced lunch eligible students
	% of minority student	Continuous	School administrator	S(2/4/5/6)MINOR	Percentage of minority students at school Less than 10 / 10 to less than 25 / 25 to less than 50 / 50 to less than 75 / 75 or more
	School size	Continuous	School administrator	S(2/4/5/6)ENRLS	Total school enrollment 0-149 students / 150-299 students / 300-499 students / 500-749 students / 750 and above

^a Cronbach's α varies across waves of data.

^b Numbers in parenthesis represents waves of data used.