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a. Specific Aims

This proposal responds to the call for research on the Science and Ecology of Early Development (SEED) with a project designed to assess the causal effects of social capital on the cognitive and social development of children in the early elementary years. We focus especially on children from low-income Latino families due to the serious economic, social, and educational disadvantages often experienced by members of this group and to the particular features of Latino families that make them a uniquely compelling target population for a study of social capital.

Social capital—by which we mean relations of trust and shared expectations among members of a social network—is inherently an ecological variable. While the effects of social capital are widely discussed, empirical assessments have thus far been limited to correlational analyses, and the benefits of social capital have been debated both conceptually and empirically. Our project is distinctive in that we will test the causal effects of social capital by implementing and assessing a randomized trial of an intervention designed to build social capital among parents, teachers, and young children. In addition, we will deepen our understanding of the processes by which social capital is generated and affects child development by studying the implementation of the intervention.

We will manipulate social capital through an intervention program, Families and Schools Together (FAST), that is explicitly designed to enhance social capital among parents, teachers, and children through an intensive after-school program and long-term follow-up. FAST *has been identified as an exemplary evidence-based model and* has been implemented in over 800 schools across the country. It has been tested in four previous randomized trials, but only at the level of individual impact, not at the ecological level or through multilevel interactions. The proposed study, which involves random assignment of schools (rather than individuals) to intervention and control groups, *and the engagement of all first graders and their families in a school into multi-family groups*, will allow us to capture the ecological conditions in which family-school relations are embedded and to assess effects that cross the multilevel boundaries of families and schools. School districts in Milwaukee, WI, and San Antonio, TX, have agreed to participate in the intervention (see “Letters of support”).

We hypothesize that children in the experimental group will display stronger social skills and school performance and fewer problem behaviors—attributable to experimentally induced changes in family-school social capital—than children in the control group. Further, we hypothesize that increases in family-school social capital among disadvantaged families will mitigate inequalities in child development, particularly for low-income Latino children.

This proposal identifies the limitations of existing research on social capital and child development; lays out a conceptual framework that explains how family-school social capital emerges and has its hypothesized impact; and discusses existing studies that strengthen our resolve to assess the causal impact of social capital through an experimental design.

The specific goals of the research are:

1. To assess the relations among parents, between parents and children, and between parents and educators via surveys of parents and teachers of all first graders in 52 schools (approximately 208 teachers and 3,120 children and parents), half of which will be randomly assigned to participate in the FAST program and half of which will serve as controls. The population from which treatment and control schools will be drawn will have high proportions of Latino students.
2. To assess the following developmental outcomes for children in first grade (when the intensive intervention occurs) and third grade (after 2 years of follow-up activities): social skills and problem behavior as rated by *parents and* teachers, and academic competence as rated by teachers; and absenteeism, grade retention, and third-grade reading and mathematics test scores as found in school district records.
3. To test the causal role of social capital in enhancing developmental outcomes in a multilevel model of students and their parents nested within schools. Social capital will appear both as a contextual variable at the school level and as an individual variable (more properly thought of as an individual’s enactment of social capital) within schools. Both will be employed as intervening variables that explain the possible effects of the intervention on child outcomes.
4. To test for possible differential effects of the intervention, and of social capital, for children of Latino, white non-Latino, and African American backgrounds; for boys and girls; and for those who receive and do not receive free or reduced-price lunch.
5. To illuminate through surveys, interviews, and observations the particular practices and experiences that affect social relations among parents, teachers, and children.

b. Background and Significance

Unequal development among children from different racial and ethnic groups is a pervasive feature of U.S. society. Differences in social and cognitive characteristics are evident among children before they enter formal schooling and increase as they age (e.g., Downey, von Hippel, & Broh, 2004; Entwisle, Alexander, & Olson, 1997; Lee & Burkam, 2002; West, Denton, & Geronimo-Hausken, 2000). Material sources of disadvantage are widely recognized, but economic aspects of family background tell only part of the story (e.g., Jencks & Phillips, 1998). Social scientists have increasingly noted that the ecological aspects of development—the variety of institutions that impinge on children’s lives, and the relations among these institutions—also contribute to inequalities among children from different racial, ethnic, and economic backgrounds. Psychologists, sociologists, and economists alike have recognized the salience of the social context in contributing to child outcomes (e.g., Bronfenbrenner & Morris, 1997; Coleman, 1988; Durlauf & Young, 2001; Gamoran, 1992; Loury, 1987; Turley, 2003b; Vandell, 2000; Vandell & Pierce, 2002). As Bronfenbrenner (2002) explained:

The effective functioning of childrearing practices in the family and other child settings requires establishing ongoing patterns of exchange of information, two-way communication, mutual expectations, and mutual trust between the principal settings in which children and their parents live their lives. (p. 51)

While this statement may be widely accepted in broad terms, its empirical verification is still subject to question due to conceptual ambiguities and uncertain causality found in existing studies. The proposed study will provide a strong empirical test of ecological factors in child development by focusing on the two most important social contexts in the lives of children: the home and the school. The proposed research is

- **Interdisciplinary**, drawing on scholars and scholarship in sociology, psychology, economics, and social work;
- **Multilevel**, crossing the boundaries among individuals, families, and schools; and
- **Policy-relevant**, potentially providing practical as well as scientific responses to questions about programs that may reduce developmental inequality among young children.

b.1. *Social capital as a resource for child development*

Recent writers use the term **social capital** to refer to what Bronfenbrenner (2002) described as relations of trust, mutual expectations, and shared values embedded in social networks (e.g., Bourdieu, 1986; Coleman, 1988; Loury, 1987; Portes, 1998). Unlike other forms of capital, social capital is not possessed by individuals, but resides in the **relationships** individuals have with one another. Individuals within a social network may vary in how they draw on social capital, but the resource exists independently of individual actors. Social capital has value for individuals because it provides an avenue for exchange of information and encourages the emergence and enforcement of social norms.¹

Among the qualities of a network that have particular salience for childrearing is **intergenerational closure**, which occurs when parents come to know the parents of their children’s friends (Carbonaro, 1998; Coleman, 1988, 1990). Closure in a parent-child network allows information to be fully shared, increasing the likelihood that norms can be enforced. For example, if the parents of child A know the parents of child B, they can more easily enforce common rules about friendships, homework, and so on. If teachers are also part of the network, information about school expectations can also be effectively integrated into school-related norms. **Trust** in the relations among parents and between parents and teachers is another key quality of a social network that reflects social capital. Members of a social network characterized by trust engage in actions that count on other people’s actions, or actions based on a judgment of the feasibility of relying on others (Tsuzuki, 2005). Relational trust is conceived as a characteristic of a community *that can be examined by assessing the quality of relationships among* individuals (Bryk & Schneider, 2002). A social network characterized by higher levels of trust is more likely to facilitate the sharing of norms and information and consequently promote child development. **Shared expectations** is another dimension of social networks whose presence reflects social

¹ Our conception thus differs slightly from that of Coleman (1988, p. S51), who declared: “Social capital is defined by its function.” We accept the critique of Portes (1998), Durlauf (2002), and others that defining social capital by its function makes it impossible to test its effects (e.g., if social capital is defined by the presence of norms, one cannot test whether social capital facilitates norms). Our conception also differs from that of Portes (1998), who viewed social capital as an individual rather than a collective resource. Instead, we follow Sampson, Morenoff, and Earls (1999, p. 635), who explained that “social capital for children refers to the resource potential of personal and organizational networks” in which children are embedded. Portes (1998) and Woolcock (1998) provide extensive discussion of the definitions and meanings of social capital.

capital (Coleman, 1988; Kao, 2004). Members of a network who perceive a shared sense of obligation to support one another can draw on those commitments to aid child development—for example, by helping to interpret and navigate the demands of school systems. In the school context, these three dimensions of social networks (intergenerational closure, trust, and shared expectations) can occur in three types of relationships: parent-school relations, parent-parent relations, and parent-child relations. We conceptualize social capital as taking form in these three types of relationships along these three dimensions.

Social capital and children's outcomes. A large body of research suggests that social capital in relations among parents and between parents and teachers supports young persons' development. Although much of the research has focused on adolescent outcomes such as test scores, delinquency, high school dropout and completion rates, and college enrollment (Carbonaro, 1998; Coleman & Hoffer, 1987; Furstenberg & Hughes, 1995; Kahne & Bailey, 1999; McNeal, 1999; Morgan & Sorensen, 1999; Stanton-Salazar & Dornbusch, 1995; Teachman, Paasch, & Carver, 1997), some recent work has examined children's outcomes. For young children, social capital primarily functions through their parents (Runyan et al., 1998). Children benefit *directly from caring relationships and indirectly* from their parents' social networks when parents are well connected with their children, their children's teachers, and other parents *in the neighborhood*.

Two main mechanisms serve to link parents' social capital with child outcomes: social support and social control. First, parents' social networks provide social support in various forms, including services and information. *Much of the research on social support comes from psychology and social work, in which a lack of social support is correlated with child maltreatment. In a recent review, Freisthler, Merritt, and LaScala (2006) identified neighborhood impoverishment and housing stress (along with unemployment, child care burden, and alcohol availability) as contributing to child abuse and neglect. These authors called for a theoretically driven explanation of these processes and appealed for the development of neighborhood-based interventions to prevent child abuse and neglect. Prospective longitudinal studies and cross-sectional studies have also suggested that the toxic combination of high stress and social isolation can push parents—especially low-income, depressed, single parents—toward child neglect and abuse (Belle, 1980; Egeland, Carlson, & Sroufe, 1993). Other studies have shown that among two-parent families, parents with more social capital are less likely to use corporal punishment, and this is attributed to the parents' having more time and resources to communicate with their children as a result of the support they receive from their social networks (Xu, Tung, & Dunaway, 2000). Similarly, African American parents of urban elementary school children who have formal contact with school staff are significantly more likely to be involved in at-home and at-school activities that support their children's educational achievement, and this is attributed to the information they receive from school staff (McKay, Atkins, Hawkins, Brown, & Lynn, 2003). More generally, parents who are less socially isolated are less likely to be irritable, districted, neglectful, or abusive, and more likely to attend and respond to their child's needs (Belsky & Vondra, 1989; Creasey & Jarvis, 1994; Garbarino, 1976; Kozlowska & Hanney, 2002; Mash & Johnston, 1990; Webster-Stratton, 1990).*

Second, parents' social networks provide social control, which helps guide children's behavior (Sampson et al., 1999). For example, in wealthy neighborhoods, preschool children have fewer behavioral problems if their parents report knowing many neighbors (Caughy, O'Campo, & Muntaner, 2003). The improved behavior is attributed to the parents' shared expectations regarding the collective socialization of children in the community. *Similarly, in low-income neighborhoods, parents who know their children's friends and their parents are better able to monitor their children's emotional growth and everyday activities, providing a more consistent and warm parent-child relationship and improving children's school outcomes (Chilcoat, Breslau, & Anthony, 1996; Izzo, Weissberg, Kaspro, & Fendrich, 1999). The existence of even one supportive, long-term relationship (which may include a relationship with a parent) has been linked to positive long-term child outcomes in many cross-sectional and longitudinal studies, and caring relationships are a "protective factor" in the prevention literature, promoting resilience for at-risk children (Catalano, Berglund, Ryan, Lonczak, & Hawkins, 2004; Furstenburg & Hughes, 1995; Resnick et al., 1997; Werner & Smith, 1992, 2001). These studies indicate that, for young children, social capital functions through parents, and parents' social networks can provide social support and social control, which are beneficial for children's psychosocial development.*

Social capital and inequality. Unequal distributions of social capital may be part of the reason for inequality in child development. Sampson et al. (1999) provided evidence from a large survey in Chicago that intergenerational closure, reciprocated exchanges, and informal social control of children were greater in more affluent neighborhoods and, in the case of social control, weaker in neighborhoods with concentrations of disadvantaged and immigrant populations. Moreover, social capital may be differentially accessible to families with different backgrounds even in the same neighborhoods. For example, Turley (2003b) found that black children did not benefit from higher income neighborhoods as much as white children due to racial divisions in

parents' social networks. As neighborhood income increased, white parents knew an increasing number of neighborhood children by name, whereas black parents knew a **decreasing** number of children. In close ethnographic detail, Lareau (2003) showed that middle-class children were more likely to engage in a wide range of after-school activities, often with overlapping social ties that may have promoted intergenerational closure. Working-class and disadvantaged children had far fewer such opportunities, remained closer to home, and spent more time with family and neighborhood peers and less time in organized activities. Middle-class families perceive a sense of entitlement when it comes to public institutions such as schools, whereas working-class families are less familiar with ways of manipulating institutions to their own advantage (see also Lareau, 2000).

Social capital has also been cited as a factor in children's mental and physical health (e.g., Waterson, Alperstein, & Brown, 2004), although the causal role of social capital in promoting health has been debated (Kunitz, 2004; Lynch, Due, Muntaner, & Davey Smith, 2000). Kawachi, Kennedy, Lochner, and Prothrow-Stith (1997) used aggregate data from 39 states in the U.S. to argue that differences in social capital may account for the relation between income inequality and health. Putnam (2000) has made similar claims for such aggregate conditions as poverty, teen births, infant mortality, juvenile crime, and failure to complete high school. These results, coupled with findings about the positive relation between social capital and children's academic and social development, suggest that enhancing social capital in disadvantaged communities may reduce inequality. Indeed, Coleman (1988) viewed increasing social capital as a way to compensate for inequality in economic conditions. In his formulation, social capital could contribute to human capital, particularly for those who lacked economic and educational resources at home.

b.2. Social capital as a remedy for the disadvantages of Latino children

Inequalities between Latinos and non-Hispanic whites. Numerous government reports and research studies have documented the disadvantages of Latino children in the United States. According to the National Center for Education Statistics (2003), only 73% of Latino youth complete high school, as compared with 93% of non-Hispanic whites. Test scores of Latinos lag far behind those of non-Hispanic whites, and since the late 1980s the gap has shown little sign of narrowing; indeed, the reading gap among 13-year-olds was significantly larger in 1999 than it was in 1992 (Campbell, Hombo, & Mazzeo, 2000). Educational inequalities among children are closely linked to inequalities among their parents (Kao & Thompson, 2003). Latino adults have the lowest educational attainment of any group in the U.S., with 43% having less than a high school diploma (Therrien & Ramirez, 2000). Although the proportion of Latinos living in poverty has decreased recently, Latinos are still three times as likely as non-Hispanic whites to live in poverty (Therrien & Ramirez, 2000). Mexican Americans, who make up 59% of the Latino population and who will be the predominant Latino population in our study, are particularly disadvantaged, both educationally and economically (Chapa & De La Rosa, 2004). Without effective intervention, many of these children will grow up to reproduce the disadvantages of their parents (Kao & Thompson, 2003).

The salience of inequality between Latinos and non-Hispanic whites will increase in the years to come, because Latinos are the fastest growing ethnic minority group in the U.S. Currently constituting about 15% of the total U.S. population, the Latino population grew by about 57% between 1990 and 2000, whereas the total U.S. population increased by only 13% (Chapa & De La Rosa, 2004). *Moreover, the Latino population is considerably younger than the population as a whole: about one-third of Latinos are under age 18, compared to about one-fourth of the total U.S. population (U.S. Census Bureau, 2006). Among second-generation Latinos, the median age is just 13, indicating that a large majority are currently enrolled in school (Tienda & Mitchell, 2006).* The Latino population grew *between 1990 and 2000* not only in areas with historically high concentrations of Latinos (such as California and Texas, where about half of the U.S. Latino population resides and where the Latino population grew by 42% and 54%, respectively), but also in areas that previously had very few Latinos (such as Wisconsin, which experienced a 107% increase) (Chapa & De La Rosa, 2004). At present, two-thirds of the U.S. Latino population resides in 39 metropolitan areas, including the two covered in this study: San Antonio, Texas, and Milwaukee, Wisconsin. Whereas San Antonio represents an area with a very large proportion of Latinos (61%), Milwaukee represents an area with a *smaller* but rapidly growing proportion (15%). If current levels of educational disadvantage are unabated as the Latino population expands, then an increasing fraction of the U.S. population will be insufficiently prepared for work and civic life; thus, the problem is not one for the Latino community alone, but for U.S. society as a whole.

Latino parents experience differential development of social capital. The relation between social capital and ethnicity is complex, and it is not the case that social capital is simply less present among minority families (Kao, 2004). On the contrary, survey and ethnographic studies have documented that strong social

ties commonly exist among immigrant families, particularly Latinos, who often immigrate to largely segregated communities (e.g., Portes & Rumbaut, 2001; Stanton-Salazar, 2001; Valenzuela, 1999). However, these social ties typically do not encompass the school (Flores-Gonzales, 2002; Suarez-Orosco, Suarez-Orosco, & Doucet, 2003). Whereas the networks of middle-class parents are significantly more likely to include educators and other professionals, the networks of working-class and poor families tend to emphasize kinship groups (Horvat, Weininger, & Lareau, 2003). As a result of these network differences, disadvantaged parents perceive a sense of separation and distance from school authorities (Stanton-Salazar, 2001). As Larson and Rumberger (1995) reported in a study of Latino teenagers in California:

There were deep chasms in the relationship and communication between school and home. School personnel had many negative misconceptions about the motivations and values of parents. There was widespread belief that parents did not sufficiently value education and that they were unwilling to give sufficient time to rearing their children and participating in school activities. On the other hand, we found most parents to be fearful and alienated from school authorities while at the same time assigning expertise and responsibility to school personnel for educating their children. (p. A66)

A sense of distance from the school system prevents the development of family-school social capital—the relations of trust and shared expectations that can help establish and enforce norms about what children need to do to succeed in school and what parents can do to help them (Coleman, 1988). Interestingly, Valenzuela and Dornbusch (1994) found that a strong family orientation contributed to school success among Mexican American youth, but only among those with highly educated parents, hinting that family support for child development is more powerful when it includes greater contact with the education system. As Suarez-Orosco et al. (2003) have explained:

Our ethnographic data suggest the crucial role of networks of social relations extending beyond the family in the successful adjustment of immigrant youth. In nearly every story of immigrant success, there is a caring adult who took an interest in the child and became actively engaged in her life. (p. 432)

Dissonant acculturation hinders the development of parent-child social capital. Stressors associated with acculturation, social marginalization, and separation from the accustomed cultural, familial, and kinship supports increase Latino parents' disengagement from the community and also contribute to challenges in parenting (Perreira, Chapman, & Stein, 2006). When children are exposed, through school and other social outlets, to norms and expectations that differ radically from those of their parents, parents respond to these outlets with resistance (Szapocznik & Williams, 2000). Increasingly dissonant acculturation processes in parents and children can lead to intergenerational conflict, rupture family ties, result in a loss of parental authority, and lead to role reversals in which the child becomes a culture broker for his or her parents (Portes & Rumbaut, 2001). A potential result is increasing disengagement and rigidity in parent-child relationships that previously had been flexible and cohesive (Gil & Vega, 1996; Szapocznik & Williams, 2000). Enhancing parent-child relationships and building parents' sense of efficacy and authority through positive parent-school interactions can promote family cohesion and social control (Valdez, Carlson, & Zanger, 2005).

Benefits of increasing social capital in Latino communities. Social relations that support children's school performance can be a source of information about resources and activities that promote success, and they can provide models of how parents can effectively interact with the school system and other community institutions to obtain the resources their children need. Enhancing existing social capital among Latino families by increasing family-school ties may improve children's chances of success. If social networks among Latino families are already strong, but ties to schools are typically more tenuous, then increasing social capital may be a particularly powerful practice for enhancing the development of children from low-income Latino families. *Moreover, enhanced family-school networks may mitigate the challenges of dissonant acculturation by strengthening family cohesion.*

Importance of parent involvement for building social capital. Most principals and teachers are committed to achieving greater parent involvement and are frustrated by unsuccessful efforts to do so (Epstein, 1996; Epstein & Becker, 1982). A growing survey literature indicates that parent involvement is associated with higher grades and test scores as well as lower dropout rates (Carbonaro, 1998; Henderson & Mapp, 2002; Ho Sui-Chu & Willms, 1996; Schneider & Coleman, 1993; Stevenson & Baker, 1987; Teachman et al., 1997). A recent meta-analysis conducted at the Campbell Collaborative reported on the basis of 19 experimental studies that parent involvement produced significant benefits in both reading and math achievement (Nye, Turner, & Schwartz, 2006). Similarly, Henderson and Mapp's (2002) review of the influence of parent involvement on student achievement reported that teacher outreach to parents and parent workshops helped children improve reading and math scores. Moreover, schools with partnership programs that were rated more

positively made greater gains on state tests than schools with programs that were less positively rated (Henderson & Mapp, 2002). Findings about school-wide programs have particular prominence in light of the emphasis in the No Child Left Behind Act (NCLB, 2002) on school-level outcomes, including student performance and parent involvement, and on the monitoring of these outcomes for demographic subgroups within schools. Parent involvement is a key element in student success, and to build family-school social capital, schools need effective programs and practices that will engage diverse groups of parents.

Reading the larger literature on parent involvement together with the research on Latino families and schools leads to the conclusion that efforts to increase parent involvement and enhance social capital between schools and Latino families must be characterized by recognition and respect for the cultural resources that parents bring with them. Connecting parents and schools may be particularly important for Latinos because of the strong family orientation of Latino immigrant children (Stanton-Salazar, 2001; Suarez-Orosco et al., 2003). A program that is “subtractive”—aiming to replace family norms with those of the school (Valenzuela, 1999)—will fail because it will alienate parents rather than strengthen their ties with the school and one another. By contrast, programs that view parents’ backgrounds as a resource stand a greater chance of success. For example, Pena’s (2000) in-depth interviews with parents at an urban, largely Mexican American elementary school in Texas indicated that establishing a relationship of trust between parents and staff was key to a school’s efforts to increase parent involvement. In particular, parents asserted that the attitudes of school staff needed to change so that parents and teachers working together could be seen as an advantage. Effective programs to engage parents need to leverage parent and school networks, tapping both rather than replacing a community network with one centered on the school (Stanton-Salazar, 2001). As Larson and Rumberger (1995, p. A66) concluded from their study of Latino teenagers, “when parents were approached with a genuine desire to serve them and their family, we found that almost all parents were exceedingly open to suggestion and to becoming more involved in directing their adolescent and monitoring school performance.” By drawing parents in while respecting their values and experiences, schools can foster relational trust—that is, social relations of trust among parents, teachers, principals, and students. As Bryk and Schneider (2002) have demonstrated, increasing relational trust is a stimulus to improved achievement. Creating positive relationships between schools and parents requires (a) individual actions on the part of school staff to be responsive and available to parents, (b) efforts on the part of the school as a whole to create a welcoming environment for parents, and (c) efforts by school support staff to engage parents and provide some structural basis for supporting parent involvement (Starkey & Klein, 2000).

b.3. The causal role of social capital

Our primary hypothesis is that social capital promotes child development; in addition, we anticipate that social capital in family-school relations is lower among students from immigrant minority families, and that increasing such social capital will reduce inequality in child outcomes. As discussed above, a variety of studies have tested the relations between social capital and child outcomes, and although most have relied on longitudinal data, the causal direction in these studies is ambiguous. Does social capital foster school success, or do better social ties emerge in communities that have more effective schools? Even Putnam (2000) acknowledged that the causal direction of social capital effects can be difficult to discern. Moreover, unobserved family characteristics may be related both to participation in social networks and to children’s development, without a necessary causal connection (Durlauf, 2002). *As Mouw (2006) explained, the effects of social capital may be overstated in survey research due to endogeneity (group members influence one another at the same time) and unobserved selectivity (unmeasured conditions may lead to both common memberships and common outcomes), and statistical efforts to overcome these problems rely on questionable assumptions.* Causal ambiguities may account for the mixed findings on the relation between social capital and health (Kunitz, 2004; Lynch et al., 2000) and between social capital and cognitive outcomes (Carbonaro, 1998; Morgan & Sorensen, 1999). Indeed, after controlling for peer relations, Morgan and Sorensen found that intergenerational closure was **negatively** associated with mathematics test scores among high schoolers. Schneider and Coleman (1993) found that family-school relations were not consistently related to success in middle school, perhaps because school contacts were initiated when students were struggling, making it difficult to tease out the causal relation between family-school connections and school performance. In addition, scholars have noted that social capital may have negative effects on development when norms that work against the demands of parents and teachers are enforced, as is often the case with peer norms (Durlauf, 2002; Kao, 2004; Portes, 1998; Portes & Landolt, 1996; Willis, 1977).

Experimental manipulation of the social relations among parents, teachers, and children offers a stronger test of hypotheses about the impact of social capital on child development. By randomly assigning a set of family/school groups to a “treatment” that enhances social capital, we may observe the causal effects of social

capital compared to an “untreated” set of controls. The experimental design eliminates problems of ambiguous causality and omitted variables that have created uncertainties in prior studies, because it renders the causal direction clear and eliminates the selectivity processes that may lead some families to obtain more access to activities that build social capital in the real world.

b.4. Intervention: Families and Schools Together (FAST)

To assess the causal impact of social capital through an experimental design, we require an intervention that has a high probability of successfully creating or enhancing social capital in the target population. The intervention we have selected is a new adaptation of Families and Schools Together (FAST), a successful, scientifically tested program (McDonald, 2002a; McDonald et al., 1997; McDonald, Coe-Braddish, Billingham, Dibble, & Rice, 1991; McDonald & Frey, 1999). *FAST is listed in the National Registry of Effective Prevention Programs of the U.S. Substance Abuse and Mental Health Services Administration (SAMHSA) based on four recently completed, randomized controlled trials of the intervention (Schinke, Brounstein, & Gardner, 2002; see also U.S. SAMHSA, 2005a), and it has been identified by the U.S. Department of Education (1998) and the U.S. Office of Juvenile Justice and Delinquency Prevention (2006) as an exemplary, research-based model program.* The FAST program is a multi-family group prevention program that is typically implemented in three stages: (a) active outreach to engage parents; (b) an 8-week program of weekly multi-family group meetings; and (c) 2 years of *follow-up* monthly parent-led meetings (*FASTWORKS*). Unique to this study will be the implementation of FAST on a school-wide basis, rather than with selected groups within schools.

The FAST team: A parent-professional partnership. At each school where FAST is implemented, a trained collaborative team is constituted to reflect the social ecology of the child. *The team includes at least one school representative and often more; several parents with children attending the school; and two community agency professionals, usually social workers with expertise in substance abuse, domestic violence, and mental health. The school representatives are selected by the principal and may be teachers, an assistant principal, or a school counselor. They make an initial presentation about the program to the school faculty, arrange for the program’s use of school facilities and resources, encourage parent participation, and mobilize school support in a variety of creative ways. They also lead the children’s activities at FAST.*

For an hour at the FAST after-school program, while the parents meet in support groups to get to know one another and share their parenting experiences, school representatives on the FAST team supervise the children in positive games and activities. The children’s time involves the siblings of the first graders and may involve over 200 children. Volunteers support the school representatives in carrying out the supervised activities, which may be arts and crafts, sports, music, or drama. Parents can see many concrete signs of the schools’ commitment to sincerely welcome the whole family into the building each week.

Parents on the FAST team are nominated by the principal and preferably are FAST graduates themselves. In an effort to overcome traditions of institutional racism that might interfere with retention rates and lead to program dropout, parent team members are chosen to be representative of the school’s parent community. For example, if over half of the families being served are of Mexican first-generation origin and speak only Spanish and the other families are Anglo American and speak only English, then the team must be similarly composed of half Spanish-speaking Mexican Americans and half English-speaking Anglo Americans. It is because of this shared-governance requirement that FAST has been accepted into socially marginalized American Indian communities, inner-city African American communities, and in Australia, Aboriginal communities. The message is that culture matters more to the effective adaptation of the program and to the quality of the service delivery than the professional credentials of the team members. Cultural representation on the team enables it to communicate respectfully and appropriately with parents in the parents’ language of choice. Written materials used for FAST activities are available in both English and Spanish.

The team is trained to adapt the program to accommodate the needs of the families that will be invited to participate in the program. For example, at sites where transportation to the school is identified as problematic, the team arranges transportation for families. Similarly, child care is provided to occupy children while adults participate in adult-only portions of the program. Core program components—including team composition, cultural representation on the team, *respectful interactions with parents*, and provision of transportation and/or child care for families that need this support—are monitored by FAST trainers through *three* site visits over 8 weeks, involving *direct observation of implementation*.

Recruitment. Participation in the FAST program is voluntary. Families are invited to *come and try it once* through home visits or other forms of face-to-face contact, as well as through other less intensive forms of recruitment (e.g., flyers sent home with children). When parents are invited to attend, they are informed that

they may bring any family members they choose. Aunts, uncles, siblings, grandparents, stepparents—all are welcome to participate in the program; however, their participation is not tracked or evaluated.

Intervention components. Each implementation of FAST involves a multi-family group of 5–10 families. *In the proposed research, each school will host up to six of these multi-family groups at a time, serving about 60 families.* Each small group of 5-10 families forms a "hub" in the family-school network. *In the school-wide multi-hub implementation, each hub will be formed from a specific first-grade classroom. These hubs will reflect the demographics of the classrooms and will probably be inter-ethnic, with mixed language skills, depending on the makeup of that classroom at that school. The culturally representative hub teams will structure and support activities to ensure that all participants understand the language.* Meeting weekly for 8 weeks and then monthly for 2 years, the 5–10 families will grow to know and trust each other within their hub, forming the relationships that embody social capital across the school.

FAST sessions last approximately 2½ hours and *follow the same routine each week: a family meal, group singing, family games and activities, parent support groups parallel with children's time, one-to-one responsive play, and a closing circle.* The FAST activities, which are based on experiential learning, are designed to enhance social capital—building relationships across the child's social ecology while also reducing family stress and increasing children's attention span. The activities apply mental health research, family systems theory, community development theory, and the social ecological theory of child development. Appendix B includes a paper by Lynn McDonald (2002b), *the program developer*, that details the research behind each activity of the FAST program. This paper, "Research Background of Each FAST Activity for Multi-Family Group Meetings," is distributed to educators and team members who support and/or participate in the FAST program. Another paper available online (McDonald & Sayger, 1998) explains how FAST enhances protective factors for reducing risk among low-income children, including strengthening the mother-child bond, promoting bonds among parents and within and between families, and developing parents' affiliations with their children's schools and community agencies. These protective factors reside not in individual characteristics, but in the relationships among individuals, and in that sense they constitute social capital in the three types of relationships in which, according to our conceptual framework, social capital resides:

- Parent-child relationship.** As part of the FAST intervention, parents are taught how to conduct 15 minutes of a non-directive play therapy activity originally developed by Hanf (see Hanf & Kling, 1973). Parents are coached to let their children initiate the topic of play. The parent follows the child's lead, describing the child's activities without asking questions, criticizing, or offering direction or teaching. This activity improves the parent-child bond and reduces problem behaviors (Forehand & McMahon, 1981; Kogan, 1978). The play activity is included in several evidence-based model programs identified by the National Registry of Effective Prevention Programs for SAMHSA (see Schinke et al., 2002), including FAST (see Kumpfer, 1993; Webster-Stratton, 1998). This uninterrupted, one-on-one parent-child play time ("special play") is at the core of the FAST intervention and is repeated each week for 8 weeks. *(Siblings remain in supervised children's activities while the focal child is at special play.) In addition, for an hour of each session, each family sits at a family table, and the parents lead positive family games and activities, including a meal.* Consistent with structural family systems theory (see Minuchin & Nichols, 1993; Szapocznik & Kurtines, 1989), information for initiating and guiding activities flows through the parents so that parental authority is supported as they deliver repeated compliance requests. *Family cohesion is fostered as the family shares fun, sustained time together and practices the building blocks for conflict resolution, including waiting for one's turn to speak and listen.* Team members are taught to respectfully coach parents through activities including special play. To avoid undermining parental authority, team members do not lecture or issue directives to parents.
- Parent-parent relationship.** Parents are more likely to use newly learned parenting behaviors if they are socially supported (Dumas & Wahler, 1983). Peer groups and mutual self-help groups are effective strategies for building support among peers (Ephross & Vassil, 2004). To foster such support, FAST uses two strategies during each weekly session: First, parents are paired off, based on either existing relationships (e.g., husband and wife) or new relationships (for parents who attend on their own). Each person in the pair takes time to speak, without interruption, about anything he or she chooses. Then the second person in the pair has a turn at uninterrupted speaking with an attentive listener. Second, parents meet in a peer support group each week for 45 minutes to discuss issues they identify as important to them. These interactions can improve parenting skills (Belle, 1980) and reduce parental stress and isolation (Taylor et al., 2000). *The structured dyad time and small group time over 8 weeks, and then monthly meetings over 2 years, seem sufficient to build friendships and circles of support among parents with same-age children attending the same school.*

- **Parent-school relationship.** Key elements of the FAST program address barriers to parent involvement in order to establish parent-school relationships. First, the *FAST implementation team provides a welcoming and respectful positive experience at the school, free transportation, free child care, a free family meal each week, lottery baskets for every family, and meeting at a time that is convenient to most of the parents' schedules.* The team is charged with the task of identifying any additional adaptations of the program that will accommodate parents' circumstances. Second, the team is required to represent parents culturally and include parents as team members. Third, the school partner for the collaborative team serves as a link between parent and family networks and school networks. Fourth, the principal for each school is required to attend the FAST graduation and hear parents' feedback about the program implementation. Finally, the strategies used to support parental authority help parents connect the cultures of home with the cultures of school for their children (Valenzuela & Dornbusch, 1994).

FASTWORKS. The second phase of FAST is FASTWORKS—parent-run monthly meetings over the course of 2 years. The FASTWORKS portion of the program is structured to *maintain the relationships of each of the small groups of parents, to reinforce the parent-child bond, and to support parent networks and parent involvement with the school and community.* FASTWORKS meetings are led by a newly graduated FAST parent in collaboration with a school *representative.* Parents choose the *agenda and activities* at meetings, but they must include special play (which reinforces the parent-child bond) and adult-only “buddy time” (which supports the development of parent relationships with other parents at the school). *The activities selected also express local concerns of the parents, who are empowered by knowing that they have support from other parents for the issues they might raise. This practice shifts the power base of the socially marginalized, previously socially isolated, parents and enables advocacy for the sake of their child.* Each group at a school also elects a parent to serve on a Parent Advisory Group within the school district. This group coordinates district-wide FASTWORKS events and activities.

Replication and evaluation. The FAST intervention has been successfully replicated and implemented in some 800 urban and rural settings in 45 states and across diverse ethnic and socioeconomic groups. Earlier versions of the program have been subjected to four randomized controlled trials (discussed in greater detail in section c, “Preliminary studies”), which have yielded consistent results, demonstrating:

1. Successful engagement of *socially marginalized, low-income* parents in collaboration with school personnel to improve children's behaviors (results showed 80% retention of parents who began the program);
2. Effective reduction of elementary school children's behavioral problems as measured on Achenbach's (1991) Child Behavior Checklist;
3. Increased children's social skills as measured on Gresham and Elliot's (1990) Social Skills Rating Scale; and
4. Improved academic performance *as reported by teachers* (Abt Associates, 2001; Kratochwill, McDonald, Levin, Young Bear-Tibbetts, & Demaray, 2004; McDonald et al., 2006).

A limitation of existing studies of FAST for the research at hand is that they were based on random assignment of individuals *or classrooms* rather than schools. In the present case, however, we have strong reason to anticipate that the effects of the program will be more powerful when applied to an entire grade cohort. This plan requires enough schools for a cluster randomized trial (see section d.4, “Data analyses,” below); none of the earlier studies included more than 10 schools, which would not suffice to address the questions raised in this study. In addition, the program will be modified to allow implementation across the full grade cohort, rather than with selected families.

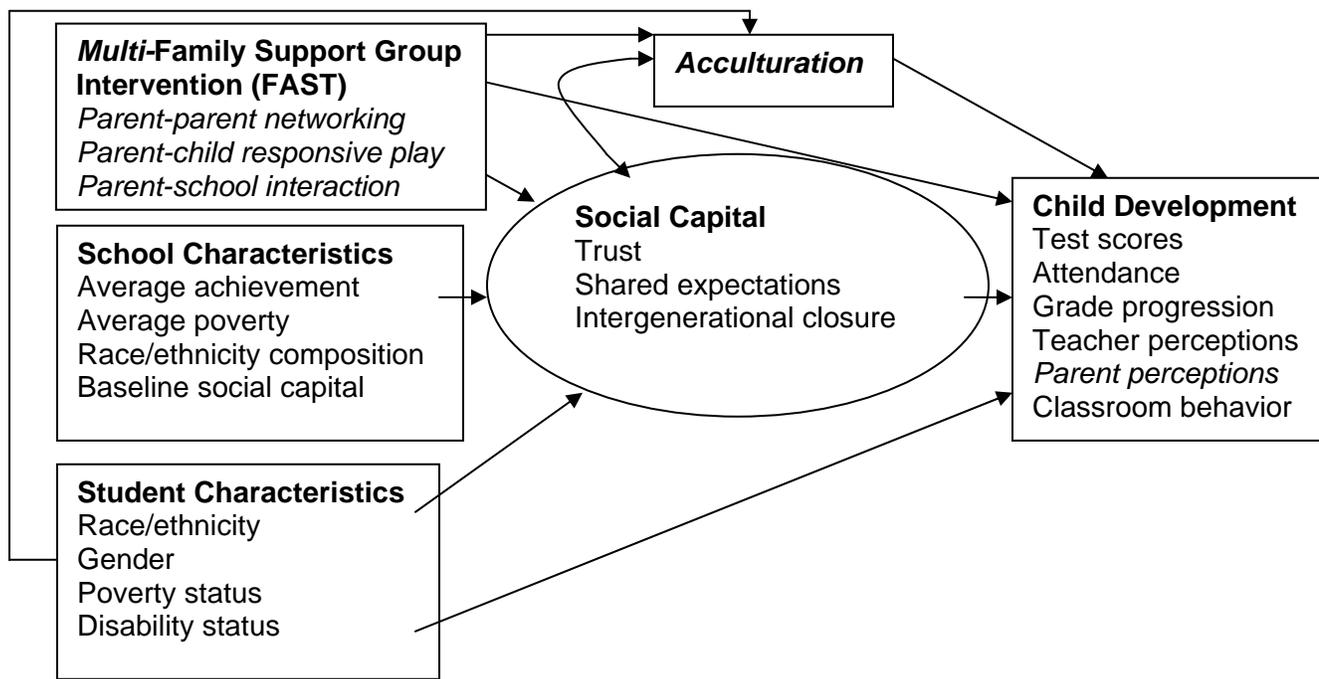
b.5. School characteristics

The school social environment plays an important role in the formation of social capital, which in turn is associated with student academic performance. School characteristics such as classroom organization, parents' socioeconomic status, and racial/ethnic composition set the context in which students, teachers, and parents develop relationships (Crosnoe, 2004; Harris, Duncan, & Boisjoly, 2002; Kubitschek & Hallinan, 1998; Morgan & Sorensen, 1999). For example, a case study of a Chicago elementary school showed that cultural diversity can challenge the relations of trust among teachers/administrators, parents, and students; at another elementary school, severe poverty and limited parental education created an imbalance of power among parents and teachers (Bryk & Schneider, 2002). Consequently, we include indicators of school context as the backdrop against which the social capital intervention takes place.

b.6. Conceptual framework

Figure 1 displays the conceptual model relating FAST to social capital and child outcomes.

Figure 1. Conceptual model.



c. Preliminary Studies

Evaluations of FAST have demonstrated the program's positive effects on parent involvement, child behavior, and teacher perceptions of child performance, and *its reduction of child aggression*. Four randomized controlled trials (RCTs) of the FAST program have recently been completed. A separate research team was created for each RCT, and each featured a different design. One was an independent study conducted by Abt Associates (2001), and the other three, like the proposed study, were based at the University of Wisconsin–Madison (UW-Madison), with a principal investigator in the School of Education or the Medical School and with the program developer, Lynn McDonald, as co-PI. The federal funding agencies for these four large research studies (3- to 5-year RCTs conducted in 31 schools with over \$6 million in funding) were the Department of Education and the Department of Health and Human Services. Three of the evaluations have been published (Abt Associates, 2001; Kratochwill et al., 2004; McDonald et al., 2006); the latter two appeared in rigorous peer-reviewed journals *and are included in Appendix B, while the first is available online. The fourth is now under journal review for publication.*

All four completed studies used standardized outcome measures of child behavior—the Social Skills Rating System (SSRS; Gresham & Elliott, 1990) and the Child Behavior Checklist (CBCL; Achenbach, 1991)—which include subscales for social skills, aggression, and academic competence. Two of the studies used measures of parent involvement. However, the populations, recruitment strategies, and research designs varied.

The first study (Abt Associates, 2001) involved low-income African American children ($N = 400$) who were identified as at risk by teachers and randomly assigned to a FAST treatment or control group. Among families that agreed to participate, 77% actually participated in at least one session, and among those who attended at least one session, 78% attended at least five, for an overall completion rate of 60%. Outcome ratings by parents and teachers for students assigned to treatment and control groups were analyzed using hierarchical linear modeling (HLM) and an intention-to-treat (ITT) model.¹ One year after the intervention, children in the FAST treatment group showed significantly more positive scores than control group children on social skills (SSRS) as rated by parents. In addition, children in the treatment group had significantly lower scores than children in the control group on the CBCL externalizing subscale as reported by their parents. Teachers, who were blind to the students' experimental conditions, gave higher social skills ratings to children in the treatment group, but the difference was not statistically significant ($F = 2.36, p = .13$). Parent involvement was analyzed after 1 year: FAST parents volunteered significantly more and were more involved as parent leaders than control group parents (Abt Associates, 2001). This finding is particularly important for our purposes in that greater parent involvement is a strong sign of enhanced family-school social capital.

A second RCT involved randomly assigning second-grade classrooms to either FAST or a comparison condition called FAME² in 10 inner-city elementary schools serving at-risk, low-income communities (McDonald et al., 2006). The study included a 2-year follow-up. The participation rate among those who agreed to join the study was 89%, and the rate of retention for at least five sessions was 78% among those who participated, for an overall completion rate of 69%. An ITT HLM analysis of 2-year outcomes found that teachers blind to condition gave higher ratings of academic competence to children assigned to the FAST condition (effect size = .23) than to children assigned to the comparison condition (Moberg, McDonald, Brown, & Burke, 2002). In the sample as a whole, findings for behavioral outcomes were non-significant (Moberg et al., 2002). However, an HLM analysis that examined the program impact on Latino children in the sample ($N = 130$) found that at the 2-year follow-up, teachers gave Latino children in the treatment group significantly higher scores on academic competence and social skills and significantly lower scores on aggression than Latino children in the comparison group (McDonald et al., 2006). Moreover, rates of participation, retention, and overall completion were especially high among Latinos—at 90%, 85%, and 77%, respectively. Similarly, while 82% of FAST graduates (program completers) attended at least one FASTWORKS session, and the average number of FASTWORKS sessions attended was 7.1 over 2 years, 91% of Latino FAST graduates attended at least one FASTWORKS session, and the average number attended was 9.9. (This is the only study in which FASTWORKS participation was tracked.) These results are particularly important in light of the proposed study's focus on Latinos and may reflect high levels of family social networks among Latinos, possibly compounding the benefits that accrue from adding school and community ties to family networks.

The third RCT (Kratochwill et al., 2004; see Appendix B) featured universal recruitment of K–2 American Indian children from three reservation schools in a generally low-income, rural area. Fifty matched pairs were

¹ HLM and ITT models are discussed at greater length in section d, "Research Design and Methods," below.

² In the FAME condition, family education booklets were mailed to participants' homes, with active follow-up.

created based on five variables (age, gender, grade, tribe, and teacher assessment of high vs. low classroom aggression on the CBCL). The matched pairs were then randomly assigned to FAST or control groups, and pre-post and 1-year follow-up data were collected and analyzed with an ITT model. All 50 families assigned to the FAST treatment group attended at least one session, and 80% returned for a minimum of five more weekly sessions to graduate. Results on student-level analyses showed statistically significant differences at 1-year follow-up. Assessments by teachers, who were again blind to condition, favored FAST participants over control participants with regard to classroom behavior (effect size = .61) and academic performance (effect size = .45) (Kratochwill et al., 2004).

The fourth RCT used a combined recruitment method: half of the children for each experimental group were identified by teachers as being at risk, and the other half were universally recruited from Grades K–2, which served at-risk, low-income communities in an ethnically diverse school district. Again, the children were assigned to matched pairs prior to randomization (based on age, gender, grade, race, and teacher assessment of high vs. low classroom aggression). All 67 parents who agreed to attend FAST attended at least one session of the program, and 90% returned for five or more additional weekly sessions. Pre-post and 1-year follow-up data were collected and analyzed with an ITT model. At the 1-year follow-up, teachers blind to condition did not show significant differences in their ratings of the FAST and control children on standardized measures. However, parents in the treatment condition rated their children significantly lower on a standardized measure of externalizing behavior (CBCL subscale) than parents in the control condition. In addition, school district data on utilization of special education services by treatment and control group children were collected for the 3 years of the study. The results showed that children who had participated in FAST received 1/14 the number of special education services received by children in the control group.

Overall, existing experimental research establishes the effectiveness of the FAST program in engaging parents and supporting the development of young students' social skills and academic competence while reducing aggression. Moreover, these effects were obtained with low-income, diverse families living in at-risk communities. That is, FAST has a systematic dissemination, cultural adaptation, and evaluation process that can effectively ensure that the benefits of the intervention are conferred on children and families wherever FAST is implemented. These findings give strong reason to believe that the FAST intervention will serve its purpose in the proposed study: to enhance social capital in a randomly selected group of family-school communities, so we can test the effects of social capital on children's development.

In addition to parent and teacher reports of child outcomes, the proposed study will examine high-stakes test scores as results of enhanced social capital. Members of the research team are experienced analysts of state test scores from Wisconsin and Texas (the two states involved in the study). One earlier study documented higher levels of achievement growth in Texas school districts participating in systemic reform initiatives (Gamoran, 2002). Another raised new questions about the impact of class-size reduction on student achievement in Wisconsin (Webb, Meyer, Gamoran, & Fu, 2004). These studies also demonstrate the investigators' versatility with a range of statistical methods that include those to be employed in the present study. Beyond studies of FAST, the investigators are also experienced analysts of cognitive and behavioral outcomes for young children (e.g., Dreeben & Gamoran, 1986; Gamoran, 1986; Milesi & Gamoran, 2006; Shumow, Vandell, & Kang, 1996; Shumow, Vandell, & Posner, 1999; Turley, 2002, 2003a, 2003b; Valdez et al., 2005; Valdez, Lambert, & Jalongo, 2006; Valdez, Riley, Keith, & Stark, 2006; Vandell & Pierce, 2003).

d. Research Design and Methods

The proposed study will involve three components:

1. An intervention designed to enhance social capital in the parent-teacher-child communities of a randomly selected set of schools;
2. The collection of data on social capital and child outcomes from parents, teachers, and children in both intervention and control schools, as well as from a study of implementation in all 26 FAST schools; and
3. An analysis of the causal effects of parent-teacher-child social capital on children's behavioral and cognitive outcomes.

d.1. Design of the intervention

In the proposed intervention, a trained team of parents and professionals will lead the FAST sessions for about 60 families of first graders per school for 8 weeks, followed by 2 years of parent-run monthly FASTWORKS meetings. Until recently, FAST has been implemented as one multi-family group of 5–10 families of at-risk children (**single-hub FAST**). In the proposed study, the program will be implemented with multiple groups of 5–10 families meeting simultaneously (**multi-hub FAST**) to systematically build relationships (a) between parents and their elementary school children, (b) between parents and other parents of children attending the same school, and (c) between children, parents, and teachers. Creating a school-wide culture of engagement is viewed as an essential component of building social capital and achieving the desired outcomes of positive social development and higher achievement (Wehlage, Rutter, Smith, Lesko, & Fernandez, 1989). We propose to build this school-wide culture of engagement by providing the FAST after-school, multi-family group intervention to all first-grade students and their families in 26 schools, randomly selected from a sample of 52 schools serving low-income, minority (25%+ Latino) communities. The 26 schools not selected for the treatment will serve as controls. This design will provide us with a randomized comparison of family-school communities in which social capital has emerged independently of child outcomes, resolving the causal ambiguity that surrounds much of the research on social capital.

Adaptation for Latino population. Beyond the program modifications required to expand the program within and across schools, the FAST intervention is always adapted **at the local level by a culturally representative team** to meet the needs of the specific population at hand—in this case, schools with moderate to high proportions of low-income Latino (mainly Mexican American) families. For example, in previous implementations, program modifications instituted by Latino members of FAST teams have enabled Latino children to see school faculty paying respect to their parents in the school building, making home visits to invite their parents to participate in the FAST family groups at school, and supporting their parents in taking the lead in family activities and expecting respectful behavior from their children. To take another example, including Latino selections in the music part of the FAST program, sung in Spanish, has helped child participants experience music as a common experience across majority and minority cultures. Finally, giving each participating family the opportunity and the funds to select, cook, and host the group meal once during the 8-week FAST program has allowed child participants to see their families' favorite foods treated with respect by other parents and school representatives, and to experience commonalities bridging minority and majority cultures.

At FAST sessions, families sit at their own tables for one hour of parent-led family activities, during which the parent directs the child and his or her siblings in their native language. The child listens to the instructions, while also observing that the parent knows what to do at the school (whether the parent is literate in English or not). The children listen to their parents for directions, draw pictures, take turns, and explain their ideas and feelings. These non-didactic activities usually generate family laughter; because the program takes place at the school, the good feelings generalize across both home and school settings. The positive experience reduces the anxiety a child might feel about being at school, which supports the learning process with the teacher.

FAST meetings also include an hour of peer group time, during which youth play together in a separate setting while the adults talk in groups of 5 to 10. High school volunteers, who are doing community service with school faculty, generate and lead activities for the children's time. The child sees the school faculty in a more informal role, leading fun activities. At the same time, the small groups of parents discuss topics of their choice and share advice in the language of choice. An active social network of parents grows in the school setting; because they get to know and trust one another, they are more likely to return to the school for other events.

The peer group and parent time is followed by 15 minutes of one-to-one parent-child time (special play), during which the child takes the lead in playing. The parent pays full attention and does not criticize or interrupt. None of these activities demands parental literacy or mastery of English. Repeating this special play time is the parent "homework."

The eight weekly meetings of FAST are followed by 2 years of FASTWORKS monthly meetings at the school. The responsibility for facilitating the after-school family support groups becomes that of the parents who have graduated. FASTWORKS provides a supportive structure for increased parent involvement at school, which becomes self-sustaining as it maintains the newly formed relationships. Especially for minority-culture parents, such a structure is welcomed as a way of finding out the “appropriate” way to negotiate the school institution for their children’s success.

Fidelity of intervention. For the 26 intervention schools, the FAST program will be implemented over a 2-year period in a standardized fashion as outlined in the FAST Program Integrity Checklist (see Appendix A) developed by McDonald (the program developer). FAST program services will be provided by trained teams and monitored by certified FAST trainers. A six-person advisory board, whose members will include low-income Latino FAST parents, will review all aspects of the implementation and research to ensure its developmental integrity. FAST training will be carried out in the school setting across the 4 years of program implementation for the project (see section d.7, “Timetable”) through intensive team trainings, followed by multiple site visits by certified FAST trainers, and through the provision of technical assistance and supporting materials (e.g., FAST training manuals and operations checklists), which are available in Spanish.

FAST has a quality assurance structure that has supported treatment integrity in program implementation in schools in both urban and rural settings and across diverse ethnic and socioeconomic groups. The quality assurance structure, which we will employ in the present study, involves certified FAST trainers who conduct multiple site visits to train teams using FAST manuals and video materials. Subsequently, the trainers observe implementation and complete the Program Integrity Checklist to ensure fidelity of implementation. Trainers make three site visits during the eight weekly meetings and two site visits per year for the monthly FASTWORKS sessions. These site visits include assessment and debriefing so that program integrity can be maintained and local adaptations noted. Trainers record the time spent in implementing the FAST program, as well as the cost of the experimental evaluation of the program. Additionally, we will report the time involved for parents, school representatives, and community professionals in all facets of the program implementation. Core components of FAST constitute 40% of the implementation; for 60% of the program, local adaptations are developed by the culturally representative teams. This ratio of fixed program to variable program contributes to the high levels of local ownership that teams report feeling toward the FAST program.

These treatment integrity mechanisms make us optimistic that the FAST intervention can be adapted successfully as a school-wide intervention. But there are other reasons for optimism. First and perhaps most important, FAST has one of the most impressive retention rates for low-income, diverse parents of any family-based intervention program (Casper & Lopez, 2006). In contrast to 12 other evidence based family involvement programs listed as model programs by SAMHSA, FAST was recognized for its strategy of cultural representation in achieving its track record for high retention rates (U.S. SAMHSA, 2005a, 2005b). In program replications of FAST in over 800 communities, the 8-week completion rate has consistently averaged 80% among families who attend FAST once. Put simply, people like FAST. Although refusal rates have not been specifically tracked, FAST consistently draws in a high percentage of families invited to participate in the intervention, across diverse communities. This is not an insignificant consideration, because our proposal to implement a voluntary program school-wide relies heavily on our conviction that we will be able to recruit and retain enough families to have an impact on social capital and student outcomes.

Another reason for optimism is that we have recently completed a pilot study of multi-hub FAST—that is, FAST delivered to multiple groups of families within the same school. We know how to implement the FAST intervention effectively with single hubs—one group of 5–10 families meeting for structured activities once each week for 8 weeks, followed by 2 years of monthly parent-led FASTWORKS meetings. To implement FAST with an entire grade level of children and their families, we have adapted the implementation structure to accommodate multiple hubs. In anticipation of the school-wide FAST implementations we are currently proposing to undertake, the Wisconsin Center for Education Research, in collaboration with the FAST National Training and Evaluation Center, collected data on an implementation of multi-hub FAST in elementary schools throughout Wisconsin. The results from this pilot study—its implementation structure, recruitment and retention rates, and post-test evaluations of effectiveness—are impressive. Aggregate data from the 12 project sites for which recruitment and retention data were collected show the following:

- The recruitment of families who expressed initial interest was 95% (range: 75–100%).
- The average retention rate for families who came once was 88% (range: 60–100%).
- Graduate (retained) families attended an average of 90% of the sessions.

These data strongly suggest that if multi-hub FAST is used as a school-wide intervention, participation will be high enough to have a potential impact on school-level data. These rates suggest that the proposed intervention will indeed create a significant increase in social capital at participating schools.

In addition to verifying that FAST can be effectively implemented using a multi-hub model *without compromising retention rates*, the pilot study suggests that multi-hub FAST does not diminish the effectiveness of the FAST intervention. When surveyed after the intervention, parents reported statistically significant increases in the number of social, school, and community relationships; statistically significant decreases in family conflict; and statistically significant improvements in their relationships with their children. Parents also reported statistically significant improvements in all social relationships, including increases in support received from other parents. Parent social networks, one of our ways of measuring social capital, thus grew significantly over the course of the FAST intervention. In terms of children's behavior, both parents and teachers indicated significant improvements on most of the strengths and difficulties subscales. In addition, teachers reported statistically significant increases in their relationships with FAST parents, and parent involvement scores increased significantly as well. Teachers also indicated an overall moderate benefit of the program in improving the FAST children's attitudes, behaviors, and relationships. Although there was no control group in this pilot study, the fact that the data are consistent with data from single-hub studies of FAST indicates that the adaptation of FAST to a multi-hub model does not compromise the effectiveness of the intervention.

d.2. Subject recruitment and random assignment

The proposed study will estimate the effects of social capital in relationships among parents, between parents and schools, and between parents and children on children's social and academic outcomes. Because social capital resides not in individuals but in the relationships among individuals (although individuals within a social group may vary in their enactment of social capital), it is more appropriately viewed as located in contextual rather than individual conditions. For this reason, randomization in this study will occur at the level of the school rather than the individual. Working with the school districts of Milwaukee and San Antonio (see "Letters of support"), we will recruit 52 schools over a period of 2 years to participate in the study. The FAST program has a longstanding relationship with both districts, and the program is eagerly awaited. Due to the great expense of school-level randomization and the large number of sites it requires, implementation will take place over 2 years rather than 1, *with half the schools selected in Year 1 (Cohort 1) and half the schools selected in Year 2 (Cohort 2)*. Each implementation will involve a cohort of first graders that will be followed for 3 years, and results from the two cohorts will be combined in a single analysis. Only schools enrolling at least 25% Latino students will be eligible for participation in the study. To ensure that our sample is representative of the schools attended by high proportions of Latino students in these cities, we will examine school-level demographic data and state achievement test results, comparing recruited schools to all schools in the two cities. After a satisfactory sample has been identified, we will assign schools at random within the cities to treatment (FAST) or control conditions.

The school districts of Milwaukee and San Antonio were selected for participation in this project for a number of reasons. First, service providers in both locations (Family Bridges, Inc., in Milwaukee and Family Service Association in San Antonio) have more than 10 years' experience providing training for and implementing excellent FAST programs in their communities, including in elementary schools serving low-income Latino students (see letters documenting capacity and commitment in section j below). Second, because of the districts' long-term relationships with and respect for the FAST program, both are willing to make significant contributions to implement this intervention as an important step in promoting the success of their students, especially low-income Latino children. As noted earlier, both urban locations have significant numbers of Latino students enrolled in their school districts (51% in San Antonio and 21% in Milwaukee,¹ a larger proportion in Milwaukee public schools than in the general population), and this is our target population. Third, although the Latino communities in Milwaukee and San Antonio differ from one another, pre-post assessments of FAST in many schools in both sites show that the program has a comparable impact in both locations. Including two locations will improve the generalizability of this study. Our aim is to include both an area with a large Latino population (San Antonio) and an area with a rapidly growing Latino population

¹ *The proportion of Latino students in Milwaukee's school population is growing by about 1% per year. Milwaukee schools tend to be segregated along racial/ethnic lines: in 2005–06, 8 schools were 80–100% Latino, and 10 schools were 60–79% Latino. Thus, in terms of ethnic composition, the Milwaukee schools in our sample may be more similar to the San Antonio schools than one might have expected. Still, there will likely be a wider range of school ethnic composition in Milwaukee than in San Antonio, and we will take this into account in planning the intervention (through local adaptation) and the analyses (by controlling for population composition).*

(Milwaukee). According to the 2000 Census, Latinos (of any race) make up 58.7% of San Antonio's population, compared to 12.5% of the U.S. population. Whereas San Antonio was chosen for its very large Latino population, Milwaukee was chosen for its rapidly growing Latino population. Between 1990 and 2000, the Latino population in Milwaukee grew by 90% (from 6.3% to 12%), compared to a national growth rate of 39%.

Milwaukee and San Antonio schools that will be recruited to participate in the study will be:

1. Title I–designated elementary schools;
2. Schools with 25% or more Latino student enrollment;
3. Schools willing to participate regardless of assignment to the treatment or control condition;
4. Schools willing, if assigned to the control condition, to forgo implementation of any FAST program from August 2007 through June 2010 or June 2011, depending on year of selection as a control school;
5. Schools willing to distribute consent letters and forms and brief questionnaires with all enrollment packets for first-grade students in 2007 or 2008, depending on year of implementation;
6. Schools willing to distribute consent letters and forms with all enrollment packets for third-grade students in 2009 or 2010, depending on year of implementation; and
7. Schools willing to provide us with standardized reading and math test scores for third-grade students in 2009 or 2010, depending on year of implementation.

The first two criteria above ensure the inclusion of low-income Latino students in the study, and these features of school enrollment are reported for all schools in Milwaukee and San Antonio. The third and fourth criteria are needed to maintain the integrity of the research design. Criteria 5 through 7 provide a basis for data collection.

In collaboration with the local school districts and the local FAST service providers, the research team will present the study to schools that meet the first two criteria. We will then seek formal consent from schools in which the principal and first-grade teachers are willing to comply with the remaining criteria. (See “Letters of support” for district commitments and school consent forms in Appendix C.) After consent is obtained, schools will be randomly assigned to treatment and control conditions. Schools that agree to participate in the project will be compensated for distributing consent forms and questionnaires and for providing third-grade reading and math test scores. *All families with first-grade children in the treatment schools will be invited to participate, and the extent of family participation in FAST among those invited will be carefully monitored.*

d.3. Data collection

Three types of data will be collected in the main study (for additional data collection, see section d.5., “Implementation study”):

Data on social capital and acculturation. Our key independent variable is social capital, which we conceptualize along three dimensions (trust, shared expectations, and intergenerational closure) embedded in three types of relations (parent-school, parent-parent, and parent-child). One source of data on social capital is the Parent Social Capital Questionnaire (see Appendix A), which includes a set of questions addressing all three types of relations, based on the three dimensions. The questionnaire is adapted from the Social Relationships and Parent Involvement scales of the FAST-designed Building Relationships Parent Survey (BRPS; McDonald & Moberg, 2002); it also incorporates a few questions about trust from Bryk and Schneider's (2002) Teacher-Parent Trust scale, adapted for parents.

The first part of the Parent Social Capital Questionnaire focuses on parent-school relations, addressing the parents' degree of trust in school staff, the extent to which the school staff share the parents' expectations for their children, and the number of school staff parents could turn to if they had questions about their children. Questions 1–3 and 5 are based on Bryk and Schneider (2002). Their full Teacher-Parent Trust scale has an alpha reliability of .78; for brevity, we have selected the most pertinent items for our survey. The second part of the questionnaire turns to parent-parent relations, asking not only about the number of other parents known, but also about the extent to which parents provide support for each other and share expectations for their children. Analyses of BRPS data from the FAST multi-hub pilot study discussed in section d.1, “Design of the intervention,” yielded a reliability of .93 for the six elements in Questions 8 and 9. The third and final part of the questionnaire focuses on parent-child relations, addressing (a) the extent to which children can trust and rely on their parents for emotional and academic support and (b) the parents' level of engagement in their children's school activities. Questions 11–14, which were used in the multi-hub pilot study, form a scale with reliability of .73; Questions 15 and 16 will be added to this scale.

The Parent Social Capital Questionnaire will be administered on three occasions: when parents register their children in the summer or fall prior to first grade (before school randomization has occurred); *and twice by*

mail or home visits in the spring of first grade and the spring of third grade (see details of parent survey administration below). The pre-treatment administration is not essential for the study, but it will allow us to assess the extent of change in parents' relationships over time, which is of interest in and of itself. Parent questionnaires will be available in English and Spanish. *Parents will receive compensation with \$10 value at the time of registration, and \$5 each time they receive a mailed or at-home survey.*

Information on family-school social capital will also come from the Parent Involvement in School Questionnaire, which teachers will complete with respect to the parents of each student, *and which parents will complete with respect to their own involvement.* This questionnaire was adapted from Shumow et al. (1996; see Appendix A). *The Teacher version covers the teacher-parent relationship (Questions 1–8; alpha-reliability reported as .96), frequency of parent-school contact (Questions 9–19; reliability = .83), and perceptions of the impact of parent-child relations on schoolwork (Questions 20–28; reliability = .86). The Parent version contains analogous items (parent perception of the teacher-parent relationship, Questions 1-9, reliability = .96; perceived school efforts to involve parents, Questions 10-19, reliability = .83; and parent-reported involvement in children's schoolwork, Questions 20-28, reliability = .74; see Shumow et al., 1996).* Table 1 summarizes our operationalization of social capital measures by combining the Parent Social Capital Questionnaire (PSCQ; completed by parents) and the Parent Involvement in School Questionnaire (PISQ–T; completed by teachers and PISQ–P, completed by parents). Exploratory factor analysis of available items from the PSCQ (Questions 8–9 and 11–14) indicated that items covering trust and expectations adhere well to the same scales, but that questions about parent-parent relations belong in a separate scale from those pertaining to parent-child relations. *(Factor loadings of items in the parent-parent factor ranged from .72 to .96, and those in the parent-child factor ranged from .46 to .76.)* Consequently, we expect to implement three indicators of social capital, relating to parent-school, parent-parent, and parent-child relations, each including the dimensions of trust and shared expectations, but with intergenerational closure included solely in the parent-parent scale (as indicated in Table 1). Teachers will be compensated (\$100) for completing all questionnaires.

Table 1

Conceptualization and Operationalization of Social Capital in the Parent Social Capital Questionnaire (PSCQ) and the Parent Involvement in School Questionnaire (PISQ) (See Appendix A for Items)

Types of relations	Dimensions of social capital		
	Trust	Shared expectations	Intergenerational closure
Parent-school relations	PSCQ 1–3,5; PISQ–T 1–5; PISQ–P 1–9	PSCQ 4, 6; PISQ–T 9–19; PISQ–P 10–19	N/A
Parent-parent relations	PSCQ 8–9	PSCQ 10	PSCQ 7
Parent-child relations	PSCQ 11–13; PISQ–T 6–8	PSCQ 14–16; PISQ–T 20– 28; PISQ–P 20–28	N/A

We will also ask parents to provide information about acculturation by responding to the Abbreviated Multidimensional Acculturation Scale (AMAS; Zea, Asner-Self, Birman, & Buki, 2003; see Appendix A). This measure assumes that acculturation is a process by which individuals retain characteristics of the culture of origin while simultaneously acquiring characteristics of the new culture. It consists of three subscales: cultural competence, language competence, and ethnic identity. The AMAS was developed in English and Spanish and has appropriate psychometric properties with both U.S.-born and immigrant populations (Zea et al., 2003). In a study with two Latino populations, alpha coefficients ranged from .83 to .97 for the immigrant sample and .90 to .97 for the U.S.-born sample. Its subscales are significantly related to length of residence in the United States, thus supporting concurrent validity, and convergent, divergent, and construct validity are also adequate (Zea et al., 2003). In addition to the AMAS, language preference will be assessed by tracking parents' requests to complete the social capital and acculturation measures in English or Spanish. Participants will also report their length of residence in the United States on a scale of 0–5 years, 6–10 years, and 11 or more years. Length of residence is a common marker of acculturation (Harris, Firestone, & Vega, 2005; Schwartz, Pantin, Sullivan, Prado, & Szapocznik, 2006).

Data on children's behavioral outcomes. Teachers and parents will also be sources of data on student behavioral outcomes. For each FAST and control student, teachers and parents will complete the Social Skills Rating System (SSRS; Gresham & Elliott, 1990; see Appendix A) in the spring of first grade, and again in the spring of third grade, to assess the impact of FAST on children's academic and social outcomes. The SSRS elicits ratings of students' social skills and problem behaviors (*from teachers and parents*), and academic

competence (*from teachers*)—precisely the outcomes that FAST is designed to affect. The SSRS has been used in numerous studies of child outcomes, including recent research with FAST, which showed lower ratings of problem behaviors and higher ratings of academic competence among students randomly assigned to FAST than among their control group counterparts (Kratochwill et al., 2004). At 1-year follow-up, effect sizes ranged from .45 for academic competence to .61 for problem behaviors at the student level.

Administration of questionnaires. *The two questionnaires for teachers (the PISQ and the SSRS) will be distributed to and retrieved from teachers at their schools by members of the research team. The PSCQ will be administered to parents at first-grade registration as noted above. Subsequently, all the parent instruments (the PSCQ, the PISQ, the AMAS, and the SSRS) will be distributed as a single, 12-page mailed survey in the spring of first and third grade by the University of Wisconsin Survey Center (see “Letters of support” for letter of commitment). Based on past experience, the Survey Center anticipates a response rate of about 60%—reasonable for a mailed survey but not adequate for our purposes, particularly because non-response may be non-random. Consequently, we will undertake home visits to obtain completed questionnaires from a random subsample of 25% of the non-respondents. If 40% of families do not return the mailed questionnaires, then our home visits will encompass 10% of families, boosting the response rate to 70% and allowing us to correct for non-response bias in our estimates of treatment effects. This is particularly important because, if the treatment is effective, non-response is likely to be greater among control than treatment families.*

Third-grade achievement tests and other district records. An important question for FAST is whether the program elevates not only teacher ratings of competence but also student performance on high-stakes tests. Third grade is the first year in which high-stakes standardized tests are administered in Wisconsin and Texas, so we will assess the impact of FAST on third-grade test performance in reading and math. Because we will obtain the achievement data from our partners at the district level, we will be able to obtain test scores for all students who remain in the districts from first to third grade, even if they change schools.

District records will also provide data on two additional outcomes: (a) students’ cumulative attendance records during first and second grade and (b) student retention in first or second grade. In addition, the districts will provide information on student gender, race/ethnicity, free or reduced-price lunch status, and disability status, all of which will be used as control variables in the analysis. Finally, we will use school average achievement data on prior (pre-FAST) cohorts as a school-level covariate to increase the precision of the analysis (see discussion of statistical power in section d.4, “Data analyses”).

The problem of “uncommon measures.” Gathering data from two different cities is a great strength of this project because it will increase our confidence in the generalizability of the results. However, a study with test scores from two states must address the problem of “uncommon measures” (Feuer, Holland, Green, Berenthal, & Hemphill, 1999), because the states do not use identical tests. We propose three strategies for addressing this challenge. All three approaches take into account the state as a potential source of variation, either by including in the analysis a dummy variable for city and an interaction term for city-by-treatment interactions or by estimating the models separately by city (see “Data analyses” below).

The first approach is a **linking** strategy. This approach links the test scores by transforming the scores from one state so that *the scores from both states* are scored on an approximately common scale. We propose to link the scores using a version of linear test equating that Robert Meyer (2004) has generalized to handle tests with different reliabilities and populations. In Meyer’s (2004) approach, which he calls **linear noise-corrected test linking**, the linking function is corrected for differential reliability if necessary. Versions of the linking strategy include **unconditional linking**, which assumes that both samples come from the same population (and thus have identical true-score variances), and **conditional linking**, which allows the samples to differ in their true-score variances based on demographic characteristics. By including dummy variables for city and for city-by-treatment interactions, mean differences are controlled out. However, this method assumes that true-score variances are equal across samples (unconditionally or conditional on observed demographic characteristics). Once the linking has been accomplished, the statistical models are the same as those set forth in “Data analyses” below, with the inclusion of a city-by-treatment interaction at Level 2.

Anticipating criticisms of linear test equating—some of which have already been addressed by the conditional linking and unreliability corrections advocated by Meyer (2004)—we propose two additional strategies. In the second, we will estimate effects on test scores separately by city and then use **meta-analytic** techniques to pool the results. In the third strategy, we will estimate two-level logistic models, with **proficiency levels** as the outcome (i.e., a third grader is judged proficient or not proficient in reading or math). In this analysis, the research question shifts to whether rates of student proficiency in reading and math rise more in FAST treatment schools than in control schools. This approach has at least three advantages: (a) it is

unnecessary to link the test scores from different states; (b) effect estimates based on proficiency levels are not subject to ceiling and floor effects; and (c) the underlying scales used to measure achievement in the two cities need not be linearly related. Under reasonable assumptions, the choice of proficiency cut point is unlikely to influence the effects estimates. Since we will have the scaled scores, we will be able to investigate the robustness of the results to different cut points. A disadvantage of the proficiency approach is that if the tests differ in the variance of measurement error, the effect estimates may not be strictly comparable across states. Fortunately, we will be able to compare the variance of the test measurement error since these test statistics are routinely provided by test publishers.

d.4. Data analyses

The methodology for this study is a **cluster randomized trial (CRT)**, using what Boruch et al. (2004) refer to as **place-based random assignment**. In ecological studies of education, CRTs randomize at an aggregate level, such as the school or classroom, and collect data on individuals within the cluster, including students, teachers, and parents. CRTs are well suited to contextual interventions, such as the one we are proposing, that are designed to affect the school (or grade-level) population as a whole. Although individuals may be affected by the intervention (e.g., student achievement may rise), the effects of the intervention must be assessed at the level at which the randomization takes place—in our case, the school (Borman et al., 2005).

Multilevel models: Linear outcomes. The appropriate strategy for the analysis of CRTs is a multilevel model (Raudenbush, 1997). In our case, a multilevel model will allow us to simultaneously model both student- and school-level sources of variability in each outcome. Failure to explicitly capture these two sources of variability (for example, by estimating the models using ordinary least squares regression) would yield incorrect estimates of standard errors and levels of significance. For this reason, we will estimate two-level hierarchical models of students nested within schools.

At Level 1, for the scaled outcomes at the student or within-school level (parent involvement and social capital, social skills, problem behavior, academic competence, attendance, test scores), the basic model may be written using the notation of Raudenbush and Bryk (2002) as:

$$\text{Level 1. } Y_{ij} = \beta_{0j} + \beta_{1j}(\text{SEX})_{ij} + \beta_{2j}(\text{LATINO})_{ij} + \beta_{3j}(\text{BLACK})_{ij} + \beta_{4j}(\text{POVERTY})_{ij} + r_{ij}$$

which represents the outcome for student i in school j regressed on the student's gender, race/ethnicity, and poverty status. The term r_{ij} is the Level 1 residual variance that remains unexplained after accounting for the student-level covariates. Parameters other than the intercept, β_{0j} , are treated as fixed in this model.

Effects of the treatment, FAST, are modeled at Level 2. We include school-level aggregates of prior achievement, poverty, and racial/ethnic composition to control for potential school-level compositional effects on mean outcomes in school j . *In addition, we control for the interaction of the treatment and the school's racial/ethnic composition.* The Level 2 model may be written as:

$$\text{Level 2. } \beta_{0j} = \gamma_{00} + \gamma_{01}(\text{MEAN PRIOR ACH})_j + \gamma_{02}(\text{PERCENT POVERTY})_j + \gamma_{03}(\text{PERCENT LATINO})_j + \gamma_{04}(\text{PERCENT BLACK})_j + \gamma_{05}(\text{FAST})_j + \gamma_{06}(\text{CITY})_j + \gamma_{07}(\text{PERCENT LATINO} \times \text{FAST})_j + \gamma_{08}(\text{PERCENT BLACK} \times \text{FAST})_j + u_{0j}$$

where the mean outcome intercept for school j , β_{0j} , is regressed on the school-level mean prior achievement score, poverty level, racial/ethnic composition, city, and the treatment indicator, plus a residual, u_{0j} . Outcomes to be examined with this model include parent involvement and social capital, and students' social skills, behavior problems, attendance, and achievement. We can also test for differences in the FAST effect across cities by adding an interaction term for FAST x City at Level 2. In addition, we can test whether pooling the data across cities is appropriate by analyzing the data separately by city. Past work with FAST has indicated the program has similar effects across communities, so we expect the pooling to be supported. If pooling is problematic, we will combine results using meta-analytic techniques instead. *Similarly, we can add terms for Year and FAST x Year to test for differences related to whether the intervention began in 2007–08 or 2008–09.*

Prior studies have shown that FAST effects generally hold for students from a variety of racial, ethnic, and economic backgrounds, but one study found more significant results for Latino children than for non-Latino whites (Moberg et al., 2002). By allowing the effects of background variables to differ across schools, we can test whether FAST effects are similar or different for students from different backgrounds. For example, we can allow β_{2j} , the coefficient for Latino, to vary across schools, and test whether the effects of FAST are the same for Latinos as they are for whites with another Level 2 equation:

$$\text{Level 2. } \beta_{2j} = \gamma_{20} + \gamma_{21}(\text{FAST})_j + \gamma_{22}(\text{CITY})_j + u_{2j}$$

where the mean gap between whites and Latinos, β_{2j} , is regressed on FAST, city, and potentially other contextual variables. Similar models will be used to test for interactions with race, poverty, and gender.

Effects of social capital. For this study, estimates of FAST impacts are merely preliminary to our main interest, which is in testing the effects of social capital on child development after social capital has been experimentally manipulated. On the basis of prior theory and research, we expect that social capital will be greater in schools undergoing the FAST treatment, and the models above will test this supposition, along with the reduced-form relation between FAST and child outcomes. To test the effects of social capital, we introduce social capital as an intervening variable between FAST and child outcomes. Although our conceptual framework identifies social capital development as a collective process, individual families within a network may vary in how much they access available social capital. Consequently, we will test for intervening effects at both the individual and the school levels. Even though we expect the average levels of social capital to be raised among all parents in FAST schools, there will still be individual variation. Thus, we add indicators of social capital to Level 1 (for ease of exposition we show this as a single variable):

$$\text{Level 1. } Y_{ij} = \beta_{0j} + \beta_{1j}(\text{SEX})_{ij} + \beta_{2j}(\text{LATINO})_{ij} + \beta_{3j}(\text{BLACK})_{ij} + \beta_{4j}(\text{POVERTY})_{ij} + \beta_{5j}(\text{SOCIAL CAPITAL})_{ij} + r_{ij}$$

In addition, we include aggregate measures of social capital at Level 2 (again shown as a single variable for simplicity):

$$\text{Level 2. } \beta_{0j} = \gamma_{00} + \gamma_{01}(\text{MEAN PRIOR ACH})_j + \gamma_{02}(\text{PERCENT POVERTY})_j + \gamma_{03}(\text{PERCENT LATINO})_j + \gamma_{04}(\text{FAST})_j + \gamma_{05}(\text{MEAN SOCIAL CAPITAL})_j + \gamma_{06}(\text{CITY})_j + u_{0j}$$

where mean social capital is the average for the school as a whole. Based on our conception of social capital, we expect this contextual (Level 2) effect of mean family-school social capital to be most essential as a mechanism through which FAST affects student outcomes. This would be revealed by comparing the results of the Level 2 equation with and without the inclusion of the mean social capital indicator (and its analogue at the within-school level). A significant contextual effect of mean social capital, coupled with a diminished coefficient for FAST when mean social capital is included in the model, would indicate that social capital mediates the relation between FAST and child outcomes. *We will test the statistical significance of the difference between the FAST coefficients before and after the social capital variables are included to test whether the mediating role of social capital is significant.* These models will be elaborated to allow tests of interactions by gender, race/ethnicity, economic background, and school composition, as explained above. *Finally, parent acculturation is another possible mechanism for the effects of FAST, so we will include and test its effects as an additional mediating mechanism. We expect its effects will occur mainly at the individual level (Level 1), although an aggregate indicator can also be computed and included (Level 2).*

Assessing bias in social capital effects. The experimental design ensures that FAST effects on parent and child outcomes will be estimated without selectivity bias. If family-school social capital is entirely a result of FAST, its effects can also be estimated without bias, but that is probably not the case, at least not uniformly so. If social capital occurs in the absence of the intervention, there may be an omitted variable that affects both social capital and the child outcomes, leading to an overestimate of social capital effects. Our design provides a number of ways to address this concern. First, we can determine the extent to which social capital is independent of FAST by assessing its presence in the control group. Second, if the effects of FAST are entirely mediated by social capital, then we can use FAST as an instrumental variable for social capital to obtain an unbiased estimate of school social capital effects. Third, we can use our pre-treatment measure of social capital to eliminate bias, because the omitted variables can be expected to be correlated with the pre-treatment measures, and changes in social capital will be experimentally manipulated. In this model, we would be estimating the effects of **FAST-induced growth** in social capital on child outcomes.

Differential non-response by treatment and control parents is another potential source of bias in estimating social capital effects. Our design provides substantial information to assess this bias and to make adjustments if necessary. Since parent consent will be sought prior to randomization, we anticipate no differential non-response in consent. Among parents who consent to participate, we will have the Parent Social Capital Questionnaire (completed at school registration) and student demographic data (from school district records). For a random subsample of non-respondents to the mailed surveys, we will collect surveys through home visits. If comparison of respondents and non-respondents yields significant differences between the treatment and control groups, we will adjust for selective attrition by weighting the sample to account for non-response.

Yet another potential source of bias is sample attrition due to high rates of mobility in the urban populations we are studying. We will respond to this challenge both in the design of our data collection and in our statistical analyses. First, several factors in our design mitigate the mobility problem. The initial round of post-intervention

data collection will occur only a few months after the intervention, so we do not expect mobility to be a major problem at that point. Although mobility will become more of an issue as the study continues, most of the mobility among urban schoolchildren occurs within the same school district. For example, using restricted data on students' zip codes in a national survey, we calculated that 7% of urban students changed zip codes over 2 years; the rate was 9% for urban Latino students (see Turley, 2006). Similarly, whereas annual mobility rates for elementary students are 21% in San Antonio and 28% in Milwaukee, only 8% and 5%, respectively, move out of the district. Our arrangement with the districts will permit access to students' third-grade test scores, and we will be able to survey parents and teachers when students are in third grade, even among mobile students. Second, we recognize that even a modest amount of sample attrition due to mobility may bias our results, because attrition is likely to be non-random, and there may well be differential mobility between the treatment and control groups. Moreover, it will not be possible to recapture these respondents through home visits because they will have left the district. Consequently, we will adjust for attrition due to mobility using statistical methods for sample selection bias, such as Heckman's (1979) two-stage correction. In this approach, other observable data (which will be plentiful because we will have baseline data) are used to predict the likelihood of mobility out of the district, which is then employed as a statistical correction in the main analysis.

Multilevel models: Binary outcomes. Two of our outcomes are binary: test scores coded as proficient versus not proficient and student status as retained versus not retained during first or second grade. These outcomes require a non-linear model at Level 1:

$$\text{Level 1. } \eta_{ij} = \beta_{0j} + \beta_{1j}(\text{SEX})_{ij} + \beta_{2j}(\text{LATINO})_{ij} + \beta_{3j}(\text{BLACK})_{ij} + \beta_{4j}(\text{POVERTY})_{ij} + \beta_{5j}(\text{SOCIAL CAPITAL})_{ij} + r_{ij}$$

where η_{ij} is the predicted log-odds of passing the proficiency level on the third-grade state test or of being retained in grade.

The model at Level 2 is the same as that above:

$$\text{Level 2. } \beta_{0j} = \gamma_{00} + \gamma_{01}(\text{MEAN PRIOR ACH})_j + \gamma_{02}(\text{PERCENT POVERTY})_j + \gamma_{03}(\text{PERCENT LATINO})_j + \gamma_{04}(\text{FAST})_j + \gamma_{05}(\text{MEAN SOCIAL CAPITAL})_j + \gamma_{06}(\text{CITY})_j + u_{0j}.$$

Here, β_{0j} can be interpreted as the school's rate of reaching proficiency (or of retention), net of the school and child characteristics taken into account in the models. Interactions for FAST x City and FAST x School Social Capital can be added to allow for differences between states in proficiency cutoffs and retention policies.

Statistical power. In a multilevel framework, statistical power may be affected by both the magnitude of the treatment effect and the probability of making a Type I error (the alpha level). In addition, in the two-level hierarchical model, statistical power is affected by the number of schools represented at Level 2 of the analysis, the number of students per school represented at Level 1 of the analysis, and the variation between schools. Moreover, as Raudenbush (1997) and Bloom, Bos, and Lee (1999) have found, the inclusion of school-level covariates in the HLM framework can dramatically increase statistical power to detect treatment effects by removing much of the variation between treatment sites that is not attributable to the treatment itself.

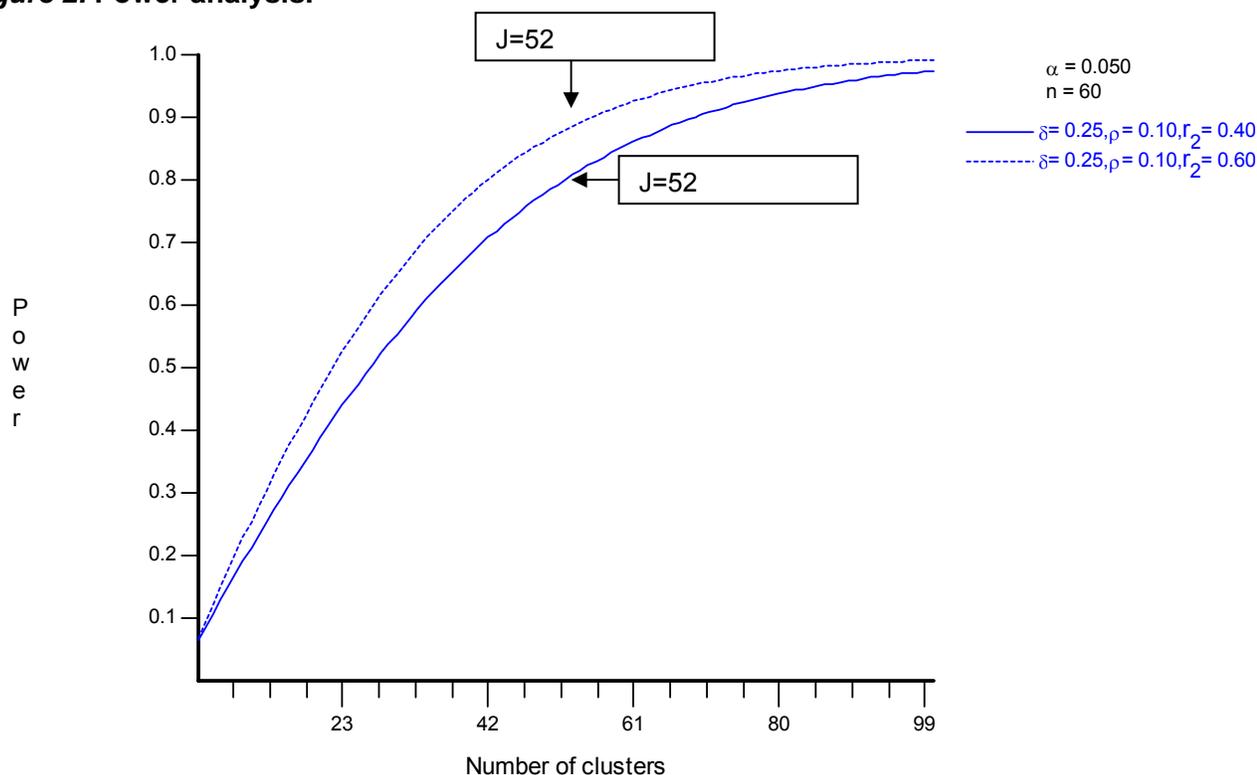
As an estimate of the magnitude of the Level 2 school-level effect of the intervention, we chose an effect size of $d = 0.25$. This is a conservative test, given that the most recent study of FAST obtained effect sizes of .45 to .61. However, social capital may not account for all of the effects of FAST, and the social capital effects are our primary scientific concern. An effect size of 0.25 would be substantively meaningful, so we need to ensure that our design has enough power to detect it.

In our power analyses, we used 0.10 as an estimate of the intraclass correlation, which represents the proportion of variance in outcomes that we expect to find between schools. Many previous studies of educational effects and variability suggest this level is reasonable (e.g., Borman et al., 2005; Hox, 1998). Finally, we set levels of .40 and .60 for variance explained by the covariates of prior achievement, race/ethnicity, and poverty level. Typically, these control variables can explain as much as 80% of the variance in student achievement, but their explanatory power may be weaker for non-cognitive outcomes, including social skills, behavior problems, and social capital. Consequently, we selected a more conservative level of variance explained in our power analyses.

We conducted a power analysis using these estimates, the sample sizes of 52 schools and 60 students per school (an average of 4 classes of 15 students each), and an alpha level of $p < .05$ (two-tailed test). Figure 2 plots our estimates for power, $1 - \beta$, where β represents the probability of failing to reject a false null hypothesis, by the total number of schools sampled. The power analysis shows that with a sample of 52 schools and an effect size of .25, our power to detect the effects of FAST is .803 if the covariates account for only 40% of between-school variance (i.e., $r^2 = .40$) and .882 if the covariates account for 60%. Where the covariates may be less powerful, effect sizes have far exceeded .25 (social skills and problem behavior).

Where effect size may be only .25 (test proficiency), the covariates will almost certainly explain more than 60% of between-school variance. Our power analysis thus gives substantial confidence that we will be able to detect the effects of social capital if it occurs according to expectations generated by past theory and research.

Figure 2. Power analysis.



Causal effects of implementation. The multilevel estimates of the program effects described above are derived from **intention-to-treat (ITT) analyses**. That is, regardless of the quality of the implementation of FAST in each school, these analyses will compare all schools assigned to the experimental condition to all those assigned to the control condition. The ITT effect represents the impact of **assignment** to the treatment, and if some subjects assigned to the treatment do not in fact participate, the ITT may not represent the true potential of the intervention when it is implemented under more optimal conditions. Because participation in FAST is voluntary, we anticipate that not all families will participate. We would like to obtain evidence on the effects of social capital **for students whose families participate**, in addition to the evidence on the effects for the school as a whole. However, within schools selected for treatment, the difference in social capital between FAST participants and non-participants will not be random, but will reflect unobserved selection mechanisms.

We will adopt an **instrumental variables approach** to examine the effects of implementation on outcomes. In this approach, assignment to treatment is modeled as an instrument for the schools' implementation of the intervention's components. We anticipate that school-level random assignment to each treatment will be correlated with actual implementation of the intervention's components, but that it will not be correlated with the error term in the outcome equation because it will be determined randomly. Under reasonable assumptions, the instrumental variables model yields a consistent estimate of the effect of **treatment on the treated**. The second-stage, or outcome, equation will be represented by models that include the variable that measures actual implementation in response to the treatment. This variable will reflect the degree to which students and their families participated in FAST—for example, how many sessions they attended and whether they participated in the follow-up FASTWORKS sessions.

d.5. Implementation study

To obtain a more nuanced understanding of the processes by which social capital affects child development, we will collect more in-depth data on FAST implementation in the 26 treatment schools. Quantitative data on social capital, *parent involvement*, *acculturation*, and child outcomes collected from both treatment and control schools will reveal the extent to which (a) the level of social capital in family-school relations affects child development and (b) the FAST intervention affects social capital and child development. These data will not suffice, however, to illuminate the process of building social capital or the conditions that affect how the FAST intervention operates in schools. Similarly, the Program Integrity Checklist will indicate

whether the elements of FAST are implemented as intended, but it will not reveal how FAST becomes integrated into different school settings. To address these limitations, we will collect additional qualitative and quantitative information about how FAST is introduced, perceived, diffused, and integrated in the schools and communities in the study.

The implementation study will serve several purposes. First, it will offer insight into the processes of increasing social capital and parent involvement. Many studies and theoretical explorations of social capital have focused on developing typologies of social capital and mapping how these typologies correlate with other social goods (Durlauf, 2002; Kawachi et al., 1997; Portes, 1998). Such studies have provided a rich understanding of the types of relationships, activities, and behavior researchers can look to as indicators of social capital. However, in addition to understanding what social capital is and how it affects people and communities, researchers have recently pointed to the importance of addressing questions about how social capital is built (Falk & Kilpatrick, 2000; Morrow, 1999). What are the processes by which social capital is increased, and how do these processes affect the ways parents interact with schools? By combining quantitative data with qualitative investigations of FAST (treatment) schools, we will gain insight into these processes of building social capital in schools, as well as into the ways in which social capital works in schools.

Second, the implementation study will give us a framework for understanding variation in the effects of FAST across schools. It is likely that we will see significant variability in the effect of FAST on school-wide measures of student achievement and parent involvement, even after other school characteristics are taken into account. By examining school contexts, we will understand how program implementation, leadership, staff attitudes, relationship to community agencies, and other conditions influence social capital–building processes in schools. This understanding will enable us to learn how the dissemination structure of FAST (for which FAST is well known) affects its integration into different schools. In addition, we will be able to gain insight into what aspects of schools provide for and inhibit the development of social capital and parent involvement.

Finally, the implementation study will help us explain our experimental results in a way that will be more helpful to practitioners. For example, we will be able not only to point out variation and outliers, but also to consider possible implementation or school factors that might account for these. For policy makers, the implementation study will provide information on the conditions that contribute to effective manipulation of social capital through the FAST intervention.

Data for the implementation study will come from surveys, individual and focus group interviews, and observations. FAST parents will respond to a brief annual questionnaire *about their experiences with FAST*. During the year of initial implementation, focus group interviews will also be conducted with a subsample of parents who attend FAST with their families, and individual interviews will be conducted with two parents who choose not to attend FAST (non-compliers). At each FAST school, researchers will also interview the principal, school counselor, and two first-grade teachers to learn about FAST implementation and the extent to which teachers perceive FAST as affecting classroom activities. Interviews with two second- and third-grade teachers will be conducted in successive follow-up years. The researchers will also conduct a focus group interview with each FAST implementation team to uncover issues affecting program implementation and perceived level of success. Finally, researchers will observe the FAST program implementation itself at various points, including (a) the training of team members; (b) the recruitment of families; (c) weekly FAST sessions; and (d) monthly parent-led FASTWORKS sessions. At the conclusion of each year, the researchers will produce an implementation report for each school in which FAST has been implemented up to that point.

d.6. Project management plan

An outstanding collaborative group has been assembled to carry out this project, bringing together:

- Disciplinary expertise in sociology, psychology, economics, and social work;
- Substantive expertise in school and neighborhood contexts and educational inequality;
- Technical expertise in the appropriate statistical methodologies; and
- Practical expertise in FAST development and implementation.

The team also provides an opportunity for nurturing young scholars and training outstanding graduate students under the careful guidance of veteran scholars. The organizational structure for the project will divide key personnel into intervention and research teams, with coordination ensured through the overall supervision of the principal investigator and liaison roles designed to ensure a smooth flow of information and data collection.

Principal investigator for the study will be **Adam Gamoran**, professor of sociology and educational policy studies and director of the Wisconsin Center for Education Research (WCER) at UW-Madison. A member of the National Academy of Education (NAE), Gamoran is widely recognized for his statistical analyses of

educational inequality, particularly his studies of grouping and tracking in elementary and secondary schools. He has extensive experience with multilevel modeling and teaches a graduate seminar on multilevel models of school effects. More recently, he has engaged in field-based experimental research with a lagged treatment design, in a randomized controlled trial of the Partnership for Literacy, a program to enhance teaching and learning in middle school English language arts. *Currently he is overseeing another randomized controlled trial of teacher professional development in elementary school science in 80 schools in Los Angeles.* His research has been supported by DHHS, NSF, OERI, the Spencer Foundation, and the William T. Grant Foundation. Gamoran will spend 10% of his time on this study, assuming overall responsibility for managing the project, including overseeing coordination between the research and intervention teams.

Ruth López Turley, assistant professor of sociology at UW-Madison, will work closely with Gamoran as leader of the research team (*a role that would formerly have been called co-PI*). A Harvard-trained sociologist, Turley conducts research on poverty, education, and socioeconomic advancement. She won a 2004 Spencer Foundation/NAE postdoctoral fellowship for her research on college proximity, and her research has also been funded by the Russell Sage Foundation. She is a native Spanish speaker who grew up in south Texas. Turley will hold primary responsibility for *school-based data collection and analysis* in the project, devoting 20% of the academic year and 2 summer months in all 5 years of the project. *Also playing a major role as an investigator on the research team will be Carmen R. Valdez, assistant professor of counseling psychology at UW-Madison. Valdez received her PhD in school psychology at the University of Texas–Austin and completed postdoctoral work at the Johns Hopkins University. She has been involved in three NIMH-funded projects examining the emotional, behavioral, and educational outcomes of low-income children whose parents struggle with depression. She has taken the lead in developing an evidence-derived family intervention (Valdez, Barrueco, Rawal, & Riley, 2004–2007), has written an authoritative review of evidence-based parent-school intervention programs (Valdez, Carlson, & Zanger, 2005), and has conducted empirical and clinical work on acculturation and adjustment of Latino families. Valdez, who will devote 12.5% of each academic year and 1 summer month to the study for 5 years, will oversee the parent data collection and will address questions of social capital development and acculturation. She is a native Spanish speaker who has lived in Texas and grew up partly in Milwaukee.* Turley, Valdez, and Gamoran will jointly supervise the graduate assistants working on the project.

Joining Gamoran, Turley, and Valdez on the research team will be two outstanding scholars in supporting roles. **Deborah Lowe Vandell** is professor and chair of education at the University of California, Irvine. A fellow of the American Psychological Association and a principal investigator for the NICHD Study of Early Child Care and Youth Development, she is one of the nation's top experts on child care and development, with numerous prominent publications on after-school care. She served on the National Research Council's Committee on Work and Family Policies and was an invited participant at the U.S. Department of Education's After-School Summit in 2003, advising the government on the challenges of randomized field trials of after-school care. Vandell will devote 10 days per year to this project in all 5 years, providing consultation on the survey measurement and analysis of social capital and child outcomes. **Robert Meyer**, an economist who serves as senior scientist at WCER, will devote 5% of his time to the project in all 5 years, with responsibility for the statistical linking of test scores from Texas and Wisconsin. Before joining WCER, Dr. Meyer was on the faculty of the University of Chicago (Harris School of Public Policy Studies) and UW-Madison (Economics Department). Dr. Meyer is known for his research on value-added modeling and evaluation methods and is currently working on projects funded by IES, NSF, the Joyce Foundation, the Wisconsin Department of Public Instruction, and the Milwaukee Public Schools.

Lynn McDonald, founder of FAST and senior scientist at WCER, will lead the intervention team (*a role that would formerly have been called co-PI*). Dr. McDonald has directed federal grants (Bureau of Justice Assistance, Center for Substance Abuse Prevention, Center for Mental Health Services) and has been a co-PI on federal grants from NIDA, OERI, OSERS, and the Office of National Drug Control Policy. She will oversee FAST implementation for this study, devoting 15–20% of her time in all 5 years to the project. **Jackie Roessler** is the *program manager* of the WCER-FAST project at UW-Madison. *She has extensive experience in managing large research grants funded by NICHD and the Centers for Disease Control.* She will be the administrative liaison between the research and implementation teams and will be directly supervised by McDonald and Gamoran. *Roessler will have responsibility for overseeing the subcontracts for training and implementation, writing reports, developing meeting agendas, and assisting with the intervention implementation.* **Phyllis Scalia**, a member of WCER's academic staff, *has been involved with FAST projects for 10 years. She has supervised data collection, training, and program implementation for FAST research projects. She will provide technical assistance to the implementation team, supervised by Roessler and McDonald.* **Patricia Davenport**, CEO of the FAST National Training and Evaluation Center, will be a

consultant to the project. FAST National is a 501(c)(3) organization responsible for the local implementation of FAST and FASTWORKS programs through its training and technical assistance services. Davenport, who is originally from Nicaragua, is an experienced social work administrator with a special interest in collaboration between schools and other systems. She has expertise as an advanced certified FAST trainer. **Ruth Enid Zambrana**, professor of women's studies at the University of Maryland, College Park, will also be a consultant to the project. Zambrana will provide technical support with the development of materials and activities for the Latino adaptation of the FAST program. She is a renowned scholar in the field of Latino family studies.

d.7. *Timetable*

A timetable of the proposed project is presented in Table 2.

Table 2
Timetable

Year	Intervention	Data collection	Analyses/reports
2007–08	Randomization of <i>Cohort 1</i> schools FAST 8-week parent-child program in <i>Cohort 1</i> treatment schools (Grade 1)	Fall, spring: <i>Cohort 1</i> parent surveys Spring: <i>Cohort 1</i> teacher surveys <i>Cohort 1</i> implementation study observations, surveys, interviews	Implementation report: <i>Cohort 1</i> Preliminary report: Social capital and early development in <i>Cohort 1</i>
2008–09	Randomization of <i>Cohort 2</i> schools FAST 8-week parent-child program in <i>Cohort 2</i> treatment schools (Grade 1) FASTWORKS in <i>Cohort 1</i> treatment schools (Grade 2)	Fall, spring: <i>Cohort 2</i> parent surveys Spring: <i>Cohort 2</i> teacher surveys <i>Cohort 2</i> implementation study observations, surveys, interviews	Implementation report: <i>Cohort 2</i> Preliminary report: Social capital and early development in <i>Cohort 2</i>
2009–10	FASTWORKS in <i>Cohort 1</i> treatment schools (Grade 3) FASTWORKS in <i>Cohort 2</i> treatment schools (Grade 2)	Spring: <i>Cohort 1</i> parent surveys Spring: <i>Cohort 1</i> teacher surveys Spring: <i>Cohort 1</i> Grade 3 achievement data	Report on combined 1-year outcomes: Test of hypotheses for Grade 1 outcomes Preliminary report: Follow-up outcomes in <i>Cohort 1</i>
2010–11	FASTWORKS in <i>Cohort 2</i> treatment schools (Grade 3)	Spring: <i>Cohort 2</i> parent survey Spring: <i>Cohort 2</i> teacher surveys Spring: <i>Cohort 2</i> Grade 3 achievement data	Preliminary report: Follow-up outcomes in <i>Cohort 2</i> Final implementation study report Preparation of data for dissemination
2011–12			Final report on combined 3-year outcomes: Test of 3-year hypotheses Final preparation of data for dissemination

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