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Effects of Child Health on Parents' Social Capital"

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Abstract

This paper adds to the literature on social capital and health by testing whether an exogenous shock in the health of a family member (a new baby) affects the family's investment in social capital. It also contributes to a small but growing literature on the effects of children's health on family resources and provides information about associations between health and social capital in a socioeconomically disadvantaged population. We use data from the Fragile Families and Child Wellbeing study, a longitudinal survey of about 5,000 births to mostly unwed parents in 20 U.S. cities during the years 1998–2000. Both parents were interviewed at the time of the birth and then again one and three years later. The infants' medical records from the birth hospitalization were reviewed, and poor infant health was characterized to reflect serious and random health problems that were present at birth. Social interactions, reported at three years, include the parents' participation in church groups, service clubs, political organizations, community groups, and organizations working with children; regular religious attendance; and visiting relatives with the child. Education, employment, wages, and sociodemographic characteristics are included in the analyses. The results suggest that infant health shocks do not affect the parents' social interactions.

Keywords

child health; social capital; USA; parents; family; new birth; socioeconomic disadvantage

Introduction

There is considerable evidence of a positive association between health and social capital. Researchers have presented cogent arguments for why social capital would promote health at both the individual and the community levels, and the literature has produced numerous empirical findings consistent with those hypotheses. At the same time, it is acknowledged that causality could run in the other direction—that health could affect social interactions, and therefore, one's investment in social capital. Because health and social capital are both forms

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of human capital and are affected by many of the same factors, and because it is difficult to identify a “shock” that may have a direct impact on one but not the other, it has been difficult to ascertain both causality and directionality. The purpose of this paper is to add to the literature on social capital and health by testing whether an exogenous shock in the health of a family member (a new baby) affects the family’s investment in social capital. As such, it will provide evidence, in a specific context, of whether there are effects of health on an individual’s social capital. Additionally, this paper contributes to a small but growing literature on the effects of children’s health on family resources, which can have implications for the health trajectories of all family members.

We use the first and third waves of the Fragile Families and Child Wellbeing (FFCWB) study--a longitudinal survey of about 5,000 births to mostly unwed parents in 20 U.S. cities during the years 1998–2000. Both the mothers and fathers were interviewed at the time of the birth and then again three years later. Poor infant health is measured in alternative ways using data from multiple sources to reflect both serious and random health conditions that were present at birth. Social interactions include the parents’ participation in church groups, service clubs, political organizations, community groups, and organizations working with children; regular religious attendance; and visiting relatives with the child, as reported in the mothers’ and fathers’ three-year follow-up interviews. Data on education, employment, wages, and sociodemographic characteristics are included in the analyses.

Because the FFCWB study oversampled non-marital births, the sample consists of adults who are relatively young and economically disadvantaged. Few studies in the social capital and health literature have focused on young adults or disadvantaged populations, which are important groups to study for several reasons. First, young adults have the potential to benefit more (i.e., for a longer period of time) than their older counterparts from investments in social capital. Second, economically disadvantaged individuals have fewer financial resources that can buffer the effects of adverse life shocks, and social capital may provide a means for overcoming such difficulties. Much previous research has found that social capital is highly associated with socioeconomic status (SES) (e.g., Saffer, 2008), but few studies of social capital and health have focused on economically disadvantaged populations. Third, economically disadvantaged men have high rates of crime and poor health, both of which can confer substantial private and social costs. Thus, social capital--if in socially desirable forms (i.e., not stemming from gang-related activity or negative peer influences)--can be an important asset for poor men, who represent an understudied group in terms of both social capital and health.

Background

Social capital has been characterized as a combination of social organizations, social networks, and civic participation that can improve the efficiency of society by facilitating coordinated actions (Putnam, 1993) and has been identified as a factor explaining variation in a wide range of public health measures. An observed relationship between social capital and health dates back over 100 years when Durkheim, in his classic study of suicide, noted that social integration can enhance well-being. Bourdieu (1980, 1985) highlighted the benefits to individuals from participating in groups, the importance of creating such interactions, and the concept that building social networks requires investment in group activities (also see Portes, 1998 for an extensive review of other contemporary contributions to the social capital literature). Recent interest in socioeconomic determinants of health has resulted in numerous studies linking social capital with various aspects of health and well-being (see Lomas, 1998 for a review).

Much research has examined the relationship between social capital and health at both the community and individual levels. Kawachi et al. (2004) reviewed 31 empirical studies investigating the relationship between social capital and health that were conceptualized at the

community level or utilized a multi-level framework to incorporate both individual- and community-level factors. They found, with few exceptions, a consistent association between social capital and health outcomes.

Particularly relevant to the current analysis are studies that have examined social capital and health or developmental outcomes within the family. Runyan, Hunter & Amaya-Jackson (1998) used longitudinal data to study the impact of social capital on child maltreatment. They constructed a total social capital score that included the following measures: two-parent family, maternal social support, number of children in family, neighborhood support, and church attendance. Child well-being was measured using the Batelle Developmental Inventory Screening Test and Child Behavior Check List. The authors concluded that social capital plays a crucial role in determining developmental and behavioral well-being in families with low levels of financial and educational resources. McNeal (1999) found positive effects of parental involvement in schools on their children's educational outcomes using the National Educational Longitudinal Study. Kana'iaupuni et al. (2005) used data from the Health and Migration Survey in Mexico to study the relationship between child well-being (health status as reported by mother) and social networks (network size, kinship roles, interaction, and provision of financial and emotional support). They found that networks with more extended kin and co-resident ties offer greater support resources to mothers with young children, particularly among the poorest families. They also found that social support and interactions with extended kin help sustain children's health.

Relatively few studies have evaluated the effects of exogenous measures of child health (e.g., health measures that are independent of social capital) on social capital investment by parents. Kazak & Wilcox (1984) found that mothers and fathers of children with spina bifida have significantly smaller social networks than comparison parents with healthy children. They also found that families with disabled children have higher-density networks, as measured by the extent to which members of the social network know and interact with one another. A study of parents with children diagnosed with phenylketonuria had a similar finding (Kazak, Reber, & Carter, 1988), although the differences in network size between families with disabled children and those without were not large in either study. Overall, the findings from these studies suggest that families with children in poor health or with disabilities are not socially isolated. The advantage of these two studies is that they focus on disabilities that were diagnosed at birth and are not believed to be related to prenatal or other parenting behaviors. The disadvantage is that they focus on only one type of disability and therefore may not be generalizable to a broader group of children with serious health conditions.

Some studies have investigated the effect of poor child health more generally on social interactions of the parents, but this research has not focused on health problems that are known to be exogenous. For example, using data from the Wisconsin Longitudinal Study, Seltzer et al. (2001) found that parents with disabled children had lower rates of social participation (as measured by participation in social organizations and frequency of visits with friends and relatives) than parents without a disabled child. In a more recent review of studies (generally qualitative analyses of small samples) describing how families cope when a child has kidney failure, Aldridge (2008) found themes of social isolation and distress. The disadvantages of this literature are that the severity of the child's health problems may be due, in part, to the intensity with which parents have invested in the child's health and that the factors affecting parental investments in the child's health may be the same as those affecting the parents' investments in their own social capital. Thus, the causal direction is not clear and it is possible that unobserved factors underlie the observed associations between child health and parental social capital.

It is important to consider the point in the life course when examining the effect of poor child health on parental social interactions. The initial reaction to the diagnosis of a disability in a child can be devastating, and parents' adaptations to the reality of raising a child with a disability are a life-long process (Hauser-Cram et al., 2001), making it difficult to predict how parents may change their behavior as their children grow. Costigan et al. (1997) found that family patterns, routines, and expectations are disrupted by the birth of a child with a disability, but that over time most families regain equilibrium in their family relationships and well-being. Gallimore et al. (1996) found that although parents make accommodations for their disabled children at all ages, the intensity of those accommodations remains stable between the ages 3 and 7 and then decreases between ages 7 and 11.

In summary, while there appears to be significant evidence suggesting a strong relationship between stocks of social capital and health outcomes, relatively little is known about how adverse and exogenous health shocks affect social capital investment. Although a few studies have examined the effects of poor child health on parental social capital, they have limitations either because they investigated very specific child health conditions and may not be generalizable, or because they did not investigate child health problems that are unrelated to parental investments. The existing literature points to a need for population-based studies that consider a range of child health conditions, investigate the effects of conditions that are unlikely to be affected by parental actions, compare individuals at the same life stage, and focus on disadvantaged populations. The current study fills these gaps by using population-based individual level data to investigate the effects of exogenous (broad-based) infant health shocks on the social interactions of their largely disadvantaged parents—mothers and fathers—three years later.

Theoretical framework

Social capital is an investment and consumption good that increases utility and improves the welfare of a household (e.g. Glaeser, Laibson & Sacerdote, 2002; Bolin, Lindgren, Lindstrom & Nystedt, 2003). In this study, we are interested in investment in individual social capital, as measured by social interactions over a 12-month period, rather than the stock of social capital at the community level. We thus define social capital as an individual attribute arising from social networks and relationships rather than as a collective response that is located in the context of a country, region or state. A family invests in social capital by forming and maintaining social interactions wherein the returns from this investment yield utility and improve resource allocations (e.g. through information sharing and efficiencies in decision making).

We follow the theoretical model from Bolin et al. in which the family is a producer of health and social capital and simultaneously invests in both. In this framework, the returns from investing in social capital (forming and maintaining connections to other people) are both direct (in that interactions yield utility) and indirect (in that social capital stretches the household's resources). The factors that determine the family's ability to transform time and market goods into commodities enter the demand functions for market goods, health and social capital. In its simple form, Bolin et al. present household utility function where utility at one point in time, t , is derived from consumption of a vector of commodities (Z_t), the health of each member of the family [each parent (P^1 , P^2) and each child (C^j)], and social capital (S_t):

$$U(H_t^{P^1}, H_t^{P^2}, H_t^{C^j}, Z_t, S_t) \quad (1)$$

The household allocates its resources over time to maximize lifetime utility subject to a subjective rate of discounting and initial stocks of health and social capital for each family

member. The stocks of health and social capital will change according to the gross levels of investment in health and social capital and relevant rates of depreciation.

The model predicts that the level of social capital will decrease with age if the rate of depreciation of social capital increases with age. Education may increase the marginal product of time and therefore may have a positive effect on investment in social capital. Highly educated individuals are also more likely to be informed and have the skills necessary to engage in social activities. Investment in social capital may be lower for those who are married or cohabiting if a partner is considered a substitute for social capital. Presence of children in or outside of the household may increase or decrease social capital, depending on whether children are considered substitutes or complements to social capital. For instance, having children may increase parental involvement in school-related activities. However, having children with other partners may decrease social interaction by increasing time constraints. Employment effects may go in either direction, as they depend on whether working time is a complement to or substitute for social capital.

The key effect of interest in this paper is that of poor child health (defined later) on the social interactions of the parents. We estimate the demand for a parent's social interactions as a function of the characteristics from the basic Bolin et al. model plus other variables that are related to the arguments in Equation 1 and may affect the costs or benefits of engagement in social interactions. The expected sign of poor child health is ambiguous, as having a child in poor health could increase both the potential benefits of social capital and the costs of the investment. For example, parents may feel a greater need to be a part of a formal religious community, which would increase the expected benefits. However, the time demands on parents of children in poor health might increase the opportunity cost of their time spent in formal social interactions, which would increase the costs of social interactions.

Data

We use data from a recent national birth cohort survey that have been linked to medical records of mother respondents and their newborns. The Fragile Families and Child Wellbeing (FFCWB) survey follows a cohort of mostly unwed parents and their newborn children in 20 large U.S. cities (in 15 states). The study was designed to provide information about the conditions and capabilities of new (mostly unwed) parents, the determinants and trajectories of their relationships, and the consequences for parents and children of welfare reform and other policies.

The FFCWB study randomly sampled births in 75 urban hospitals between 1998 and 2000. By design, approximately $\frac{3}{4}$ of the interviewed mothers were unmarried. Face-to-face interviews were conducted with 4898 mothers while they were still in the hospital after giving birth. The infants' fathers were also interviewed, shortly thereafter in the hospital or at another location (see Reichman et al., 2001 for a description of the research design). Baseline response rates were 86 percent among eligible mothers and 78 percent among eligible fathers (fathers were eligible if the infant's mother completed an interview). Additional data have been collected from the hospital medical records (from the birth) for a sub-sample of 3684 births.

Follow-up interviews with both parents were conducted over the telephone approximately three years after the birth of the focal child. Eighty six percent of mothers who completed baseline interviews were re-interviewed when their child was between 30 and 50 months old. Of the fathers who completed baseline interviews, 77 percent of fathers who completed baseline interviews completed the three year follow-up interview. Follow-up interviews also took place approximately one year after the birth, but our analyses rely almost exclusively on baseline and three year follow-up data.

The FFCWB data are well suited for analyzing the effects of child health on social capital. They were collected as part of a longitudinal birth cohort study, and include: (1) detailed data on the child's health at birth from hospital medical records; (2) questions about participation in community organizations and visiting relatives asked to each parent at three years; (3) detailed measures of both parents' human capital; and (4) detailed information on the parents' relationship status, living arrangements, and other children.

Descriptive Analysis

We use two different analysis samples--a mother sample and a father sample. Below we describe the measures we use in our analyses, present summary statistics, and point out salient characteristics. Unless indicated otherwise, poor child health and all covariates are measured at baseline. In general, we use each parent's reports about themselves. However, in cases where father data are missing, we use mother reports about the father if those are available.

The mother sample is limited to cases for which medical record data are available and the mother completed the 3-year survey. Of the 3684 mothers with medical record data available, 3192 completed the 3-year survey. Of the 3192 mothers, 52 were excluded from the analyses because of missing information on the social interaction variables and 159 were excluded because of missing data on one or more covariates. Similarly, the father sample is limited to cases for which medical record data (for the mother and child) are available, a three-year interview was completed by the father, and the father had some relationship with the mother at the time of the birth. Of the 3684 fathers with medical record data (for the mother and child) available, 2490 completed the 3-year survey. Of the 2490 fathers, 78 were excluded because they rarely or never talked with the mother at the time of the birth, 230 were excluded from the analyses because of missing information on the social interaction variables, and 37 were excluded because of missing data on one or more covariates.

Measures of social interaction

We consider two measures of formal social interaction in our primary analyses--participation in any group or organization and regular religious attendance. In the 3-year follow-up surveys, both parents were asked about their own participation in a variety of different types of groups and organizations during the past 12 months. Specifically, they were asked if they had participated in: (1) a group affiliated with their church in the past year, (2) a service club, such as the Police Athletic League, (3) a political, civic, or human rights organization, (4) a community organization, such as a neighborhood watch, or (5) an organization working with children or youth. The last category could potentially include health or disability related parent support groups, depending on the parents' individual interpretation of the question. We constructed a measure of participation in any of the five types of groups or organizations in the past 12 months (i.e., a positive response to at least one of the five questions listed above). Parents were also asked in the 3-year interviews how often they attend religious services, and we used their responses to construct a measure of regular religious attendance (at least a few times per month). In supplementary analyses, we consider two alternative measures of social interaction--the number of organizations or groups in which the individual participated (ranging from 0 to 5) and one measure of informal social interaction--whether the parent visited relatives with the child at least once per week.

Almost half (45%) of mothers in the sample participated in at least one type of group or organization, with an average of .76 organizations; the figures for the fathers were virtually identical to those for mothers (Table 1). Almost one third (31% of both mothers and fathers) said that they participated in a church group, 7 percent of mothers and 8 percent of fathers said that they participated in a service club, 3 percent of mothers and 5 percent of fathers said that they participated in a political group, 12 percent of mothers and 14 percent of fathers said that

they participated in a community organization, and almost a quarter (23%) of mothers and 20 percent of fathers said that they participated in an organization working with children or youth in the past 12 months (figures not shown in tables). Over half (58%) of the mothers reported that they attend religious services regularly, while only one third of fathers reported regular attendance. Most mothers (89%) and fathers (85%) reported that they visit relatives with the child at least once per week.

Measures of poor child health

In constructing measures of poor child health, we were looking for a measure which met two criteria: (1) It characterizes a health shock that was present at birth and unlikely a function of parental behaviors. (2) It includes conditions that are strongly associated with long-term morbidity. In terms of the former, our goal was to capture conditions that are for the most part random (e.g., Down Syndrome, congenital heart malformations), given that the pregnancy resulted in a live birth.

Our first measure of poor child health—*severe child health condition*—coded from the medical records and one-year maternal reports of child disability, is whether the infant had an abnormal condition at birth that met the two criteria above. The coding of the abnormal conditions was conducted by an outside pediatric consultant who was directed to classify a case as having poor child health if the child had a condition that is severe, chronic, unlikely caused by parents' prenatal behavior, and in the case of one-year maternal reports, likely present at birth. This measure mostly closely matches our two criteria for an exogenous health shock. A disadvantage of this measure (for the analyses) is that it is rare: Only 2 percent of the children in our samples had a *severe child health condition* as we have defined it (Table 1).

The second measure of poor child health, *severe child health condition or VLBW* is measured as *severe child health condition* and/or was very low birth weight (<1500 grams). Very low birth weight is associated with a number of serious and long-term child health conditions (Reichman 2005). Reports of birth weight came from the medical records for over 99% of the sample. For the remaining cases, birth weight was ascertained from maternal baseline reports. Three percent of the samples had a *severe child health condition or VLBW* (Table 1). The advantage of this measure is that we gain a few more analysis cases with poor child health. The disadvantage is that the VLBW component may not be truly exogenous.

The third measure is a direct, but broad, measure of poor child health—whether the child had an abnormal condition that meets the criteria for *severe child health condition* or has a more moderately severe condition that is considered random (not a function of parental behavior). This measure includes conditions that may or may not have poor long-term prognoses (examples are hydrocephaly and cleft palate). We call this measure *moderate or severe child health condition*. Again, the coding was conducted by an outside pediatric consultant who systematically reviewed the medical record data on child conditions, as well as data from the one-year interviews on physical disabilities of the child. About one fifth of the children in the samples were coded as having a *moderate or severe child health condition* as we have defined it (Table 1). The advantages of this measure are that all of the conditions are considered random (exogenous) and that there are more cases of poor child health to analyze. The disadvantage is that most of the conditions do not fall in the “severe” category.

Covariates

The choice of covariates was guided by the theoretical model presented earlier. Unless indicated otherwise, all covariates are measured at baseline. These include a basic set of sociodemographic characteristics -- age, race/ethnicity, immigration status, education, whether the parent lived with both of her/his parents at age 15 (a potential indicator of intergenerational

poverty), and whether the birth was covered by Medicaid (a proxy for poverty). Race/ethnicity and immigrant status are included to capture differences in cultural norms and experiences across groups and because social trust has been found to vary by race (e.g., Glaeser, Laibson, Scheinkman & Soutter, 2000; Toussaint, Kiecolt & Morris, 2000; Alesina & La Ferrara, 2002). We also control for regular attendance at religious services at baseline in the models of regular religious attendance at three years, allowing us to capture the dynamics in that outcome (corresponding baseline controls were not available for the other measures of social participation).

The father sample is slightly older than the mother sample (28.1 versus 25.0 years) (Table 1). About half of both mothers and fathers are non-Hispanic Black and a quarter of each group is Hispanic. About 1 in 7 of each group was foreign-born. Education levels were low: About a third (31%) of the mothers were high school graduates but did not attend college and only 10% were college graduates. The figures are similar for fathers--35% were high school graduates but did not attend college and 12% were college graduates. About two thirds of the births (65% of the mother sample; 60% of the father sample) were covered by Medicaid, indicating that a large proportion of the sample is poor or near poor. About a third (38% of mothers, 30% of fathers) regularly attended religious services at the time of the birth; this variable is used as a control variable in models of religious attendance at 3 years (we did not have corresponding baseline controls for participation in any organization).

We include measures of the individual's employment and wage. For mothers, the measure of employment was whether they worked within the two-year period preceding the child's birth (82%). For the fathers, the measure of employment was whether they were working at the time of the child's birth (also 82%). Fathers were asked how much money they earned in their current or most recent job held for two weeks or more. For fathers who had never been employed for two or more consecutive weeks, their reported reservation wage (how much they would need to be paid per hour to accept a job offer) was used, and for those with missing information on wages (12%), we set hourly earnings to zero and included a flag variable for missing data on wage (not shown in tables). Mothers were asked how much money they earned the last time that they worked two or more consecutive weeks, and those responses were used to construct a measure of hourly wage. For mothers who had never been employed for two or more consecutive weeks, the hourly wage was set to zero (reservation wage was not asked of the mothers).

We also include a number of variables capturing the parents' relationship and family structure. We consider whether the parents were married, cohabiting, or neither married nor cohabiting at the time of the birth. Over three quarters (76%) of the mother sample was unmarried and almost half (49%) of mothers who were unmarried lived with the child's father. Sixty nine percent of the father sample was unmarried and more than half (61%) of those who were unmarried lived with the mother. We also include whether the father visited the hospital during the birth hospitalization (81% for the mother sample; 92% for the father sample), to capture relationship quality rather than status; whether the mother and father had any previous children together; whether the mother had children with another partner; whether the father had other children with another partner (this variable was measured at one year due to data availability); and whether the father did not complete a baseline interview.

Finally, we include whether the focal child is male, whether the birth was a multiple (2% in both the mother and father samples; not shown in tables), and indicators for the mother's state of residence at the time of the baseline interview.

If our measure of child health is random, we would expect it to be unrelated to maternal behavioral characteristics, such as educational attainment and marital status. To assess this

assumption, we compared the characteristics of mothers with children in poor health (using the moderate or severe condition variable) to those of children not in poor health. We found significant differences only for the two variables describing the biological characteristics of the infant-- child gender and multiple birth. Thus, our bivariate results are consistent with the assertion that our child health variable is unrelated to maternal behaviors.

Multivariate Analysis

We use probit models to predict both participation in any organization and regular religious attendance. Table 2 presents the probit results based on *moderate or severe child health condition* as the measure of poor child health. Each cell contains probit coefficient on top, the marginal effect in brackets, and the standard error of the probit coefficient, which is corrected for city clustering of observations using the Huber-White method, in parentheses.

Poor child health is positively associated with parents' social interactions (assessed at three years), but never statistically significant at conventional levels (this was also the case when controlling for no covariates, not shown). Race, nativity, college education, and marital status are associated with both participation in any social organization and religious attendance in the expected directions, for both mothers and fathers. Hispanic ethnicity is positively associated with religious attendance, as is baseline religious attendance. Medicaid births are negatively associated with both social interaction outcomes for mothers, but positively associated with participation in any organization for fathers. Some of the strongest effects are for religious attendance. For example, the mother being non-Hispanic Black increases her likelihood of regular religious attendance at three years by 20 percentage points, and attending religious services regularly at baseline increases the likelihood of subsequent regular attendance by 41 percentage points for mothers and 43 percentage points for fathers. Controlling for all of these factors, employment and wages have insignificant or extremely weak associations with both social interaction outcomes. The associations between the family characteristics and social participation outcomes are mixed, but generally insignificant. There are no statistically significant effects of child gender or multiple birth (not shown).

In Table 3, we present estimates of the effects of poor child health from alternative model specifications. These models include alternative measures of poor child health described earlier (*severe child health condition* or *severe child health condition or VLBW*) or *moderate or severe health condition*, which was used for Table 2. Estimates are shown for the two primary outcomes (participation in any organization and regular religious attendance), as well as two alternative outcomes (number of organizations and visited relatives with the child). The estimates for the number of organizations are Ordinary Least Squares regression coefficients corrected for city clustering of observations using the Huber-White method. The other estimates are probit marginal effects. Only the religious attendance models control for baseline religious attendance; otherwise, all of the models include all of the controls from Table 2. Covariate estimates are not presented, but are very similar to those obtained using the other two measures of poor child health (and for visiting relatives, are very similar to those for formal social interactions) and are available upon request. Again, poor child health does not appear to affect parents' social interactions. For mothers and fathers, there are no significant effects and the sign is inconsistent across specifications. Overall, the results indicate that adverse infant health shocks do not have negative effects on parents' social interactions when their children are a few years old.

Supplementary Analyses

We conducted several specification checks and auxiliary analyses (estimates are not shown, but are available upon request). First, we estimated models predicting each of the five types of social interaction alone and found no associations with poor child health. Second, we estimated

a full set of models restricting the sample to mothers having first births (40% of the mother sample) to eliminate potential confounding by health status of the parents' other children (information on the health of non-focal children was not available) and found the estimated effects of poor child health to be insensitive to this sample restriction. Third, we ran models using low birthweight (< 2500 g) as the measure of poor child health. The advantage of this measure is that it is well measured, widely available, and often used as a proxy for poor child health. The disadvantage is that it is unlikely to be exogenous. Although most associations between low birthweight and parents' social interactions were insignificant, they were negative and significant for regular religious attendance (for mothers) and for visiting relatives with the child (for fathers). Finally, based on findings that social trust and religious attendance are positively correlated and that frequent religious attendance is positively associated with larger and denser social networks (Ellison & George, 1994; Glaeser, Laibson, Scheinkman & Soutter, 1999), we estimated models of participation in any organization, number of organizations, and visiting with relatives that controlled for baseline religious attendance (the only available measure of social interaction at baseline). We found that although baseline religious attendance was highly significant and positively associated with the various outcomes, including it did not change the insignificant effects of poor child health.

To place our data (from a largely disadvantaged sample) in context, we explored the well-documented positive association between adult health and social interaction. For mothers, we used a self-reported measure of overall health status from the first follow-up interview (this information was not collected at baseline). We found that mothers who reported excellent or very good health were about 9 percentage points more likely than those who reported good, fair, or poor health to participate in at least one organization. We used the same self-reported measure of overall health status for fathers, but from the baseline interview, and found that fathers were also 9 percentage points more likely to participate in any organization if they reported their health to be very good or excellent. Positive and significant associations were found between both parents' health and the number of organizations, as well. The estimated effects of parents' own health on their own social interactions were smaller in the multivariate context than when not controlling for any factors, but the effects of poor child health were not affected by including parents' health.

Finally, to further explore our findings, we ran models for all outcomes that stratified the sample by neighborhood poverty, which may be related to availability of organizations that facilitate social interactions. For both mothers and fathers and for both poor and non-poor neighborhoods defined various ways, we found a pattern of insignificant associations between exogenous shocks in poor child health and parents' social interactions.

Conclusion

The contribution of this study is three-fold. First, we contribute to the literature on social capital and health by exploiting an exogenous health shock and estimating effects from health to social capital, rather than the other way around. We found that infant health shocks do not reduce the social interactions of the child's parents (as we have measured them). The estimated effects of poor child health on our measures of social interactions were insignificant and inconsistent (in sign) for mothers, and positive but insignificant for fathers. Thus, we do not find any compelling evidence that an exogenous shock to health "causes" changes in specific types of social interactions (which can be viewed as investments in social capital) in a specific three year window.

Second, we have added to the small but growing literature on the effects of poor child health on family resources, which can have implications for the health and well-being of all family members. Recent studies have found that mothers of children born in poor health are less likely

to live with the child's father one year later (Reichman, Corman & Noonan, 2004) that and poor child health leads to reductions in both mothers' and fathers' labor supply (Corman, Noonan & Reichman, 2005; Noonan, Reichman & Corman, 2005). The findings from this study indicate that poor child health does not take yet another toll on family resources by reducing the parents' social interactions, at least in the first three years of the child's life.

Third, we explored relationships between health and social interactions in a cohort of mostly disadvantaged young adults and their young children. We found positive associations between parents' health and their social interactions as has been found in the broader literature. Similar to findings of Schultz, O'Brien & Tadesse (2008) and others, we found that education, children, and religiosity have positive impacts on adults' participation in formal activities and on one type of informal interaction (visiting relatives) even in our relatively disadvantaged population.

Although our results inform the debate on the direction of the causality between health and social capital, more work needs to be done. This study was specialized in several ways. We considered only one type of health shock, a diagnosis of a serious condition of a newborn, and linked it to social interactions when the child was approximately three years old. It could be that similar shocks to older children or to the parents themselves would result in different effects, or that the effects of the infant health shock have shorter or longer term effects on parents' social interactions (that said, the uniform age of the children was a strength of our study). We explored a limited set of social interaction outcomes (e.g., we were not able to characterize certain types of informal interactions, such as friendships or participation in support groups, with our data); it is possible adverse child health shocks have significant effects on those types of interactions but not on the types that we measured. We were able to capture the dynamics in only one social interaction outcome (regular religious attendance), by controlling for the pre-birth level of that outcome. However, if the child health shocks are truly exogenous (and the evidence supports this), controlling for the initial level of the outcome may not be necessary for obtaining unbiased estimates. Our sample--although population-based, interesting, and policy relevant--is not representative of the entire U.S. population; rather, it consists of urban, mostly unmarried parents with a new baby. It could be that the same shock would affect non-urban or higher-SES parents differently.

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Table 1
Sample Characteristics

	Mothers	Fathers
Parents' Social Interactions (measured at 3 years)		
Participation in any organization	.45	.43
Number of organizations	.76 (1.04)	.76 (1.10)
Regular religious attendance	.58	.33
Visiting relatives with child	.89	.85
Child Health (at birth)		
Severe health condition	.02	.02
Severe health condition or VLBW	.03	.03
Moderate or severe health condition	.20	.21
Parent Characteristics		
Age, years	25.00 (6.00)	28.09 (7.25)
Non-Hispanic Black	.49	.47
Hispanic	.27	.27
Other race/ethnicity *	.24	.26
Immigrant	.15	.17
< High school graduate *	.34	.33
High school graduate	.31	.35
Some college but not graduate	.25	.23
College graduate	.10	.12
Lived with both parents at age 15	.42	.44
Medicaid birth	.65	.60
Attended religious services regularly	.38	.30
Employed	.82	.82
Hourly wage, dollars	8.15 (9.13)	11.02 (14.50)
Relationship Characteristics		
Married	.24	.31
Cohabited	.37	.42
Father visited hospital	.81	.92
Mother had children with another man	.33	.32
Father had children with another woman	.33	.28
Parents had other children together	.37	.40
Father did not complete baseline interview	.18	.08
N	2981	2145

Notes: Standard deviations in parentheses.

* Reference category in regression models. VLBW = very low birth weight (< 1500 g). All parent and relationship characteristics were measured at baseline, except father had children with another woman, which was measured at 1 year.

Table 2
Multivariate Probit Estimate of Effects of Poor Child Health and Covariates on
Parents' Social Interactions at Three Years

	Mothers (N=2981)		Fathers (N=2145)	
	Participation in Any Organization	Regular Religious Attendance	Participated in Any Organization	Regular Religious Attendance
	Coefficient [ME] (SE)	Coefficient [ME] (SE)	Coefficient [ME] (SE)	Coefficient [ME] (SE)
Child Health				
Moderate or severe health condition	.07 [.03] (.07)	.04 [.01] (.09)	.14 [.05] (.07)	.08 [.03] (.10)
Parent Characteristics				
Age	.01 [.01] (.02)	.08* [.03] (.04)	-.01 [-.00] (.02)	.02 [.01] (.04)
Non-Hispanic Black	.23** [.09] (.06)	.52** [.20] (.10)	.17* [.07] (.08)	.23* [.08] (.10)
Hispanic	-.08 [-.03] (.08)	.52** [.19] (.07)	-.05 [-.02] (.12)	.15 [.05] (.09)
Immigrant	-.44** [-.17] (.10)	.31** [.11] (.10)	-.27 [-.10] (.16)	.36** [.13] (.08)
High school graduate	.09 [.04] (.07)	-.02 [-.01] (.06)	.11 [.04] (.08)	-.15* [-.05] (.07)
Some college, but not graduate	.41** [.16] (.05)	-.04 [-.01] (.07)	.37** [.15] (.09)	-.19 [-.07] (.11)
College graduate	.77** [.29] (.08)	.25** [.09] (.12)	.65** [.25] (.11)	-.17 [-.06] (.15)
Lived with both parents at age 15	.03 [.01] (.05)	.03 [.01] (.07)	.09 [.04] (.08)	.05 [.02] (.08)
Medicaid birth	-.11** [-.04] (.04)	-.14* [-.05] (.07)	.10* [.04] (.04)	.06 [.02] (.06)
Attended religious services regularly		1.15** [.41] (.05)		1.17** [.43] (.06)
Employed	-.07 [-.03] (.05)	-.10 [-.04] (.09)	.03 [.01] (.08)	.02 [.01] (.10)
Hourly Wage	-.00 [-.00] (.00)	-.01 [-.00] (.01)	.01* [.00] (.00)	.00 [.00] (.00)
Relationship Characteristics				
Married	.26** [.10] (.10)	.03 [.01] (.10)	.17 [.07] (.08)	.26 [.09] (.13)
Cohabited	.03 [.01] (.07)	.01 [.00] (.06)	-.15 [-.06] (.08)	.06 [.02] (.07)
Visited hospital	.05 [.02] (.06)	.05 [.02] (.08)	.03 [.01] (.09)	-.13 [-.05] (.11)
Mother had child with another man	.02 [.01] (.06)	.07 [.03] (.06)	.04 [.01] (.06)	.07 [.02] (.06)
Father had children with another woman	-.02 [-.01] (.06)	-.03 [-.01] (.04)	.19* [.08] (.08)	.10 [.04] (.05)
Parents had other children together	.10* [.04] (.05)	.06 [.02] (.06)	.12 [.05] (.07)	-.08 [-.03] (.06)
Father did not complete baseline interview	-.03 [-.01] (.06)	.10 [.04] (.07)	-.09 [-.04] (.18)	.57** [.21] (.18)

** Notes: significant at 1% level;

* significant at 5% level. All models include quadratic terms for age; indicators for the child's gender, multiple birth, and mother's state of residence at baseline; and (for fathers) an indicator for missing wage (estimates not shown). ME: Marginal Effect; SE: Standard Error.

Table 3
Effects of Poor Child Health on Parents' Social Interactions, Alternative Model Specifications

	Participation in Any Organization (ME)	Number of Organizations (OLS coefficient)	Regular Religious Attendance (ME)	Visiting Relatives With Child (ME)
Mothers				
Severe Child Health Condition	.05	-.02	.09	.04
Severe Child Health Condition or VLBW	.02	-.02	.05	.02
Moderate or Severe Child Health Condition	.03	.06	.01	.02
Fathers				
Severe Child Health Condition	.10	.14	-.09	.02
Severe Child Health Condition or VLBW	.06	.04	-.08	-.04
Moderate or Severe Child Health Condition	.05	.09	.03	-.02

Notes: Each of the 24 models includes the same set of covariates as in Table 2 (except that baseline religious attendance is included only in the models for regular religious attendance). ME = marginal effect (from probit model); OLS = Ordinary Least Squares; VLBW = very low birth weight (< 1500 g). No coefficients are statistically significant at conventional levels.