Getting a Child through Secondary School and to College in India: The Role of Household Social Capital

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University of Maryland

2017

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The Role of Household Social Capital

ABSTRACT In the classic formulations of social capital theory, families employ their social capital resources to enhance other capitals, in particular their human capital investments. Social capital would seem to be especially important in the case of India, where, in recent years, higher education has been under considerable stress with rising educational demand, inadequate supply, and little parental experience to guide children's transition through the education system. We use the 2005 and 2012 waves of the nationally representative India Human Development Survey (IHDS) to show how relatively high-status connections advantage some families' chances of their children reaching educational milestones such as secondary school completion and college entry. The 2005 IHDS survey measure of a household's formal sector contacts in education, government, and health predicts their children's educational achievements by the second wave, seven years later, controlling for households' and children's initial backgrounds.

INTRODUCTION

Social capital research attempts to understand how one type of capital—human connections—can be transferred into other kinds of capital (Bourdieu 1986) to benefit individuals and families. In his seminal work, Coleman (1988) succinctly indicated that "social capital is productive, making possible the achievement of certain ends that in its absence would not be possible" (p. S98). But to access the seeming value of social capital—often knowledge and other resources that people have to offer—actors must find the right source(s) of social capital, since these critical resources are embedded within specific networks of actors (Lin 1999). While this relationship has been well studied in high-income countries, a less-developed literature exists in low-income countries, where, arguably, residents might more desperately need to translate social capital into human capital or other important outcomes in order to achieve upward mobility or even survive. In such settings, those most in desperate need of social capital—often those of low social status—will not necessarily benefit from their connections to similar individuals (Narayan et al. 2000; Narayan, Pritchett, and Kapoor 2009) but rather from individuals with higher social status who have the necessary resources to aid in these efforts (Szreter and Woolcock 2004), yet who are likely more difficult to access.

To our knowledge, virtually no studies in low-income contexts assess how social capital predicts educational achievement, despite the nearly universal perception that education is

the most important route for upward mobility in such settings. Unlike some studies, this one restricts the definition of a household's social capital by not considering family characteristics, such as parental encouragement of education or even the effects of mere parental and extended kin presence on educational achievement, as social capital (e.g., Marjoribanks and Kwok 1998). Rather, we are interested in a household's *connections* as a form of social capital, especially considering Coleman's (1988) conceptualization emphasizing the importance of social capital accessed through the family and household in achieving desired outcomes, including remaining in secondary school.

In our study, we use two waves of the nationally representative Indian Human Development Survey (IHDS) to show how household social capital—in the form of "formal sector" connections to individuals (family members, acquaintances, and/or community members) in government, education, and/or health (excluding business)—potentially assists families in obtaining secondary and postsecondary education for their children. Presumably, individuals within these formal sectors have relatively high levels of education and understand how to acquire it. We believe that knowing someone within one of these institutions signifies access to an individual (or even multiple individuals) who could provide information, resources, and additional network connections that might improve the chance of one's child(ren) completing secondary school or getting into college. Such individuals are also among a select group of Indian workers—those who do not farm for a living and those not among the approximately three-quarters of agricultural and nonagricultural laborers in India's informal labor sector (NSSO 2014).

In the last 15 years, India's economic growth has been fueled by rapidly broadening educational attainments, and vice versa: increasing family incomes have in turn led to an explosive growth in the demand for more and better schooling. It is not surprising that households invest their resources in attaining higher levels of education for their children (Becker 1964; Schultz 1961), and this is evident in the pace at which private educational expenditures have proliferated in recent years. In 2014, Indian households invested, on average, 2.75 times more per child of primary and secondary school age in expenditures like tuition or tutoring than they had invested as recently as 2007—a jump from roughly US$36 to US$100 (NSSO 2015). Coupled with government schemes designed to universalize access to primary education, such as the Sarva Shiksha Abhiyan (SSA) program starting in 2000, and the comprehensive Right to Education (RTE) Act in 2009, as well as the Rastriya Madhyamic Shiksha Abhiyan (RMSA) program in 2009 aimed at achieving universal secondary school enrollment, school attendance and advancement have dramatically increased. In 2010, an estimated 98.6 percent of children were enrolled in primary school compared to 83.5 percent of children a decade earlier (UN 2014). Not only have initial enrollments increased, but the proportion of children who finished primary instruction has also risen from 71.5 percent in 2000 to 97.2 percent in 2009 (UN 2014). Yet by 2010, less than two-thirds of Indian children who were eligible to be enrolled in secondary school actually were enrolled (World Bank 2014). University enrollments have also expanded—in the first decade of the century alone, tertiary enrollments nearly doubled from 9.5 percent to 18.2 percent (World Bank 2014)—but are considerably below primary and secondary levels.

A pervasive zeal for education clearly exists in contemporary India, yet government schools are perceived to offer poor-quality education, and many families desiring to send their children even to "low-fee private" schools cannot do so because of income and informal social barriers (Härmä 2009, 2011). Further, Indian higher education has been under considerable stress from this rising educational demand and inadequate supply for labor market skills required by early-career Indians (Agarwal 2008; Forbes 2014). The current generation of students also face tremendous uncertainty because of the growing importance of acquiring higher education but typically have little family experience in completing secondary school, let alone managing the transition to college. When considering the aforementioned disjuncture between primary, secondary, and tertiary school enrollment, it is evident that the most crucial gap that needs to be bridged in India is between primary school completion and secondary school completion, which would pave way for tertiary school access. This situation is likely to reinforce the role of a household's social capital in accessing embedded, valuable resources: knowing others who understand the steps needed to progress children through secondary school and, eventually, into the college entry process.

We evaluate the predictive power that households' social capital—net of critical stratifying characteristics in India such as caste/religion, gender, income, and employment—has on their children's subsequent educational attainment at two critical stages in efforts to enter the formal employment sector and build toward achieving economic security: secondary completion and college entrance. Our results support this recognition that household-level social capital is an important resource for that effort but more for secondary school completion—the major barrier in the way of attending college.

THE BENEFITS OF SOCIAL CAPITAL: WHAT WE KNOW IN LOW-INCOME COUNTRIES

Across a variety of national and local contexts, research has recognized that social capital, however conceptualized (see Adler and Kwon 2002; Halpern 2005; Lin 2001 for detailed examples), is often essential for individuals and communities to improve their livelihoods. The utility of social capital is conditional, though, as different types of social capital must be valued within a particular social structure in order to be effectively used in attaining human capital or other desired outcomes. For instance, having a robust network of individuals who can be called upon for agricultural help does not automatically mean that these same sources of social capital would be drawn upon for advice about sending a child to secondary school. Lin's (1999) salient discussion of the critical resources embedded in networks indicates how accessing the right kind of social capital can improve the chances of acquiring human capital, like education. Of course, there is a dark side to social capital: as Portes (1998) notes, "Mafia families, prostitution and gambling rings, and youth gangs offer so many examples of how embeddedness in social structures can be turned to less than socially desirable ends" (p. 18). But regardless of its desirability, social capital can promote a range of important outcomes.

In low-income country contexts, though, where families, communities, and nations experience more inequality than elsewhere in the world (Korzeniewicz and Moran 2009), there has been an underlying pessimism about the value of social capital. Being engaged in an

impoverished local community or trusting others nearby might signify that individuals or households have social capital, but there are no guarantees that these factors are associated with better livelihood outcomes (Myroniuk and Vearey 2014). The poor may be unlikely to lift one another out of their current circumstances because of everybody's lack of resources (Narayan et al. 2000; Narayan, Pritchett, and Kapoor 2009); having an expansive stock of social capital may not be any more beneficial than having a smaller stock.

However, simply knowing just *one* relatively highly situated person in a community can improve one's livelihood (Szreter and Woolcock 2004). For example, slum leaders in Delhi act as intermediaries between individuals, the local community, and the government, so knowing one of these leaders can increase the chance of receiving the many benefits coming from legal authorities (Jha, Rao, and Woolcock 2007). In India, such connections may even reduce caste inequalities and increase political participation of the poor (Krishna 2002). While there appear to be benefits linked to social capital, research is often limited by cross-sectional data in low-income countries. Such studies suffer from endogeneity issues, since it is difficult to evaluate whether having social capital is a cause of various outcomes or a consequence.

Among the limited studies of social capital in low-income countries, health has been the most popular outcome to investigate (see Agampodi et al. 2015; Story 2013). Only one study that we are aware of *explicitly* evaluates the relationship between social capital and education in such a setting. S. Hasan and Bagde (2013) show that having higher-quality college peers— one's social capital—predicts better college grades over several terms for Indian engineering students. Their fixed-effects analysis is especially persuasive because it eliminates underlying, time-invariant characteristics of students, and thus much of the endogeneity between social capital and educational achievement. However, students in an Indian engineering college are a select group of individuals, and while having social capital is evidently important in achieving better grades, we do not know how their, or their parents', social capital might have affected their chances of getting to college or through earlier educational stages.

S. Hasan and Bagde's (2013) work is not the first to measure the relationship between social capital and education in a longitudinal framework—only the first outside of high-income countries. Several studies in the United States have employed panel designs and have generally found that higher levels of either children's or their parents' social capital predicted higher educational attainment (see the review by Dika and Singh 2002). But Lareau's (2011) work most clearly shows that the networks and various connections individuals indirectly acquire from their parents' social capital—and cultural capital in the form of their education—markedly improves their chances of being able to navigate the educational system and achieve upward mobility. We expect that accessing similar types of embedded resources, as Lareau depicts, will be advantageous for Indian children in their educational achievement too.

BARRIERS TO ATTAINING HIGHER LEVELS OF EDUCATION IN INDIA

Since India's economic expansion began in the late 1990s, educational enrollments clearly have improved for both boys and girls, in part because of the expansion of government efforts to promote education, but also undoubtedly as a consequence of many households'

recognition that in an expanding economy education for a child has become increasingly important. However, despite the rapid expansion, only a small portion of Indian households can invest in higher levels of education.

Selection out of the educational system proceeds at every level of schooling (Desai et al. 2010), but competition for the available college openings still is especially fierce. Boys and girls have declining parallel trends in school attendance at each subsequent age, but, up until class 11, boys' enrollment is consistently about 15 percent higher than girls' (Lewin 2011), which reflects broader social and filial disadvantages that girls face (e.g., Bhaskar and Gupta 2007; Clark 2000; Das Gupta 1987). Economic differences figure in this selection at each stage (Azam and Blom 2009; Härmä 2009, 2011). Children, especially girls, in families with little educational attainment have few opportunities to advance in their schooling without the interpersonal support and guidance from sympathetic family and community members (Kelly, Bhabha, and Krishna 2015). For those who complete secondary school, though, economic status is a significant predictor of college attendance (R. Hasan and Mehta 2006).

Private education—especially for wealthier families—has been shown to lead to significantly better educational attainment outcomes for schoolchildren (Desai et al. 2009), thus increasing the importance of family choices for their children's futures. Private tutoring is popular among in Indian families (IDFC Foundation 2013), with nearly a quarter of students receiving it (Pratham 2014), and with a greater portion receiving such tutoring while preparing for crucial examinations in class 10 and class 12. One's social group—defined by caste or religion—matters as well. While Hindus of nearly all caste groups outperform Muslims, among Hindus, Scheduled Tribes and Castes have the lowest educational attainment and particularly girls from Scheduled Tribes (Lewin 2011). Thus education is not practically accessible for everyone as one progresses through the school system; children and households must overcome economic and social barriers to acquire more schooling.

THE POTENTIAL OF SOCIAL CONNECTIONS FOR EDUCATIONAL ACHIEVEMENT IN INDIA

The role of social networks—the building blocks of social capital—in shaping access to opportunities in India has long been acknowledged. Srinivas and Beteille vividly described this process in an article published in 1964:

> The concept of social network makes for an effective representation of the links radiating from the village to the outside world. . . . One of the Brahmin landowners of Sripuram wanted to get a seat for his son in an engineering college at Madras. He approached an influential Non-Brahmin friend at Tanjore who was also his father's client, the father of the Brahmin landowner being a lawyer in a nearby town. The Non-Brahmin friend, who is chairman of a transport undertaking at Tanjore, had influential business associates at Madras. Some of these persons were able to put the landowner from Sripuram into touch with a member of the committee of the college to which he was seeking admission for his son. (p. 166)

The role of social capital in shaping educational outcomes likely varies at different stages of one's educational trajectory. Research has shown that in primary education skill attainment is closely linked to parents' social class and caste, which shape their access to social

capital (Desai, Adams, and Dubey 2009) and increase children's learning outcomes (Kandpal and Baylis 2013). However, with the implementation of the RTE Act in 2009, all students in primary school are routinely promoted. This social promotion creates a situation in secondary school where students of unequal skills are grouped together, and without parental advocacy it would be easy for children to fall so far behind that they might not be able to pass the standardized examinations in class 10 and class 12. But how can parents, who themselves may not be highly educated, identify children who are falling behind and seek help? This is where a household's social capital can come into play.

Parents who are comfortable dealing with impersonal bureaucratic structures are plausibly far more likely to be able to navigate school systems and obtain appropriate feedback from teachers. Secondary school is likely the most crucial stage for parents to set the stage for their children to succeed in competitive examinations for entry into coveted fields like medicine and engineering. Indian children are expected to select between arts and humanities, commerce, and science streams as early as class 11 and then begin taking competitive examinations that will allow for entry into medicine, engineering, medical technology, and other highly coveted fields. Parents with more experience in achieving higher levels of education would seemingly have a greater likelihood of understanding the role of these examinations and ensuring that their children select subjects that are more likely to pave their way to success and that they get private tutoring when needed. In absence of this experience, gaining knowledge of the process through social connections who have such experience would likely be a crucial tool for households looking to ameliorate their children's disadvantages. Finally, gaining admission to these programs often requires strategic planning such as exploiting quotas for specific states or obtaining documentation indicating participation in extracurricular activities. Indian colleges also have rigid quotas for lower castes, tribes, and other marginalized groups. However, gaining entrance through these quotas requires a caste certificate, which is more easily procured by parents with social connections to bureaucrats and other relatively high-status individuals than by those without such social connections.

While the literature has identified many different dimensions of social capital (e.g., Adler and Kwon 2002; Halpern 2005; Lin 2001), the processes described above are best served by parental access to bureaucratic systems that require higher education and are embedded in the formal economy. Since a vast majority of jobs in India are in the informal sector—by some accounts encompassing between 70 and 80 percent of all jobs (NSSO 2014; Sinha and Kanbur 2012; Unni 2002)—the pool of formal sector connections, such as individuals in schools, medical clinics, and government offices, is relatively small. However, given that publicly funded jobs in India—including those in the civil service—are constitutionally bound by affirmative action caste-based reservation quotas, access to individuals in the formal sector is *not exclusive* to upper castes and those with high social status. We hypothesize that the households who are connected to this formal structure have a greater chance of assisting their children to get a good start in primary school, ensuring their success in secondary school, securing admission for their children to college, and helping them gain admission to coveted specialties.

Last, Bourdieu (1986) postulates that social, cultural, human, and economic types of capital can act as substitutes for one another—essentially a plethora of one type can facilitate

the acquisition of a type of capital that one lacks. Evidence from India and other low-income contexts supports the notion that the *right* connections (Jha et al. 2007), or useful forms of social capital, such as participation in community events in a society that strongly values communalism (Nobles and Frankenberg 2009), can make up for the deprivation of other types of capital. Therefore, in this paper, we also expect that children from disadvantaged families will benefit most from their household social capital. Families that already have many resources—financial, human, and cultural capital—do not need as much help from others as do those with fewer resources. Paradoxically, while disadvantaged families may benefit most from social capital, they are also the least likely to have it (Stanton-Salazar and Dornbusch, 1995; Teachman, Paasch, and Carver 1997).

METHODS

Data

We use the 2004–5 and 2011–12 waves (shortened to wave-1 and 2005, and wave-2 and 2012, respectively in the following text) of the IHDS to examine the extent to which social capital predicts acquiring human capital. The IHDS is a nationally representative, face-to-face survey of over 41,000 households in 1503 villages and 971 urban blocks throughout India (see Desai et al. 2010). In 2012, 83 percent of the wave-1 households were resurveyed: 90 percent in rural areas and 72 percent in urban areas. The resurvey sample also includes households that separated from the original household (e.g., two brothers starting separate households) but remained in the same area. Information on educational attainment was also collected for individuals who left their 2005 households because of marriage, migration, or other reasons. Questionnaires were translated into 13 Indian languages and administered by pairs of local interviewers. The wave-1 fieldwork was carried out from September 2004 to August 2005, and wave-2 from September 2011 to August 2012, both under the supervision of the National Council of Applied Economic Research, New Delhi.

We test the relationship between households' social capital and their children's subsequent educational attainment for 23,225 Indian youth who were 13 to 18 years old (inclusive) in 2005. This analytical sample includes individuals who were resampled in the same home in 2012 as in 2005 (N = 15,044) and those who had moved away from their 2005 home but whom survey teams were able to track at a different location(N = 8,181). These young Indians lived in a total of 14,893 households within 2,411 villages or urban blocks. This sample *excludes* 4,138 young Indians who were sampled in the first wave but who had moved *and were not tracked in 2012*, and thus were lost to attrition. We descriptively show the unweighted wave-1 differences between these missing individuals and nonmissing individuals in Appendix table 1. Although these missing individuals statistically differ on nearly all observed measures (because of the large sample sizes), substantive differences are found mainly in the household location and source of income; urban households, and thus households with nonagricultural incomes, were disproportionately not followed in the 2012 survey.

Educational Outcomes

We look closely at the chances of completing secondary education, ever attending college, and entering a prestigious college major, since we expect that these achievements come at

critical junctures in the Indian educational system when social capital may be especially important. Completing secondary school and entering college are significant accomplishments in India and likely cannot be realized without the assistance of others who can help these young Indians through the process, especially given the extent to which stratifying factors such as income, caste, religion, and gender create large inequalities in access to education (e.g., Azam and Blom 2009; Bhaskar and Gupta 2007; Clark 2000; Das Gupta 1987; Desai, Adams, and Dubey 2009; Härmä 2009, 2011; Kandpal and Baylis 2013; Lewin 2011).

In our first set of analyses, though, we begin by using individual and household indicators from 2005 (wave-1) for children aged 13 to 18—those who are of secondary school age—to predict their likelihood of being "on pace" in their schooling in 2005, and therefore the cross-sectional relationship between social capital and education. We define children in 2005 as on pace if they are in the appropriate class for their age or even ahead of those in their age group. Those who are "off pace" are one year or more behind in their schooling relative to their age, and we calculated this by subtracting a child's age from the number of years of schooling he or she had completed and then adding a constant of 7—an approximate and slightly generous age at which Indian children would be expected to start school. Although many children start their formal schooling at age six, not all children who start school on time are six years old (they could be five years old), and considering the problematic issue of age recall bias in survey research, the employment of a constant of 7 is appropriate here, even though it might include some children who are a year behind in their schooling as "on pace." Compared to static measures of schooling, one's pace of schooling better accounts for selection mechanisms throughout a child's life, such as wealth or location, that have contributed to that child's ability to maintain his or her academic progression as tested in comparable settings in Bangladesh (e.g., Canals-Cerda and Ridao-Cano 2004; Kuhn 2006).

Then, in the next set of models, we examine the likelihood that by 2012 (wave-2), when they are 20 to 25 years old, these individuals will have completed secondary school and have attended college. These analyses control for whether they were on pace in 2005 in order to more clearly assess whether 2005 levels of social capital predict subsequent educational achievements.

After these models, we estimate whether the relationship between social capital and educational achievement varies by other dimensions of family and child advantages—father's education, income, whether a household's income is primarily derived from nonagricultural work, distance to nearest secondary school or college, urban location, educational pace, caste/religion, and gender—to see whether social capital increases or decreases inherent advantages that some children might already possess.

Our final analysis examines the relationship between household social capital and the type of college major that young Indians choose, conditional upon their having completed secondary school and entered college. Engineering and medicine are the most sought-after professions in India, so we are particularly interested in whether households can enroll their children in the science and engineering programs that are needed to enter those professions. Unlike aforementioned methodological designs, this analysis is based only on nonmigrant youth (N = 15,044), since, for migrants (those who *were tracked* in 2012 and *not lost* to

attrition), there are no data on college majors, only on educational attainment. Although part of our original sample is excluded in our final analysis, our estimates of college enrollment do not differ dramatically when results of the nonmigrant sample and those of the full sample are compared (discussed in results, below).

Social Capital

Our key independent variable captures the variety of contacts that a household had in education, in government, and in health care institutions as reported in 2005. The primary household respondent (usually the male household head) was asked: "Among your acquaintances and relatives, are there any who . . . are doctors or nurses or who work in hospitals and clinics? Are teachers, school officials, or anybody who works in a school? Are in government service (other than doctors, teachers, above)?" We refer to these as formal sector contacts, as noted earlier. We measure whether a household has at least one contact in each of these institutions and aggregate these measures to create a 0 to 3 scale that we treat as a continuous variable. We expect that social capital is a generalized social resource so that linkages with any of these formal institutions smooths access to all other formal institutions.

Models

Since we explore dichotomous outcomes (on pace in school or not, having completed secondary or not, having attended college or not, having attended college or not after completing secondary school, and having enrolled in science/engineering or not once in college), we employ binary logistic regression models in our multilevel framework. Our variables occur at three levels of analysis: individual (e.g., youths' personal characteristics and prior education), households (e.g., social capital), and community (e.g., distance from the nearest college). There are 14,893 cases where multiple children reside in the same household and thus are recorded with the same social capital score in the survey. We account for the lack of independence between multiple children being from the same household (and thus having the same contacts) by employing random intercepts in our multilevel analyses (described below). Our design uses 2005 characteristics to predict education outcomes that occur by 2012. While we control for many of the key stratifying characteristics for educational attainment in India, we cannot account for any time-varying characteristics before and between waves, or any time-invariant unobserved characteristics such as a child's will to go to school or natural ability. While our approach reduces the chance that many stratifying factors influence estimates of how household social capital predicts children's educational attainment, the relationship is not causal.

In the first level of our analyses, we control for individual characteristics such as gender, age in 2005, whether the father and mother are alive and present, and father's and mother's education (Standard 12 or higher—at least secondary school completion—compared to Standard 11 or lower), and (except where this variable is the outcome) whether a child is on pace in his or her schooling. At the second level of analysis we control for household characteristics such as caste and religion, main source of income (agricultural/ nonagricultural), household income (natural log), household consumption per capita (natural log), and numbers of adults (22 years and above), children (0 to 14 years), and teens and youth

(15 to 21 years) in the household. The third level of analysis accounts for village or urban block characteristics such as the natural log of the distance to the nearest school (either secondary school or college, depending on the outcome variable) and rural/urban residence. At this level, we also control for underlying, interstate differences that could contribute to disparities in educational outcomes—such as variation in language or wealth—via fixed effects for 33 states/territories, which were collapsed into 21 categories in our analyses.

We begin by constructing models using our entire sample—including tracked migrants—on the likelihood of being on pace in school, completing secondary school (controlling for pace), and attending college (also controlling for pace). Our final set of models examines only nonmigrants and focuses on whether they entered science or engineering majors in college.

Each multilevel model contains three equations distinct to each level of analysis (although for the models explicitly measuring "pace" and college major as outcomes, state fixed effects are the only level 3 variables and are not presented in our tables). "Pace" of schooling is accounted for only in appropriate models presented in our analyses but is included in these generic equations. If we combine these equations, the models are structured as such:

$$\eta ijk = \ln\left(\frac{probability\ of\ schooling\ outcome}{1-probability\ of\ schooling\ outcome}\right)$$

$$
\begin{aligned}
= &\ \gamma_{000} + \gamma_{001}(state\ dummies)_k + \gamma_{002}(distance\ to\ nearest\ school[ln])_k + \gamma_{010}(\#adults)_{jk} \\
&+ \gamma_{020}(\#children)_{jk} + \gamma_{030}(\#teens)_{jk} + \gamma_{040}(consumption[ln])_{jk} + \gamma_{050}(income[ln])_{jk} \\
&+ \gamma_{060}(formal\ sector\ contacts)_{jk} + \gamma_{070}(income\ source)_{jk} + \gamma_{080}(location)_{jk} \\
&+ \gamma_{090}(caste/religion\ dummies)_{jk} + \gamma_{100}(gender)_{ijk} + \gamma_{200}(age)_{ijk} \\
&+ \gamma_{300}(father\ alive\ and\ present)_{ijk} + \gamma_{400}(mother\ alive\ and\ present)_{ijk} \\
&+ \gamma_{500}(father's\ education)_{ijk} + \gamma_{600}(mother's\ education)_{ijk} + \gamma_{700}(pace)_{ijk} + r_{0jk} + u_{00k}
\end{aligned}
$$

The analyses that include social capital interactions would each add an additional term, although in separate models. For instance, the interaction between father's education and social capital (level 1 x level 2) would be incorporated after father's education with the notation $\gamma_{510}(father's\ education_{ijk}\ x\ formal\ sector\ contacts_{jk})$.

RESULTS

Descriptive Statistics

We report the sample characteristics in table 1. In 2005, 46 percent of these children were on pace in their educational attainment, while the other 54 percent were off pace. By 2012, and despite dramatic growth in the availability of education in India, only 33.4 percent of these youths had completed secondary school and only 20.8 percent had attended college. Even among those who had been on pace in 2005, only 38.2 percent had attended any college seven years later. Of respondents who had completed secondary school, 61.3 percent went on to college. Although higher education in India was by no means universally attained in this sample, this is a generational revolution. Only a small minority of the children had a father (9.2 percent) or mother (3 percent) who had completed even Standard 12 to graduate from secondary school. Therefore, only a small minority of youth came from

TABLE 1. Distributions of Categorical and Continuous Variables

Categorical Variables		%
Caste and Religion, Mutually Exclusive	Forward Caste	19.4
	Other Backward Class	33.8
	Scheduled Caste	22.2
	Scheduled Tribe	7.4
	Muslim	14.5
	Christian, Sikh, or Jain	2.6
Gender	Male	51.9
	Female	48.1
Location	Rural	71.3
	Urban	28.7
Main Source of Income	Agriculture	43.4
	Nonagriculture	56.6
Age in 2005	13	17.6
	14	18.1
	15	17.8
	16	16.1
	17	12.4
	18	18.1
Father Alive and Present	Yes	87.4
Mother Alive and Present	Yes	91.8
Father's Education	Std. 12 or higher	9.2
	Std. 11 or lower	90.8
Mother's Education	Std. 12 or higher	3.0
	Std. 11 or lower	97.0
On Pace in Education	Yes	46.0
Completed Secondary by 2012	Yes	33.4
Attended College by 2012	Yes	20.8

Continuous Variables	Mean	Std. Dev
Social Capital: Formal Sector Contacts	1.0	1.1
Household Total Income (ln) in Rupees	10.3	1.3
Household Consumption per Capita (ln)	8.9	0.6
# Adults (22+) in Household	2.8	1.5
# Children (0-14) in Household	2.1	1.8

Categorical Variables		%
# Teens/Youth (15–21) in Household	1.7	1.1
Distance to High Secondary km (ln)	1.1	1.1
Distance to College km (ln)	1.8	1.4
N =		23225

TABLE 1. Distributions of Categorical and Continuous Variables (*continued*)

households with the educational background that would have provided any familiarity with college entrance, or relatively high academic achievement by Indian standards.

Social capital in 2005 was elusive for these households. While the average household had about one contact in a formal sector, 45.7 percent of households did not have a contact in any of these sectors. Thus only 54.3 percent of households had at least one of these contacts, and only 16.2 percent had a connection in each of the education, government, and health sectors.

The range of other variables employed in the subsequent analyses reflects the diverse, nationally representative sample.

Multivariate Results

Table 2 assesses the association between a household's formal sector connectivity in 2005 and three educational outcomes: the associations with being on pace in 2005, with having completed secondary school by 2012, and with having attended college by 2012. Column 1 reports the cross-sectional association between household social capital and a child being on pace at the first wave. As expected, households with a greater variety of sector contacts have children who are already more likely to be on pace in their schooling: children who are keeping up in school come from well-connected families.

In the second and third models, we are able to get a better sense of the potential influence of social capital on educational achievements by examining how household social capital in 2005 predicts whether children graduate from secondary school and whether they attend college within the next seven years, holding constant their past educational achievement (being on pace). We see that the average young Indian in a household in 2005 with one contact in an additional formal sector has nearly 20 percent higher odds ($e^{0.18}$, $p < 0.001$) of completing secondary schooling than a child in a household without that contact. Children fortunate enough to come from a family with contacts in all three high-status sectors have 72 percent higher odds of completing secondary school than equivalent youths without any of these contacts. Having a contact in an additional formal sector raises the chances of a child going to college by about 11 percent ($e^{0.10}$, $p < 0.001$), after controlling for household and other individual characteristics.

TABLE 2. Multilevel Logistic Regression Models Predicting Educational Outcomes in 2005 and by 2012

	On Pace (2005)	Graduated Secondary	Attended College
Level 3—Villages/Urban Blocks	**N = 2331**	**N = 2331**	**N = 2331**
Distance to High Secondary/College km (ln)	—	−0.16***	−0.19***
		(0.0)	(0.04)
Urban (Rural)	0.27***	0.16*	−0.02
	(0.06)	(0.08)	(0.10)
Level 2—Households	**N = 14378**	**N = 14378**	**N = 14378**
Social Capital: Formal Sector Contacts	0.20***	0.18***	0.10***
	(0.02)	(0.02)	(0.02)
# Adults	0.14***	0.10***	0.10***
	(0.02)	(0.02)	(0.02)
# Children	−0.10***	−0.05**	−0.05**
	(0.02)	(0.02)	(0.02)
# Teens	−0.07**	−0.04	−0.05*
	(0.02)	(0.03)	(0.03)
Consumption (ln)	0.71***	0.62***	0.63***
	(0.05)	(0.04)	(0.05)
Income (ln)	0.03*	0.07***	0.05*
	(0.02)	(0.02)	(0.02)
Nonagriculture Income (Agriculture)	0.10	0.09	0.04
	(0.05)	(0.06)	(0.06)
Caste/Religion (Forward Castes)			
Other Backward Class	−0.33***	−0.24***	−0.16*
	(0.07)	(0.07)	(0.07)
Scheduled Caste	−0.60***	−0.40***	−0.27***
	(0.08)	(0.08)	(0.07)
Scheduled Tribe	−0.66***	−0.45***	−0.09
	(0.11)	(0.12)	(0.13)
Muslim	−0.88***	−0.91***	−0.59***
	(0.09)	(0.09)	(0.09)
Christian, Sikh, Jain	0.06	0.06	0.16
	(0.17)	(0.19)	(0.16)
Level 1—Individuals	**N = 22825**	**N = 22825**	**N = 22825**
On Pace in Education	—	2.10***	1.84***
		(0.06)	(0.06)
Female	−0.12***	−0.24***	−0.11*
	(0.04)	(0.05)	(0.04)
Age	−0.48***	0.10***	0.04*

	On Pace (2005)	Graduated Secondary	Attended College
	(0.02)	(0.02)	(0.02)
Father Alive and Present	0.17*	0.16	0.11
	(0.08)	(0.08)	(0.09)
Mother Alive and Present	0.65***	0.59***	0.60***
	(0.10)	(0.11)	(0.13)
Father Education 0–Std. 11 (Std. 12+)	−0.89***	−1.04***	−0.79***
	(0.08)	(0.09)	(0.08)
Mother Education 0–Std. 11 (Std. 12+)	−0.72***	−0.80***	−0.20
	(0.16)	(0.19)	(0.14)

Note: *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. Population averaged results with robust estimates are presented. State fixed effects are not presented but are included in each model. All variables are centered on the grand mean. 2005 weights are used.

Not surprisingly, greater proximity to the nearest school is significantly associated with greater log odds of a child both graduating from secondary school and attending college. In all models, children from households with higher levels of consumption and higher incomes have better chances of being on pace, completing secondary school, and attending college too. Children in forward caste households generally have significantly higher log odds of academic attainment than other children, with the exception of those from minority religions. Further, girls, and children whose fathers did not complete secondary school, also face disadvantages in educational achievements. Last, from columns 2 and 3, it is clear that being on pace in one's schooling in 2005 is linked to higher chances that one will complete secondary school and attend college.

In table 3, we examine how the cross-level interaction between household social capital and a father's education predicts the child's secondary school completion and college attendance. (We present coefficients only for the two main effects and the interaction in each model.) The significant interaction terms mean that household social capital is more closely related to higher chances of achieving these educational outcomes for children whose fathers have not completed secondary education. In fact, the coefficients suggest that, for fathers who have already finished secondary school, social capital seems relatively unimportant for their children's success. It would seem that those fathers have already done it; they do not need others' help. But for fathers for whom this is a new experience, contacts with those who have progressed through the formal education system can make a difference for their children's progress.

In other results not presented here, we also investigated cross-level and within-level interaction effects of social capital with other stratifying features of higher educational

TABLE 3. Multilevel Logistic Regression Models, with Interaction Effects, Predicting Educational Outcomes by 2012

	Graduated Secondary	Attended College
Level 2—Households (N = 14378)		
Social Capital: Formal Sector Contacts	−0.00	−0.03
	(0.07)	(0.06)
Level 1—Individuals (N = 22825)		
Father's Education 0–Std. 11 (Std. 12+)	−1.17***	−0.90***
	(0.10)	(0.09)
Interactions		
Father's Education 0–Std. 11 x Social Capital	0.20**	0.16
	(0.08)	(0.07)*

Note: *p < 0.05, **p < 0.01, *** p < 0.001. Population averaged results with robust estimates are presented. Only coefficients for main and interaction effects in a particular model are presented. Other variables in Table 2 not listed here are still included in each model. All variables are centered on the grand mean *except for the non social capital main effects of each interaction term*. 2005 weights are used.

attainment in India—income, whether a household's primary income stems from nonagricultural work, caste/religion, proximity to the nearest secondary school or the nearest college, adequate educational pace, gender, and urban residence—factors that might potentially substitute for the benefits associated with having social capital. None of these interactions (except for two caste/religious groups) with formal sector contacts in 2005 proved statistically significant for predicting college attendance by 2012. The interaction between caste/religion and social capital produced only three significant effects with regard to secondary school completion and college attendance: having a greater array of formal sector connections is inexplicably associated with lower chances of secondary completion and college attendance for Christians, Sikhs, and Jains, while it is positively associated with college attendance for Scheduled Castes. One would expect all caste/religious groups of lower social status to benefit more from this form of social capital. Thus we still we believe that father's education in the interactions presented in table 3 is not just proxying for higher social status. It is the lack of parental experience with secondary school graduation itself that makes social capital more important.

These first analyses do not fully establish when household social capital might most influence a child's educational progress. The positive associations with both secondary school graduation and college attendance leave open whether social capital helps more before or during the college transition. In this next model, we therefore test whether social capital still predicts college attendance with the condition that individuals have completed secondary school. Then we also examine whether social capital predicts the type of college major—science or engineering compared to all other majors—for those that enter college.

To investigate these relationships, we can draw upon only 63 percent of our original sample, since college *major* data were not collected for youth who had moved to a different household after 2005 (but were still tracked in the 2012 survey). Prior to running the analyses in table 3, we tested the same relationship as in the third column of table 2—the likelihood of college attendance without any conditions—for this nonmigrant sample to check if the relationship between social capital and college attendance is similar to that in the full sample (results not presented). Most importantly, the magnitude, direction, and level of significance for the effects of social capital for this nonmigrant sample are consistent with those in the third column of table 2. Similarly, for other relationships, the direction and magnitude (and usually significance) are nearly the same for the subsample as for the full sample in the third column of table 2. The main exception is gender: girls are significantly more likely to attend college than boys in this nonmigrant subsample. The less academically engaged girls from the entire sample may have been selected out through earlier marriages or potentially as a result of having been in a secondary school that did not promote gender equality through education. So, with minor exceptions, we assume that the ensuing results in columns 1 and 2 of table 4 would be similar if we indeed had been able to get college major information on the entire sample.

TABLE 4. Multilevel Logistic Regression Models Predicting Educational Outcomes

	Attended College	Science/Engineering (Attended College)
Level 3—Villages/Urban Blocks	**N = 1763**	**N = 1474**
Distance to College km (ln)	−0.08	—
	(0.06)	
Urban (Rural)	0.03	0.26
	(0.18)	(0.15)
Level 2—Households	**N = 4205**	**N = 2875**
Social Capital: Formal Sector Contacts	−0.00	0.15**
	(0.04)	(0.05)
# Adults	0.04	−0.00
	(0.03)	(0.04)
# Children	−0.02	0.01
	(0.03)	(0.05)
# Teens	−0.05	−0.13*
	(0.04)	(0.06)
Consumption (ln)	0.34***	0.32**
	(0.08)	(0.12)
Income (ln)	−0.02	0.03
	(0.03)	(0.05)

(*continued*)

TABLE 4. Multilevel Logistic Regression Models Predicting Educational Outcomes (*continued*)

	Attended College	Science/Engineering (Attended College)
Nonagriculture Income (Agriculture)	−0.00	0.12
	(0.10)	(0.17)
Caste/Religion (Forward Castes)		
Other Backward Class	−0.09	0.29
	(0.10)	(0.16)
Scheduled Caste	−0.03	−0.07
	(0.12)	(0.20)
Scheduled Tribe	0.48*	0.18
	(0.22)	(0.30)
Muslim	0.00	−0.19
	(0.15)	(0.21)
Christian, Sikh, Jain	0.00	0.41
	(0.15)	(0.23)
Level 1—Individuals	**N = 5128**	**N = 3353**
On Pace in Education	—	—
Female	0.47***	−0.48***
	(0.08)	(0.12)
Age	−0.08***	−0.02
	(0.02)	(0.03)
Father Alive and Present	0.03	0.21
	(0.16)	(0.24)
Mother Alive and Present	0.46	−0.09
	(0.26)	(0.48)
Father Education 0–Std. 11 (Std. 12+)	−0.46***	−0.37*
	(0.12)	(0.18)
Mother Education 0–Std. 11 (Std. 12+)	0.27	−0.29
	(0.16)	(0.18)

Note: $*p < 0.05$, $**p < 0.01$, $***p < 0.001$. Population averaged results with robust estimates are presented. State fixed effects are not presented but are included in each model. All variables are centered on the grand mean. 2005 weights are used.

The first column of table 4 shows that a household's formal sector connections are not significantly predictive of college attendance for young Indians who graduated from secondary school, after accounting for village/urban block, household, and individual characteristics. This contrasts with significant, positive coefficients of 0.10 for college entry among

the entire sample and 0.18 for secondary school completion. Together these results suggest that the main effect of household social capital on Indian children's educational attainment is to enable them to complete secondary education, and not so much to manage the transition to college, as we first expected. (This model was also replicated with the entire sample—nonmigrants and tracked migrants—in robustness checks not presented, with nearly identical results.)

In the final model (column 2), we test whether social capital predicts entrance into the most prestigious college majors—either science or engineering compared to all other majors—conditional upon individuals attending some college. We find an interesting twist on the social capital–college entry story. For young Indians who completed secondary school *and* attended college, having a more diverse array of formal sector contacts is significantly associated with higher odds ($p < .01$) of getting into a high-prestige science or engineering major, even after controlling numerous stratifying factors. Having these formal sector contacts is clearly related to young Indians' advantages in acquiring the college training that is most likely to lead to future economic success.

DISCUSSION

Few studies in low-income nations have been able to prospectively assess the potential influence of social capital on the attainment of human capital as Bourdieu (1986) and Coleman (1988) postulated—and with the exception of S. Hasan and Bagde (2013), none have measured the extent to which social capital predicts important educational achievements. These nationally representative, longitudinal data from India allow us to expand the literature on social capital to show prospective effects on the secondary school and college attainment of a household's youth. This research comes at a critical time in India, when primary education is universally accessible, yet with great variation in quality, and the socially disadvantaged—such as women, lower-caste groups, Muslims, rural dwellers, and those whose families have little experience in the education system—are markedly hindered in acquiring secondary and tertiary education and thus the tools necessary to achieve upward mobility.

The type of social capital accessed by households—connections with individuals whose presence in such formal sector institutions entails at least secondary school achievement, if not higher—is matched to our research question about how the resources embedded in it could improve children's circumstances. For example, children who have stayed on pace are likely to already have a wide range of institutional network contacts, along with other endogenous covariates such as being of a higher-caste group, living in urban areas, benefiting from higher household incomes, and having highly educated parents. Thus, when we find that, even after these factors are controlled for, social capital in 2005 predicts a higher likelihood of completing secondary school and attending college by 2012, we have increased confidence that these institutional connections indeed influenced the creation of human capital and not vice versa. But we cannot rule out that other, unobserved, traits associated with higher academic achievement affect this relationship. Further, although our data preclude finer methods in efforts to

better estimate a causal relationship, we still control for a large amount of endogeneity that would undoubtedly be associated both with households' formal sector contacts and with the chances of a child attending college (Mouw 2006).

We find that formal sector contacts have varying predictive powers on our different educational outcomes. It is intriguing that these effects of social capital on college entry are diminished if we condition our results to include only those who graduated from secondary school, yet they reappear when we consider the college major an individual is enrolled in. The effects witnessed in the unconditional model for college attendance may reflect mainly how social capital predicts secondary completion—a prerequisite for college attendance. Families with a variety of this type of social capital succeed more often in getting their children into college, but mainly because they have succeeded in getting them through secondary school. Completing secondary education is nowhere near a universal achievement in India, so social capital may be very important for clearing this hurdle. Nevertheless, these formal connections also enable children to get into a science or engineering major at a university rather than a less competitive arts or commerce track.

Another wave of data would enable us to see whether social capital predicts college completion as it does secondary school completion; college completion is likely a better indicator of future upward mobility than simply college attendance. Although social capital research has focused more on transitions *into* college (e.g., Lareau 2011), it could be that social contacts are most important in maintaining progress—for instance, in overcoming the unforeseen obstacles that inevitably interrupt many students' lives. This possibility is hinted at through the positive moderating effects of social capital for children whose fathers did not complete secondary school; such children did not have immediate access to a parent who had gone through the educational system and had acquired experience overcoming bureaucratic obstacles like filling out school paperwork, or substantive obstacles like completing a high-level mathematics course.

Qualitative work would allow us to more definitively understand how the skills and knowledge held by education, government, and health contacts are used to promote educational advancement. Our data do not reveal whether their influence is normative, political, cognitive, or some combination of those possibilities. Are the advantages these contacts hold for households something that is deliberately tapped in efforts to progress one's children through the Indian education system? Or does the social milieu of these households provide broader, more taken-for-granted advantages that smooth the way through secondary schools and into more elite university training?

While many interesting possibilities remain, our results nonetheless document that these formal sector sources of social capital are valuable—to varying degrees—in getting young Indians *through* secondary school, *into* college, and *enrolled* in a prestigious field of study. These results provide evidence that, as theorized, prior social capital—in the form of relatively high-status formal sector contacts—is important in the creation of subsequent human capital in a developing country setting where individuals' and families' livelihoods are likely to become dependent on it. ▪

APPENDIX TABLE 1. Distributions of Categorical and Continuous Variables Comparing Nontracked Respondents from 2004–5 to Analytical Sample

		Non-Tracked Analytical	Analytical Sample
Categorical Variables		%	%
Caste and Religion, Mutually Exclusive	Forward Caste	24.1	19.4
	Other Backward Class	30.0	33.8
	Scheduled Caste	16.9	22.2
	Scheduled Tribe	7.3	7.4
	Muslim	18.7	14.5
	Christian, Sikh, or Jain	2.9	2.6
Gender	Male	48.5	51.9
	Female	51.5	48.1
Location	Rural	47.9	71.3
	Urban	52.1	28.7
Main Source of Income	Agriculture	26.0	43.4
	Nonagriculture	74.0	56.6
Age in 2005	13	16.1	17.6
	14	19.2	18.1
	15	17.0	17.8
	16	16.8	16.1
	17	12.2	12.4
	18	18.8	18.1
Father Alive and Present	Yes	85.7	87.4
Mother Alive and Present	Yes	90.4	91.8
Father's Education	Std. 12 or higher	16.3	9.2
	Std. 11 or lower	83.7	90.8
Mother's Education	Std. 12 or higher	7.4	3.0
	Std. 11 or lower	92.7	97.0
On Pace in Education	Yes	51.5	46.0
Continuous Variables		*Mean*	*Mean*
Social Capital: Formal Sector Contacts		1.1	1.0
Household Total Income (ln) in Rupees		10.5	10.3

APPENDIX TABLE 1. Distributions of Categorical and Continuous Variables Comparing Nontracked Respondents from 2004–5 to Analytical Sample (*continued*)

	Non-Tracked Analytical	Analytical Sample
Household Consumption per capita (ln)	9.1	8.9
# Adults (22+) in Household	2.5	2.8
# Children (0–14) in Household	1.7	2.1
# Teens/Youth (15–21) in Household	1.6	1.7
Distance to High Secondary km (ln)	1.2	1.1
Distance to College km (ln)	0.8	1.8
N (maximum)	4138	23225

Note: All outcomes were significantly different at p <0.05 level between the nontracked and analytical samples except for age. This is largely due to sample size. Chi-square and t-tests were used to determine these differences.

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