

Children's Educational Engagement in Rural China*

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ABSTRACT

Educational research in developing countries often investigates school and family socio-economic influences on children's achievement and attainment. Less research has sought to identify factors that engage children in the schooling process. Because elements of engagement are likely to play a significant role in decisions about subsequent persistence in schooling, the concept is particularly relevant in developing country settings where early school-leaving remains problematic. Similarly, the social and cultural environments that engage children in schooling are important topics of inquiry in settings where families and schools operate under extreme economic constraints over which they have little control.

Analyzing a survey of 2000 children and their parents and teachers in Gansu, China, we investigate four dimensions of engagement: aspirations, academic confidence, industriousness, and alienation. Results show lower aspirations among girls and, to some degree, reduced engagement among low socio-economic status children. Net of family socio-economic status and school and teacher characteristics, family and classroom environments matter. At home, parent-child interactions and the presence of books significantly predict engagement. In the classroom, stable access to classes and peer disruptiveness are significant predictors. Results demonstrate significant mechanisms linking families and classrooms to the educational outcomes of children--mechanisms that would be obscured within conventional school and family effects research frameworks.

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INTRODUCTION

Educational research in developing countries often investigates school and family socio-economic influences on children's achievement and attainment. Less research has sought to identify factors that engage children in the schooling process. Because elements of engagement are likely to play a significant role in decisions about subsequent persistence in schooling, the concept is particularly relevant in developing country settings where early school-leaving remains problematic. Similarly, the social and cultural environments that engage children in schooling are important topics of inquiry in settings where families and schools operate under extreme economic constraints over which they have little control.

In this paper, we examine how family and classroom factors, including both observable characteristics and a range of measures of family and classroom environment, affect children's educational engagement in rural northwest China. We utilize data from a rural children's survey that collected detailed information based on questions asked of primary school-aged children, their parents, and their teachers. We begin the paper with a brief overview of related research and an introduction of the educational context in rural China. We then describe our data and measurement strategy, providing our definitions of relevant concepts. Finally, we investigate how family and classroom social and cultural environments link to educational engagement measures by examining correlations among key indices and by conducting a multivariate statistical analysis of the determinants of engagement.

RESEARCH CONTEXT

Much of the survey research on children's school outcomes in developing countries falls into two categories (for reviews, see Fuller, 1987; Fuller and Clarke, 1994; Buchmann and Hannum, 2001). First, there is a body of "school effects" research that is designed to produce policy-relevant insights on those measurable aspects of school or teacher quality that significantly affect achievement. Second, a body of "family effects" research has sought to shed light on household economic and demographic factors affecting human capital investment. Broadly defined, this research includes both educational stratification studies focusing on socio-economic status and attainment and demographically-oriented studies of family structure and education.

These bodies of research have contributed significant insights on the important question of what factors contribute to children's school achievement and attainment in less developed settings. Two significant gaps, however, are lack of attention to the attitudes of children themselves that may place them at risk for poor performance or early school leaving, and lack of attention to the environmental factors at home and in the classroom that support favorable attitudes. The lack of focus on these issues probably stems from perceptions that school quality problems, prohibitive costs, and family poverty are more significant as constraints on children's schooling in less-developed settings. However, to move beyond tracing the patterns of educational advantage and disadvantage associated with better- and worse- resourced schools and wealthier and poorer families requires attention to the mechanisms by which these patterns emerge. As we will argue below, important among these mechanisms are children's own engagement with the schooling process and the environmental factors that affect engagement.

Academic Engagement

In US-based sociology of education research, engagement is coming to be recognized as an important research topic. For example, in a recent paper, Johnson, Crosnoe, and Elder (2001: 318) characterize the educational experience of American middle school and high school students as “a multifaceted phenomenon that encompasses far more than academic achievement and degree attainment, which have been the primary foci of sociological research.” Other important aspects of the educational experience include daily participation in school and students’ feelings about school. Johnson et al. (2001) argue that these latter, and much less understood, aspects of the educational experience also have important consequences in children’s lives.

A child’s degree of educational engagement provides obvious benefits for his or her school performance, as measured by other educational outcomes. For example, US-based research indicates that academically engaged students are less likely to drop out of high school or to engage in other problematic behaviors (e.g., Bryk and Thum 1989; Farkas et al. 1990; Jenkins 1995; Johnson, Crosnoe, and Elder, 2001; Newmann, Wehlage, Lamborn 1992).

However, engagement may also be a fundamental component of what Johnson et al. (2001) refer to as the “good student” role; a role that may set the stage for successful functioning in non-school settings later in life. In other words, engagement may engender or reflect traits such as ambition, confidence, and socialization that determine future life outcomes independently of academic success. This indirect mechanism could help explain the puzzling finding that educational inputs and school quality do not affect test scores significantly, but do strongly affect labor market outcomes later in life (Burtless, 1996; Hanushek, 1996; Card and Krueger, 1992; 1996). Thus, engagement is potentially important as an influence on future socio-economic status, either instrumentally through its effect on academic achievement and persistence, or directly by fostering character traits that predict success in the labor market. In either case, the importance of such effects suggests that educational engagement itself is an outcome worthy of study. However, as Johnson et al. (2001) point out, few studies have systematically analyzed the determinants of different engagement measures. This critique applies even more strongly in the case of research on education in developing country settings.

Family and Classroom Environments

A second way that US-based empirical research in sociology of education has investigated the mechanisms linking children to school performance has been by considering the social and cultural environment in the family. A prominent conceptualization has been in terms of the presence of “social capital” or “cultural capital” in families (Bourdieu, 1977; Coleman, 1988). Analyses of survey data have suggested the significance of social and cultural environments, defined in a variety of ways, as influences on children’s achievement scores, cognitive and emotional development, and school persistence and educational attainment (Farkas et al., 1990; Parcel and Menaghan, 1993; Furstenberg and Hughes, 1995; Teachman et al., 1995; Carbonaro, 1998; Parcel and Dufur, 2001). More recently, quantitative and qualitative studies have extended these ideas to include parallel notions of the social and cultural environment within schools and classrooms, focusing particularly on the role of hospitable and inhospitable environments for learning (Anyon, 1981; Lareau, 1987; Goyette and Conchas, 2001; Parcel and Dufur, 2001).

Despite many promising findings, one of the problems of previous research is that a consensus has yet to emerge regarding appropriate definitions for family social and cultural resources, and

regarding the classroom environments that matter.¹ This situation has led to inconsistent and highly selective operationalization of concepts in empirical research. Many studies have focused narrowly on one or a few aspects of social and cultural environments, leading to questions about whether measured effects are capturing all of the important effects, or are picking up the effects of unobserved, correlated factors. An additional problem is that the US-focused conceptualization and testing of environmental factors supporting education may point to particular measurement strategies with little relevance in other national or cultural settings.

CHINA CONTEXT

We address some of these gaps in earlier research using the case of rural China. Before describing our research design, we provide a brief overview of recent, relevant educational trends in China. We then characterize existing research on educational stratification in rural China.

Market Reforms and Education

Education in China has undergone dramatic changes in the wake of market reforms dating from the late 1970s and early 1980s. On the positive side, market reforms have stimulated unprecedented economic growth, enabling increased family investments in education. In addition, government policies encouraging educational expansion have emerged. Most notably, the Law on Compulsory Education of 1986 designated nine years of education, 6 years of primary and three years of lower secondary, as compulsory for all children (Ministry of Education, 1986; Lewin et al., 1994:20). Laws through the 1990s and into the 21st century affirmed government commitments to implementing compulsory education in impoverished regions and expanding educational access.²

On the other hand, rising regional economic inequality, coupled with education finance policies of the reform period, set the stage for new educational inequalities. Inter-provincial income inequality increased markedly from the late 1980s to at least the mid-1990s, and the urban-rural gap in income and living standards remained large, by some estimates wider than anywhere in the developing world (Carter, 1997; Khan and Riskin, 1998). Coinciding with new economic inequalities was the decentralization of the administration and finance of primary, secondary and tertiary education. Decentralization had a profound, exacerbating impact on variation in public educational expenditures (Park, Li and Wang 2002; Tsang 1996).

Currently, the central government runs and finances certain institutions of higher education; more typically, provincial, county, township and village governments respectively take responsibility for schools at the tertiary, upper secondary, lower secondary, and primary levels (Tsang, 2000:13). In

¹ One problem has been shifting boundaries that divide social and cultural capital (see, for example, Lareau, 1987 and Coleman, 1988 for differing characterizations of family involvement in schools as social or cultural capital). In addition, excessive extensions of the notion of social capital in recent years have jeopardized its heuristic value (Portes, 1998). A similar problem has plagued the concept of cultural capital: Its initial conceptualization as participation in elite status culture (Bourdieu, 1977; Dimaggio, 1982; Katsillis and Robinson, 1990) has metamorphosed into practices that signal middle class culture and dominant social values to teachers (Farkas et al., 1990; Lareau, 1987).

² The Education Law of 1995 affirmed a government commitment to equality of educational opportunity regardless of nationality, race, sex, occupation, property conditions or religious belief (UNESCO, 1998). The 1999 Action Plan for Revitalizing Education in the 21st Century confirmed a commitment to implementing compulsory education across the country (Ministry of Education, 1999). A more recent campaign to pour development money into the western interior part of the country, where poverty is concentrated, took education as an important element (State Council, 2000)

general, the government budget finances only teachers' wages.³ Other costs must be covered from local resources, either through specially raised earmarked funds collected from households, collective contributions, school-generated revenues, or fees charged directly to students (Hannum and Park, 2002). Student fees can be a major component of school finance, especially in poor rural communities where other options for generating school revenues are limited. For example, in rural Gansu, about seventy percent of daily costs such as classroom supplies, heating, and other similar obligations are financed from student fees, and twenty percent are financed from school-generated revenue, mostly in richer villages (Hannum and Park, 2002).

Thus, rising educational fees particularly affect children in poor communities least able to subsidize schools (Davis, 1989; Lewin and Wang, 1994). Rising fees have coincided with new opportunity costs associated with educating children: in the years since market reforms allowed households to begin engaging in income-generating activities, children have been able to contribute directly to the family economy (Powell, 1992; Summerfield, 1994; see also Lo, 1984; World Bank, 1992; Lin, 1993).

Educational Stratification in Rural China

Studies of educational stratification in rural China have traced overall educational trends and social disparities in enrollment and attainment in the wake of market transition. These studies have generally shown a trend of improving enrollment rates in the later 1980s and through the 1990s (Hannum and Liu, 2002). However, studies also attest to the continuing enrollment disadvantages associated with rural residence and with both household and community poverty (Brown and Park, 2003; Connelly and Zheng, 2003; Hannum, 1999; 2003; Hannum and Liu, 2002). Studies also indicate that the disadvantage of poor children emerges strongly at the stage of junior high school, when costs associated with schooling increase.

However, the precursors to these patterns of stratification remain largely unknown. In particular, what is happening to children while they are still in school that leads to the observed patterns of school leaving has not been studied. Of course, prior research has established that family economic constraints are a major precipitant of school-leaving in rural China (Hannum, 2002). However, presumably, when parents come to the decision that school is too expensive, other factors enter into this decision, such as how well the child is doing in school and how the child feels about school. Children's own attitudes toward schooling, and household practices that promote favorable attitudes, remain largely unexplored.

Nor have studies tried to quantitatively assess the role of classroom environment. Because decentralization led to dramatic variation in school resources and teacher qualifications, it is likely that the classroom environment for learning varies greatly from place to place (Cheng, 1996, pp. 24-29; Tsang, 1994; Lo, 1984; World Bank, 1992). The prevalence of less-qualified teachers in the poorest rural areas is particularly significant, as qualifications can be systematically linked to student learning (Park and Hannum, 2001). Rural teachers are often poorly paid, have little decision-making authority

³ For many poor rural areas, the lack of local government revenues or subsidies from upper levels of government precluded local governments from meeting salary obligations to government officials such as teachers (Park et al., 1996; Tsang 2002; Park, Li and Wang 2002).

and face a very heavy workload. However, how the classroom environment differs from place to place, and how it links to student outcomes, are unknown.

RESEARCH DESIGN

This study seeks to address some of the gaps identified in research on academic engagement and family and school environments, and in the China-specific research. Specifically, accounting for socio-economic status and school quality differences, we test family cultural and social environment measures and classroom environment variables as predictors of academic engagement. We exploit an unusually rich dataset that contains multiple measurements of engagement, social and cultural resources in the home, and classroom environment. Rather than focusing on one specific aspect of social or cultural environment or classroom environment, we test a range of commonly-used measurement strategies for these concepts. Unlike previous research, we choose as a research site a rural setting where families and schools function within stringent resource constraints. We focus on primary school-aged students, a stage before dropping out becomes a significant problem. In investigating on the mechanisms of achievement and attainment, rather than the socio-economic predictors of achievement and attainment, we seek to demonstrate a new approach relevant to educational stratification research in other developing countries.

Data

We draw on a unique data set, the Gansu Survey of Children and Families (GSCF), a multi-site survey designed to increase understanding of children's schooling and welfare in the context of rural poverty. The GSCF, conducted by the authors in the summer of 2000, is a survey of 2000 children aged 9-12 and their families in rural areas of 20 counties in Gansu Province. The sampling strategy, described more fully in Appendix 1, involved a multi-stage, cluster design with random selection procedures employed at each stage. At the final stage, children were sampled from lists of all 9-12 year-old children in selected villages, enabling us to avoid concerns about selection bias that afflict school-based samples. The analysis presented below excludes children in junior high school (N=50) and children not currently in school (N=23), leaving a maximum sample size of 1927 for analyses.

Study Site

Gansu is one of China's poorest provinces. While rural industries have emerged as in other parts of China with the economic liberalization dating from the early 1980s, rural residents are predominantly employed in subsistence farming or animal husbandry. Gansu's socioeconomic profile resembles that of other poor, interior provinces: relative to the nation as a whole, Gansu exhibits high rates of illiteracy, prevalent poverty, and lackluster economic growth. Funds available for educational investments are also limited (see Appendix Table A1).

Measurement

The GSCF included extensive, separate questionnaires for children, parents, teachers, schools, and communities. We focus on a subset of questionnaire items that cover children's and their teachers' demographic and socioeconomic characteristics, social and cultural resources in the family, classroom environment, and engagement with schooling. Here, we describe our measurement strategy for engagement, family social and cultural environment, and classroom environment. We also discuss controls for economic resources, human capital, and other factors in the family and school.

Engagement

Here, we define four dimensions of engagement, each based on child's self-report: *educational aspirations*, *academic confidence*, *industriousness*, and *alienation* from school. Table 1 shows measures of each of these dimensions of engagement, as well as the distributions of their component variables. *Aspirations* were converted from levels shown in Table 1 to years corresponding to the completion of those levels. *Academic confidence*, *industriousness*, and *alienation* were generated by standardizing the component variables shown in Table 1, summing them, and dividing by the number of components.

Family Social Environment

For measures of family social environment, we draw on concepts of social capital. Coleman's (1988) treatment of social capital offered a diverse set of potential operational definitions for use by subsequent empirical researchers. Coleman emphasized that human capital needed to be "activated" through time spent with children, noting that if the human capital of the parents was not complemented by social capital embodied in family relations, it was irrelevant to the child's educational growth. The same work also emphasized the integration of families with their communities and the related concept of "intergenerational closure": the ability of families and friends to supervise children.

We use these definitions to derive three social environment indicators. One measure is *community cohesion*, a scale of nine variables measuring mothers' perceptions of the village environment. A second measure is *parent-child interaction*, a scale of five items measuring children's perceptions of frequency of different kinds of activities with parents. Finally, following Carbonaro (1998), we operationalize *closure* in terms of how well mothers know their children's friends, using a scale of five variables. Table 2 displays the means and standard deviations for these indicators and specifies their component variables. Scales were generated by standardizing the component variables, summing them, and dividing by the number of components.

Family Cultural Environment

Our measures of the cultural environment in the home draw on recent empirical specifications of cultural capital, such as reading practices and cultural norms about involvement in the schools (e.g., Farkas, 1996; Crook, 1997).⁴ We use indicator variables based on mothers' reports of whether or not there are *children's reading materials*, a *dictionary*, and a *child's desk* in the home. Following Lareau (1987), we also consider a scale of *parental involvement at school* that is a composite of six variables indicating how frequently mothers attend school to volunteer, observe classes, take part in activities, or talk to teachers and principals. Table 2 describes this scale and its component variables.

Classroom Socio-Cultural Environment

Just as the home environment is important for learning, aspects of the classroom environment, such as academic orientation and behavioral norms, are thought to exert strong influences on children's engagement with schooling, and their performance and sponsorship by teachers. Ethnographic work (e.g., Anyon, 1981; Davidson, 1996; Goyette and Conchas, 2001) has long

⁴ This contrasts with initial conceptions of cultural capital as participation in elite cultural activities such as attendance at theaters, museums, or art galleries (Bourdieu 1977; Dimaggio, 1982; Katsillis and Rubinson, 1990).

suggested that the environment in the classroom plays an important role in conditioning the educational progress and achievement of children from different social groups, availing some more than others an opportunity to engage and learn. In survey studies, the importance of classroom social and academic environment—beyond traditional economic measures of school quality—has been recognized as well (Goyette and Conchas, 2001; Parcel and Dufur, 2001).

As measures of classroom environment, we focus on environmental factors related opportunities to learn: instability, classroom behavioral problems, and classroom intellectual environment. *Instability* is measured in a scale of child's reports of how often the school is closed or the teacher fails to come to class. While instability as a concept is not commonly employed in sociology of education, we think that may be relevant in a developing country setting. *Behavioral problems* refer to a composite scale of standardized child reports of the frequency of cheating, violence, stealing, and other disruptions and rule violations in the classroom. Classroom *intellectual environment* is measured by a teacher report of the number of children in the class unable to keep up with lessons.

Economic and Human Resources

Human capital of parents and the material resources in the household lend themselves fairly easily to measurement in terms of parents' education and family wealth. Here, we use *mother's* and *father's years of education* as indicators of human capital. *Wealth*, measured in logs, is used as a measure of family material resources. Family wealth was constructed from detailed measures of household assets, including the value of housing, fixed capital, and household durable goods.

In parallel, to isolate the effects of classroom environment, analyses control for teachers' *lower secondary*, *upper secondary* or *tertiary* educational attainment,⁵ teacher's total *years of experience*, whether or not the teacher is from the village, and the log of teacher's *monthly income*, including salary and bonuses.

We include child and teacher *gender* in all analyses. Child gender has been found to be significant as a predictor of educational outcomes in rural China in earlier studies (Hannum and Xie, 1994; Hannum, 2002) and teacher gender is often cited as a salient factor in perceived quality of education in developing countries. Finally, to account for potentially confounding effects of economic resources available at schools, we test robustness of coefficients by re-estimating all models with fixed effects for schools.

Other Control Variables

Because siblings are commonly perceived to “dilute” family resources—economic, social, or cultural—we also control for sibship size. Because there may be developmental changes in children's attitude reporting, we include age as a control variable. Finally, because feedback from teachers about

⁵ High school level education includes those who graduate from regular high school or from a specialized teacher training school attended after middle school (*zhongzhuan*). College-level education includes those that graduate from regular universities (very few) or from a normal college (*dazhuan*) following the completion of high school. There are some teachers who take correspondence courses to receive accreditation for *dazhuan* without ever having completed high school. Because of the design of the survey instrument, we have difficulty distinguishing these cases from teachers who receive *zhongzhuan* degrees, and so they are categorized as having high school-level education. Thus “tertiary” is equal to one only when the teacher completes both high school and college-level schooling, and “upper secondary” captures all other educational outcomes except those teachers who hold only a middle school degree.

achievement may play an important role in conditioning engagement, we test the robustness of coefficients by estimating models with controls for previous semester's math and language grades.

ANALYSIS

Socio-Economic Status and Engagement

Our analyses address the question of whether children's aspirations, confidence, industriousness, and alienation vary with socio-economic and teacher characteristics. We then consider the role of family and classroom environments in engagement. We begin by describing differences in engagement associated with socio-economic background characteristics in Table 3.

We might expect that each dimension of engagement would favor higher socio-economic status children and boys. Looking first at socio-economic status, we see support for this notion in the aspirations measure. In the sample, children with more educated parents and children from wealthier households have strikingly higher aspirations. For example, 45 percent of children whose mothers have no education have college aspirations, compared to 71 percent of children whose mothers have a high school or better education. Chi-square tests show that the associations are significant for father's educational attainment ($\chi^2(15) = 30.2206$, $p = 0.011$), mother's educational attainment ($\chi^2(15) = 31.5188$, $p = 0.007$), and income quintile ($\chi^2(20) = 34.5005$, $p = 0.023$).

Tabulations of the alienation measures also suggest that higher socio-economic status children are less alienated. The scope of difference can be striking. Taking mother's education as an example, 12 percent of children in the sample whose mothers had a high school or better education agreed or completely agreed with the statement, "I don't want to attend school most of the time." Among children whose mothers had no education, almost one-fourth of children agreed or completely agreed. For the statement, "I often feel lonely at school," comparable figures were 30 percent for children with uneducated mothers and 17 percent for children whose mothers had a high school or better education. Not wanting to attend school was significantly associated with father's education ($\chi^2(9) = 24.2952$, $p = 0.004$), mother's education ($\chi^2(9) = 24.7697$, $p = 0.003$), and wealth ($\chi^2(12) = 34.0920$, $p = 0.001$). Boredom at school was significantly associated with wealth ($\chi^2(12) = 25.0899$, $p = 0.014$); loneliness at school was significantly related to father's education ($\chi^2(9) = 25.9538$, $p = 0.002$), mother's education ($\chi^2(9) = 15.8409$, $p = 0.070$), and wealth ($\chi^2(12) = 24.4278$, $p = 0.018$). In contrast, tabulations of academic confidence and industriousness measures by socio-economic status do not suggest a consistent, positive link.

Considering gender, we observe the unsurprising result that boys are somewhat more likely to aspire to a college education than girls, and the association is significant ($\chi^2(5) = 11.4238$, $p = 0.044$). In contrast, and somewhat surprisingly, girls are not disadvantaged for the other measures of engagement. Girls were slightly more likely to rate themselves as good students and to rate their language abilities highly. Both of these associations were significant ($\chi^2(2) = 9.6043$, $p = 0.008$ for the good student measure; $\chi^2(4) = 13.4664$, $p = 0.009$ for the language ability ratings). Further, girls in the sample rate themselves as hard working in language at a higher rate than boys; the relationship with gender is significant ($\chi^2(2) = 31.0551$, $p = 0.000$). Finally, the alienation measures also suggest, weakly, that where gender differences exist, girls are less alienated. Boredom at school was marginally

significantly related to gender ($\chi^2(3)=6.9707$ $p=0.073$); loneliness at school and not wanting to attend school were not significantly associated with gender.

Family Background and Social and Cultural Resources

A second consideration in understanding the relationship between socio-economic status and educational outcomes is how social and cultural environments link to children's background. Table 4 shows correlations of children's background factors and the environment measures that are the focus of subsequent analyses. The lower left panel demonstrates significant, moderate positive associations between the socio-economic status measures and family social and cultural environment measures. Parental education and family wealth are moderately positively related to social closure measures, and weakly positively related to community integration. Mother's education is weakly positively related to the parent-child interaction variable. For the cultural environment measures—books, desk, dictionary, and parental involvement in schooling—significant positive associations emerge with parental education and wealth.

With respect to the classroom environment, the story is mixed, with different results for different dimensions of socio-economic status. Children in wealthier households with better-educated fathers are somewhat less likely to experience school instability. Children with more educated fathers were somewhat less likely to have peers having difficulty with class materials. On the other hand, mother's education is positively related to disciplinary disruptions in the classroom.

Social and Cultural Resources and Engagement

Before putting all of the elements together, we address one final question. Can environment measures be linked to engagement? The correlation coefficients presented in Table 5 show that many of the expected relationships hold. More parent-child interaction is generally associated with greater engagement, with the exception that it is positively linked to alienation. The closure measure diminishes alienation. Among family cultural environment measures, presence of books, a dictionary and a desk are significantly positively related to aspirations and significantly negatively related to alienation. Books are linked to more confidence; parental involvement is linked to less alienation.

Classroom environment variables are also significantly related to engagement. School instability and peers having difficulty keeping up are significantly negatively related with aspirations. School instability is also negatively related to industriousness and positively related to alienation. Behavioral disruptions are negatively related to academic self-confidence and degree of industriousness.

Modeling Engagement

In this section, we examine engagement in a multivariate context. Table 6 reports estimates from linear regression models predicting aspirations, academic confidence, industriousness, and alienation. We report robust standard errors adjusted for clustering by teacher. We consider three different specifications. The first regresses engagement measures (E) on family background (F) and teacher characteristics (T):

$$E_i = \alpha + \hat{\alpha}_F F_i + \hat{\alpha}_T T_i + e_i$$

This specification is a reduced form which captures the direct effects of family background and teacher characteristics on engagement, including those effects that result from social and cultural environment associated with F_i and T_i , as well as the indirect effects on engagement mediated through the effects on academic achievement. In other words, background factors can influence engagement by increasing school performance if success in school itself encourages children to be more engaged.

The second specification adds additional variables that measure environment in the family (C) and in the school classroom (S):

$$E_i = \alpha + \hat{\alpha}_F F_i + \hat{\alpha}_T T_i + \hat{\alpha}_C C_i + \hat{\alpha}_S S_i + e_i$$

The addition of these variables allows us to assess whether background factors affect engagement independently of their effect on C and S, and whether the family social and cultural environment factors affect engagement independently of background factors. As before, the coefficients reflect both direct effects and those intermediated through achievement.

The third specification controls for academic achievement (G) to test whether background factors and social and cultural factors affect engagement outcomes independently of their effect on academic performance. Favorable family and classroom environments might simply help children to achieve in school, and the children who are achieving well respond to their achievement with higher levels of engagement. Because achievement, too, is positively affected by engagement, the endogeneity problem will bias toward zero our estimates of the direct effects of family and classroom background variables and social and cultural resources.

In the third specification, we also include school fixed effects ($\tilde{\alpha}_v$) to control for unobserved heterogeneity at the school level that might introduce bias. There could be unmeasured inter-school- or inter-community differences in norms about schooling or in the commitment of economic or other kinds of resources to schools. For example, if school poverty is associated with engagement and with poor classroom environments, observed classroom environment effects may simply be picking up the effects of school poverty. Our third specification thus can be specified as follows:

$$E_i = \alpha + \hat{\alpha}_F F_i + \hat{\alpha}_T T_i + \hat{\alpha}_C C_i + \hat{\alpha}_S S_i + \hat{\alpha}_G G_i + \tilde{\alpha}_v + e_i$$

Reduced Form: Child Background and Teacher Characteristics

Panel A of Table 6 shows that children with better-educated parents and wealthier families have higher aspirations. Girls' aspirations are much lower than boys'. In addition, children with teachers from the local village and teachers who are female have higher aspirations. However, net of other factors, teacher years of experience affects aspirations somewhat negatively. The model of academic confidence fails to show a clear pattern of effects. We observe significant positive effects for father's education and presence of a local teacher only. Confidence is significantly negatively related to age, and there are marginally negative effects for mother's education. For industriousness, among the socio-economic status measures, father's education alone is positive and marginally significant. Girls are significantly more likely to report working hard than boys. Age is significantly positively related to industriousness. The presence of siblings is also marginally significant, and is positively related to industriousness. Finally, for alienation, all socio-economic status measures are important and work in the expected direction. Wealthier children from more educated families report significantly less

alienation, as do children with better-paid teachers. Teachers' monthly income is negatively related to alienation. Most strikingly, girls report significantly lower levels of alienation. Consistent with the "dilution hypothesis," children with more siblings report higher degrees of alienation.

Summarizing these results, we can make several observations. First, better-off students are more engaged. Across all measures of engagement, some dimension of family socio-economic status matters, even after controlling for teacher characteristics. Second, consistent with findings in the achievement literature, the standard teacher characteristics—education, income, and experience—are not consistently influential in determining levels of engagement. However, it is striking that local and female teachers seem able to sustain the aspirations of children. Third, girls' disadvantage in engagement measures is only present in terms of aspirations. Differences in industriousness and alienation, rather, favor girls.

Family Resources and Classroom Environment

Next, we consider the results from estimating specification 2 above, which includes environmental factors. Considering first aspirations, we observe that among the child background variables, only father's education and gender remain significant. Teacher gender is no longer significant. These changes suggest that the family and classroom environment variables do explain some of the relationship between socio-economic background and aspirations. Notably, teacher's local status remains highly significant, and teacher's education becomes significant.

Turning to the family and classroom environment measures, we find significant results among each of the family social environment, family cultural environment, and classroom sets of measures. The parent-child interaction variable is significant, as is one of the cultural environment measures, presence of a dictionary in the home. Perceived instability in the classroom is significantly strongly negatively related to aspirations.

Considering academic confidence, fathers' education alone remains significant among the family background factors, and having a local teacher among the teacher background factors. The parent-child interaction measure of family social environment and the children's reading materials measure of family cultural environment significantly promote academic confidence. One measure of classroom environment—peer disruptive behavior—significantly detracts from academic confidence.

For industriousness, among the socio-economic status measures, none are significant, but girls are still significantly more likely to report working harder than boys. None of the teacher variables is significant when classroom environment is controlled. The community cohesion measure significantly detracts from industriousness in this model, but the parent-child interaction measure and the parental involvement in school measure exert significant positive effects. Peer disruptive behavior shows a significant negative effect.

Finally, for alienation, among socio-economic status measures, mother's education and wealth remain significant, and children with better-paid teachers remain less alienated. The gender coefficient remains marginally significant, with girls less alienated. The presence of a dictionary in the home appears to reduce alienation, while instability in the classroom greatly increases it. Finally, and somewhat counterintuitively, the parent-child interaction has a marginally significant positive effect, meaning that more parent-child interaction is associated with greater alienation.

Overall, this table suggests that social and cultural environmental factors in the home and classroom do play an important role in linking human capital and material resources in the family and classroom to student outcomes. While the specific indicators that matter vary with the dimension of engagement, each category—social environment, cultural environment, and classroom environment, contributes to engagement. Finally, we again find that girls have lower aspirations, but are not disadvantaged in other dimensions of engagement.

Accounting for Achievement and Cross-School Variation

Panel C of Table 6 offers a conservative test of the robustness of family and classroom social and cultural environment measures that addresses these possibilities. It accounts for the feedback students receive about their achievement with previous semester's math and language test scores. However, because engagement also is likely to positively affect test scores, the test score coefficients are likely to be upward biased. It includes fixed effects for schools, so that estimated effects of resources on engagement are net of all between-school differences (some of which may be legitimate). Because the sample consists of elementary students, and the vast majority of villages have just one primary school, this strategy also has the effect of excluding cross community differences (though we cannot distinguish cross-community differences from cross-school differences).

Unsurprisingly, the introduction of these additional controls has the effect of further reducing the effects of family background factors. Among family socio-economic status variables, the single remaining significant effect across all models is father's education in the aspirations model. Gender remains significantly negative in the aspirations model, and significantly positive in the industriousness model.

Among teacher variables, the experience and education variables achieve marginal significance in the alienation model. Interestingly, the protective effects of teacher wages for student alienation remain stable, although only marginally significant, with test scores and fixed effects included. Finally, the benefits of having a local teacher disappear with the test score and school controls; having a female teacher becomes significantly positive for confidence.

Among the social environment measures, parent-child interaction keeps a significant positive effect on aspirations, academic confidence, and industriousness; the anomalous positive effect on alienation disappears. Among the family cultural environment measures, the presence of books or a dictionary in the home is beneficial for aspirations, confidence, and alienation (though the specific indicator that matters shifts across the models). The classroom environment variables sharpen in their effects. Peer disruptive behavior exerts a significant negative effect on both confidence and industriousness; class instability detracts from aspirations and industriousness and contributes to alienation. The sole anomalous finding is that, net of other factors in the model, children in classes with more peers having difficulty report less alienation.

DISCUSSION AND CONCLUSIONS

Analyzing a survey of 2000 children and their parents and teachers in Gansu, China, we have investigated four dimensions of engagement: aspirations, academic confidence, industriousness, and

alienation. Results showed lower aspirations among girls⁶ and, to some degree, reduced engagement among low socio-economic status children. However, analyses also indicated that engagement was not simply a function of background characteristics, but rather could be linked to certain social and cultural environmental factors at home and in the classroom.

Among family social environment measures, we found little evidence that closure and community cohesion mattered. This finding suggests that these concepts, which figure prominently in US research on social capital, are not significant problems in the setting of rural villages. However, we found evidence that parent-child interactions supported children's aspirations, confidence and industriousness.

Among family cultural environment measures, we found no support for the notion that parental involvement in schools was consistently associated with children's engagement. However, we found strong evidence that the presence of books in the home, whether a dictionary or children's reading materials, supported aspirations and confidence and detracted from alienation. This result suggests that, unlike patterns that feature prominently in the US sociology of education literature, parents support children's learning less through interactions with schools and teachers and more through providing a stimulating home environment for learning.

Finally, we found strong evidence that the environment in the classroom made a difference for academic engagement. While our measure of intellectual environment, the teacher's report of the number of children having difficulty keeping up with lessons, did not show significant results, other dimensions of the classroom environment did. In our specification with the largest number of controls, interruptions in access to the classroom were associated with lowered aspirations, lower levels of industriousness, and higher levels of alienation; an environment where peers were engaged in disruptive activities reduced confidence and industriousness. Strikingly, the classroom environment measures worked better than standard teacher background characteristics in explaining academic engagement.

Our results suggest some of the difficulties inherent in developing replicable measures of environmental factors for use in cross-cultural studies. Unlike economic resources, which could be expected to operate in relatively similar fashion across socio-cultural settings, many of the specific ways that social and cultural environment support children's schooling may be highly culturally dependent. Some concepts may work differently in different settings. For example, parental involvement in schooling, while important in rural China, works more through providing a conducive home environment for learning than through the kind of parental involvement with the schools often thought to matter in the US sociology of education literature. There are also elements of environment that may matter much more in less developed than in more developed settings. For example, part of the classroom environment that seems to matter in Gansu is stable access to the classroom and teacher. Barriers to access are more commonly mentioned in research on educational problems in

⁶ Echoing social disparities revealed in the many studies of children's enrollment and attainment in rural China, this paper has confirmed lower educational aspirations for girls. Also echoing results from studies of enrollment and attainment, we have documented a significantly lower degree of academic engagement, particularly in terms of lower aspirations and higher alienation, among children from disadvantaged socio-economic backgrounds. On a more positive note, we find that dimensions of engagement other than aspirations do not show strong gender gaps, and where there are differences, girls are favored. The lack of a disadvantage for girls in confidence, industriousness, or alienation suggests the possibility that the difference in aspirations is linked to practical considerations, rather than to internalized norms about abilities.

developing than developed countries. Finally, other concepts developed primarily in the US setting, such as intergenerational closure and community cohesion, seem largely irrelevant in rural Gansu, where the context of education is one of less mobile, more closely-knit communities than in the US.

Despite difficult measurement issues, the environmental factors that predict engagement, or other schooling outcomes, in less-developed country settings are important elements of educational stratification in these settings. These factors might be considered the proximate determinants of educational outcomes—the intervening institutional mechanisms by which patterns of advantage and disadvantage in homes and schools emerge. For example, family socio-economic status is well understood to be a strong predictor of educational attainment in many settings. However, why this relationship emerges cannot be fully understood without attention to the different family and classroom environments in which high- and low-socio-economic status children learn. Further, classroom environment measures may offer an additional use. Studies of the impact of school economic resources and teacher qualifications on student outcomes in many national settings have offered few insights about measurable attributes consistently linked to favorable student outcomes. Measures of classroom environment may offer an alternative approach that could prove more fruitful in school effects research.

Finally, we believe that engagement is worthy of additional attention in studies of educational stratification in less-developed settings such as rural Gansu. Our results have shown that children's engagement with schooling is complex, not well explained by simple reference to family socio-economic status or school and teacher characteristics. Engagement has implications for more traditional stratification outcomes. While household economic considerations and school quality concerns are undoubtedly important in school continuation decisions in settings such as Gansu, it is likely that children's engagement also plays a role. All else equal, parents whose children have high aspirations, perceive themselves as good students, are hard working, and enjoy school are likely to be influenced by these factors as they consider the mounting costs of schooling. Undoubtedly, children's engagement also influences school attainment indirectly, through effects on achievement and relationships with teachers. These mechanisms are obscured within the research frameworks that guide much of the achievement and attainment research in developing countries, which tend to ignore children's own agency.

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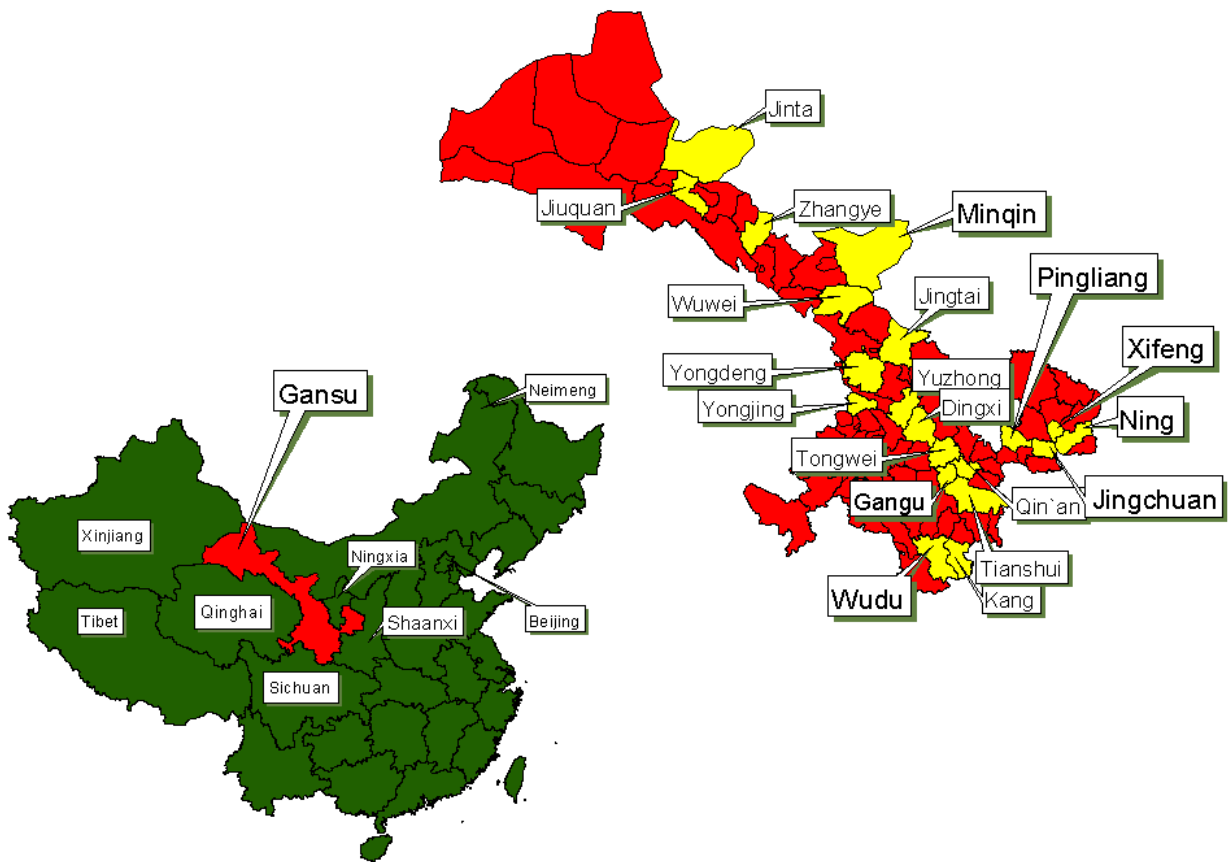
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APPENDIX 1: SAMPLING METHOD FOR THE GANSU SURVEY OF CHILDREN AND FAMILIES

The sample design for the GSCF consisted of a primary sample of 2000 children in 20 rural counties aged 9-12 in July 2000; five linkable secondary samples of children's mothers, household heads, home-room teachers, school principals, and village leaders; and a linkable census of primary school teachers and school principals in sampled villages. The sample was drawn using a multi-stage, cluster design with random selection procedures employed at each stage. First, a systematic random sample of 20 counties was selected from the total of 86 counties in Gansu, ordered according to per capita income level in each county (see Map 1). Tibetan counties from which foreign access is restricted were excluded from the initial frame. The number of households selected from each county was determined according to the proportion of the rural population in each selected county. A random-start, systematic sample of two townships was then selected from the list of all townships for each county, and a random-start, systematic sample of five villages was selected from each sampled township (townships and villages were listed in “natural” or geographic order). Finally, a random sample of 20 children was selected from a listing of all 9-12 year old children in each selected village.



Map 1. Gansu Province, GSCF Counties Marked

