Independent Reading in Rural China’s Elementary Schools: A Mixed-Methods Analysis

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Abstract

There is consensus in the international literature that independent reading leads to improvements in both traditional and nontraditional academic outcomes. Countries throughout the world invest heavily in independent reading programs. However, little research has been done about independent reading in rural China, where students are falling behind their urban counterparts in academic subjects at alarming rates. This article seeks to explore the prevalence of independent reading and its associations with test scores. It brings together data from a survey of 13,232 students and findings from 745 interviews with students, teachers, principals, and heads of household. Using a mixed methods approach, we try to probe more deeply into the ways that investments into libraries and book resources as well as reading programs in school and at home can serve to help (or not help) students develop cognitive and non-cognitive skills. According to our quantitative findings, although independent reading is correlated with higher test scores, only 16% of students typically read for more than 60 minutes per day. Furthermore, school libraries in Chinese schools—as they are currently designed and managed—do not appear to be affecting student performance. Extensive qualitative interviews provide a range of possible explanations for why reading programs and investments into books by schools and families play such a minimal role in rural schools in China. In short, the qualitative analysis finds that inaccessible bookstores, curriculum constraints, and unsupportive home environments may explain the low levels of reading presented in the quantitative data. The poor quality of school libraries and insufficient school investment also may be contributing to the nonexistent relationship between libraries and academic achievement. We also interviewed principals, teachers, parents and students from schools which have NGO-funded libraries, book corners and reading classes. When these facilities and programs are fully accessible to students, the perception of our interviewees is that reading is highly correlated with more interest in school and better performance at school.

Keywords: Independent reading; rural China; academic performance; elementary school; qualitative study; mixed methods

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1. INTRODUCTION

Independent reading—unassigned reading for personal pleasure—has been shown to be an important factor in early years educational development (National Reading Panel, 2000; Slavin et al., 2009). Indeed, research has shown that independent reading is positively correlated with increased vocabulary, reading comprehension, and verbal fluency (Cullinan, 2000; Anderson et al., 1988; Greaney 1980; Guthrie and Greaney 1991; Taylor, Frye, and Maruyama 1990). It is widely understood that children who succeed in becoming fluent, strategic and joyful readers have a better chance at achieving academic success, becoming active citizens, and experiencing self-fulfillment (Cullinan, 2000).

Reading at an early age—particularly the elementary school years—appears to be especially important. It is during this phase that children develop skills such as word recognition, language cues, and vocabulary. If adequate reading skills and abilities are not developed by the age of 10 (grades 3 or 4), students may fall into the “fourth-grade slump,” a term used by scholars to describe how reading gaps in the critical fourth grade period may underlie a deceleration in reading comprehension among children—an effect that can last a lifetime (Chall et al., 2009). For this reason, experts emphasize the need to confront reading challenges early in children’s lives.

Poor children are particularly prone to the developmental delays that arise from reading challenges (Chall et al., 2003; Snow, 2002). Among other factors, low-income children may suffer from lack of fluency and automaticity and avoid difficult reading materials (Chall and Jacobs 2003; Stanovich, 1986); have fewer reading materials at home relative to their high-income counterparts (Chin & Phillips, 2004); or have less expansive vocabularies and, therefore, lower reading comprehension (Anderson & Freebody, 1981). For
these reasons there is a consensus in studies based in developed countries that without ample remediation reading gaps may quickly widen after grade 4 and disadvantaged students will likely remain behind for their entire lives.

One method that may help promote children’s academic achievement and stave off developmental delays is encouraging children to increase their reading volume. Research has suggested that simply the amount that a child reads is positively correlated with his or her educational outcomes, irrespective of underlying cognitive ability (Cunningham & Stanovich, 2001; Baker, 1999; Nueman & Roskos, 1993; Rucker, 1982). McQuillan and Au (2001) suggest that differences in the academic achievement of students can be explained in part by the quantity they read both in school and at home. Cunningham and Stanovich (2001) posit that a child’s reading volume may be a potential source of cognitive skills, as the amount a child reads improves verbal skills, increases content knowledge and establishes a positive feedback loop that promotes future learning. Similarly, research has demonstrated that simply increasing children’s access to reading materials is related to positive academic outcomes (Small et. al, 2009; Krashen, 1995). This finding may suggest that granting children access to reading materials can help promote higher reading volume and, in turn, induce academic gains.

In acknowledgement of the significant benefits of reading, numerous developed countries have invested tremendous time, effort and financial resources to promote regular reading habits among children during the early stages of education (Torgesen et al., 2006). For example, between 2001 and 2008 the US allocated $1.1 billion to its Reading First program and $132 million for Early Reading programs (U.S. Department of Education, 2005). In 2012, Australia declared a “National Year of Reading,” initiating several programs across the country that focused on children and young people with the hope of increasing Australia’s literacy rate (Australian Bureau of Statistics, 2012). The Israeli city of Netanyu
implemented a program that placed specially-trained teacher assistants in first and second grade classrooms to ensure that children have mastered the required reading skills for their age group (The Jerusalem Post, 2009). Most developed countries recognize the important role reading plays in learning and, as a result, have implemented numerous reading programs of different sizes and scope.

In addition, research has provided evidence that children’s reading volume has significant impacts on academic achievement in developing countries as well. For example, reading frequency has shown to be related to educational performance of students in rural Uganda (Dent & Goodman, 2015). The number of books on loan from a school library is positively and significantly correlated with student achievement levels in several Latin American countries (Coleman et al., 1966). Evidence also has suggested that access to a wide variety of books and other reading materials may contribute to educational gains in developing countries (Bristown, 1992; Hayneman and Loxley, 1983; Haron, 1977). These effects are of particular importance in developing countries as they suggest that increasing children’s reading volume can improve educational achievement, in turn offering a potential mechanism through which these countries can spur future growth.

Recognizing the benefits of reading, the developing world or at least those in development organizations has experienced a proliferation of reading-focused programs and initiatives. Many of these programs have been implemented by NGOs and international development organizations rather than local governments. Reading initiatives directed towards young students have been implemented by USAID and other organizations in Africa, Southeast Asia, Latin America and the Caribbean (First Principles for Early Grades Reading Programs in Developing Countries, USAID; USAID/Ghana Country Development Cooperation Strategy 2013-2017). Read India, a program first introduced in 2007, was recently replicated and scaled-up in partnership with Indian state governments, affecting an
estimated 4.7 million children in the 2013-2014 year (Pratham USA). Additionally, 15 countries in Sub-Saharan Africa and South Asia currently employ Literacy Boost, a reading program developed by Save the Children that works with the existing national curriculum to promote, encourage, and develop reading skills (Save the Children). In Nepal, Room to Read has established over 3,776 libraries and implemented reading, writing, and girls’ education (Room to Read).

However, there is very little known about independent reading in China’s heavily populated rural hinterland, an area where almost 15 percent of the developing world’s children reside (United Nations Bureau of Statistics). There are virtually no published papers in the English language academic press on the issue. The handful of papers in China’s academic press that address independent reading are case studies. These case studies are typically written by teachers and other educators and they only describe practices observed in their individual classrooms (Zheng & Tong, 2010; Xu, 2013).

Given what appears to be the important role of independent reading in enhancing learning, the lack of research on the matter in China is somewhat surprising. Educational inequity is severe in China, as rural students lag far behind their urban peers (Wang et al., 2013). The problem of educational inequality may have implications for China’s continued economic growth and even social cohesion (Zhang et al., 2013). It is possible that placing emphasis on independent reading habits could help narrow this educational gap as it has appeared to have done in certain developed contexts (Kim & Quinn, 2013; Kim, 2006). In its 2015 annual work report, Chinese government promised to promote reading nationwide (People.cn, 2015). Unfortunately, little is known about China’s reading programs, its investment into reading resources, or how it manages those resources. In addition, there is almost no research on how an assessment of current reading habits should be constructed or how to develop potential remediating strategies.
The goal of this study is to investigate the connection between independent reading, reading resources, and academic outcomes among rural children in China. To meet this goal, we have several specific objectives. First, using quantitative methods, we establish the empirical facts. We seek to show how much kids read, the importance of reading on academic performance, and the way in which access to books affects student test scores. The second and perhaps more important objective is to illuminate the mechanisms behind these quantitative findings. Using qualitative interviews, we seek to uncover why kids read (or do not read), and why access to books at home and in school is correlated (or not correlated) with higher test scores. We also show that when schools do have open library, accessible reading corner and reading classes, interest in school and other outcomes appear to improve.

2. QUANTITATIVE DATA AND RESULTS

Sampling Procedure and Data Collection

To achieve these objectives, we draw on a large-scale survey in northern Guizhou province in southwest China and in southern Jiangxi province in southeast China in the spring of 2015 (Figure 1). Trained enumerators collected data from 13,232 students from 150 rural schools. The surveys were designed to collect information about the independent reading habits of rural elementary school students. Independent reading (read “kewaishu”) was specifically defined in the survey as reading outside of school for a purpose not related to school.

The student survey included two parts: a questionnaire and three standardized tests. The questionnaire collected information on student reading habits and attitudes, as well as access to books at school and home. Using the information from the survey, we generated variables of whether the student spends more than 60 minutes on independent reading per day (1=yes; 0=no), whether the student likes reading (1=yes; 0=no), whether the school has a
library (1=yes; 0=no), whether the student *borrows books from the school library* (1=yes; 0=no), whether the student’s *parents buy books for the student* (1=yes; 0=no) and whether the student *reads books at home* (1=yes; 0=no).

The standardized tests included reading, math, and Chinese language. The reading test questions were adapted from the Progress in International Reading Literacy Study (PIRLS) test, an international test of reading comprehension that is widely used throughout the world. The test questions were carefully translated according to the PIRLS translation guidelines and reviewed by a panel of experts and local teachers well versed in China’s education system. The translated reading tests then went through several rounds of pilot tests in Chinese schools. The results were independently reviewed by a group of test assessment experts and were revised to make sure they are of the highest quality and appropriate for student levels. In the survey, students were required to finish the reading test in 30 minutes. The enumeration team closely monitored the test and strictly enforced the time limits.

The tests in math and Chinese language were carefully designed with assistance from educators in the local bureaus of education to ensure coherence with the national curriculum. We pretested the exam repeatedly to ensure its relevance and to make sure the time limits were appropriate. Both the tests in math and Chinese language took 30 minutes. When we administered the exam in the sample schools, it was timed carefully and proctored closely by trained enumerators. For analysis, the scores for the standardized tests in reading, math and Chinese are all normalized by the distribution of scores in each grade.

**Statistical Approach**

In investigating how independent reading is correlated with reading skills, math and Chinese test scores, we regressed student standardized test scores (reading, math, Chinese) on student reading behaviors, attitudes, and access to books at school and home. We estimated the following ordinary least squares (OLS) model:
where the dependent variable $Y_{ijc}$ indicates the standardized test score of student $i$ in school $j$ and county $c$, $\text{Read}_i$ is a vector that includes six variables of reading behaviors, attitudes and school and home access to books. Specifically, $\text{Read}_i$ includes whether student $i$ is an independent reader (equaling 1 if the student spends more than an hour per day on independent reading, and equaling 0 if the student doesn’t); whether the student likes reading (1=yes; 0=no), whether the school has a library (1=yes; 0=no); whether the student borrows books from the school library (1=yes; 0=no); whether the student’s parents buy books for the student (1=yes; 0=no); and whether the student reads books at home (1=yes; 0=no).

The vector $X_i$ includes student characteristics, family characteristics and school characteristics. The student characteristics include student age (in years), student gender (1=female; 0=male), boarding (1=boarding student; 0=non-boarding student). The family characteristics include the household consumption asset value (to calculate an asset index, we asked the students to fill out a checklist of household consumption, then used the coefficients from principal component analysis to create a single measure of wealth). The school characteristics include classroom has a book corner (1=classroom has a book corner; 0=classroom doesn’t have a book corner) and number of students at school.

We run equation (1) for three dependent variables, including standardized reading test scores, standardized math scores and standardized Chinese scores. We also add county fixed effects, $\phi_c$, to account for county-level heterogeneity. We compute heteroskedasticity-robust standard errors and adjust for clustering at the school level in all of our regressions.

**Quantitative Results: The Prevalence of Reading**

The quantitative data analysis found low levels of reading and reading resources among rural students. Table 2 shows data from 13,232 students in grades three through six. Only 2,197 out of 13,232 (16.6%) students read for more than 60 minutes per day. Also, only
2,646 of 13,232 (20.0%) students reported borrowing books from the school library in the past semester. Students appear to lack support for reading at home. Only 4,075 of 13,232 (30.8%) students have independent reading books at home and only 1,284 of 13,232 (9.7%) students report that their parents purchase books for them.

The Correlates of Test Performance

Based on the OLS multivariate analysis in Table 3, reading for more than 60 minutes per day, reading books at home, and enjoying reading are correlated with higher test scores in all three tests administered: math, Chinese, and critical reading. Reading for more than 60 minutes per day is correlated with a 0.09 SD higher reading score (significant at 1%) and improvements of 0.09 and 0.08 SD in math and Chinese, respectively (significant at 1% and 5%) (row 1, columns 1, 2 & 3). Furthermore, enjoying reading is correlated with a 0.35 improvement in reading and a 0.49 SD improvement in Chinese (both significant at 1%) and a 0.32 SD improvement in math (significant at 1%) (row 2, columns 1, 2 & 3). Finally, reading books at home is correlated with 0.21 SD improvements in both Chinese and reading (significant at 1%) and a 0.20 SD improvement in math (significant at 1%) (row 6, columns 1, 2 & 3).

The results of the correlation analysis also contained some surprises (Table 3). Whether or not a school has a library or whether the student borrows books from the library was not correlated with test scores (row 3, columns 1, 2 & 3). Moreover, there is a strong and negative correlation between parents who purchase books for their children and children’s test scores (row 5). When parents buy books for their children, the children score worse by 0.38 SD in math, 0.26 SD in Chinese, and 0.28 SD in reading (row 5, columns 1, 2 & 3). All of the correlations are significant at the 1% level. These surprises in part motivate the qualitative results in the next section.
3. QUALITATIVE FINDINGS AND MIXED-METHODS ANALYSIS

Qualitative Data Collection

As part of our effort to interpret and better understand key findings from the quantitative data, we conducted three waves of qualitative interviews. Specifically, we wanted to investigate why many students do not read, why school libraries are not positively correlated with test scores, and why parents buying books for their children is negatively correlated with test scores.

First, a five-person team (from Shaanxi Normal University and Stanford University) interviewed students, parents, teachers, and education bureau officials from ten elementary schools in two of the sample counties in Guizhou province. In total, 22 teachers, 18 students, eight heads of household, and three education bureau officials were randomly selected and interviewed. All interviews were conducted in June 2015. The interviews lasted from 20 to 60 minutes and were semi-structured: interviewers referenced a scripted interview protocol but also had the freedom to diverge from this protocol in order to investigate specific responses that emerged. Relevant portions of each interview were transcribed with personally identifiable information removed.

Second, a team of 12 enumerators (graduate students from Shaanxi Normal University) conducted in-person interviews with 213 randomly selected fourth and fifth grade math and Chinese teachers and 113 principals from 113 schools in Jiangxi province. The team also conducted telephone interviews with 322 heads of household. All interviews occurred over a five-day period in April 2015. All interviews were conducted one-on-one and transcribed. All participants gave informed consent, and all personally identifiable information was removed from the transcripts. The interviews lasted from ten to 15 minutes and were a structured set of five free-response questions.
For the third wave of interviews, we randomly selected 46 students who read (defined as students who read independently for more than 60 minutes a day) and 10 parents who buy books for their children (as reported on the quantitative surveys). All interviews were conducted one-on-one by phone in July 2015 and transcribed. All participants gave informed consent, and all personally identifiable information was removed from the transcripts.

In the following sections, we include quotations from all three waves of interviews. The selected quotations are representative of the sentiments expressed by a majority of respondents on any given issue. These sentiments were common to the responses we heard.

Qualitative Findings

In our interviews, there were four themes that emerged that seem to help understand the quantitative results. First, we noticed three main factors that may be acting as barriers to reading in rural area: inaccessible bookstores, curriculum constraints, and unsupportive home environments. Second, we hope to further understand why school libraries are not correlated with test performance. Based on our interviews, we suggest that the poor quality of school libraries and insufficient school investment as well as the lack of commitment to independent reading by educators (principals and teachers) may contribute to the failure of libraries to boost test scores. Third, we examine why children whose parents buy books for them perform worse on the tests. Our qualitative interviews present two possible explanations: books are not suited for independent reading and books are used as test remediation. In the rest of the paper we explore through these qualitative data the factors that may explain the quantitative survey results.

Barriers to Reading in Rural Areas

In general, we find three main factors that appear to be acting barriers to reading: students in rural areas lack suitable independent reading books; rural students do not always have sufficient free time; and rural students receive little encouragement to read within the
household. It is our belief that this combination of factors may contribute to the low levels of reading reported in our quantitative data.

Inaccessible bookstores

Both our qualitative analysis and casual observations suggest that the unavailability of bookstores in rural areas may deter students from reading. Our interviewees echoed the challenges of accessing a bookstore near their home.

“I don’t own any books. If I wanted to go buy one from the bookstore, I would have to walk down to the road, take a minivan to the township, then take a bus to the county seat and go to the bookstore, then come all the way back. I don’t know how long that would take.” (Student, 2011S1)

“I’d say one out of five of the students will buy books for themselves besides the curriculum books. They buy them in the township. There’s no bookstore there but they sell workbooks in the convenience store. But as for any other kind of book, nobody buys any of them. And even if they wanted to, they aren’t available.” (Principal, 2034H1)

Over the course of our interviews in Guizhou, we visited five townships with over 60 schools and an estimated 10,000 students. However, not a single township contained a bookstore or a store that sold independent reading books. This severe supply-side constraint may factor into children’s low independent reading habits.

Curriculum constraints

According to our interviews, rural elementary schools are faced with a variety of responsibilities, including preparing students for standardized examinations, adhering to the standard curriculum, and fulfilling government directives. These functions require significant time and resources and may render schools unable to oversee independent reading.

The education system in China revolves around high-stakes examinations beginning in elementary school and lasting through selection into tertiary schooling (Loyalka, et al., 2014). Perhaps as a result, classes often focus on test preparation (Thogerson, 2000). This emphasis on test scores may leave little room for teachers to encourage independent reading. Many teachers we interviewed spoke about the limitations posed by the test-focused system.
“The standard curriculum doesn’t emphasize independent reading. The only focus is on scores. The purpose of the system is to pass the college entrance exam. If a student is falling behind, he’ll sometimes get special tutoring after class. But if he can’t keep up, he should just self-study the dictionary at home.” (Teacher, 2034T1)

“Under China’s exam-oriented education system, I believe that students should pay attention to textbooks rather than independent reading books because textbooks are the foundation.” (Teacher, 2063T1)

Moreover, teachers report being pressured to adhere to the rigid week-by-week national curriculum called renjiaoban (人教版). This material is the central source of teaching and learning material for the majority of rural schools throughout the country (Paine, 1998; Huang, 2004). However, our interviews indicate that this curriculum is quite difficult and the pace is too fast for most rural students. The rigorous and inflexible curriculum may leave little time for teachers to incorporate supplementary activities such as independent reading, especially in low-performing schools (Wang, 2011).

“All of our curricular materials are the standard curriculum, which, to be honest, and I'm speaking frankly now, is too hard for rural students like the ones at this school. But the fact is that we have to teach them. If they understand the material, we teach it. If they don’t understand the material, we still teach it because we don’t have any other options.” (Teacher, 2022T2)

“Our curriculum is designed by experts somewhere, we don’t know where. Someone, we don’t know who, tells us which curriculum to use. We have to implement that curriculum. If we don’t think it’s suitable, we don’t have a choice. There are no independent reading programs that are part of that curriculum.” (Teacher, 1000T3)

In addition to complying with the standard curriculum, schools and teachers must implement government-mandated supplementary initiatives such as safety training and International Children’s Day performances. Many teachers and principals complained about these burdens, which demand significant time and money. When directives such as these divert schools’ resources, schools may lack capacity to focus on other activities such as independent reading.

“The government mandates that schools employ safety education. We place a heavy emphasis on safety training. For example, we have to teach kids not to swim in the
river, not to eat wild mushrooms, how to cross the road properly, not to chase each other around the campus, and not to jump near the windows. In short, rural areas are unpredictable in many ways and when accidents happen, society becomes upset and expects responsibility to be assigned for those accidents. Often schools are blamed. Therefore we do our best to implement safety training, which ends up being a significant burden in terms of time and resources.” (Principal, 2034H1)

“Basically, I don't read because I don't have any time. I haven't read a book in two years, and even that book was for work and not for fun. It’s the same for the other teachers. They never have time to go to the library and read books; not only do I have to teach the 4th grade class but I’m also a homeroom teacher and principal of the school. The teaching staff has a wide variety of tasks they have to do outside of teaching that are mandated from above. For example, they have to institute a safety education program, which requires developing materials, displaying information, and lecturing on how to deal with traffic. All of these tasks take an enormous amount of time. Do we need this knowledge? Of course we do. But we don’t have enough people to properly cover all of this material. (Teacher, 2022T1)

Even if there were sufficient time and resources to encourage independent reading, it is not clear that teachers value reading, let alone provide guidance about independent reading to students. Although most teachers said that independent reading is important, few spoke of concrete methods to encourage reading. Teachers commonly expressed the attitude that independent reading is a student’s personal responsibility.

“I have been a Chinese teacher for 28 years. The library at the school was built, oh, I’d say, 10 years ago. I’ve rarely gone in there. I don’t think there’s many independent reading books in there—I think that most of the books are workbooks. For reading outside of class, that’s really the students’ business and something they need to address on their own. If it were up to me, I’d recommend that they read workbooks.” (Teacher, 2034T2)

“None of the students read for fun. The school has a library, but the teachers don't manage it. They don't record who checks out the books. The students just like TV and cartoons, and in rural areas very few students read outside of school. They don’t even read textbooks. Teachers don't care what students do outside of school.” (Teacher, 2042T2)

The test-driven and rigid standard curriculum appears not to foster ample opportunities for independent reading. Even if a student is falling behind, the curriculum must carry on. In such a system, it comes as no surprise that many teachers do not value
independent reading—the focus is on scores and they view textbooks and workbooks as the only keys to examination success.

*Unsupportive home environment*

Based on our interviews, the living situations of many rural students do not foster independent reading for two main reasons. First, many students have significant time constraints outside of school. Second, households may not encourage independent reading. In China’s elementary schools, school days are long, often extending from 7:30 am to 4:00 pm. After school, many of the children who we interviewed must walk home and help around the house, performing tasks such as cooking, caring for younger siblings, and working on the farm. These activities limit time available for independent reading.

> “After school, I walk home and then feed the geese, ducks, and chickens. I then do my homework. Then I cook, do more homework, and go to sleep.” (Student, 2022S1)

> “Listen, some of our students live a two hours walk away. They are from places where there aren’t roads whatsoever. They wake up before sunrise, walk to school, spend all day in school, and sometimes—especially during the wintertime—they have to walk home in the dark. Some of them have to traverse the mountain behind the school, a two hour walk, every day.” (Teacher, 2022T3)

On top of substantial time constraints, few children appear to receive encouragement from their families to invest time in independent reading. In rural China there are as many as 58 million children who are left behind by parents who have migrated to faraway cities in search of work (China Youth Research Center, 2006). Left-behind children generally have limited contact with their parents: fewer than 30% of left-behind children see their parents every year (Ye, et al., 2005). Unfortunately, migrating parents may be unable to supervise their children’s education and encourage independent reading habits.

Many left-behind children are raised by their grandparents. Our qualitative data shows that grandparents are often too busy and ill equipped to supervise the study and independent reading habits of their grandchildren.
“We are a poor family. Our son and his wife have four kids, and only completed fifth grade, so they have to work in a factory in Guangdong to make a living. They left their children at home with us. If the children do well in school, great. If not, it doesn’t matter to us. We don’t have any books at home and we’re illiterate so we can’t help with their homework or reading.” (Grandparent, 2011G1)

“Generally, kids live with their grandparents because their parents are out of town working. Grandparents are most concerned with getting food and clothes for the kids. As long as those two things are met, they don’t think about much else for the children.” (Teacher, 2041T1)

Furthermore, independent reading may not be a common practice in rural China, as evidenced by our survey finding that only 30 percent of households own books. Many interviewees explained the limitations of households in supporting children’s independent reading.

“In the countryside I can safely say that no parents read to their kids. The parents lack time and also lack sophistication.” (Teacher, 2022T2)

“Independent reading increases students’ burdens. It also makes them wild and distracts from curricular learning. Independent reading does not benefit language or math grades—it will affect students’ concentration. Our family does not buy independent reading books for the children because we fear that it will affect their studies.” (Parent, 3062P2)

In a home environment where independent reading does not seem to be valued—only 9.7% of parents buy books for their children and free time is scarce—rural students may not find the time or may lack the motivation to read. Reading independently may run counter to their guardians’ expectations and take away from valuable time they believe should be purely focused on academics.

School Libraries Do Not Improve Test Performance

By definition, school libraries are supposed to provide access to books. One of the expressed purposes of libraries in schools is to foster independent reading among students (Morrow 1991). Although our research shows that reading books is correlated with higher test scores, the test performance of students was not associated with the existence of a library
at their school. The qualitative interviews, we believe, help explain this discrepancy: we found that libraries are of poor quality and lack school support, which, it appears, contributes to their lack of impact on academic outcomes.

*Inadequate School Libraries*

In rural areas, libraries may lack sufficient human resources and suitable books to effectively improve academic performance. One fundamental issue with many libraries in our qualitative sample of rural elementary schools is that they are often closed. Schools lack the human resources to maintain and supervise libraries, causing the libraries to open infrequently, as in this case:

“The library is required to be open Monday to Friday. But, in fact, it is only open once a month because there’s not a teacher whose responsibility it is to manage the library.” (Teacher, 2041T1)

Furthermore, schools may lack control over the selection of books available in their libraries. Most books in rural schools are provided by donations or are ordered by the local bureau of education. However, books are not always chosen with the needs of students in mind.

“A fraction of the books in our reading room were supplied by the education bureau. They just give us the books. They never ask us what kind of books we need. In fact, I think that some of the books they give us are not suitable for students to read. For example, books about how to code or repair computers. These kids have never touched a computer. How could that be useful?” (Principal, 1081H1)

One reason that some rural children do not utilize libraries may be that they cannot find books of topics and difficulty levels suitable for independent reading. In addition, books in the library may not often accord with student interests. Our quantitative results reveal that 76% of students are interested in fables, while 43% and 45% are interested in novels/kung-fu
novels\textsuperscript{1} and nature books, respectively. Libraries, however, clearly do not make it a priority to have these books in their collections; most school libraries do not have any or many of these types of books. This may be due to the belief held by many teachers that these types of books are not appropriate for elementary school students. Instead, the teachers believe that students should focus on reading classics and reference books.

“I think students should read reference books. For example, essay writing books, the dictionary of ancient Chinese expressions, fables, and the dialects of Confucius and Mencius. Even if students cannot understand the Chinese classics, it is still good for them to read these types of books. Novels are not good for students. They are too long and students don’t have enough time to finish them. It’s a waste of time for the students and they cannot understand these novels. Romance novels are also bad for the students. However, I’ve never read any of them.” (Teacher, 2022T1)

“Kids should not read manga or science fiction because content of manga books is imaginary. They don’t help students solve real world problems and lack educational value. In fact, they have a negative influence on students because they try to mimic the violence and humor in books. Village students should not read science fiction because those books have content such as spaceships that students won’t comprehend.” (Teacher, 2042T2)

In addition to potential challenges with the types of books available, school libraries contain books that are damaged and outdated. This may contribute to school libraries’ lack of success in improving academic performance.

“Almost 70 percent of the books from the library are damaged or out of fashion. They’re old, out of date, broken, and missing pages. The last time the government sent us a book was around ten years ago.” (Teacher, 2022T1)

“The books in the library are generally out of fashion; kids do borrow books, but they will read a few pages and then return them. They do not have much interest. I think that students could be interested in books if there were new books that were shiny, colorful, and had pictures or if there was a teacher there to help students decide what they want or how to be interested in reading. The books haven’t been updated in all of my time here.” (Teacher, 2041T1)

School libraries face interesting demand-side and supply-side dilemmas. On the demand-side, teachers disapprove of students reading outside of class books and instead

\textsuperscript{1} Kung-fu novels (in Chinese: “武侠小说”) are a popular genre of Chinese adventure literature that blend martial arts with historical fiction.
encourage their children to read materials such as classics of Mencius or Tang Dynasty poems. Even if students wanted to find extracurricular books in the library, it is possible that they may be unable to do so—the library’s limited hours and scarce supply of often damaged or outdated books represents a significant supply-side constraint. Although all ten of the schools we visited for qualitative interviews in Guizhou had libraries, these constraints almost certainly contribute (at least in some part) to the absence of a relationship between test scores and school libraries.

\textit{Insufficient school investment}

The decentralization of school finances in China has led to unequal distribution of money and resources among schools (Park, et al., 1996; Tsang, 1996). Rural schools generally receive less funding and human resources than urban schools and face severe budgetary constraints (Huang, 2004). These financial challenges may prevent reading resources and programs from becoming a priority. This is evidenced by the importance of donated books in libraries in rural schools. Of the ten schools visited during the qualitative interviews in Guizhou, all of them relied on donations for their library materials. Many teachers and administrators described the financial challenges of their schools.

“Our budgets are extremely tight. In fact, we’re in the red. We need to buy teaching materials like paper, pens, computers, folders, and bookcases. We have to prepare for and pay for community activities like the Children’s Day presentation. We have to pay for all the expenses of supervising the exams every year, which includes transporting our teachers to other schools and hosting the visiting teachers. Plus, teacher training, transport and accommodation during county meetings. Then there’s the sound system, the electricity bill, the Internet bill. Each year we go further into debt just to cover these fundamental costs.” (Principal, 2032H1)

“If I had 50,000 spare RMB, first and foremost I would make the required safety improvements at our school. Safety is first, after all. So that means fixing the stairs, repairing cracked walls and windows, things of that nature. After that, I’d say we definitely need some computers and multimedia hardware. Finally, it would be improvements to the teachers’ office space, including desks and shelves and whatnot.” (Teacher, 2034T1)
Non-central rural schools are especially strained economically. Beginning in the late 1980s and early 1990s, China began to close village schools in an effort to centralize resources (Paine, 1998). As students move out of remote areas per a government effort to consolidate villagers (Chan, 2009) many of the most remote schools will likely be closed in the near future. The government may not want to invest in a school with an uncertain future. Therefore, these schools often lack support from above. Some teachers cited this as a key reason for insufficient school libraries.

“Of course the school needs equipment and investment. We need a wall around the school and other hardware investments like books. We’ve been asking the Education Bureau for things like this for ten years. But the fact of the matter is that in this area there are fewer and fewer kids and the government has probably decided that it is not worth investing in this school anymore.” (Teacher, 2022T4)

“The education bureau has a policy to combine relatively small schools. For that reason, it’s possible that this school will be shut down next year. But I’m not sure. I haven’t received any kind of concrete news even though it’s only a year away.” (Principal, 2031H2)

As shown, the financial challenges burdening rural schools appear to be significant—principals report having to cope with constrained budgets and little prospect for future funding. As such, independent reading is not of primary concern for these educators. Rather, they must focus on the costs they consider fundamental to their schools’ operation. And, as our interviews revealed, books or programs for independent reading are almost never cited as essential to a school’s functioning.

Children Whose Parents Buy Books for Them Score Worse on Tests

The multivariate analysis shows that parents purchasing books for students is significantly and negatively correlated with student test scores (Table 3). The qualitative interviews reveal two possible explanations for this phenomenon. First, parents might buy
books for remediation if their child’s academic performance is poor. Second, the books that parents buy are often unsuitable for independent reading.

Books for remedial learning

Our qualitative data suggests that the correlation between purchasing books and poor test performance may occur because parents only buy books for children when they fall behind in school. That is, only the children falling behind have books purchased for them by their parents. In our third wave interviews, 80 percent of parents who bought books for their kids did so because their children were falling behind in school. This suggests that it is not book purchases that decrease test performance; rather, it is poor test performance that prompts book purchases.

"My child is not doing well in school at all and his teacher asked me to buy some books for him. So I bought him a storybook and a dictionary. I don't know if it helps improve his grades." (Student, 2021S1)

"My kid came back told me that her teacher asked her to buy some books so I gave her about 20 RMB. I didn't pay attention to what books she got. I don't know if they help her study because she can't even understand the textbooks in class." (Student, 2021S2)

In response to struggling rural students, parents seem to acknowledge the value of books in boosting learning. In accordance with our prior findings, however, parents may still lack a comprehensive understanding of the types of books and reading habits that will most effectively boost their children’s academic performance.

From this discussion, the negative correlation that we are observing appears to be one of reverse causality. It is not that the books that parents buy for their children lead to lower grades. Rather, it appears that, at least according to our interviews, that parents buy books for children when their grades are falling or are low.

Books are not suited for independent reading
When parents purchase books for their children, these books may go unread. Many rural Chinese parents believe that their children should read books to supplement their academic work. Therefore, they direct their children towards classics and poetry, which children may often be reluctant to read.

“As long as Dad agrees, we can buy the books. Sometimes, if the book is a fairy tale or something not related to school, Dad will say it is not useful. The books that we buy are those that he thinks are useful for my studies. They're all workbooks. In addition, my parents bought me the books that were recommended by my teacher, which are the twelve classics. I have only read one of the twelve classics so far.” (Student, 2041S1)

“My son is not interested in reading and I don't know how to encourage him. I bought him a book of the dialects of one of Confucius’s disciples. But he hasn’t read it. He just wants to watch TV. I very rarely read with my kid.” (Teacher, 2022T1)

It is possible that a student may feel deterred from independent reading if their only option is a long, difficult, and complex classics from China’s antiquity. The misalignment of parents’ book preferences with their children’s reading interests may be a factor driving rural children’s low levels of reading.

4. DOES INDEPENDENT READING LEAD TO BETTER LEARNING?

So what can be done? Would accessible library resources and reading programs that encourage independent reading lead to increased love of reading and other educational outcomes of students? To examine this, we visited two NGO-run reading programs in two areas of rural China, Guizhou and Jiangxi. In these areas the typical intervention has three parts: a) increased number of book resources (resources that are attractive to children); b) setting up book corners in the classrooms; and c) training teachers to run reading classes. The programs were run for an average of 2 years. In the rest of the section, we report the interviews with students, parents, teachers and principals who participated in these programs
and examine whether they believed that reading programs increased the love of reading and other educational outcomes.

Reading programs and love of reading

In the schools that have the NGO reading programs, principals and teachers observed an increased number of students who borrowed books and an increased number of students who read books after school. The donated books increased the amount of reading materials and variety that students could choose from. According to the principals and teachers, those books were of the types of books that in fact were appealing to the students. Setting up book corners in the classrooms also brought the books closer to students and removed the hurdles of having to borrow books from the library which is often inaccessible, or at best is located in another school building.

“The school does not have the budget to buy books and we don’t even have a room that can be set up as the library. The program brought books that are interesting to the students. A lot of books have pictures and are written with big fonts. The students loved the books. By having book corners in the classrooms or corridors, it also created a free reading environment that is exactly in a place where students study and play. Students became more interested in reading without us imposing this on them.” (Principal, 2061H1)

“Before the program was launched (by the NGO), students had nothing to do but running and playing in the corridors and playground. After we had the book corners, students would sit and read in the classrooms, corridors or on the stairs after class.” (Principal, 2071H1)

“We used to open the school library to let students borrow books, but students were rarely interested in borrowing. The books were really boring, I must say. The program made a huge change. Now the books are in the classrooms where it is much easier for students to get access to. The books are much more interesting and attractive to the children. Many more students started borrowing books. The amount of reading per student has increased tremendously.” (Principal, 2081H1)

Students also showed enthusiasm in reading and in the books they read. In the program schools we interviewed, almost every student said they had borrowed and read books from the book corners. On average, one fifth of students said they would borrow books
every week. Almost every student could name at least one book that they had read and really liked. Some students could easily recite the stories from their favorite books.

"After I eat lunch, I go to the book corner and read books for fun until the afternoon reading class." (Student, 1081S1)

"I now love reading. My favorite books are novels and nature books, especially the one about dogs in Alaska. I am now reading My Daughter's Story by Meizi Han." (Student, 1081S2)

The reading class seems to be a success in promoting student interest in reading. Teachers received trainings that were organized by the NGOs. Teachers now run reading classes once per week. In the classes, teachers organize reading activities to introduce materials, answer questions that students have and read together with students the books from the book corners. These classes appear to have been effective in making reading more attractive to students, partly because students now realize there is reading beyond their textbook that can be fun, interesting and imaginative.

“After I received the training (by the NGO) on independent reading, I started to run reading classes once a week. In each class I would introduce one new book to the students. The book is picked from the donated books and students can borrow it after class. The book would always become the most popular book after I introduced it in the reading class.” (Teacher, 2081T1)

“Last week I taught a reading class where I introduced a book about animals going on a boat trip. First I explained the story. Then I asked questions about the story to help students understand better. Finally we had a role playing game by having a couple of students play different animal characters in the story. The kids loved it.” (Teacher, 2071T1)

Although some parents still do not appear to fully understand the importance of independent reading, other parents expressed their support towards reading at home. Such a change in attitude towards reading often involved interactions and discussions between parents and teachers. It may also be partly because the parents saw a positive change in their children’s behavior at home.

“At home we don’t have any books for my kid. I don’t even know where to buy these types of books. I don’t know what kind of books to buy for him. In a parents meeting the teacher asked us to encourage kids to read extracurricular books at home. After
that my son would bring home books. He used to watch a lot of TV. Now he spends more time reading. I feel this is good for him.” (Parent, 2081P1)

Reading program and other educational outcomes

Principals and teachers in the program schools believed that reading had a positive impact on academic performance. Almost everyone agreed that reading helps improve Chinese test scores. Some teachers also think by improving Chinese, students may also be understanding math better and may even be scoring higher on math tests as well.

“Last year, there was a boy who transferred to our school. When he arrived, his grades were terrible and he just couldn't keep up. But, he started to read all the time and after some time all of his grades went up. His Chinese language grade improved. It was almost as if he was a magical student.” (Teacher, 2022T3)

“Students who are not good at Chinese language are often not good at math either. Reading definitely leads to improvement Chinese language and comprehension in general. I also believe that reading helps student score higher in math as students are able to understand the questions better. ” (Principal, 2061H1)

“Extracurricular reading is extremely important because it teaches you things you can’t learn in a textbook and it helps your logic and your thinking process. I now recommend extracurricular reading to my students as much as possible. Of course, learning from a textbook is probably the most important, but extracurricular reading can play an important supplemental role.” (Teacher, 2011T3)

Moreover, reading was considered to have benefits beyond improving test scores.

After the introduction of reading programs, principals and teachers believed that books were able to provide new insights and experiences, boost creativity and train logic. They also found that reading helped develop confidence. Parents also observed that their kids becoming happier after they started to engage in independent reading.

“I now am beginning to understand that reading extracurricular books is important. Books give students experiences that they have never experienced. Good books will have a long-lasting impact on students after they grow up.” (Principal, 2071H1)

“Last semester we held painting and writing competitions. In the competitions students were encouraged to paint or write any stories that they wanted to. There were students who had great stories about their family or some imaginary world. You can tell that many of the stories are inspired by the books they read. Many of them are really shy kids that rarely express themselves. This would have never have happened without the reading program. I think reading is a great way to boost creativity and confidence.” (Teacher, 2081T1)
“At the beginning I was worried that reading books that are irrelevant to study (textbooks) would hurt my kid’s test scores. But she would just keep reading. After a semester, her test scores improved and now she ranks the second in the class. She is also happier and talks more.” (Parent, 2081P2)

5. CONCLUSION

This paper presents mixed methods analysis of results from a large-scale survey of six rural counties in the Guizhou and Jiangxi provinces. Using the quantitative data, we show that among a sample of 13,232 students, only 16.6% are considered readers (which we defined as students who read independently for more than 60 minutes a day). We also demonstrate that there is a strong, positive correlation between independent reading and test scores. However, we find no correlation between student test scores and either the existence of a school library or whether the student borrows books from the library. Students whose parents purchased books for them were actually found to have lower test scores.

We also engaged principals, teachers, parents and students in a set of dialogues as part of the qualitative phase of the study which was carried out in order to better understand some of the seemingly surprising quantitative results. Based on the findings from more than 700 interviews, we believe that we were able to identify several mechanisms that are driving low levels of reading among rural students and the disconnect between book resources in schools and at home and educational performance. Inaccessible bookstores, curriculum constraints, and unsupportive home environments may explain the low levels of reading that were documented in the quantitative data. The poor quality of school libraries and insufficient investment by schools into book resources almost certainly were creating the disconnect between libraries and academic achievement. Interviews revealed that the negative observed relationship between parents buying books and the test scores of their children almost certainly was due to the fact that parents were mostly only buying books after their children’s grades had already fallen. Whether in school libraries or in collections of books at home, the
reading materials available to most rural students can only be describe as unattractive and boring. Most children only have access to classics, poetry, or academic workbooks, which are clearly not catching their imaginations or interests.

While independent reading opportunities were not available to most rural students, this does not mean that students are not interested in reading (when given a chance to do so). In our interviews we found overwhelming evidence that independent reading programs seemed to have strong, positive impacts on the love of reading of students. More importantly, there is a strong impression by all participants that reading also leads to higher test scores and other educational outcomes. With more books at school and in the classroom, with a more interesting, child-friendly set of book resources, and with the provision of reading classes organized by teachers, many students quickly developed a love of reading. According to teachers and parents, both Chinese and math test scores also improved. In addition, some interviewees also strongly believed that the programs may also have had positive impacts on other outcomes, such as creativity, logic, confidence and happiness.

According to our findings, it appears as if one way China’s education system might try to begin to improve rural education would be to aggressively expand the number and quality of book resources in rural schools, make them more readily accessible to students and to begin to regularize reading programs run by teachers in school that will teach and motivate students to read more. In fact, in 2014, the national government launched a program that is called Every Citizen Should Read (全民阅读). We believe the results of this paper are consistent with efforts by officials to implement this new reading movement in rural schools. The NGO-funded programs that have met with such success may provide lessons for the government to learn from so there is no need to “start from scratch.” If governments and NGOs and citizens all pushed independent reading programs forward, it would appear as if
educational performance of rural students as well as their love of learning would all gain an extra push.
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Figure 1: Map of Survey Areas
Figure 2: Reading Behavior, Book and Library Resources and the Propensity of Students to Borrow Books from School Libraries in Rural Elementary Schools in Guizhou and Jiangxi Provinces, China.
Table 1: Sample Sizes of Quantitative Surveys and Number of Interviewees in the Qualitative Study in Guizhou and Jiangxi Provinces, China.

<table>
<thead>
<tr>
<th></th>
<th>Students (1)</th>
<th>Heads of Household (2)</th>
<th>Teachers (3)</th>
<th>Principals (4)</th>
<th>Education Bureau Officials (5)</th>
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<tbody>
<tr>
<td><strong>Quantitative Data</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guizhou Survey</td>
<td>2,152</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jiangxi Survey</td>
<td>11,080</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Surveys</strong></td>
<td><strong>13,232</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Qualitative Data</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Jiangxi Interviews</td>
<td>46</td>
<td>322</td>
<td>213</td>
<td>113</td>
<td>0</td>
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<tr>
<td>Guizhou Interviews</td>
<td>16</td>
<td>10</td>
<td>18</td>
<td>4</td>
<td>3</td>
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<tr>
<td><strong>Total Interviews</strong></td>
<td><strong>62</strong></td>
<td><strong>332</strong></td>
<td><strong>231</strong></td>
<td><strong>117</strong></td>
<td><strong>3</strong></td>
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Table 2: Summary Statistics of Student Survey in Guizhou and Jiangxi

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean (1)</th>
<th>SD  (2)</th>
<th>Min (3)</th>
<th>Max (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Characteristics</td>
<td>n = 13,232</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Grade 3-6</td>
<td>4.515</td>
<td>0.652</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>2. Age (Years)</td>
<td>11.15</td>
<td>1.060</td>
<td>7</td>
<td>18</td>
</tr>
<tr>
<td>3. Gender (1=Male)</td>
<td>0.520</td>
<td>0.500</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>4. Spend more than 60 mins on independent reading per day (1=Yes)</td>
<td>0.166</td>
<td>0.372</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>5. Have books at home (1=Yes)</td>
<td>0.308</td>
<td>0.462</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>6. Parents buy books for students (1=Yes)</td>
<td>0.0971</td>
<td>0.296</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>7. School has library (1=Yes)</td>
<td>0.722</td>
<td>0.448</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>8. Borrow books from school library (1=Yes)</td>
<td>0.200</td>
<td>0.400</td>
<td>0</td>
<td>1</td>
</tr>
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</table>

Data source: Authors' survey, 2015
Table 3: OLS Estimates of the Correlations between Reading and Academic Performance

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<th>Dependent Variable</th>
<th>Reading</th>
<th>Math</th>
<th>Chinese</th>
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</thead>
<tbody>
<tr>
<td>Standardized Test Score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Spend more than 60 mins on reading per day (1=Yes)</td>
<td>0.09***</td>
<td>0.09***</td>
<td>0.08**</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(0.03)</td>
<td>(0.03)</td>
</tr>
<tr>
<td>2. Like reading (1=Yes)</td>
<td>0.35***</td>
<td>0.32***</td>
<td>0.49***</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(0.03)</td>
<td>(0.03)</td>
</tr>
<tr>
<td>3. School has library (1=Yes)</td>
<td>0.06</td>
<td>0.07</td>
<td>0.03</td>
</tr>
<tr>
<td></td>
<td>(0.05)</td>
<td>(0.05)</td>
<td>(0.06)</td>
</tr>
<tr>
<td>4. Borrow books from school library (1=Yes)</td>
<td>-0.01</td>
<td>-0.04</td>
<td>0.00</td>
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<tr>
<td></td>
<td>(0.04)</td>
<td>(0.04)</td>
<td>(0.06)</td>
</tr>
<tr>
<td>5. Parents buy books for students (1=Yes)</td>
<td>-0.28***</td>
<td>-0.38***</td>
<td>-0.26***</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(0.04)</td>
<td>(0.04)</td>
</tr>
<tr>
<td>6. Read books at home (1=Yes)</td>
<td>0.21***</td>
<td>0.20***</td>
<td>0.21***</td>
</tr>
<tr>
<td></td>
<td>(0.02)</td>
<td>(0.03)</td>
<td>(0.03)</td>
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<tr>
<td>Constant</td>
<td>0.12</td>
<td>-0.11</td>
<td>0.43**</td>
</tr>
<tr>
<td></td>
<td>(0.14)</td>
<td>(0.16)</td>
<td>(0.18)</td>
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<tr>
<td>Observations</td>
<td>13,183</td>
<td>6,944</td>
<td>6,288</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.093</td>
<td>0.086</td>
<td>0.131</td>
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</tbody>
</table>

Cluster-robust standard errors adjusted for clustering at the school level in parentheses. * means significant at 10% level; ** means significant at 5% level; *** means significant at 1% level.

County fixed effects are used.

Data source: Authors’ survey, 2015