



Independent reading in rural China's elementary schools: A mixed-methods analysis



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ABSTRACT

Independent reading—unassigned reading for personal pleasure—has been shown to be an important driver of reading skills and academic success. Children that commonly read for pleasure exhibit higher academic performance. However, little research has been done on independent reading in rural China, where the education system is charged with schooling tens of millions of students. Many rural students fall behind their urban counterparts in school, with potentially troubling implications for China's ongoing development. This article explores the prevalence of independent reading and its associations with reading ability and academic performance among rural students. Using a mixed methods approach, we analyze quantitative data from a survey of 13,232 students from 134 rural schools and interviews with students, teachers, principals, and caregivers. We find that independent reading is positively and significantly correlated with reading ability as well as standardized math and Chinese tests scores. Despite such correlations, only 17 percent of students report reading for pleasure for an hour a day. Interview findings suggest that inaccessible bookstores, curriculum constraints, unsupportive home environments, low availability of appealing and level-appropriate books, and insufficient school investment in reading resources may explain the low prevalence of independent reading.

1. Introduction

Independent reading—unassigned reading for personal pleasure—has been shown to be an important driver of reading skills among children and adults (National Reading Panel, 2000; Slavin et al., 2009). Indeed, research internationally has shown that independent reading is positively correlated with increased reading comprehension, verbal fluency, and vocabulary (Anderson et al., 1988; Cullinan, 2000; Greaney, 1980; Guthrie and Greaney, 1991; Taylor et al., 1990). It is generally understood that independent reading habits and reading skills enjoy a reciprocal, mutually reinforcing relationship.

Independent reading and the development of reading skills are also important for academic success. Reading at an early age—particularly the elementary school years—appears to be especially important. Research findings consistently show a strong correlation between reading proficiency and academic success at all ages, from primary school to university: students who read a lot and who understand what they read usually attain good grades (Clark and Rumbold, 2006; Gioia, 2008). Students who read independently become better readers, score

higher on achievement tests in all subject areas, and have greater content knowledge than those who do not (Cunningham and Stanovich, 1991; Krashen, 2004; Stanovich and Cunningham, 1993). Studies have shown that reading facilitates children's communication, concentration (Cox and Guthrie, 2001; Phasha et al., 2012; Dent and Goodman, 2015), and imagination (Watts, 1944; Wells, 1982). Through reading, children absorb information on how to structure sentences and how to use words effectively in their writing and speaking, thus improving vocabulary and language skills. This knowledge then helps children improve their capacity for and tendency to self-educate and follow class content, thereby boosting learning outcomes (Biesta, 2015; Brockett and Hiemstra, 1991). As a consequence, reading programs for vulnerable youth attempt to encourage positive reading habits in order to boost reading skill levels and in turn remediate learning in school (Kim, 2006; Kim and Quinn, 2013).

Little is known about independent reading habits in rural China, where one of the largest education systems in the world is charged with schooling tens of millions of students. Educational inequality across the rural-urban divide is severe in China, as rural students lag far behind

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their urban peers (Wang et al., 2013). Many factors have been shown to contribute to the education shortfall in rural China, including poor student nutrition, lack of primary healthcare, lack of remedial tutoring, and low teacher quality (Luo et al., 2012; Mo et al., 2013; Sylvia et al., 2013; Yang et al., 2013; Yi et al., 2015). But it is not known to what extent the existence or lack of independent reading habits may be helping or holding rural students back. Given that China's education gap may have implications for the nation's continued economic growth (Zhang et al., 2013), and given the important link between independent reading, literacy, and academic achievement, an investigation into independent reading in rural China is overdue.

The purpose of this paper is to investigate the prevalence of independent reading habits in rural China, the correlations of these habits to achievement in China's school system, and the barriers common in rural areas to independent reading. To meet this goal, we have several specific objectives. First, using a quantitative methodology we document the prevalence of and attitudes toward independent reading in China's poor rural areas. Second, also based on empirical evidence, we examine the correlation between independent reading and reading ability as well as academic performance in math and Chinese. Third, in trying to address a number of issues that are more difficult to quantify with information from survey-based data, we employ a qualitative methodology to better understand the quantitative findings on the prevalence of and correlates of independent reading in rural areas.

2. Quantitative data and results

Our statistical analysis, the focus of this section of the paper, has four parts. First, we describe the sampling and data collections protocols. Second, we review the statistical methods that we use in the quantitative analysis. Third, we describe the prevalence of independent reading and reading resources. Fourth, we examine the correlation between independent reading and reading ability as well as academic performance. After reviewing the empirical evidence on these issues, we use qualitative data to examine some of mechanisms underlying the quantitative results.

2.1. Sampling procedure and data collection

The quantitative data come from a large survey conducted in Guizhou and Jiangxi provinces in southern China. Data from the sampled locations can yield important insights into circumstances typical of vast areas of rural China that are home to hundreds of millions of people. The three sample counties in Jiangxi province all underdeveloped and have been designated by the national government as poverty counties since 2012. In 2015, per capita GDP of the three counties were all less than US \$3,000 and were lower than 40 percent of the national average. Over 80 percent of the population of the sample counties was registered as rural, which is higher than the national (44 percent) and provincial (48 percent) average. The three counties we sampled in Guizhou are also comparable to other poor rural areas of the country. The average net per capita income in our study area in Guizhou was US \$1,550, which was lower than the national average for all rural areas in China (China National Bureau of Statistics, 2015). In sum, the six counties share many representative features of the 680 nationally designated poor counties in China, where nearly one fifth of the population lives. It should be noted, however, that although we randomly selected sample schools from within the sample counties, the counties themselves were not randomly selected. For this reason, the counties should not be considered fully representative of the two provinces.

The selection of the sample schools consisted of two steps. Step one involved the selection of rural primary schools from the six study counties. With the help of the local education bureaus, we were given access to a comprehensive listing of primary schools that contained all six primary grades (typically known as *wanxiao*, or complete primary schools, in China). We then applied two selection criteria to the listing. First, because we were interested in rural schools only, we excluded

those that were located in the county seats (because these schools are considered urban schools). Second, because China's central government has been taking measures to merge small, village-level rural schools into larger, town-based ones (Liu et al., 2010; Wong et al., 2014), we excluded schools that had fewer than 100 students to reduce the possibility that the schools might not be in existence at the end of the study. After applying the two selection criteria, we then randomly drew 134 schools from the sample frame, including 120 schools from Jiangxi and 14 from Guizhou.¹

Step two involved the sample student selection process. We conducted our study among classes and students from the third to sixth grades of each of the sample schools. Due to financial constraints, we randomly selected at most two classes in each grade in each school. Specifically, if there were one or two classes in a grade, all classes in this grade were selected. If there were more than two classes in a grade, we randomly selected two classes. We surveyed all students in the sampled classes. Ultimately, we sampled a total of 13,232 students in these 134 schools.

The survey was administered to sample elementary school principals, teachers, students, and caregivers. The survey for principals, teachers, and caregivers contained a questionnaire only, while that for the students contained a questionnaire and three standardized tests. The questionnaires were designed to collect information about the independent reading habits and attitudes of rural elementary school students and their caregivers, teachers and school principals. Independent reading (*kewai yuedu*) was specifically defined in the survey as reading outside of school for a purpose not related to school. Part of the questionnaire adapted items from the Progress in International Reading Literacy Study (PIRLS) survey, an international measure of reading comprehension that is widely used throughout the world (PIRLS, 2011). The adapted questions also generated a standard measure of student confidence in reading. Additionally, the student survey questionnaire sought to capture how much time students spent reading for pleasure outside of class, how they felt about this activity, and their access to books at school and at home². Students were also asked to fill out a checklist of household consumption. The caregiver questionnaire collected information on whether they believe reading at home is an important activity, and whether the parents of students had out-migrated for more than six months during the previous 12 months period. If both of a student's parents have out-migrated for more than six months during the previous 12-month period, that student is considered to be a "left-behind child." Left-behind children generally have limited contact with their parents. In our sample, 37 % of students are left behind children.

In addition to the questionnaire, students also completed three standardized tests. Each test required 30 min to complete and the enumeration teams carefully timed and proctored the exams. We pre-tested the exams repeatedly to ensure their relevance and to make sure the time limits were appropriate. The first test was carefully designed to measure reading skills. The reading test questions were adapted from those found in the PIRLS test. The reading test questions were carefully translated according to the PIRLS translation guidelines and reviewed by a panel of experts and local teachers who are well-versed in China's education system. The translated reading tests then went through

¹ Due to geographic and population differences between the sample areas in these two provinces, Guizhou has much fewer schools than Jiangxi. Our sample area in Jiangxi is in a basin with a population of 9.8 million. In contrast, the sample area in Guizhou is a mountainous area with a population of just over 1 million and much lower population density than Jiangxi (China National Bureau of Statistics, 2015). Because of this, in the sample drawn from Guizhou there was a smaller number of schools in the sample frame after excluding schools with fewer than 100 students.

² In rural China, books have been shown to be the main reading resource for children. Previous studies show that rural students have very limited access to reading material on digital devices. For example, only 10% of the rural students have a computer at home and only 5% of them have access to the internet (Yang et al., 2013), while over 70% of the rural primary students have never used the internet (Mo et al., 2015).

several rounds of pilot testing 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. We administered the reading test to all sample students.

The two remaining standardized tests were in math and Chinese language. Both tests were carefully designed with assistance from educators in the local bureaus of education to ensure coherence with the national curriculum. Due to time constraints, however, we did not administer the Chinese language and math tests to all sample students. Instead, in each of our sample classes, we randomly assigned half of the students to take the language test and the other half to take the math test.

2.2. Statistical approach

In investigating how independent reading is correlated with reading skills and performance in math and Chinese (results reported in the next subsection), we regress student standardized test scores in reading, math, and Chinese on student reading behaviors, attitudes, and access to books at school and home. We estimate the following ordinary least squares (OLS) model:

$$Y_{ijc} = \alpha + \beta' Read_i + \gamma' X_{ij} + \phi_c + \varepsilon_{ijc} \quad (1)$$

where the dependent variable Y_{ij} indicates the standardized test score of student i in school j and county c , $Read_i$ is a vector that includes four variables pertaining to reading. Specifically, $Read_i$ includes whether student i is an independent reader (equaling 1 if the student spends more than 60 min per day on independent reading, and equaling 0 if the student does not); whether the school has a library (1 = yes, 0 = no); whether the student borrows books from the school library (1 = yes, 0 = no); and whether the student's caregivers buy books for the student (1 = yes, 0 = no).

The vector X_i includes student, family, and school characteristics, which serve as controls. The student characteristics include student age (in years), student gender (1 = male; 0 = female), and boarding status (1 = boarding student; 0 = non-boarding student). The family characteristics include the household 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 whether the school size is larger than average (1 = yes, 0 = no). The school size in our paper is measured by the number of students in each school; the average school size in our sample is 510 students.

We estimate Eq. (1) for three dependent variables, including standardized reading test scores, standardized math scores and standardized Chinese scores. We also add county fixed effects, ϕ_c , to account for county-level heterogeneity.

2.3. Quantitative results

Table 1 indicates that in total the surveyors collected data from 13,232 students in 134 rural schools across six counties in Guizhou and Jiangxi provinces.

As shown in **Table 2**, fifty-two percent of the sample students were male, which is consistent with the gender ratio in rural China (China National Bureau of Statistics, 2015). Sample students ranged in age from nine to fifteen and grades three to six, with an average age of 11.2. About nine percent of the students are boarding at school; this proportion is close to the national average for rural primary students.³

On the whole, students reported limited independent reading behavior and did not typically report placing much value on independent reading. Less than one in five students reported reading for pleasure for

³ According to China Educational Statistics Yearbook, on average, 11% of the rural primary students are boarding students (Ministry of Education, 2015).

at least an hour per day (row 5). Only about one in ten students (12 percent) were indicated as confident readers (according to the PIRLS metric⁴; row 6). A large majority of students did not believe independent reading to be helpful for Chinese or Math class (only 39 and 21 percent agreed it is helpful, respectively; rows 7 and 8). Interestingly, although most schools in rural China have libraries, only twenty percent of students indicated they borrowed books from the school library (row 9). Moreover, as will be discussed in the next section, even when students report borrowing books, it is possible that many of these books are exercise books, rather than leisure reading materials.

The weak attitudes of students toward independent reading reflected in the results above are generally shared among caregivers. Less than ten percent of caregivers were reported to have purchased independent reading books for their children (row 10). Even fewer (6.2 percent) had ever read to their children at home (row 11). At most, only 27 percent caregivers are thought to value reading at home (but, again, it is not clear if caregivers value independent reading rather than reading/reviewing exercise books—row 12).

School principals generally support the notion that independent reading can improve grades in Chinese class. According to our data, 69 percent believe this is true (row 13). Interestingly, this means that 31 percent of the sample principals do not believe there is a connection between independent reading and language performance. Barely one in ten agree independent reading can help a student in their math test score (11 percent; row 14).

Perhaps not surprisingly given the tepid support for independent reading among caregivers, principals, and students themselves, students tend to have limited access to independent reading resources. Two thirds of students have less than ten books at home (69 percent, row 15). Most students report that their schools have a library (72 percent, row 16) but only a third of them indicate that it is open to the students (row 17).

Our quantitative result also suggests that there are differences between girls' and boys' reading habits (Appendix **Table A1**). For example, girls are more likely to spend more time on reading than boys, and the result is consistent using both the 30 min and 60 min cutoff. Girls are more likely to borrow books from the school library; this difference is significant at 1% level. Interestingly, we also find that the percentage of student reporting that caregivers buy books for them is slightly higher for girls than for boys. Girls outperformed boys in both the reading and Chinese tests, but not in math.

2.3.1. Reading and academic performance

Results from the multivariate analysis in **Table 3** reveal a number of insights about the correlates of reading resources, independent reading, and student academic performance.

First, the correlation analysis contains a number of results that may be helpful in understanding the independent reading environment in rural China. For example, the simple regression results show that whether a school has a library is positively correlated with student reading test scores in a statistically significant way (**Table 3**, column 1). When adding the variable about whether students borrows books from the library, the school library dummy variable still shows a significant positive correlation with student performance (column 2). This is probably because only 20 % of students borrow books from school

⁴ PIRLS Student Confidence in Reading (SCR) scale was used as an assessment of reading confidence. The SCR scale is an international assessment of reading confidence among grade 4 students that has been used in 49 countries of various development and income levels (Martin et al., 2011). The assessment contains seven statements, to which students are asked to indicate whether they "agree a lot," "agree a little," "disagree a little," or "disagree a lot" with each statement. A final SCR scale score is calculated based on how the student responds to each statement. Following PIRLS protocol, SCR scores were then used to sort students into three categories: "Confident," "Somewhat Confident," and "Not Confident".

Table 1

Sample sizes of quantitative surveys and number of interviewees in the qualitative study in Guizhou and Jiangxi Provinces, China.
Data source: Authors' data, 2015.

	(1) Students	(2) Caregivers	(3) Teachers	(4) Principals	(5) Education Bureau Officials
Quantitative data					
Guizhou Survey	2,152	2,152	156	14	0
Jiangxi Survey	11,080	11,080	576	120	0
<i>Total Surveys</i>	13,232	13,232	732	134	0
Qualitative Data					
Guizhou Interviews	16	10	18	4	3
Jiangxi Interviews	46	322	213	113	0
<i>Total surveys</i>	62	332	231	117	3

Table 2

Summary Statistics on Independent Reading in China's Rural Elementary Schools.
Data source: Authors' survey, 2015.

	(1) Mean	(2) SD	(3) Min	(4) Max
<i>Student biographical data</i>				
1. Gender (1 = Male)	0.520	0.500	0	1
2. Age (Years)	11.150	1.047	9	15
3. Boarding at school (1 = Yes)	0.093	0.291	0	1
<i>Student independent reading behavior and attitudes</i>				
4. Spend more than 30 min on reading per day (1 = Yes)	0.437	0.491	0	1
5. Spend more than 60 min on reading per day (1 = Yes)	0.176	0.381	0	1
6. Students confident in reading (PIRLS scale) (1 = Yes)	0.116	0.320	0	1
7. Students think reading helps Chinese score	0.392	0.488	0	1
8. Students think reading helps Math score	0.206	0.404	0	1
9. Borrow books from school library (1 = Yes)	0.200	0.400	0	1
<i>Caregiver and school principal independent reading attitudes</i>				
10. Caregivers buy books for students (1 = Yes)	0.097	0.296	0	1
11. Caregivers read to students (1 = Yes)	0.062	0.242	0	1
12. Caregivers think reading is important at home	0.270	0.444	0	1
13. Principals think reading helps Chinese score	0.691	0.461	0	1
14. Principals think reading helps Math score	0.111	0.314	0	1
<i>Student independent reading resources</i>				
15. Have less than 10 books at home (1 = Yes)	0.692	0.461	0	1
16. School has library (1 = Yes)	0.722	0.448	0	1
17. School library opens to students (1 = Yes)	0.337	0.472	0	1

Note: 13,232 students participated in the survey.

library. However, when adding the variable of whether students read books to the model, whether the student reads for more than 60 min per day shows significant correlation with student performance (column 3),

but the school library variable becomes insignificant.

Of course, there is a caveat to the finding that in the full regression models (columns 4–6) school libraries are not significantly associated with better test performance. We can see that when controlling for whether students get books from the library, students actually reading the books is significantly associated with better academic performance. This suggests that school libraries only impact student reading and academic outcomes if students borrow books from libraries and actually read them.

Among those students that do read independently for a significant amount of time each day (60 min), test scores are significantly higher across all subject areas: reading (0.14 SD), math (0.13 SD) and Chinese (0.14 SD). All three results are statistically significant at the 1 percent level (columns 4–6). Such results are consistent with those found elsewhere in the literature. For example, international studies show that students who read independently score higher on achievement tests than those who do not (Cunningham and Stanovich, 1991; Krashen, 2004; Stanovich and Cunningham, 1993).

Students that receive books from their caregivers are more likely to perform worse on all three standardized tests, reading, math, and Chinese (all significant at the 1 percent level; row 4, columns 4–6). In other settings outside of rural China, researchers have found negative correlations between tutoring classes and student performance (Cheo and Quah, 2005; Ha and Harpham, 2005). One interpretation of this result is that parents respond to their children performing poorly in school by taking remedial action. In our case, parents may be responding to students performing poorly in school by purchasing books to help them learn. We also explore this finding further in the qualitative analysis.

To check for robustness, we also undertake the analysis using different standards to identify children who read independently. The results of both checks are consistent. Students that spend even 30 min a

Table 3

OLS Estimates of the correlations between student reading and academic performance.

	(1) Reading Score	(2) Reading Score	(3) Reading Score	(4) Reading Score	(5) Math Score	(6) Chinese Score
1. School has a library, 1 = yes	0.11** (0.05)	0.11** (0.05)	0.03 (0.05)	0.03 (0.05)	0.02 (0.05)	0.01 (0.07)
2. Borrows books from school library, 1 = yes		0.03 (0.04)	0.03 (0.04)	0.04 (0.04)	0.00 (0.04)	0.06 (0.06)
3. Spends 60 min. or more on reading per day, 1 = yes			0.13*** (0.03)	0.14*** (0.03)	0.13*** (0.03)	0.14*** (0.04)
4. Caregivers buy books for student, 1 = yes				-0.23*** (0.03)	-0.34*** (0.04)	-0.19*** (0.04)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,232	13,232	13,232	13,232	6,944	6,288
R-squared	0.044	0.044	0.053	0.058	0.061	0.076

Note: all regressions above include county fixed effects. Cluster-robust standard errors adjusted for clustering at the school level in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

Control variables include student's gender, age, boarding status, family asset value, and school size.

day (rather than 60) also are more likely to perform better on all three tests. Similar results are had when we use students who are confident readers according to their responses to questions adapted from the PIRLS questionnaire. The 30 min reader and confident reader results are reported in Appendix Tables A2 and A3, respectively. In these tables, as with the 60 min readers reported above, spending more time reading is positively correlated not only with better reading ability but also higher academic achievement in math and Chinese.

In sum, the quantitative findings do not show that students, their caregivers, or school principals attach much importance to independent reading despite an unambiguous positive correlation between independent reading and school performance. The lack of attention paid to independent reading is made clear by the generally low level of reading and reading confidence among students, the lack of support for independent reading on behalf of caregivers and principals, and the under-utilized nature of reading resources such as books purchased on the market or borrowed from the library. In fact, as shown in a paper by Gao et al. (2018), when compared to the PIRLS, 2011 international results in reading, rural China appears to be an extreme outlier: students reading skill test and confidence in reading score among the lowest in international reading scales. The lack of independent reading may be one reason why rural students' academic performance are far behind their urban peers in China (Loyalka et al., 2014).

3. Qualitative data and results

3.1. Qualitative data collection

As part of our effort to interpret and better understand key findings from the quantitative analysis, we conducted three waves of qualitative interviews. Specifically, we wanted to investigate why many students do not read, why the utilization of school libraries is low, and why caregivers buying books for their children is negatively correlated with test scores. A qualitative analysis in this case is needed, since we found it difficult to quantify, using standard pre-coded questions, many of the beliefs and norms and actions that underlie behavior in rural China when it comes to independent reading.

To conduct the qualitative study, we systematically took steps to organize this part of the study into three waves. First wave interviews occurred over a five-day period in April 2015. A team of 12 enumerators conducted in-person interviews with 213 randomly selected math and Chinese teachers and 120 principals from 120 schools in Jiangxi province. According to the main caregiver's phone number each student provided in the survey form, the team also conducted telephone interviews with 322 caregivers of students. 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 min and were a structured set of free-response questions, including: Is independent reading valuable for students? What kind of books should students read? Does independent reading impact students' academic performance? Do you buy books for your child?

The second wave interviews were conducted in June 2015. A five-person team interviewed students, caregivers, teachers, and education bureau officials from ten elementary schools in two of the sample counties in Guizhou province. In total, 16 students, ten caregivers, 18 teachers, four principals, and three education bureau officials were interviewed⁵. The interviews lasted from 20–60 min and were semi-structured: interviewers referenced an 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

⁵ We tried to schedule interviews with all 10 principals of the sample schools in Guizhou. Six of the principals could not make time for the interview and four of them agreed to be interviewed.

transcribed with personally identifiable information removed.

For the third wave of interviews, interviews were conducted one-on-one by phone in July 2015. In order to learn what factors may have driven book purchase behaviors, we randomly selected 46 students who read independently and ten caregivers who bought books for their children (according to the quantitative survey data). 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.

3.2. Qualitative findings

The qualitative patterns from our interviews allowed us to shed further light on our three main quantitative findings: why many students do not read, why the utilization of school libraries are low, and why caregivers buying books for their children is negatively correlated with test scores. First, our interviews suggest that the low prevalence of independent reading in rural China is associated with the following potential barriers: *inaccessible bookstores*, *curriculum constraints*, and *unsupportive home environments*. Second, our interviews illuminate why the utilization of school libraries is low. Based on our interviews, we suggest that the *poor quality of school libraries* and *insufficient school investment in reading resources* may contribute to the low utilization of libraries. Third, we examine why children whose caregivers buy them books perform worse on the tests. Our qualitative interviews present two possible explanations: *books are purchased as a remedy for weak academic performance* and *books are not suited for independent reading*. In the following section, we explore each of these three themes in detail.

3.2.1. Barriers to reading in rural areas

In general, we find three main factors that appear to be acting as barriers to reading: students in rural areas lack suitable independent reading books; rural students do not always have sufficient free time; and 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.

3.2.1.1. 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 would 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 ten townships with over 60 schools and an estimated 10,000 students. However, not a single township contained a bookstore or a store that sold extracurricular reading books for children. This severe supply-side constraint may factor into children's low independent reading habits.

3.2.1.2. 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.

Perhaps the most emphasized of these responsibilities is preparing students for the high-stakes examinations that begin in elementary school and last through selection into tertiary schooling (Loyalka et al., 2014). As a result, classes often focus on test preparation (Thogersen, 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, which serves as the central source of teaching and learning material for the majority of rural schools throughout the country (Huang, 2004; Paine, 1998). Similar to studies found in other developing countries (Duflo et al., 2011; Glewwe et al., 2009, 2011), our interviews indicate that this curriculum is quite difficult and the pace may be 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, I'm speaking frankly now, is too hard for rural students. 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 school 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. The teaching staff has a wide variety of tasks they must 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. These tasks take an enormous amount of time." (Teacher, 2022T1)

Even if there were sufficient time and resources to encourage independent reading, it is not clear that teachers value independent

reading, or are willing to 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 10 years ago. I've rarely gone in there. I don't think there are 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 watching 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, which suggests that students who fall behind in learning how to read at school will face difficulties in reading at home. In such a system, it also may not be surprising that many teachers do not emphasize independent reading—the focus is on scores and they may view textbooks and workbooks as the only keys to examination success.

3.2.1.3. Unsupportive home environment. Based on our interviews, the living situation of many rural students does not foster independent reading for two main reasons: significant time constraints faced by students outside of school and lack of encouragement for independent reading.

In China's elementary schools, school days are long, often extending from 7:30 a.m. to 5:00 p.m. 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 hour 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). 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 show that grandparents are often too busy and ill-equipped to supervise the studying 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)⁶

"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, rural students may lack the motivation or the choice to read. Reading independently may run counter to their caregiver's expectations and take away from valuable time they believe should be purely focused on academics.

3.2.2. Low utilization of school libraries

Almost by definition, school libraries are supposed to increase students' reading volume. However, although our quantitative results show that students who read independently are better readers and perform better in school, only twenty percent of students indicated that they borrowed books from the school libraries. This appears to be due in large part to the low utilization of school libraries: our quantitative data show that only a third of sample students indicated that school libraries were open to them.

Our qualitative interviews may help explain the matter. We found that libraries may lack sufficient human resources and suitable books to effectively improve student reading habits. One fundamental issue with many libraries in rural elementary schools is that they are often closed because of shortage of managers.

"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)

Additionally, school libraries are often closed due to a lack of suitable books. Schools are required to keep at least 15–30 books per students in school library (MOE, 2003). Due to fears of students losing books, schools often choose to close their libraries to students. In our interviews, teachers also revealed that schools close their libraries to students because they fear students will lose the books they borrow.

"Actually, we don't like leaving the library open very often. If we leave it open and children borrow books, they may not return them. If we get an inspection from above, we have to have a certain number of books in the library. If the kids take away the books, we may not pass the inspection – that would be a big problem. We have no choice but to keep our library locked". (Teacher, 1043T3)

Even when libraries are accessible, schools may lack control over the selection of the available books. Most books in rural schools are provided by donations or purchased 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)

Indeed, one reason that school libraries were not being used may be that students 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 (武侠小说)⁷ and nature books, respectively. School libraries, however, seem not to prioritize having these books in their collections; most 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 the 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 the students 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 how school libraries' do not promote better reading skills.

"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)

3.2.2.1. Insufficient school investment in school libraries. 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

⁶ As shown in Table 2, only 6.2 percent of the caregivers had ever read to their children at home.

⁷ Kung-fu novels are a popular genre of Chinese adventure literature that blend martial arts with historical fiction.

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). 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 pattern 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." (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.

In summary, school libraries face demand-side and supply-side problems that inhibit students from using them. On the demand-side, teachers encourage children to read materials that may be inappropriate given either their current reading level or their interests. Even if students had the liberty to choose books that they like, they may be unable to borrow books if the library is closed or the books are falling apart. Financial constraints also contribute to the inadequate libraries in rural schools. These constraints may explain, at least in some part, why only twenty percent of students borrowed books from school libraries.

3.2.3. Children whose caregivers buy books for them score worse on tests

The multivariate analysis shows that students whose caregivers buy them books are, on average, worse readers, and that the relation is statistically significant (Table 3, row 4). The qualitative interviews may explain this result by revealing that book purchases usually take place to remedy poor reading abilities, rather than to provide more materials for interested readers. Moreover, the interviews show the books that caregivers buy are often unsuitable for independent reading, and thus fail to satisfy their purpose.

3.2.3.1. Books for remedial learning. Our qualitative data suggests that the correlation between purchasing books and poor reading skills may

occur because caregivers buy books for children when they fall behind in school or cannot read as well as their peers. In our third wave interviews, 80 percent of caregivers who bought books for their children did so because their children were falling behind in school. This suggests that it is poor reading skills and/or 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." (Parent, 2021P1)

"My kid came back and 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." (Parent, 2021P2)

From this discussion, we also learn that caregivers do acknowledge the value of books in boosting learning. Given our earlier discussion on how bookstores can be scarce, it is possible that caregivers go to great lengths to be able to provide these books. However, the fact that caregivers only provide books when children are falling behind shows that caregivers may perceive the purpose of books as limited to an academic remedial tool. Alternatively, this suggests that caregivers may be underestimating the value of reading books outside of school, as a path for acquiring skills or intellectual and cognitive growth which all children can benefit from, regardless of their academic performance.

3.2.3.2. Books are not suited for independent reading. When caregivers purchase books for their children, these books may go unread. Many rural Chinese caregivers 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." (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 Analects 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 classic from China's antiquity. The misalignment of caregivers' book preferences with their children's reading interests may thus be a factor driving low levels of reading among rural children.

4. Conclusion

This paper presents a mixed methods analysis of a large-scale survey on independent reading in six rural counties in the Guizhou and Jiangxi provinces in China. Using the quantitative data, we show that although there is a clear, positive correlation between independent reading and test scores in reading, math, and Chinese, support for independent reading in rural China is low among students, caregivers, and school principals. This finding is made clear by very low rates of independent reading and reading confidence among students, and an inattention on the part of caregivers and principals to the potential benefits of independent reading. Purchase of independent reading books on the market or borrowing them from local school libraries is uncommon.

Our qualitative interviews show possible mechanisms that may constrain independent reading habits. Rural students often have little or no convenient place to purchase books. Moreover, the school environment focuses heavily on testing, and students may therefore find little time or support from teachers for developing independent reading habits. Finally, the home environment in many rural households seems to

have internalized a negative view on independent reading whereby it is thought to substitute away from academic learning.

This study makes two additional findings about independent reading in China. First, our interviews with students, teachers and school principals suggest that library quality and an unappealing selection of books may limit the utility of libraries as independent reading resources. Our study also suggests that stakeholders view independent reading as a remedial solution for students falling behind in class rather than a valuable end in itself.

As the quantitative findings of the current study are correlational in nature, we cannot draw a causal relationship between student independent reading and school achievement. The positive correlation we found between student independent reading and school achievement could be due to self-selection of students into independent reading. For example, students with better academic performance may tend to spend

more time in reading. Further research employing experimental methodologies is required to better understand the extent to which increased independent reading and independent reading programs can actually raise student schooling outcomes, such as a randomized controlled trial involving an intervention that provides more suitable reading materials to children, steps to make school libraries more accessible, or reading instruction to students. Even at this early stage, however, the promise of independent reading to remediate learning and help students become inquiring and motivated learners warrants attention from China's educators and policy makers alike.

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Appendix A

Table A1
Difference in reading time and academic performance between girls and boys.

Variable	N	Girls (1)	N	Boys (2)	Difference (1)-(2)
Spends 60 min. or more on reading per day, 1 = yes	6346	0.184 (0.005)	6886	0.150 (0.004)	0.034***
Spends 30 min. or more on reading per day, 1 = yes	6346	0.477 (0.006)	6886	0.401 (0.006)	0.075***
Borrows books from school library, 1 = yes	6346	0.215 (0.005)	6886	0.186 (0.005)	0.029***
Caregivers buy books for student, 1 = yes	6346	0.103 (0.004)	6886	0.091 (0.003)	0.012**
Reading Score	6346	0.058 (0.012)	6886	-0.048 (0.012)	0.106***
Math Score	3332	-0.110 (0.016)	3612	0.108 (0.017)	-0.218***
Chinese Score	3014	0.138 (0.018)	3274	-0.120 (0.017)	0.258***

*** p < 0.01, ** p < 0.05, * p < 0.1.

Table A2
OLS Estimates of the correlations between reading and academic performance for students who spends 30 min. or more on reading per day.

	(1) Reading Score	(2) Math Score	(3) Chinese Score
1. Spends 30 min. or more on reading per day, 1 = yes	0.26*** (0.04)	0.33*** (0.04)	0.18*** (0.05)
2. School has a library, 1 = yes	0.02 (0.05)	0.01 (0.05)	0.01 (0.07)
3. Borrows books from school library, 1 = yes	-0.06* (0.04)	-0.13*** (0.04)	-0.01 (0.06)
4. Caregivers buy books for student, 1 = yes	-0.22*** (0.03)	-0.34*** (0.04)	-0.18*** (0.04)
Controls	YES	YES	YES
R-squared	0.063	0.071	0.077
Observations	13,232	6,944	6,288

Note: all regressions above include county fixed effects. Cluster-robust standard errors adjusted for clustering at the school level in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

Control variables include student gender, age, boarding status, family asset value, and school size.

Table A3

OLS estimates of the association between independent reading with reading skills and academic performance.

	(1) Reading Score	(2) Math Score	(3) Chinese Score
1. Confident reader, 1 = yes	0.52*** (0.03)	0.39*** (0.03)	0.49*** (0.04)
2. School has a library, 1 = yes	0.04 (0.04)	0.03 (0.05)	0.01 (0.07)
3. Borrows books from school library, 1 = yes	0.03 (0.04)	-0.00 (0.04)	0.05 (0.06)
4. Caregivers buy books for student, 1 = yes	-0.23*** (0.03)	-0.34*** (0.04)	-0.19*** (0.04)
Controls	YES	YES	YES
R-squared	0.083	0.075	0.098
Observations	13,232	6,944	6,288

Note: all regressions above include county fixed effects. Cluster-robust standard errors adjusted for clustering at the school level in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

Control variables include student gender, age, boarding status, family asset value, and school size.

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