

November 2017

Student Confidence in Reading in Rural China

Qiufeng Gao, Hongmei Yi, Huan Wang, Yaojiang Shi, Cody Abbey, and Scott Rozelle

Abstract

This paper aims to investigate student confidence in reading in a developing and middle-income country by collecting and reporting on survey data from 135 primary schools in rural China. In the survey, we adopted and conducted the Progress in International Reading Literacy Study (PIRLS) scales of confidence in reading and reading skills test items. Our analysis shows that compared to the other 45 countries/regions that took the PIRLS tests, rural China ranks last (or the lowest) with regard to student confidence in reading and reading achievement. The correlation analysis reveals that in rural China there is a strong correlation between reading confidence and reading achievement. Particularly, the correlation is stronger among the worse readers. Additionally, school and teacher factors are found to be associated with reading confidence. Specifically, having an accessible classroom library is associated with higher reading confidence, especially among the poor readers. Teacher instruction in reading, including whether key reading skills are taught in an early grade or whether teachers use children's books in instruction, correlates with higher confidence in readers for high achievers. Overall, our findings indicate that the government should develop effective policies to improve student confidence in reading and reading skills in China, especially in rural China.

Keywords: reading achievement, confidence in reading, rural China

Working Paper 327

November 2017

reap.fsi.stanford.edu



Student Confidence in Reading in Rural China

Introduction

The beliefs people hold about their capabilities exert a powerful influence on the level of accomplishment that individuals ultimately realize (Pajares & Schunk, 2001). Individuals tend to engage in tasks about which they feel competent and confident and avoid those about which they do not (Bandura, 1986). Such beliefs also help determine how much effort people will expend on an activity, how long they will persevere when confronting obstacles, and how resilient they will be in the face of adverse situations (Schunk, 1981; Schunk & Hanson, 1985; Schunk, Hanson, & Cox, 1987).

Confidence in reading is believed to have a strong influence on reading achievement and other academic outcomes. Studies have found a positive relationship between confidence in reading and reading achievement (Pajares & Valiante, 1997, 1999). Studies also have suggested that there is a causal effect of confidence in reading on student academic achievement (Schunk et al., 1987; Schunk & Swartz, 1993). Students who have confidence in the fact that they have a strong ability in reading are more motivated readers and are more likely to continue to improve their reading skills by building on current levels of learning (Charlton, Williams, & McLaughlin, 2005).

School environment and teaching practices are among the most important factors that influence student confidence (Stiggins, 1999). The literature suggests that it is through the efforts of teachers at school that persuade students that they are capable and can acquire the skills to achieve academic success that student confidence can be increased (Pajares & Schunk, 2001; Pajares & Valiante, 1997; Schunk, 1991). Improving confidence and engagement in

reading may also compensate for any reading disadvantages that have arisen due to low family income and social status. Confident readers from poor socioeconomic backgrounds may even achieve better reading outcomes (or improve more when given reading instruction) than less confident readers from more well-off socioeconomic backgrounds (Wigfield & Guthrie, 1997).

Although a large number of studies have been done to investigate student confidence and its correlates, most of them focus on developed countries or high-income countries (Griffin, Burns, Snow, & others, 1998; Lonigan & Shanahan, 2009). Developing countries or low/middle-income countries provide an interesting case to study how the school environment can affect student confidence because they differ from the developed countries or high-income countries in not only the degree of access to educational resources but also culture and values that shape educational practices (Glewwe, 2002; Glewwe, Hanushek, Humpage, & Ravina, 2011). Studies have documented the low levels of literacy and deficits in reading ability in developing countries (Thorndike, 1976; Goldstein*, 2004; United Nations Educational & (UNESCO), 2012). However, to our knowledge, no empirical study has ever been conducted to assess the correlation between confidence in reading and reading achievement as well as how the school environment and teaching practices are associated with confidence in reading in developing countries.

In this study, we mainly focus on China and primary school students from rural regions of the country. In this way China is not only representative of a developing world environment, but specifically a developing environment in Asia. Examining student confidence in reading in an Asian country may be of particular interest since students from Asian countries overall – when compared to students in other parts of the world – are often found to exhibit different degrees of confidence depending on the academic area or skill in question. The early studies on

international differences in confidence regarding general knowledge (e.g., answering questions such as whether Europe is larger than America) showed that Asian students tended to be more confident than British or American students (Wright et al., 1978; Wright & Phillips, 1980; Yates et al., 1989; Yates, Lee, & Shinotsuka, 1996). In contrast, other studies have documented that Asian students were less confident than American students in the areas of math and other academic subjects in general (Krauthammer, 1990; Salili, Chiu, & Lai, 2001). In the case of reading, there might be one additional element of student confidence since Chinese characters are more difficult to learn (than a language based on an alphabet). It is possible that a character-based language, particularly one with as many characters as Chinese, may undermine student confidence in reading. Given such dynamics, and despite the potentially interesting findings that a cross-country reading confidence study that includes Asian countries might produce, to our knowledge, no such studies have yet been conducted.

China provides an interesting case to investigate student confidence in reading. The severe educational inequalities that exist between China's urban and rural areas may hinder the nation's meteoric economic growth and social harmony; thus, a further emphasis on reading could be beneficial in China (Wang, Liu, Zhang, Shi, & Rozelle, 2013; Zhang, Yi, Luo, Liu, & Rozelle, 2013). As increasing the focus on reading has been shown to be beneficial for educational outcomes in developed countries, it is possible that this could have a similar effect in China and, therefore, narrow China's educational gap (Kim, 2006; Kim & Quinn, 2013). In its 2014 annual work report, the Chinese government announced a new, nationwide initiative for an increased focus on reading, and so it appears that the nation's leaders have realized the importance of improving reading skills (People.cn, 2015). Since then, many programs have been established across the country to encourage reading, especially in less developed regions

(GMW.cn, 2015). However, there has been yet no study that compares China with other nations in regards to confidence in reading and its correlates.

Given this absence of evidence in the literature, in this paper our overall goal is to investigate student confidence in reading in rural China, a context that represents one of developing and middle-income Asian nations. To meet this goal, we have three specific objectives. First, in order to understand how rural Chinese students perform against the rest of the world, we compare student confidence in reading and reading achievement between rural Chinese students and students in other countries/regions that participated in the Progress in International Reading Literacy Study test (henceforth *PIRLS*). Second, we use our data to examine the relationship between confidence in reading and reading achievement among sample students with different levels of reading achievement. Finally, we explore the factors associated with the school environment and teaching practices that correlate with confidence in reading among sample students with different levels of reading achievement.

To meet this goal and the specific objectives, the rest of the paper is organized as follows. In the next section, we describe our sampling, data collection, and statistical approach. In section three we present our results. In the final section we end with a discussion and concluding remarks.

Data Collection and Empirical Methods

Sampling Procedure and Data Collection

This paper draws on survey data collected by the authors in May 2015. The sample was chosen in several steps and covers primary schools in different regions of rural China. First, we sampled two provinces in China: Guizhou and Jiangxi, which are representative of the populous, predominantly rural provinces in China's hinterland. The average annual income of

the rural residents of Jiangxi and Guizhou in 2013 was 2,005 USD (PPP adjusted), which was close to, but slightly lower than, the national average in China’s rural areas (2,511 USD—PPP adjusted, National Bureau of Statistics of China, 2014). After selecting the two sample provinces, we selected three counties within each province. These counties, themselves, are close to being representative when compared to the province’s average rural income (their average annual income was 2,025 USD—PPP adjusted). Within each of these six counties, we randomly selected 135 rural primary schools. In each school, we then randomly chose at most two classes in the fourth grade of each sample school. In total, we included 4,616 students in grade 4 from the 135 sample primary schools in the study. Given the way we collected the data, we believe it is possible to say that the data from the sample schools to a certain degree can represent the vast areas of poorer rural populations in China.

In our survey, we adopted the test items and survey questions from the PIRLS (Mullis, Martin, Foy, & Drucker, 2012). Prior to our study, the PIRLS had been used as an assessment of reading achievement and attitudes (including confidence in reading) of grade 4 students across 45 countries/regions of a variety of different development and income levels (i.e. developing, developed, high-income, and middle-income countries/regions—Table 1). Using PIRLS survey questions and test items, we collected information on student confidence in reading and reading achievement. The PIRLS scale of confidence in reading contains seven statements and students were asked to rate how much they agree with each of the statements (see Appendix Table 1 for a list of the statements). The confidence score is calculated based on how the student responds to each statement. Students were also asked to complete a 30-minute reading test that used test items from the PIRLS pool. The test items were carefully translated according to the PIRLS translation guidelines and the content validity was reviewed by a panel

of experts and local teachers who had a familiarity with rural China's education system. The translated reading tests then went through several rounds of pilot testing in a number of rural schools. The results were reviewed independently by a group of test assessment experts and revised to ensure they were of the highest quality and appropriate for the student ability levels.

Besides the reading confidence scale and the reading achievement test, we also collected a set of school and teacher characteristics through the PIRLS survey questions. This part of the survey sought to capture student access to books, e.g., whether the school library has 5,000 or more book titles, and whether the class has a classroom library. Teachers were surveyed about their gender, education levels, teaching experience, and professional training hours in reading in past two years, as well as asked several questions about at which grade do schools emphasize a set of eleven key reading skills and whether they use children's books in reading instruction. We also calculated teacher-student ratios based on the answers of principals to the survey questions.

In addition to the school and teacher characteristics, we also administered two tests and surveyed students about their home learning environment and individual characteristics. Students were randomly chosen to finish a 30-minute math test or a 30-minute Chinese language test. The tests were standardized across all schools and were carefully proctored to ensure the test quality. The survey questions covered information such as student gender, whether students have fewer than 10 books at home, and whether students have their own room for study at home.

Statistical Approach

In investigating the correlates of confidence in reading, we regressed the outcome variable of the student score on the scale of confidence on the variables of reading test score,

access to books at school, teacher characteristics and reading instruction, as well as a set of control variables. Specifically, in the paper we estimated the following ordinary least squares (OLS) model:

$$Y_{ijc} = \alpha + \beta'Score_i + \gamma'Access_{jc} + \delta'Teacher_{jc} + \theta'X_i + \phi_c + \varepsilon_{ijc} \quad (1)$$

where the dependent variable Y_{ijc} indicates the scaled score of confidence in reading of student i in school j and county c . $Score_i$ is the student's reading test score. The vector $Access_{jc}$ includes variables that indicate student access to books at school, i.e. whether the school library has 5,000 or more book titles and whether the student has a classroom library. $Teacher_{jc}$ is a vector of variables that indicate teacher characteristics (teacher gender, teacher education, teaching experience, professional training hours in reading in past two years) and teaching practices (whether students are taught key reading skills at grade 4 or higher and whether teacher uses children's books in reading instruction). X_i includes a set of control variables (student gender, student math or Chinese test score, teacher-student ratio, student has fewer than 10 books at home and student has own room for study at home). We also add county fixed effects, ϕ_c , to account for county-level heterogeneity.

In addition, we examine how correlates vary among students with better and worse reading skills. In doing so, we divided students into terciles based on their reading test scores and ran equation (1) among the three subgroups of students. In all these regressions, we accounted for the clustered nature of our sample by constructing Huber-White standard errors corrected for class-level clustering.

Results

Confidence in Reading and Reading Achievement of Rural Chinese Students

After comparing our results to the other 45 countries and regions in the PIRLS study, we found that rural China ranks at the very bottom in confidence in reading (Table 2). Only 11% of the students rated themselves as confident readers, 68% of the students rated themselves as (only) somewhat confident readers, and 21% rated as unconfident readers (Row 46). Most of the top-ranked countries/regions are high-income economies, such as Israel, Finland, Austria and Sweden. In these countries, almost 50% of student participants were found to be “confident.” Interestingly, despite the high levels of income and economic development, Chinese Hong Kong and Taiwan Province (henceforth *Hong Kong and Taiwan*) rank among the lowest with only around 20% of study participants calling themselves “confident” readers (Row 43 & 44). So what is the source of the poor levels of reading confidence in rural Chinese schools? While, in part, it could be due to being socioeconomically poorer, the results from Hong Kong and Taiwan suggest that it is possible that low confidence in reading is (at least in part) an Asian (or East Asian) trait, since the relatively low level of confidence in Hong Kong and Taiwan is clearly not an income issue.

The data from the reading tests show that rural China ranks again at the bottom of the list in reading achievement (Table 3). In other words, when comparing rural China relative to all other countries/regions that have taken and reported the results of PIRLS tests, we find that readers in rural China are the weakest in terms of reading achievement (Row 45). Hence, it is clear that the hypothesis that confidence is a significant factor in determining reading achievement is supported by the case of our rural Chinese schools. When we look at different reading skills separately by categorizing test items into those that test the skills of information retrieval and inference as well as the skills of integration and text evaluation, we find that rural students from China got the lowest percentage correct on both sets of test items (Row 45). In

other words, this result suggests that rural Chinese students are weak in both the basic and more advanced sets of reading skills.

The importance of confidence in explaining reading achievement levels is somewhat undermined by the reading achievement scores of students from Hong Kong and Taiwan. Hong Kong and Taiwan, in contrast to their rankings of confidence, performed well in reading achievement. In fact, the students from Hong Kong are the top performers, and students from Taiwan rank 16th (out of 45, nearly in the top tercile) in reading achievement (Table 3, Row 1 & 16).

So what is driving the higher reading achievement test scores of Hong Kong and Taiwan? It is possible that in the case of these two Asian economies, there is an income effect that overcomes the absence of student confidence. Interestingly, when looking at the correlation between student reading achievement test scores and GNI per capita in all of the international PIRLS countries/regions, there is clearly a positive relationship between reading achievement and levels of national income (Figure 1). Compared to the other countries/regions, Hong Kong ranks 15th in GNI per capita and 1st in reading achievement while Taiwan ranks 25th in GNI per capita and 16th in reading achievement. Considering that nations with higher incomes are more likely to provide more educational resources, our findings suggest that while confidence in reading may be important, access to adequate reading resources may also be playing an important role in student reading development.

Correlation between Reading Confidence and Reading Achievement in Rural China

Despite the differences in the relationship between confidence in reading and reading achievement among Hong Kong/Taiwan and rural China, when applied to the entire sample of all countries/regions that took the PIRLS test (including our sample in rural China), the

correlation test demonstrates that confidence in reading is highly correlated with reading achievement, with a correlation coefficient of around 0.11 (significant at 5% level). The graph showing the relationship of each country or region is in Figure 2. Note that in this figure, Hong Kong and Taiwan appear to be outliers (low levels of student confidence in reading and high levels of reading achievement).

Using individual data from our rural China sample, we also examine the correlation between student confidence in reading and reading achievement among rural Chinese students (Table 4, Row 1). Overall, our sample data show that, when holding constant student access to books, teacher characteristics, teaching practices, and other student and school characteristics, reading achievement is highly correlated with confidence among rural Chinese students (Est. = 0.24, $p < .001$ —Row 1, Column 1).

When dividing the full sample by different levels of student reading skills, the correlation is stronger among the weaker performers in reading skills than the stronger performers in rural China. Specifically, the correlation is stronger for the students who scored in the bottom tercile (Est. = 0.44, $p < .001$) than the top tercile (Est. = 0.21, $p < .001$) or the middle tercile (Est. = 0.27, $p < .05$ —Table 4, Row 1, Columns 2 to 4). In other words, it appears as if for weaker readers in China's poor rural areas, the importance of confidence in reading is greater if these weak readers try to get higher reading achievements. When families/students are better off, weak readers (perhaps) may have other ways (e.g., lots of resources spent on reading classes or reading programs) that can offset the low confidence in reading and ultimately improve reading achievement. While we can not say for sure, in some way, the same dynamic may be at work here as was at work in the cases of Hong Kong and Taiwan (places where better off students had low confidence but higher reading achievement levels).

Correlation between Reading Confidence and School Environment/Teaching Practices in Rural China

So what factors are associated with student confidence in reading? Using our data from rural China sample, we first find that having access to books seems to have an impact on student confidence in reading (Table 4, Rows 2 & 3). Specifically, our results show that access to books at school affects student confidence in reading only if there is a classroom library, especially among weak readers. In rural China, books in school libraries do not appear to correlate with confidence in reading (Row 2). However, having a classroom library does positively correlate with confidence (Est. = 0.23, $p < .01$ —Row 3, Column 1). Again, the correlation is stronger for the students who performed poorly in the reading test (Est. = 0.43, $p < .001$ —Row 3, Column 4). The estimates of the correlation for the top and middle terciles are positive but not significant (Row 3, Columns 2 & 3).

Besides access to reading books, teacher characteristics and teaching practices are also shown to be associated with confidence in reading, especially among students with higher reading achievement (Table 4, Rows 4 to 9). Specifically, teaching experience positively correlates with the confidence of the better performers in reading (Est. = 0.01, $p < .05$ —Row 6, Column 2). In other words, the more experience a teacher has, the more confident the better readers are. If schools delay teaching key reading skills until grade 4, the better performers are less likely to do well (Est. = -0.14, $p < .05$ —Row 8, Column 2). In addition, the better performers seem to benefit from the use of children's books at school (Est. = 0.13, $p < .05$ —Row 9, Column 2). However, none of these teacher characteristics or teaching practices correlates with the confidence levels of worse performers (Rows 4 to 9, Column 4).

Discussion and Conclusion

This study provides a deeper understanding of primary school student confidence in reading in rural China, a place that has the characteristics of both a developing and middle-income Asian country. Our results indicate that Chinese students in rural areas exhibit low levels of confidence in reading. The analysis finds that in this aspect rural China ranks the lowest among all the countries/regions that participated in the PIRLS tests. It may be partly related to the fact that the student participants have weak reading skills. In fact, according to our data, the reading achievement of rural Chinese students is also the worst among all the PIRLS participant countries/regions. Our analysis also shows that there is indeed a positive correlation between confidence in reading and reading achievement in rural China (as well as among all sample countries/regions in the world). These results are consistent with the studies that found a positive relationship between the confidence in reading and reading achievement (Pajares & Valiante, 1997, 1999). Our results also support those of Krauthammer (1990) and Salili, Chiu, & Lai, (2001), which showed that Asian students tend to have lower confidence than American students in school subjects.

In rural China, having access to books is related with higher confidence in reading among those students with weaker reading skills. Our data show that having classroom libraries is highly correlated with confidence in reading as well. The literature suggests that classroom libraries provide ready access to books and magazines to students that can be part of their reading lessons and activities (Fractor, Woodruff, Martinez, & Teale, 1993; Worthy, 1996). One of the possible reasons for the low confidence in rural China could be the absence of classroom libraries. Compared with other countries/regions, rural China ranks among the lowest in the prevalence of classroom libraries (Appendix Table 2, Row 46). This suggests that one of the

main barriers for improving reading confidence in rural China may be the absence of books in the immediate learning environment of students.

Interestingly, having a school library does not seem to be related to student confidence in reading in rural China. In China, it is a national policy that every elementary school has to be equipped with a school library (Ministry of Education of the People's Republic of China, 2003). In fact, our data also demonstrate that 78% of rural students are in schools with school libraries. Interestingly, in this metric, rural China ranks 22th among all countries/regions (Appendix Table 3, Row 22). Media and research, however, have reported that the school libraries in rural schools are rarely used (Sohu News, 2016; Wang et al., 2015). School libraries often are only open when there are inspections from the government and are locked up the rest of the time. The rare usage of school libraries is likely to be the reason why having a school library is not correlated with confidence in reading in rural China. Therefore, making better use of existing school libraries may be a cost-effective way to improve student confidence in reading.

For students with stronger abilities in reading, reading instruction seems to be paramount in improving their confidence in reading. Particularly, if teachers incorporate key reading skills into instruction at an early stage, the better performers are likely to have higher confidence. Many studies have stressed the importance of introducing students to increasingly complex reading skills and strategies as they advance through elementary school (Geva, Chall, Jacobs, & Baldwin, 1993; Slavin, Lake, Chambers, Cheung, & Davis, 2009). The existing literature has also shown that if students are to be able to learn to read by the third grade, then the introduction to reading skills and strategies should begin when students enter the first grade, if not before (Martin & Mullis, 2013). The majority of countries that participated in PIRLS emphasized these skills at third grade or earlier, while 38% of rural Chinese students attend

schools where these skills are emphasized only at the fourth grade or even later (Appendix Table 4, Row 45). In addition, the use of children's books in instruction seems to be effective at increasing the levels of confidence of these students, perhaps because it can make students more interested in reading (Gunning, 2000). However, these teaching practices in reading instruction do not seem to matter for weak students in rural China. One of the possible reasons may be that the reading skills of the weaker performers in rural areas of China are so low that they cannot benefit from reading instruction that incorporates the key reading skills at early grades.

One of the explanations for the poor confidence of Chinese readers and their poor reading outcomes in the grade 4 PIRLS test may be that Chinese characters take longer to learn and thus, reading skills develop naturally slower. The results from Hong Kong and Taiwan, however, show that this is not universally true. In fact, the characters learned in Hong Kong and Taiwan are more complicated (traditional characters rather than the simplified characters that are used in mainland China). Hence, such comparisons would suggest that poor reading results arise mainly due to the absence of resources and focus on teaching reading instruction in rural Chinese schools.

Are there any other insights from our analysis that explain the interesting fact that students from Hong Kong and Taiwan have high reading achievement in spite of their low confidence in reading? Part of the reason for low confidence in reading in Hong Kong and Taiwan may be cultural, which is suggested by studies of Krauthammer (1990) and Salili, Chiu, & Lai, (2001). However, some characteristics of schools or teachers in these education systems may play a role as well. Our analysis suggests that access to books is only correlated with the confidence in reading of weak performers. Since both Hong Kong and Taiwanese students are overall strong readers as shown by the PIRLS results, increasing access to books may not

contribute much to confidence in reading. Indeed, access to books in developed nations and territories such as Hong Kong and Taiwan is no longer an issue. Appendix Table 2 shows that more than 90% of Hong Kong and Taiwanese students have classroom libraries (Rows 6 & 7). Appendix Table 3 further shows that 90% of students from Hong Kong and 82% of students from Taiwan have school libraries with 5,000 book titles or more (Rows 1 & 2). The two regions are highly ranked among all the countries/regions in terms of access to books. Our analysis also suggests that for strong readers, what likely matters more is reading instruction. The data supports our speculation: only 16% of students from Hong Kong and 17% of students from Taiwan received reading instruction on key reading skills at second grade or before (they are among the lowest-ranked countries/regions—Appendix Table 4, Rows 30 & 31). Although it is beyond the scope of the study to provide rigorous evidence for such speculation, the insights gathered from our analysis seem to suggest that one way to boost student confidence in reading in Hong Kong and Taiwan may be to introduce reading skills to students at an earlier stage in their elementary education.

Our study not only reveals that there are low levels of student confidence in reading in rural China, but it also suggests that the low confidence in reading could hinder the reading achievement of these students. For these reasons, decision makers in China’s education system must pay more attention to how to improve student confidence in reading and reading skills in rural China. Providing adequate access to books and improving teacher instruction appear to be important for improving student confidence in reading. Therefore, we suggest that the Chinese government should both make better use of existing school libraries as well as develop teacher training on methods of reading instruction, which could ultimately improve student confidence in reading and reading skills.

References

- Bandura, A. (1986). The explanatory and predictive scope of self-efficacy theory. *Journal of Social and Clinical Psychology, 4*(3), 359–373.
- Charlton, B., Williams, R. L., & McLaughlin, T. F. (2005). Educational Games: A Technique to Accelerate the Acquisition of Reading Skills of Children with Learning Disabilities. *International Journal of Special Education, 20*(2), 66–72.
- Fractor, J. S., Woodruff, M. C., Martinez, M. G., & Teale, W. H. (1993). Let's not miss opportunities to promote voluntary reading: Classroom libraries in the elementary school. *The Reading Teacher, 46*(6), 476–484.
- Geva, E., Chall, J. S., Jacobs, V. A., & Baldwin, L. E. (1993). The Reading Crisis: Why Poor Children Fall Behind. JSTOR. Retrieved from <http://www.jstor.org/stable/23087250>.
- Glewwe, P. (2002). Schools and skills in developing countries: Education policies and socioeconomic outcomes. *Journal of Economic Literature, 40*(2), 436–482.
- Glewwe, P. W., Hanushek, E. A., Humpage, S. D., & Ravina, R. (2011). School resources and educational outcomes in developing countries: A review of the literature from 1990 to 2010. National Bureau of Economic Research. Retrieved from <http://www.nber.org/papers/w17554>.
- GMW.cn. (2015). Reading Initiative in China [accessed June 4, 2017]. Retrieved from http://epaper.gmw.cn/gmrb/html/2015-01/06/nw.D110000gmrb_20150106_3-11.htm.
- Goldstein*, H. (2004). Education for all: the globalization of learning targets. *Comparative Education, 40*(1), 7–14.
- Griffin, P., Burns, M. S., Snow, C. E., & others. (1998). Preventing reading difficulties in young children. National Academies Press. Retrieved from http://books.google.com/books?hl=en&lr=&id=ggE9sixBdHEC&oi=fnd&pg=PT17&dq=preventing+reading+difficulties+in+young+children&ots=kxyGMmdnr7&sig=Q430wICOjE0QbS18yCHHjjR_pzk.
- Gunning, T. G. (2000). Creating literacy instruction for all children. ERIC. Retrieved from <http://eric.ed.gov/?id=ED449496>.
- Kim JS. (2006). Effects of a voluntary summer reading intervention on reading achievement: Results from a randomized field trial. *Educational Evaluation and Policy Analysis, 28*(4) :335-355.
- Kim, J. S., & Quinn, D. M. (2013). The effects of summer reading on low-income children's literacy achievement from kindergarten to grade 8: A meta-analysis of classroom and home interventions. *Review of Educational Research, 83*(3), 386-431.
- Krauthammer, C. (1990). Education: Doing bad and feeling good. *Time Magazine, 78*.
- Lonigan, C. J., & Shanahan, T. (2009). Developing Early Literacy: Report of the National Early Literacy Panel. Executive Summary. A Scientific Synthesis of Early Literacy Development and Implications for Intervention. National Institute for Literacy. Retrieved from <http://eric.ed.gov/?id=ED508381>
- Martin, M. O., & Mullis, I. V. (2013). TIMSS and PIRLS 2011: Relationships among Reading, Mathematics, and Science Achievement at the Fourth Grade—Implications for Early Learning. ERIC. Retrieved from <http://eric.ed.gov/?id=ED545256>

- Ministry of Education of the People's Republic of China. (2003). Rules for libraries in primary and secondary schools in China [accessed June 4, 2017]. Retrieved from http://www.moe.edu.cn/publicfiles/business/htmlfiles/moe/moe_35/201006/88596.html.
- Mullis, I. V., Martin, M. O., Foy, P., & Drucker, K. T. (2012). PIRLS 2011 International Results in Reading. International Association for the Evaluation of Educational Achievement. Herengracht 487, Amsterdam, 1017 BT, The Netherlands. Retrieved from <http://files.eric.ed.gov/fulltext/ED544362.pdf>.
- National Bureau of Statistics of China (2014). China Statistical Yearbook 2013. Beijing: China Statistics Press.
- Pajares, F., & Schunk, D. (2001). The development of academic self-efficacy. Development of Achievement Motivation. United States, 7. Retrieved from <https://pdfs.semanticscholar.org/f580/9944e9988646fbb58bbae6eb0366d2f61ff7.pdf>
- Pajares, F., & Valiante, G. (1997). Influence of self-efficacy on elementary students' writing. *The Journal of Educational Research*, 90(6), 353–360.
- Pajares, F., & Valiante, G. (1999). Grade level and gender differences in the writing self-beliefs of middle school students. *Contemporary Educational Psychology*, 24(4), 390–405.
- People.cn. (2015). Report on the work of the government [accessed June 5, 2017]. Retrieved from <http://www.people.com.cn/n/2015/0305/c347407-26643598.html>.
- Salili, F., Chiu, C., & Lai, S. (2001). The influence of culture and context on students' motivational orientation and performance. In Student motivation (pp. 221–247). Springer. Retrieved from http://link.springer.com/chapter/10.1007/978-1-4615-1273-8_11.
- Schunk, D. H. (1981). Modeling and attributional effects on children's achievement: A self-efficacy analysis. *Journal of Educational Psychology*, 73(1), 93.
- Schunk, D. H. (1991). Self-efficacy and academic motivation. *Educational Psychologist*, 26(3–4), 207–231.
- Schunk, D. H., & Hanson, A. R. (1985). Peer models: Influence on children's self-efficacy and achievement. *Journal of Educational Psychology*, 77(3), 313.
- Schunk, D. H., Hanson, A. R., & Cox, P. D. (1987). Peer-model attributes and children's achievement behaviors. *Journal of Educational Psychology*, 79(1), 54.
- Schunk, D. H., & Swartz, C. W. (1993). Goals and progress feedback: Effects on self-efficacy and writing achievement. *Contemporary Educational Psychology*, 18(3), 337–354.
- Slavin, R. E., Lake, C., Chambers, B., Cheung, A., & Davis, S. (2009). Effective reading programs for the elementary grades: A best-evidence synthesis. *Review of Educational Research*, 79(4), 1391–1466.
- Sohu News. (2016). Reasons of the inaccessible school libraries in rural China [accessed September 27, 2017]. Retrieved from http://www.sohu.com/a/57258619_241736.
- Stiggins, R. J. (1999). Assessment, student confidence, and school success. *The Phi Delta Kappan*, 81(3), 191–198.
- Thorndike, R. (1976). Reading comprehension in fifteen countries. *New Horizons in Reading*, 500–507.

- United Nations Educational, S., & (UNESCO), C. O. (2012). Youth and skills: putting education to work. UNESCO, Paris, France. Retrieved from <http://www.voced.edu.au/content/ngv:53464>
- Wang, H., Mo, D., Yi, H., Seevak, E., Manheim, R., Boswell, M., ... & Shi, Y. (2015). Independent Reading in Rural China's Elementary Schools: A Mixed-Methods Analysis. Reap, fsi. stanford. edu. Retrieved from https://reap.fsi.stanford.edu/sites/default/files/321_-_independent_reading_in_rural_chinas_elementary_schools.pdf.
- Wang, X., Liu, C., Zhang, L., Shi, Y., & Rozelle, S. (2013). College is a rich, Han, urban, male club: research notes from a census survey of four tier one colleges in China. *The China Quarterly*, 214, 456-470.
- Wigfield, A., & Guthrie, J. T. (1997). Relations of children's motivation for reading to the amount and breadth of their reading. *Journal of Educational Psychology*, 89(3), 420.
- Wikipedia. (2015). Developing country [accessed September 27, 2017]. Retrieved from https://en.wikipedia.org/wiki/Developing_country.
- World Bank. (2017). World Bank Country and Lending Groups [accessed September 27, 2017]. Retrieved from, <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>
- Worthy, J. (1996). Removing barriers to voluntary reading for reluctant readers: The role of school and classroom libraries. *Language Arts*, 73(7), 483-492.
- Wright, G. N., & Phillips, L. D. (1980). Cultural variation in probabilistic thinking: Alternative ways of dealing with uncertainty. *International Journal of Psychology*, 15(1-4), 239-257.
- Wright, G. N., Phillips, L. D., Whalley, P. C., Choo, G. T., Ng, K.-O., Tan, I., & Wisudha, A. (1978). Cultural differences in probabilistic thinking. *Journal of Cross-Cultural Psychology*, 9(3), 285-299.
- Yates, J. F., Lee, J.-W., Shinotsuka, H., Patalano, A. L., & Sieck, W. R. (1998). Cross-cultural variations in probability judgment accuracy: Beyond general knowledge overconfidence? *Organizational Behavior and Human Decision Processes*, 74(2), 89-117.
- Yates, J. F., Zhu, Y., Ronis, D. L., Wang, D.-F., Shinotsuka, H., & Toda, M. (1989). Probability judgment accuracy: China, Japan, and the United States. *Organizational Behavior and Human Decision Processes*, 43(2), 145-171.
- Zhang, L., Yi, H., Luo, R., Liu, C., & Rozelle, S. (2013). The human capital roots of the middle income trap: the case of China. *Agricultural Economics*, 44(s1), 151-162.

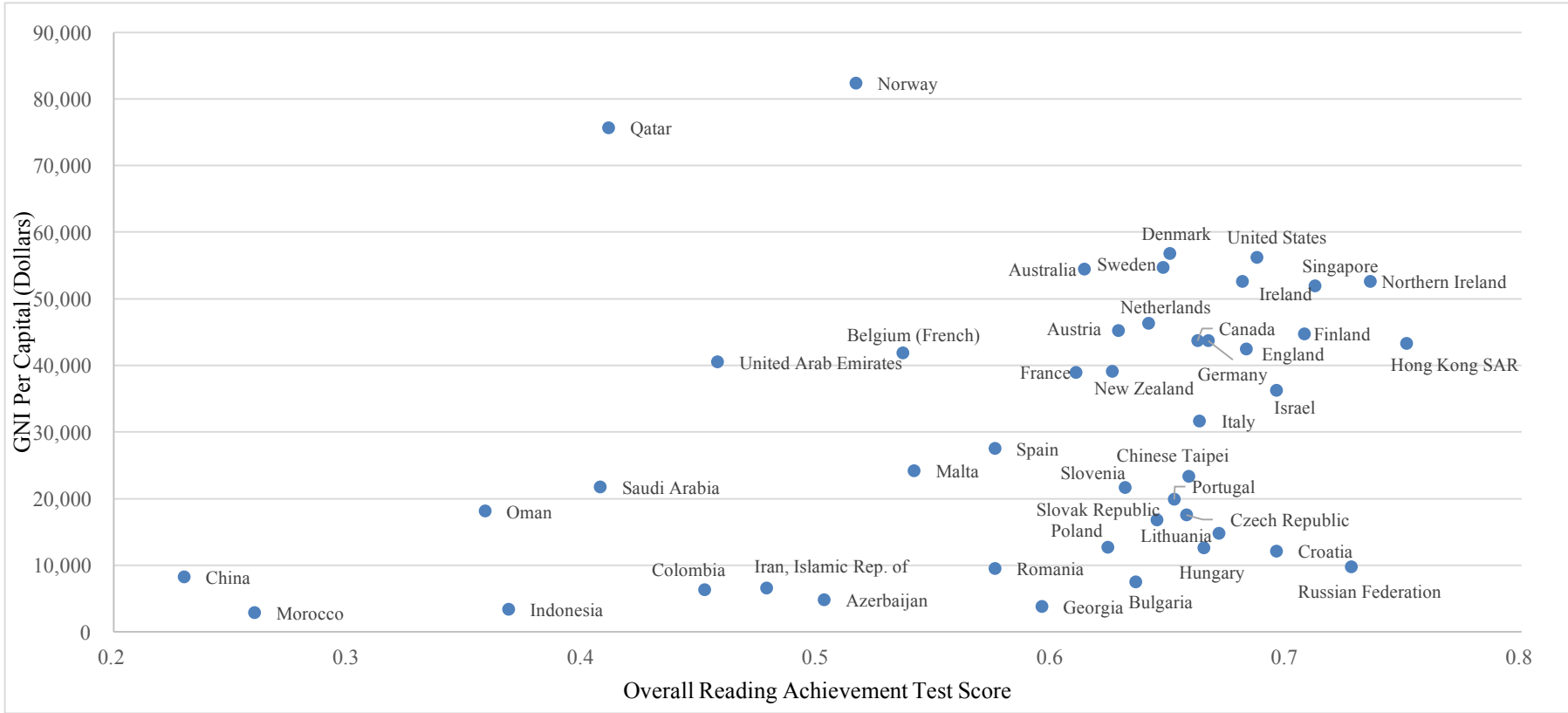


Figure 1: Correlation between Student Reading Achievement and GNI per Capital in All Countries/Regions

Source: Progress in International Reading Literacy Study (PIRLS) and authors' own data

Note: There are 46 sample countries/regions that took part in the PIRLS reading test (including our sample in rural China). The reading achievement is measured by the overall average student reading test score in each sample country/region. For the GNI per capita of each sample country/region we used the GNI per capita that was reported by the World Bank in 2016.

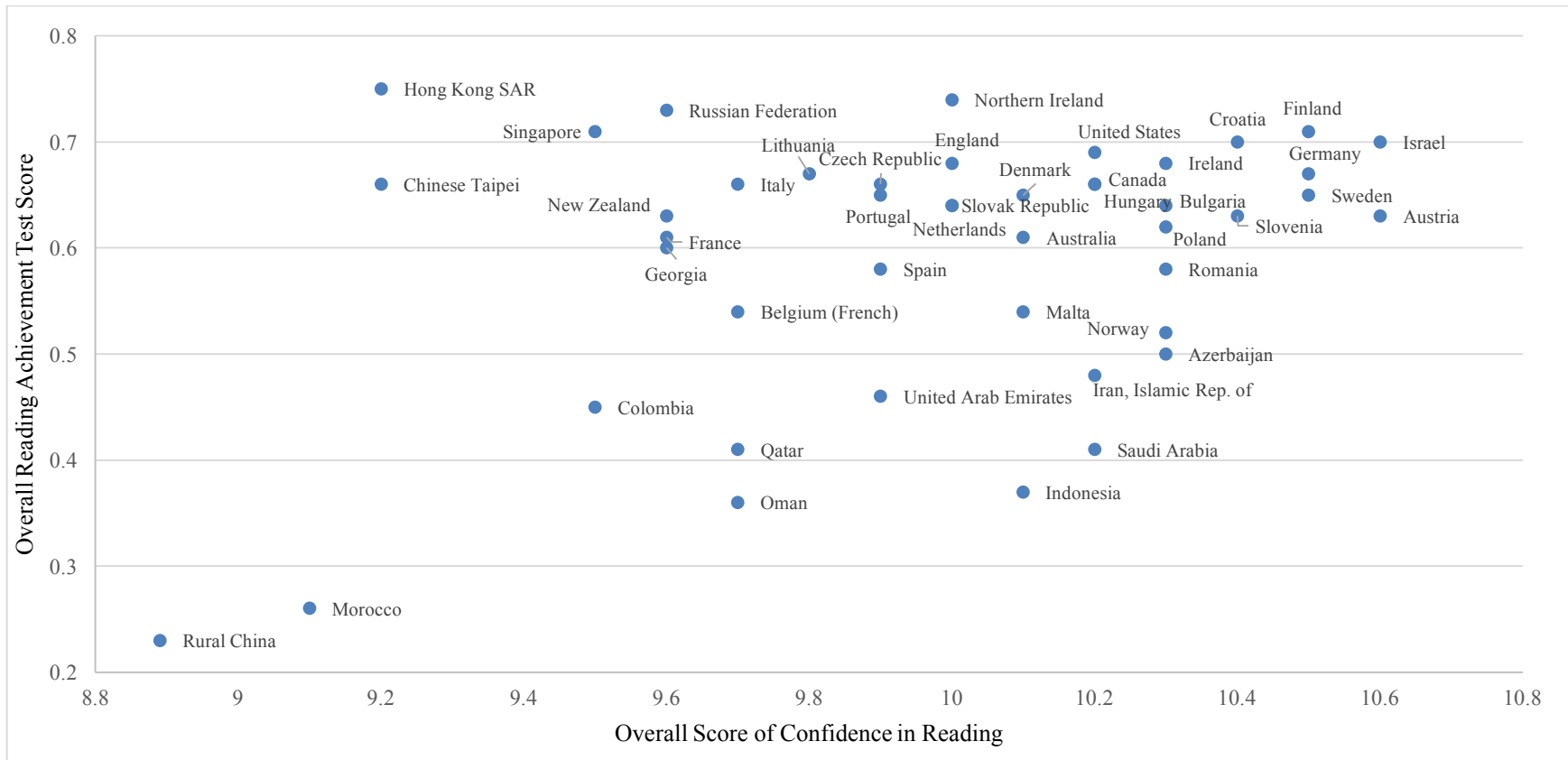


Figure 2: Correlation between Student Confidence in Reading and Reading Achievement in All Countries/Regions

Source: Progress in International Reading Literacy Study (PIRLS) and authors' own data

Note: There are 46 sample countries/regions that took part in the PIRLS reading test (including our sample in rural China). The confidence in reading is measured by the average scale score of student confidence in reading while the reading achievement is measured by the overall average student reading test score in each sample country/region.

Table 1: Sample Countries/Regions Classified into Different Income and Economic Development Groups

Country/Region	Type of Income Group	Type of Economical Development
1. Austria	High-income country/region	Developed country/region
2. Australia	High-income country/region	Developed country/region
3. Belgium (French)	High-income country/region	Developed country/region
4. Canada	High-income country/region	Developed country/region
5. Chinese Taipei	High-income country/region	Developed country/region
6. Czech Republic	High-income country/region	Developed country/region
7. Denmark	High-income country/region	Developed country/region
8. England	High-income country/region	Developed country/region
9. Finland	High-income country/region	Developed country/region
10. France	High-income country/region	Developed country/region
11. Germany	High-income country/region	Developed country/region
12. Hong Kong SAR	High-income country/region	Developed country/region
13. Ireland	High-income country/region	Developed country/region
14. Israel	High-income country/region	Developed country/region
15. Italy	High-income country/region	Developed country/region
16. Lithuania	High-income country/region	Developed country/region
17. Malta	High-income country/region	Developed country/region
18. Netherlands	High-income country/region	Developed country/region
19. New Zealand	High-income country/region	Developed country/region
20. Northern Ireland	High-income country/region	Developed country/region
21. Norway	High-income country/region	Developed country/region
22. Portugal	High-income country/region	Developed country/region
23. Singapore	High-income country/region	Developed country/region
24. Slovak Republic	High-income country/region	Developed country/region
25. Slovenia	High-income country/region	Developed country/region
26. Spain	High-income country/region	Developed country/region
27. Sweden	High-income country/region	Developed country/region
28. United States	High-income country/region	Developed country/region
29. Hungary	High-income country/region	Developing country/region
30. Oman	High-income country/region	Developing country/region
31. Poland	High-income country/region	Developing country/region
32. Qatar	High-income country/region	Developing country/region
33. Saudi Arabia	High-income country/region	Developing country/region
34. Trinidad and Tobago	High-income country/region	Developing country/region
35. United Arab Emirates	High-income country/region	Developing country/region
36. Azerbaijan	Upper middle-income country/region	Developing country/region
37. Bulgaria	Upper middle-income country/region	Developing country/region
38. Colombia	Upper middle-income country/region	Developing country/region
39. Croatia	Upper middle-income country/region	Developing country/region
40. Iran, Islamic Rep. of	Upper middle-income country/region	Developing country/region
41. Mainland China	Upper middle-income country/region	Developing country/region
42. Romania	Upper middle-income country/region	Developing country/region
43. Russian Federation	Upper middle-income country/region	Developing country/region
44. Georgia	Lower middle-income country/region	Developing country/region
45. Indonesia	Lower middle-income country/region	Developing country/region
46. Morocco	Lower middle-income country/region	Developing country/region

Source: Progress in International Reading Literacy Study (PIRLS) and authors' own data

Note: We used the classification standard of income groups from the World Bank in 2017 and the classification standard of economical development from the UNDP in 2015 for reference.

Table 2: Student Confidence in Reading: Rural China Compared to Other Countries/Regions

Country/Region	Confident		Somewhat Confident		Not Confident		Average Scale Score	
	Percent of Students	SD	Percent of Students	SD	Percent of Students	SD	Score	SD
1. Israel	0.49	1.20	0.43	0.90	0.08	0.50	10.60	0.05
2. Finland	0.48	1.20	0.47	1.10	0.05	0.50	10.50	0.05
3. Austria	0.48	0.90	0.44	1.10	0.08	0.50	10.60	0.04
4. Croatia	0.48	0.70	0.43	0.70	0.09	0.50	10.40	0.03
5. Sweden	0.47	0.80	0.48	0.90	0.05	0.40	10.50	0.04
6. Bulgaria	0.47	1.40	0.40	1.10	0.12	1.00	10.30	0.07
7. Germany	0.46	1.00	0.45	1.00	0.09	0.50	10.50	0.05
8. Ireland	0.44	1.10	0.49	1.10	0.08	0.60	10.30	0.05
9. Poland	0.44	0.80	0.45	0.80	0.12	0.60	10.30	0.04
10. Romania	0.44	1.20	0.44	1.20	0.12	1.20	10.30	0.06
11. Slovenia	0.43	1.00	0.48	1.00	0.10	0.50	10.40	0.04
12. Canada	0.41	0.70	0.51	0.60	0.09	0.40	10.20	0.04
13. Hungary	0.41	1.00	0.45	0.80	0.14	0.80	10.20	0.05
14. Norway	0.40	1.40	0.53	1.40	0.06	0.50	10.30	0.05
15. United States	0.40	0.90	0.49	0.70	0.11	0.40	10.20	0.04
16. Azerbaijan	0.39	1.60	0.54	1.60	0.08	0.60	10.30	0.07
17. Iran, Islamic Rep. of	0.39	1.00	0.54	0.90	0.07	0.40	10.20	0.04
18. Saudi Arabia	0.39	1.50	0.53	1.40	0.08	0.60	10.20	0.07
19. Malta	0.39	0.80	0.48	0.80	0.13	0.60	10.10	0.04
20. Denmark	0.38	0.90	0.54	0.80	0.08	0.40	10.10	0.04
21. Trinidad and Tobago	0.38	1.20	0.49	1.00	0.13	0.70	10.00	0.05
22. England	0.37	1.10	0.53	1.20	0.10	0.60	10.00	0.05
23. Australia	0.37	0.90	0.53	0.80	0.10	0.60	10.10	0.04
24. Slovak Republic	0.37	0.90	0.49	0.90	0.13	0.60	10.00	0.04
25. Netherlands	0.37	1.00	0.48	1.00	0.15	0.70	10.00	0.05
26. Czech Republic	0.36	1.00	0.51	1.10	0.13	0.60	9.90	0.04
27. Northern Ireland	0.35	1.00	0.55	1.10	0.10	0.60	10.00	0.04
28. Spain	0.35	1.00	0.54	1.00	0.10	0.50	9.90	0.03
29. Indonesia	0.34	1.50	0.62	1.30	0.05	0.50	10.10	0.06
30. United Arab Emirates	0.33	0.60	0.57	0.60	0.10	0.30	9.90	0.03
31. Lithuania	0.33	0.90	0.54	1.10	0.13	0.60	9.80	0.04
32. Portugal	0.32	1.40	0.60	1.20	0.08	0.50	9.90	0.06
33. Qatar	0.30	1.10	0.59	0.90	0.11	0.50	9.70	0.04
34. Oman	0.29	1.10	0.58	1.00	0.13	0.60	9.70	0.06
35. Belgium (French)	0.29	1.00	0.58	0.90	0.12	0.80	9.70	0.04
36. Italy	0.28	0.80	0.63	0.80	0.10	0.60	9.70	0.03
37. Russian Federation	0.28	0.80	0.59	0.80	0.14	0.60	9.60	0.04
38. Georgia	0.28	0.90	0.56	1.00	0.16	0.80	9.60	0.04
39. New Zealand	0.27	0.80	0.61	0.80	0.13	0.60	9.60	0.04
40. Singapore	0.26	0.70	0.61	0.60	0.13	0.60	9.50	0.03
41. France	0.26	0.70	0.60	0.80	0.14	0.70	9.60	0.04
42. Colombia	0.24	1.00	0.65	1.10	0.11	0.80	9.50	0.05
43. Chinese Taipei	0.21	0.80	0.57	0.80	0.22	0.90	9.20	0.04
44. Hong Kong SAR	0.20	0.90	0.62	0.80	0.18	0.90	9.20	0.05
45. Morocco	0.17	0.90	0.64	1.00	0.19	1.20	9.10	0.05
46. Rural China	0.11	0.31	0.68	0.47	0.21	0.41	8.89	1.29

Source: Progress in International Reading Literacy Study (PIRLS) and authors' own data

Table 3: Student Reading Achievement: Rural China Compared to Other Countries/Regions

Country/Region	Overall Reading Average Scale Score		Retrieving and Straightforward Inferencing		Interpreting, Integrating and Evaluating	
	Score	SD	Score	SD	Score	SD
1. Hong Kong SAR	0.75	1.57	0.85	1.35	0.63	1.80
2. Northern Ireland	0.74	1.71	0.87	1.58	0.58	1.86
3. Russian Federation	0.73	1.72	0.83	1.42	0.61	2.02
4. Singapore	0.71	1.44	0.83	1.22	0.57	1.67
5. Finland	0.71	1.62	0.84	1.37	0.55	1.87
6. Croatia	0.70	1.54	0.82	1.40	0.54	1.69
7. Israel	0.70	1.64	0.81	1.47	0.55	1.82
8. United States	0.69	1.05	0.79	0.91	0.56	1.21
9. England	0.68	1.80	0.79	1.60	0.56	2.03
10. Ireland	0.68	1.87	0.80	1.76	0.54	2.00
11. Lithuania	0.67	1.73	0.81	1.52	0.50	1.95
12. Germany	0.67	1.63	0.82	1.45	0.48	1.82
13. Hungary	0.66	1.60	0.81	1.48	0.49	1.73
14. Italy	0.66	1.72	0.81	1.47	0.49	1.97
15. Canada	0.66	1.19	0.79	1.05	0.51	1.34
16. Chinese Taipei	0.66	1.59	0.83	1.31	0.45	1.87
17. Czech Republic	0.66	1.93	0.82	1.69	0.46	2.18
18. Portugal	0.65	2.00	0.76	1.97	0.52	2.04
19. Denmark	0.65	1.41	0.81	1.22	0.46	1.60
20. Sweden	0.65	1.67	0.76	1.48	0.51	1.88
21. Slovak Republic	0.64	1.70	0.78	1.51	0.49	1.91
22. Netherlands	0.64	1.60	0.79	1.37	0.46	1.83
23. Bulgaria	0.64	1.91	0.77	1.82	0.48	2.02
24. Slovenia	0.63	1.73	0.76	1.56	0.47	1.91
25. Austria	0.63	1.68	0.79	1.56	0.43	1.82
26. New Zealand	0.63	1.64	0.73	1.52	0.50	1.78
27. Poland	0.62	1.68	0.76	1.54	0.46	1.83
28. Australia	0.61	1.67	0.74	1.63	0.47	1.73
29. France	0.61	1.68	0.76	1.55	0.43	1.82
30. Georgia	0.60	1.78	0.70	1.64	0.47	1.94
31. Spain	0.58	1.49	0.72	1.47	0.40	1.51
32. Romania	0.58	2.06	0.69	1.99	0.43	2.13
33. Malta	0.54	1.77	0.68	1.73	0.38	1.81
34. Belgium (French)	0.54	2.05	0.72	2.03	0.32	2.08
35. Norway	0.52	2.20	0.70	1.92	0.30	2.50
36. Azerbaijan	0.50	1.98	0.65	2.03	0.32	1.93
37. Iran, Islamic Rep. of	0.48	1.67	0.63	1.73	0.30	1.60
38. United Arab Emirates	0.46	1.08	0.60	1.10	0.29	1.05
39. Colombia	0.45	2.13	0.63	2.19	0.24	2.06
40. Qatar	0.41	2.06	0.54	2.08	0.26	2.04
41. Saudi Arabia	0.41	1.97	0.55	2.08	0.24	1.82
42. Indonesia	0.37	1.94	0.51	2.05	0.20	1.80
43. Oman	0.36	1.34	0.48	1.45	0.21	1.20
44. Morocco	0.26	1.58	0.38	1.89	0.11	1.09
45. Rural China	0.23	0.24	0.33	0.34	0.10	0.17

Source: Progress in International Reading Literacy Study (PIRLS) and authors' own data

Note: There is no data available for Trinidad and Tobago.

Table 4: The Correlation between School Environment, Student Reading Achievement, and Student Confidence in Reading in Rural China

Dependent variable	Student Confidence in Reading ^a			
	Total Sample (1)	Top Tercile ^b (2)	Middle Tercile ^b (3)	Bottom Tercile ^b [4]
Reading achievement				
1. Standardized reading test score (SD)	0.24*** (0.02)	0.21*** (0.05)	0.27* (0.13)	0.44*** (0.09)
Access to books				
2. School library has 5,000 or more book titles (1=yes)	-0.11 (0.07)	-0.11 (0.06)	-0.07 (0.08)	-0.15 (0.10)
3. Classroom library (1=yes)	0.23** (0.09)	0.12 (0.09)	0.14 (0.10)	0.43*** (0.13)
Teacher characteristics and teaching practices				
4. Teacher gender (1=female)	0.05 (0.08)	0.12 (0.09)	0.15 (0.09)	-0.12 (0.13)
5. Teacher has postsecondary education (1=yes)	0.01 (0.09)	0.06 (0.08)	0.01 (0.11)	-0.03 (0.12)
6. Teacher teaching experience (years)	0.01 (0.01)	0.01* (0.01)	0.01 (0.01)	-0.00 (0.01)
7. Teacher received professional training in reading for 16 hours or more in past two years (1=yes)	-0.10 (0.15)	-0.03 (0.15)	-0.25* (0.12)	-0.02 (0.23)
8. Students are taught key reading skills at grade 4 or higher (1=yes)	-0.05 (0.07)	-0.14* (0.07)	-0.04 (0.09)	0.01 (0.11)
9. Teacher uses children's books in reading instruction (1=yes)	0.03 (0.07)	0.13* (0.06)	0.02 (0.09)	-0.09 (0.13)
Control variables				
10. Student gender (1=girl)	0.29*** (0.04)	0.22*** (0.05)	0.36*** (0.07)	0.31*** (0.07)
11. Standardized math or Chinese test score (SD)	0.17*** (0.02)	0.09* (0.04)	0.22*** (0.04)	0.21*** (0.05)
12. Teacher-student ratio	-0.71 (1.72)	-0.56 (2.11)	-0.40 (2.35)	-1.34 (2.35)
13. Student has fewer than 10 books at home (1=yes)	-0.29*** (0.04)	-0.04 (0.06)	-0.37*** (0.07)	-0.42*** (0.08)
14. Student has own room for study at home (1=yes)	0.18*** (0.03)	0.19*** (0.06)	0.21*** (0.06)	0.15* (0.07)
15. Constant	8.73*** (0.18)	8.40*** (0.20)	8.61*** (0.23)	8.84*** (0.28)
Observations	4,616	1,524	1,573	1,519
R-squared	0.122	0.060	0.081	0.098

Source: Progress in International Reading Literacy Study (PIRLS) and authors' own data

Note: Robust standard errors in parentheses, *** p<0.001, ** p<0.01, * p<0.05

^a Student confidence in reading is measured by their score in the scale of confidence in PIRLS questionnaire.

^b Students are divided into terciles based on their test reading scores in the PIRLS test. Columns 2 to 4 present results of running equation (1) among the top, middle and bottom terciles of students.

Appendix 1: The Statements of PIRLS Scale of Student Confidence in Reading

Items

1. I usually do well in reading
2. Reading is easy for me
3. Reading is harder for me than for many of my classmates
4. If a book is interesting, I don't care how hard it is to read
5. I have trouble reading stories with difficult words
6. My teacher tells me I am a good reader
7. Reading is harder for me than any other subject

Note: These seven statements are used to measure student confidence in reading. They were developed by the Progress in International Reading Literacy Study in 2011.

Appendix 2: Classroom Library Resources: Rural China Compared to Other Countries/Regions

Country/Region	Have a Classroom Library	
	Percent of students	SD
1. United States	0.99	0.70
2. New Zealand	0.99	0.50
3. Ireland	0.98	0.80
4. Northern Ireland	0.97	1.50
5. Canada	0.95	1.80
6. Hong Kong SAR	0.95	2.50
7. Chinese Taipei	0.92	2.40
8. Singapore	0.92	1.20
9. Spain	0.91	2.00
10. Australia	0.91	2.10
11. Malta	0.90	0.10
12. Israel	0.89	2.60
13. Belgium (French)	0.89	2.30
14. Lithuania	0.87	2.30
15. England	0.87	2.90
16. France	0.87	2.40
17. Netherlands	0.86	2.60
18. Germany	0.82	2.80
19. Hungary	0.80	2.30
20. Austria	0.78	2.80
21. Russian Federation	0.77	2.40
22. Italy	0.73	3.20
23. Qatar	0.73	2.70
24. Azerbaijan	0.71	3.40
25. Romania	0.69	4.00
26. Slovak Republic	0.69	3.30
27. Trinidad and Tobago	0.69	3.50
28. Portugal	0.67	3.90
29. Poland	0.65	4.10
30. Norway	0.60	4.30
31. United Arab Emirates	0.59	2.60
32. Slovenia	0.59	3.80
33. Indonesia	0.58	3.90
34. Czech Republic	0.55	3.60
35. Georgia	0.54	3.90
36. Iran, Islamic Rep. of	0.53	3.90
37. Sweden	0.52	4.20
38. Croatia	0.51	3.90
39. Finland	0.51	3.80
40. Bulgaria	0.49	3.90
41. Oman	0.41	2.80
42. Saudi Arabia	0.39	4.00
43. Denmark	0.38	3.60
44. Colombia	0.37	4.10
45. Morocco	0.30	4.20
46. Rural China	0.26	0.44

Source: Progress in International Reading Literacy Study (PIRLS) and authors' own data

Appendix 3: Size of School Library: Rural China Compared to Other Countries/Regions

Country/Region	More than 5,000 Book Titles		501–5,000 Book Titles		500 Book Titles or Fewer		No School Library	
	Percent of Students		Percent of Students		Percent of Students		Percent of Students	
	SD	SD	SD	SD	SD	SD	SD	SD
1. Chinese Taipei	0.90	2.80	0.09	2.70	0.00	0.00	0.01	0.80
2. Hong Kong SAR	0.82	3.30	0.18	3.30	0.00	0.00	0.00	0.00
3. Singapore	0.77	0.00	0.22	0.00	0.01	0.00	0.00	0.00
4. Denmark	0.73	2.80	0.22	2.90	0.01	0.60	0.05	1.40
5. Slovenia	0.66	2.90	0.27	3.60	0.06	2.70	0.01	0.60
6. Poland	0.65	3.60	0.32	3.60	0.02	1.00	0.01	0.90
7. Russian Federation	0.65	3.40	0.31	3.40	0.03	1.80	0.01	0.00
8. United States	0.63	2.60	0.34	2.80	0.02	0.80	0.01	0.40
9. Australia	0.56	3.60	0.42	3.70	0.01	0.50	0.01	0.00
10. Canada	0.53	2.70	0.42	2.80	0.03	0.70	0.01	0.40
11. Hungary	0.52	4.00	0.41	4.30	0.03	1.30	0.04	1.60
12. Qatar	0.52	3.40	0.34	3.30	0.13	2.20	0.01	1.00
13. New Zealand	0.47	3.30	0.52	3.30	0.01	0.80	0.00	0.00
14. Lithuania	0.46	3.90	0.45	4.00	0.06	1.70	0.03	0.80
15. Romania	0.45	3.90	0.45	4.20	0.06	1.70	0.04	1.70
16. Croatia	0.39	4.20	0.53	4.30	0.08	1.80	0.00	0.00
17. Georgia	0.35	3.20	0.49	3.60	0.13	2.40	0.02	1.30
18. Azerbaijan	0.29	3.60	0.44	4.10	0.28	3.70	0.00	0.00
19. United Arab Emirates	0.27	1.40	0.47	2.30	0.23	2.10	0.03	0.80
20. Bulgaria	0.25	3.60	0.44	4.30	0.14	2.90	0.18	3.40
21. Spain	0.21	2.80	0.65	3.80	0.10	1.90	0.05	1.60
22. Rural China	0.21	0.41	0.40	0.49	0.17	0.38	0.22	0.41
23. Norway	0.18	3.90	0.73	4.80	0.04	2.30	0.05	2.10
24. Sweden	0.18	3.70	0.52	5.00	0.12	3.40	0.18	3.80
25. Israel	0.13	2.90	0.47	4.60	0.24	4.00	0.17	3.20
26. England	0.11	2.90	0.67	4.80	0.14	3.40	0.08	2.80
27. Slovak Republic	0.11	2.00	0.58	3.90	0.20	3.20	0.12	2.60
28. Malta	0.11	0.10	0.58	0.10	0.17	0.10	0.14	0.10
29. Oman	0.11	2.20	0.58	3.70	0.10	2.10	0.21	2.70
30. Colombia	0.11	2.40	0.26	4.00	0.27	3.80	0.37	4.10
31. Ireland	0.07	2.10	0.30	4.00	0.14	2.90	0.49	4.70
32. Czech Republic	0.06	1.60	0.55	4.10	0.23	3.60	0.17	3.50
33. Indonesia	0.06	1.80	0.39	4.70	0.33	4.30	0.22	3.30
34. Portugal	0.05	2.20	0.47	5.60	0.24	4.20	0.24	4.00
35. Italy	0.05	1.40	0.41	3.90	0.42	3.80	0.12	2.60
36. Finland	0.04	1.70	0.47	4.30	0.28	3.80	0.21	3.40
37. Belgium (French)	0.04	1.50	0.26	3.80	0.40	4.50	0.29	4.80
38. Northern Ireland	0.03	1.50	0.51	4.60	0.15	3.90	0.31	4.00
39. Iran, Islamic Rep. of	0.03	1.20	0.40	4.00	0.37	3.60	0.20	3.10
40. Saudi Arabia	0.03	1.50	0.17	3.00	0.55	4.20	0.25	3.60
41. France	0.02	1.20	0.43	4.50	0.28	4.30	0.27	3.80
42. Germany	0.02	1.00	0.39	3.40	0.33	3.60	0.26	3.30
43. Trinidad and Tobago	0.02	1.20	0.23	3.60	0.56	4.40	0.19	3.40
44. Austria	0.01	0.10	0.45	4.50	0.27	4.20	0.27	3.60
45. Netherlands	0.00	0.00	0.37	5.00	0.46	5.40	0.17	3.30
46. Morocco	0.00	0.40	0.06	2.10	0.23	2.90	0.70	3.30

Source: Progress in International Reading Literacy Study (PIRLS) and authors' own data

Appendix 4: School Emphasis on Reading Skills and Strategies in the Early Grades:
Rural China Compared to Other Countries/Regions

Country/Region	At or Before Second Grade		At Third Grade		At Fourth Grade or Later		Average Scale Score	
	Percent of		Percent of		Percent of		Score	SD
	Students	SD	Students	SD	Students	SD		
1. England	0.84	3.30	0.15	3.20	0.01	0.90	12.60	0.20
2. United States	0.75	2.70	0.24	2.70	0.01	0.50	12.20	0.11
3. Australia	0.73	4.00	0.27	4.00	0.00	0.00	12.60	0.19
4. New Zealand	0.73	3.60	0.27	3.60	0.00	0.00	12.20	0.16
5. Israel	0.59	4.70	0.41	4.70	0.00	0.00	11.50	0.16
6. Northern Ireland	0.55	4.60	0.45	4.60	0.00	0.00	11.60	0.17
7. Canada	0.55	2.70	0.44	2.70	0.01	0.40	11.40	0.09
8. Russian Federation	0.50	3.70	0.50	3.70	0.00	0.00	11.10	0.10
9. Singapore	0.46	0.00	0.54	0.00	0.00	0.00	10.90	0.00
10. Ireland	0.40	4.00	0.60	4.00	0.00	0.00	10.60	0.13
11. Sweden	0.37	4.50	0.63	4.50	0.00	0.00	10.50	0.17
12. Trinidad and Tobago	0.32	3.80	0.66	4.00	0.02	1.10	10.30	0.13
13. Croatia	0.31	4.10	0.68	4.20	0.01	0.00	10.30	0.14
14. Germany	0.30	3.40	0.69	3.30	0.01	0.40	10.40	0.10
15. Spain	0.29	3.20	0.71	3.20	0.01	0.80	10.20	0.12
16. Austria	0.29	4.20	0.71	4.20	0.00	0.00	10.30	0.12
17. Belgium (French)	0.29	5.00	0.70	5.10	0.01	0.00	10.20	0.20
18. Hungary	0.28	4.10	0.71	4.00	0.01	0.00	10.20	0.13
19. Portugal	0.25	4.10	0.75	4.10	0.00	0.00	10.30	0.11
20. Bulgaria	0.25	3.50	0.74	3.60	0.01	0.00	10.40	0.11
21. Slovak Republic	0.24	3.20	0.76	3.30	0.01	0.60	10.10	0.12
22. Czech Republic	0.24	3.80	0.74	4.00	0.02	1.20	10.00	0.16
23. Qatar	0.24	3.00	0.66	3.40	0.10	1.70	9.40	0.15
24. Lithuania	0.23	3.30	0.76	3.40	0.01	0.60	10.10	0.12
25. Netherlands	0.22	4.40	0.78	4.40	0.00	0.00	9.90	0.15
26. Denmark	0.21	2.40	0.79	2.40	0.01	0.50	9.70	0.10
27. Georgia	0.20	2.80	0.79	2.90	0.01	1.20	9.90	0.12
28. Azerbaijan	0.19	3.60	0.79	3.80	0.02	1.20	9.70	0.14
29. France	0.18	3.30	0.81	3.40	0.01	0.70	9.60	0.13
30. Chinese Taipei	0.17	3.00	0.80	3.00	0.03	1.40	9.40	0.14
31. Hong Kong SAR	0.16	3.50	0.81	3.80	0.03	1.60	9.50	0.14
32. Italy	0.15	2.50	0.84	2.50	0.01	0.80	9.40	0.12
33. United Arab Emirates	0.15	1.30	0.68	2.20	0.18	2.00	8.70	0.09
34. Romania	0.14	3.40	0.85	3.50	0.01	0.90	9.80	0.12
35. Norway	0.14	3.40	0.83	3.90	0.03	1.90	9.30	0.16
36. Malta	0.13	0.10	0.87	0.10	0.00	0.00	9.40	0.00
37. Colombia	0.13	3.30	0.81	3.60	0.06	1.90	9.10	0.18
38. Finland	0.10	2.60	0.87	2.80	0.03	1.50	9.20	0.12
39. Slovenia	0.08	1.80	0.87	2.40	0.05	1.90	8.90	0.11
40. Iran, Islamic Rep. of	0.07	1.60	0.85	2.40	0.08	1.80	8.70	0.11
41. Saudi Arabia	0.07	1.70	0.78	3.50	0.15	3.10	8.30	0.13
42. Poland	0.06	2.10	0.94	2.10	0.00	0.00	9.30	0.10
43. Indonesia	0.04	1.90	0.88	3.20	0.08	2.50	8.50	0.12
44. Oman	0.04	0.90	0.86	2.00	0.11	1.90	8.40	0.09
45. Rural China	0.03	0.16	0.59	0.49	0.38	0.49	7.46	1.71
46. Morocco	0.01	0.60	0.48	4.00	0.51	4.00	6.80	0.12

Source: Progress in International Reading Literacy Study (PIRLS) and authors' own data