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Can School Counseling Reduce School Dropout in Developing Countries?

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Abstract

An alarming number of students drop out of junior high school in developing countries. In this study, we examine the impacts of providing a school counseling intervention on student dropout behavior and learning anxiety. Analyzing data from a randomized controlled trial involving 74 junior high schools and 7,495 students in rural China, we find that school counseling reduces dropout and decreases learning anxiety in the short-term but not in the long-term. Furthermore, we suggest that the attenuation in impacts over time (for the average student) is largely due to decreasing student interest in the school counseling program. However, we find that school counseling reduces dropout and learning anxiety among students at high-risk of dropping out (older students and students with friends who have already dropped out) in both the short and long-term.

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Can School Counseling Reduce School Dropout in Developing Countries?

An alarming number of students in developing countries enroll in junior high school but do not graduate. For example, in India and Ghana, the official dropout rates during junior high school are approximately 27% and 21% (Choudhury, 2006; Sabates et al., 2010). In Mexico, close to one-third of students drop out of junior high school (Behrman et al., 2005). These rates are alarming because they suggest that a large number of youth will have difficulty finding higher wage employment in the future. Moreover, high dropout rates reduce a nation's stock of human capital, ultimately leading to increased unemployment and even social instability (Hanushek et al., 2006; Oreopoulos, 2007).

A major reason for the high rates of dropout in developing countries—and the reason that has received the most attention in the development literature—is the high costs of attending school. Specifically, credit constraints combined with high tuition prices encourage students to prematurely leave school (Banerjee et al., 2000). In addition, students find it prohibitively expensive to stay in school when the opportunity costs of attending school are high (Angrist and Lavy, 2009). In response to these high costs, policymakers in some developing countries have provided students with conditional transfers to stay in junior high school. These conditional cash transfers have proved to be one effective means to reduce dropout in developing countries (see Mo et al., 2013; Chaudhury and Parajuli, 2010; De Janvry et al., 2006; Heinrich, 2006; Gertler, 2004; Schultz, 2004).

Although the high costs of attending school is an important reason behind the dropout of junior high school students in developing countries, psychological factors, such as learning anxiety, may also play a significant role. A number of studies show a strong, positive

relationship between learning anxiety and dropout among disadvantaged students. For example, analyses based on nationally representative data from the United States show that students who experience high levels of learning anxiety at school are more likely to drop out than those who do not (Reardon et al., 2002). A meta-analysis of 126 small-scale studies further shows that high levels of learning anxiety are associated with reductions in academic achievement and increases in dropout (Seipp et al., 1991).

In developed countries one approach that appears to reduce student psychological problems and, by extension, dropout is school counseling. School counseling is defined as the practice by which professionals (or paraprofessionals) conduct drop-in counseling with students and/or teach courses designed to improve student psychological health (ACSA, 2012). Employing regression discontinuity, Reback (2010) finds that counselors improve non-cognitive outcomes (and reduce disciplinary problems) in Alabama elementary school districts. Most recently, Carrell and Hoekstra (2014) use a school fixed-effect model to show that school counselors can improve academic achievement. Relying on less rigorous identification strategies, a number of other studies from developed countries suggest that school counseling has a positive influence on reducing learning anxiety (Wilson, 1986; Gerler, 1985; Borders and Drury, 1992; White et al. 1998; White et al., 2010; Whiston et al., 2011). A meta-analysis of 325 studies from developed countries concluded that school counseling reduced student dropout rates (Erford, 2015).

Although (as seen in the previous paragraph), there are studies that examine the effectiveness of school counseling on reducing dropout, the literature is far from complete. By far, most school counseling programs that have been implemented and evaluated have been in developed countries (White et al. 1998; White et al., 2010). The paucity of studies from

developing countries is surprising, in part, because it could be argued that students in developing countries may have an even greater need for school counseling. For example, junior high school students in developing countries almost certainly are experiencing high rates of learning anxiety since they often face intense competition in accessing high school (White et al., 2010). Students in developing countries typically face higher-stakes and highly-competitive education systems (Carnoy et al., 2013). Students in developing countries may also receive less psychological support from parents, who often have migrated to cities in the search for higher-paying labor (Xu et al., 2008; Giles et al., 2010).

In this study our overall goal is to examine the effect of a government-implemented school counseling program on the dropout rates and learning anxiety of junior high students in a developing country. In pursuing this overall goal, we have three objectives. The first objective is to identify the causal impact of school counseling on the dropout rates and learning anxiety of junior high students in both the short- and long-term. The second objective is to explore why school counseling works or does not work. The third objective is to examine whether school counseling affects students who are at the highest risk of dropping out (those that have reached the legal working age, have friends that have dropped out, or have lower academic achievement).

To fulfill these objectives, we analyze data from a randomized controlled trial (RCT) involving 74 schools and 7,495 students in rural China. Similar to other developing countries, dropout rates in junior high schools in rural China are high (Yi et al., 2012). Furthermore, one reason for the high rates of dropout may be that students face considerable learning anxiety as they compete to enter academic high school (Wang et al., 2014). Because of these similarities, exploring the impacts of school counseling in rural China may have implications for students in other developing countries.

By exploring the impacts of school counseling on school dropout, our study makes several contributions to the literature on school counseling and, more generally, the literature on improving the educational outcomes of youth in developing countries. First, our study is one of the first to rigorously examine the causal impacts of a supply-side intervention (school counseling as opposed to a demand-side intervention such as conditional cash transfers) on reducing dropout in junior high schools in a developing country (e.g. Tan et al., 1999). Second, the vast majority of experimental evaluations of school counseling in developed countries (and of school-based randomized interventions in developing countries more generally) can be considered *efficacy* studies (Glewwe et al., 2011; Wilson, 1986). Efficacy studies are characterized by program interventions that are implemented with a high degree of fidelity (Gartlehner et al., 2006). By contrast, our study evaluates the impacts of a school counseling program that was implemented under a more realistic, policy-relevant context—by local governments and schools. Third, our study not only examines the short-term impacts of school counseling on student outcomes (dropout and learning anxiety), but also longer-term impacts. This fact is important because interventions can have short-term, "novelty" effects that wear off over time (Kulik et al., 1982; Li and Ma, 2010). For example, short-term novelty effects may occur if students, teachers, and/or school administrators are only temporarily excited about new programs. Fourth, we not only examine whether school counseling has positive impacts on reducing school dropout and learning anxiety for the average student, we also examine whether school counseling works for students at-risk of dropping out.

The remainder of the paper is organized as follows. In Section 2 we provide additional background on the high-stakes competition facing junior high school students in rural China and policymaker attention towards schooling counseling as a possible means to alleviate student

learning anxiety. In Section 3 we describe the sampling, intervention, data collection and analytical approach of our study. Section 4 reports the results from our study and Section 5 concludes.

2. Dropout Rates, Learning Anxiety, and School Counseling in Rural China

To study the effects of school counseling on student dropout rates and learning anxiety, we conducted a randomized controlled trial (RCT) in rural China. We chose China for the study because, similar to other developing countries, dropout rates in junior high schools in rural China are high (approximately 24% from the start of grade 7 to the end of grade 9—Yi et al., 2012). The reasons for dropout—including high direct and indirect costs as well as psychological factors—are similar to those in other developing countries (Shi et al., 2014).

Students from junior high schools in rural China also face considerable learning anxiety as they compete to enter academic high school (Wang et al., 2014).[1] Like students in other developing countries, students must score well on a high-stakes and highly competitive high school entrance exam (HSEE—Loyalka et al., 2013). If students fail to pass the HSEE, they must either wait a full year to take the HSEE again or must forego their chance to go to academic high school. The high-stakes and competitive nature of the testing system increases anxiety among students (Liu et al., 2009; Reddy and Sinha, 2010).

In part in response to these high levels of anxiety, China's government has begun to emphasize school counseling as a way to reduce learning anxiety. During the last decade, policymakers at the national and local levels have recognized the high levels of learning anxiety

[1] The term "learning anxiety" can be used to refer to several constructs. In the context of this paper, we are examining trait anxiety, which refers to systematic feelings of discomfort and stress when learning new content (Spielberger 1995).

facing junior high school students in rural China. China's State Council has issued four documents since 2008, each requesting the Ministry of Education to find ways to decrease the learning anxiety facing junior high students from rural areas. In particular, the policy documents recommended school counseling as a means of helping students cope with learning anxiety (Ministry of Education, 2008; Ministry of Education, 2010; Ministry of Education, 2012).

Unfortunately, these mandates have not been informed by evidence demonstrating the effectiveness of school counseling. Despite the consistent calls to establish school counseling, few local governments and schools in rural areas have provided school counseling to their students. Furthermore, to the best of our knowledge, no public or private agency has evaluated whether providing school counseling to students in rural areas helps them overcome their learning anxiety (or behaviors that are possibly exacerbated by learning anxiety such as the decision to drop out of school).

3. Research design, interventions, data and statistical approach

To study the impacts of school counseling on student outcomes, we conducted a cluster randomized trial among 7,495 seventh and eighth grade students in 74 public junior high schools located in 8 poor counties in a northern prefecture of Shaanxi province.[2] In choosing our sample, we first obtained a list of all counties in the prefecture. We collected the average per capita income for each county in 2011(based on the Shaanxi Provincial Statistical Yearbook—SPSY 2011) and ranked the 12 counties in the prefecture from richest to poorest. We then chose the 8 poorest counties from among the 12 counties in the region.

[2] The name of the prefecture omitted for the sake of confidentiality.

Using official records, we next created a sampling frame of all junior high schools in the sample counties. There were a total of 170 junior high schools. Based on administrative records, we applied two exclusion criteria to these 170 schools. First, because our interest is in rural schools, we excluded junior high schools that were located in county seats or prefecture seats (which primarily enrolled urban students). There were 12 such schools. Second, because China's government is currently consolidating existing rural schools into new centralized schools, we excluded schools with fewer than 90 students (45 students in seventh and eighth grade, respectively) to safeguard against excessive attrition. After applying exclusion criteria, we had 74 schools as our sample schools. On average, there were 102 seventh and eighth grade students in each school. In the baseline, we surveyed all seventh and eighth grade students in all 256 classes in all 74 schools. Our sample is roughly representative of rural, public junior high schools in poor counties in Northwest China.

The next step of our study was to conduct a baseline survey at the end of the school year in December 2012.[3] In the survey, we collected data from all 7,495 seventh and eighth grade students, their homeroom teachers and school principals. In particular, we asked each student to take a learning anxiety scale. Enumerators also collected information on a series of individual and family characteristics (see "Data Collection" below).

Following the baseline examination, and as part of our randomized design, we randomly allocated our sample schools into a treatment (school counseling) or control group. To do so, we first stratified the 74 sample schools into 37 equal size pairs within each county to increase the

[3] We conducted the baseline at the end of the school year (instead of the beginning) to ensure sufficient time notify teachers and principals assigned to the treatment arm of the counseling intervention.

statistical power of our analyses (Imai et al., 2009)[4]. The pairs were created within each county by first ranking schools by seventh and eighth grade enrollments within each county (from lowest to highest), then choosing the first two schools for the first block, the next two schools for the second block, and so on. After blocking, we randomly assigned one school in each pair to one of two experimental arms: a treatment and control arm.[5] In total, 37 schools were assigned to receive a school counseling intervention and 37 schools to the control arm (no counseling).

We checked to see whether our treatment and control schools were balanced on observable characteristics at the time of our baseline survey. According to Table 1, the treatment and control groups showed only small and statistically insignificant differences on demographic or family characteristics (Rows 1-9, Column 5). Students also did not differ across treatment and control schools in terms of their self-reported behaviors (skipping class) or future plans for school (Rows, 10-12, Column 5). Finally, at the baseline the treatment and control groups had similar prevalence of students with learning anxiety (Rows 13-14, Column 5).

After randomizing the schools into treatment and control groups, we followed up the students at the baseline at two subsequent time periods. After the end of one semester (our first follow-up survey), we asked students to fill out another survey form and take a second learning anxiety scale. After the end of two semesters (our second follow-up survey), we again asked students to fill out a survey form and take a third learning anxiety scale. Figure 1 depicts the flow of participants through each stage of the study.

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[4] Fortunately, none of the counties had an odd number of schools.

[5] Choosing 74 schools gave us enough statistical power to measure the effect of counseling. Using rural junior high school data from previous studies, we assumed an intraclass correlation coefficient of 0.15 and an R-squared of 0.5. As is standard in much of the social science literature, we set alpha = 0.05 and beta = 0.8. We then calculated that we required at least 100 individuals per school and 33 schools per arm to detect a standardized effect size of 0.20.

We checked for attrition bias after conducting the first and second follow-up surveys. For our first and main outcome variable (dropout), we did not have any attrition in either the first or second follow-up survey. We were able to contact all students (by phone) that were not present during the follow-up surveys and were able to confirm whether they had dropped out. For our second outcome variable (learning anxiety—see Data Collection below), however, 14.5% (1,090 students) and 19.4% (1,457 students) of our sample did not fill out the learning anxiety scale during the first and second follow-up surveys, respectively. These were students that had dropped out (470 students in first / 703 students by second follow up survey), were on sick leave (58 students / 63 students), or had transferred to other schools (562 students / 691 students). To test for possible attrition bias in the analyses using learning anxiety as an outcome variable, we compare the baseline covariates of "non-missing" cases and "missing" cases across treatment and control groups. In both cases, we find that there are few statistically significant differences between the treatment groups and control groups on a variety of baseline covariates. Two exceptions are gender and grade. Among the non-attrited students in the first-follow-up survey, the percentage of female students is slightly higher in the treatment group compared to the control group (a difference of 0.07, statistically significant at the 5% level—Table 2, Panel A, Row1, Column 1). Among the non-attrited students in the second follow-up survey, the percentage of eighth grade students is also slightly higher in the treatment group than the control group (a difference of 0.07, statistically significant at the 10% level—Table 2, Panel B, Row 1, Column 3). To account for the minor imbalance between the treatment and control groups due to attrition (as well as to increase the efficiency of our estimates), we control for these and other covariates in our subsequent analyses.

3.1. Experiment arms/interventions

Although our research team randomly assigned schools to the school counseling intervention, officials in the prefectural department of education implemented the intervention. In the case of the 37 treatment schools, principals were sent an official document in December 2012 to each school explaining their intention to implement a new school counseling program.[6] The principal in each treatment school was asked to designate a music, art or physical exercise teacher with previous experience as a homeroom teacher to serve as a part-time school counselor. Serving as a part-time school counselor was supposed to comprise 50% of each teacher's teaching workload.

Before the beginning of the spring semester (January 2013), the selected teachers and their principals came to a centralized training location in the prefecture seat. The training was fully scripted and a professional trainer from Beijing Normal University conducted a five-day training for the teachers and a half-day training for the principals. The school counselor/teachers were instructed on how to execute each of the 32 fully-scripted, 45-minute sessions per week to their seventh and eighth grade students.

The curriculum was carefully designed to meet international and local standards for schooling counseling programs. The design of the curriculum was originally based on guidelines from the American School Counselor Association (Gysbers, 2004). To also ensure that the curriculum met the Chinese government's curricular guidelines for school counseling programs (China Ministry of Education, 2012), four professional experts in clinical psychology (from Beijing Normal University) edited the curriculum.

[6] The department of education also agreed to refrain from publicizing the program or notifying the control schools until after the evaluation period to avoid potential spillovers between schools. When we asked control schools to discuss whether they knew of any school counseling programs, none of them identified the program described in our experiment.

The primary focus of the curriculum was to help students deal with learning anxiety, in general, and with stressful relationships with teachers and fellow students, in particular. Each of the 32 lessons (distributed across 6 units per semester or 12 units in total) taught specific skills to deal with learning anxiety, such as help-seeking, the management of emotions, or conflict management. The skills were taught mostly through activities and games rather than through lectures or presentations.

To ensure that the curriculum was appropriate for the context of schools in rural China, we conducted extensive piloting before providing the materials to the implementing government agency. We piloted the teacher training protocol and curriculum at four rural junior high schools in a nationally designated poverty county in Shaanxi. After a one-year pilot, we modified the curriculum based on feedback from principals, teachers, and students in pilot schools.

3.2. Data collection

The data for this study are drawn from a baseline survey (2012), a first follow-up survey (2013), and a second follow-up survey (2014). Baseline surveys were administered in four blocks in December 2012. In the first block, students were asked to provide basic demographic and family background characteristics, including their gender, age, parental education (whether their father or mother graduated from junior high school), parental migration status (whether their father or mother migrated to the cities at the time of the baseline), and number of siblings. In this block, we also asked a series of questions related to whether the student's household assets: whether the student's household owned certain common household items, livestock, small businesses, the material used to construct their home, and the size of their home. Most responses to household asset ownership variables in our dataset were dichotomous, so we used polychoric principal components analysis (PCA—Kolenikov and Angeles, 2009) to construct a standard

index for household wealth among our sample students. We did so because recent studies suggest using household asset indicators and PCA to construct continuous measures for household wealth is more reliable than self-reported income (for a review, see Kolenikov and Angeles, 2009).

In a second block, students were asked to provide characteristics that might predict future dropout behavior: whether they skipped class in the previous week, whether they kept in touch with students who had dropped out before, whether they aspired to attend academic high school, whether they aspired to attend vocational high school.

In a third block, we gave students a 30-minute standardized math test based on items we collected from the Chinese national curriculum framework (China Ministry of Education, 2011). We could ensure that students and teachers could not prepare for the test because we administered and printed the test ourselves. No one in the sample schools knew of the questions beforehand. The enumeration team closely proctored the students in order to minimize cheating, and we strictly enforced time limits for the exams. Finally, the scores were scaled into z-scores by subtracting the mean and dividing by the standard deviation (SD) of the math score distribution of all students tested at the baseline. These normalized scores are used as our key measure for baseline math achievement.

Finally, we administered a variation of the Child Manifest Anxiety Scale (CMAS) called the Learning Anxiety Index (Reynolds and Richmond, 1978). The Learning Anxiety Index is a set of 15 questions from the Mental Health Test (MHT), the most widely used scale to measure the anxiety status of grade school students in China (Zhou, 1991; Gan et al., 2007). The MHT has a reliability of 0.84-0.88 and a retest reliability of 0.78-0.86 (Yao et al., 2011). In the

Learning Anxiety Index, if the student's score is over 7, the student is considered clinically anxious about learning and needs assessment and potential treatment by a clinical psychologist.

In our first and second follow-up surveys in August 2013 and February 2014, we collected information on two student outcome variables: (a) student dropout (a binary variable) and (b) learning anxiety (measured using the Learning Anxiety Index described in the paragraph above). We adhered to the following protocol in order to collect information on student dropout rates. The enumerators were asked to record the attendance of each student during the first and second follow-up surveys. If a student was absent, the enumerators asked the class monitor regarding the whereabouts of the student. As an additional check, we called the student's home and asked the parents or the caregiver about the status of the student. Fortunately, in 100% of our cases, the students coded as dropped out by the class monitor were also described as having dropped out by the parents or caregiver.

In our first and second follow-up surveys, we also collected information from students about their engagement with and impressions of the school counseling intervention. Specifically, we asked students to identify which units of the program they had actually attended. Moreover, we asked students to rank-order the school counseling program in terms of a) importance and b) interest with 8 other common courses at school (music / art, physical education, Chinese, English, math, geography, history, and politics). We did so to examine the degree to which students found school counseling important and/or interesting.

3.3. Statistical approach

We use unadjusted and adjusted ordinary least squares (OLS) regression analysis to estimate how dropout and learning anxiety changed for students in the school counseling

intervention relative to students in the control arm. The basic specification of the unadjusted model is:

$$Y_{ij} = \gamma_0 + \gamma_1 T_j + \varepsilon_{ij} \quad (1)$$

where Y_{ij} represents the outcome variable of interest of student i in school j. T_j is the treatment variable, taking on a value of 1 if the school that the student attended had a school counselor and 0 if the school that the student attended was in control arm; ε_{ij} is a random error term.

To control for the potential confounding effects of student and family characteristics, we also adjusted for additional covariates (X_{ij}) and a fixed effect for blocks (school-pairs) φ_b. We call equation (2) below our adjusted, block fixed effects model:

$$Y_{ij} = \alpha_0 + \alpha_1 T_j + X_{ij}\alpha + \varphi_{2b} + \varepsilon_{2ij} \qquad (2)$$

where the additional X_{ij} represents a vector of student and family characteristics. The characteristics include gender (equals 1 if the student is female and 0 otherwise), age (in months), grade (equals 1 if the student is grade 8 and 0 if the student is grade 7), the education level of parents (equals 1 if the father/mother of the student has graduated from junior high school and 0 otherwise), parental migration status (equals 1 if the father/mother of the student migrated to the cities and 0 otherwise), number of siblings, and household asset value (equals 1 if the student's household is the lowest quartile and 0 otherwise). The characteristics also include dummy variables for whether the student skipped class in the previous week (1 = yes, 0 = no), aspired to attend academic high school (1 = yes, 0 = no), aspired to attend vocational high school (1 = yes, 0 = no), and whether the student felt teachers cared about them (1 = yes, 0 = no). Finally, X_{ij} also includes measures of baseline mathematics achievement.

To examine whether the school counseling interventions affected certain subgroups of students more than others, we estimate treatment parameters in the following heterogeneous effects model:

$$Y_{ij} = \beta_0 + \beta_1 T_j + \beta_2 T_j * H_{ij} + X_{ij}\beta + \varphi_{3b} + \varepsilon_{3ij} \qquad (3)$$

In equation (3), we interacted the school counseling treatment variable with a student background indicator (H_{ij}). The student background indicators are alternatively: (a) whether the student is older than 16 years; (b) whether the student keeps in touch with friends who already dropped out of school; and (c) whether student has poor academic achievement (in the lowest 30% of math score distribution). We choose these background indicators because they identify students who are most vulnerable in terms of dropout (Yi et al., 2012; Ampiah and Adu-Yeboah, 2009; Hunt, 2008). In all regressions, we accounted for the clustered nature of our sample by constructing Huber-White standard errors corrected for school-level clustering.

4. Results

4.1. Impacts of school counseling on student outcomes

According to the results of our unadjusted model, school counseling had positive impacts on dropout and learning anxiety in the short-term. At the time of the first follow-up survey, the average dropout rate among control group students was 7%, compared to the 5% dropout rate experienced by treatment group students (Table 4, Row 1, Columns 2 and 3). The percentage of students who were at risk for learning anxiety was 65% in the control group, compared to 61% in the treatment group (Row 2, Columns 2 and 3).

Our adjusted results, which control for block fixed effects, student characteristics and family characteristics, suggest a similar story: counseling yields positive impacts in the short run.

Specifically, our adjusted results show that school counseling reduces dropout by 2.2 percentage points at the time of our first follow-up survey (Table 5, Row 1, Column 2). This is a decrease of 25%, and significant at the 10% level (Row 1, Column 2). Our adjusted results also show that school counseling reduced the percentage of clinically anxious students by 3 percentage points.

As of our second follow-up survey, however, our unadjusted results show that school counseling had no positive impacts on dropout or learning anxiety. By the time of the second follow-up survey, the average dropout rate among control group students was 10%, compared to 9% among the treatment group (Table 4, Row 3, Columns 2 and 3). The difference in dropout rates between the treatment and control group, however, is not statistically significant. The percentage of students who were at risk for learning anxiety also fell among the control group to 61% and remained the same among the treatment students (61%—Row 4, Columns 2 and 3).

Our adjusted results also show that the intervention had no impact on either student dropout rates or learning anxiety at the time of the second follow-up survey. School counseling reduces dropout rates by one or two percentage points, but the results are not statistically significant (Table 5, Row 1, Column 6). School counseling also reduces learning anxiety by one percentage point, but again the results are not statistically significant (Row 1, Column 8).

Taken together, we find that school counseling does yield some short-term positive benefits for the average student over the first semester. Students experience less learning anxiety and drop out less. However, when students are followed up through the end of the school year, the observed benefits of school counseling attenuate and drop to null.

4.2 Novelty Effects in School Counseling

The fact that the school counseling intervention had measurable impacts in the short term, but not the long term, is suggestive that there was a novelty effect in the life counseling program.

In other words, while the program initially may have caught the interest of students, teachers, and/or school administrators, they may have lost interest in the counseling program in the second semester. For example, students may have lost interest if the program became institutionalized/routine. Alternatively, students may also have lost interest from the program if teachers decreased their effort or received less support from school administrators to effectively teach the program. In this section, we further explore whether the decline in treatment effect might be due to novelty effects by comparing student interest and engagement in the program across the time of the first and second follow-up surveys.

As it turns out, students found school counseling somewhat less important and interesting by the time of our second follow-up survey. At the time of our first follow-up survey, students reported that approximately 3 subjects were more important than school counseling (primarily Chinese, English, and math—Figure 2). However, after our second follow-up survey, students reported that approximately 4 subjects were more important (now including subjects covered in the high school entrance examination—history and politics). This indicates that school counseling was diminishing in importance in the minds of students. The difference is significant at the 1% level.

In terms of student interest in the counseling course, students reported liking an average of approximately 3 subjects more than the counseling program. However, after 14 months, this number increased to approximately 3.5 subjects, meaning that student interest in school counseling was also diminishing relative to other subjects (Figure 2). The difference is also significant at the 1% level.

In terms of their engagement in the school counseling program, students appeared to demonstrate slightly less engagement over time. In the first follow-up survey, an average of 78

percent of students participated in activities during school counseling class, whereas in the second follow-up survey this number declined to 73 percent. This difference is significant at the 1% level. More importantly, we found that students attended fewer school counseling classes in the second semester (compared to the first semester). At the first follow-up survey, students reported that they had finished 4.3 units out of the 6 required units, but at the second follow-up survey, they only finished 3.7 units. This difference is significant at the 1% level (Figure 3).

The evidence suggests that student, teacher, and/or school administrator novelty effects were indeed at play in the intervention. One possibility is that (the average student) school counseling improved outcomes in large part because it was exciting and new for students. Of course, another possibility is that student interest per unit of teacher effort was constant. However, teachers and/or school administrators no longer exerted as much effort. While we cannot be sure which interpretation is most accurate, the evidence does suggest that (at the time of the second follow-up survey) the program was no longer as exciting for students, teachers, and/or school administrators, and the treatment impacts returned to null.

4.3. Effects on disadvantaged (at-risk) students

Even though there was no average long-term impact of school counseling on the learning anxiety and dropout behavior of the average student, perhaps there was an impact for disadvantaged or at-risk students. We define disadvantage in three ways: students older than 16 (the age after which students can legally enter the labor force), students who report keeping in touch with friends who have already dropped out, and those with low academic achievement. The variables were chosen because they have been found in the literature to be highly predictive of dropout behavior in rural China. First, older students in rural China are substantially more likely to drop out because the opportunity costs of staying in school are higher (Yi et al., 2012).

Moreover, a 16-year-old student in seventh or eighth grade is older than his or her peers. As such, older students may also feel like they belong less at school than in the labor market. Second, Li et al. (2013) find that each percentage point increase in the dropout rates of a given student's friends increases the student's dropout rate by 0.4 to 0.5 percentage points. Third, students with low academic achievement are also vulnerable to dropping out because they are less likely to perform well on the high school entrance examination (Yi et al., 2012). Because these three types of disadvantaged students have a high risk of dropping out, they are important policy targets.

We find that school counseling reduced the dropout rates of older students (over the age of 16), both in the short and long-term. According to the results from our adjusted model (Table 6), counseling reduced dropout rates an additional 9 percentage points (or a 46 percent decrease) by our first follow-up survey (significant at the 1% level—Panel A, Row 3, Column 1). More importantly, the effect was sustained over time. At the time of the second follow-up survey, counseling continued to reduce dropout rates by an additional 7 percentage points. This is a 35 percent decrease (significant at the 5% level—Panel A, Row 3, Column 3).

Surprisingly, although school counseling did not reduce learning anxiety among older students in the short-term, it actually reduced learning anxiety in the long-term. Specifically, at the time of the first follow-up survey, our results show that school counseling reduced learning anxiety by 5 percentage points. However, this finding was not statistically significant at the 10% level (Table 6, Panel A, Row 3, Column 2). At the time of the second follow-up survey, our results show that school counseling reduced learning anxiety by 7 percentage points, significant at the 10% level (Row 3, Column 4).

In terms of students who reported having (and keeping in touch with) friends who had already dropped out, the intervention appears to have a persistent and significant impact on their

dropout rates. For such students, school counseling reduced dropout rates by 6 percentage points by our first and second follow-up surveys (significant at the 1% and 5% level, respectively—Panel B, Row 3, Columns 1 and 3). The reductions are both equivalent to a 30 percent decrease in dropout. School counseling did not, however, reduce the levels of learning anxiety for students with friends who had previously dropped out (Row 3, Columns 2 and 4).

School counseling did not have differential impact among students ranking at the bottom 30% of their class. Specifically, the coefficients for our interaction term between our treatment assignment and an indicator variable for whether the student ranked in the bottom 30% of their class are all effectively zero (Table 6, Panel C, Row 3, Columns 1-4); none of the coefficients are statistically significant.

Although school counseling had no impact on average, these findings suggest that it benefits certain at-risk students: those who are older and have friends who had previously dropped out. In other words, the intervention helps those who most need to be helped and (perhaps not surprisingly) does not improve the outcome of students who are less likely to drop out or suffer from learning anxiety in the first place. However, why were students with low academic achievement unable to benefit from the intervention? One possibility is that older students and students with friends outside of school experienced learning anxiety or dropped out because they were not well integrated at school. The intervention improved their relationships to teachers and peers and allowed them to feel more integrated with the school. This improvement countered the factors motivating them to enter the workforce. By contrast, students with low academic achievement might have felt that the intervention failed to address their root problem: their inability to compete with others in the high school entrance examination. Indeed, the school counseling intervention was not designed to improve academic achievement.

5. Discussion and Conclusions

In this study, we estimated the impact of providing a school counseling intervention on student dropout behavior and learning anxiety. Analyzing data from a randomized controlled trial involving 74 schools and 7,495 students in rural China, we found that school counseling reduces dropout and decreases learning anxiety (for the average student) in the short-term but not in the long-term. That is, counseling reduced dropout rates by 25% and reduced the proportion of students with learning anxiety by 3 percentage points over the course of the first semester it is implemented. However, the treatment impact was no longer present by the end of the second semester. Our findings suggest that the reduction of the treatment impact over time may be due to declining interest and engagement with the program, thus raising the possibility that student, teacher, and/or school administrator novelty effects were driving impacts in the short-term. In spite of the absence of long-term impacts on the average student, we did find both short-term and long-term impacts on dropout and learning anxiety among certain subgroups of students at high-risk of dropping out (older students and students with friends who have already dropped out).

These findings imply that school counseling does have potential to reduce dropout and learning anxiety among at-risk students in rural China (and perhaps other developing countries as well). Indeed, one of the most interesting aspects of the intervention was that it was run by a government agency instead of the research team. The majority of experimental evaluations of school counseling in developed countries (and of school-based randomized interventions in developing countries more generally) can be considered *efficacy* studies (Glewwe et al., 2011; Wilson, 1986). Efficacy studies are characterized by program interventions that are monitored closely for deviations in protocol (Nelson et al., 2012). By contrast, the *government-run*

intervention evaluated in this study (to our knowledge the first rigorous evaluation of school counseling in a developing country context) was able to benefit disadvantaged students at risk of dropping out. Because the impacts of this school counseling program are those implemented under a realistic, policy-relevant context—by local governments and schools—we believe the findings imply the potential of a targeted school counseling program to reduce dropout and learning anxiety in rural China.

Notably, although the curricula evaluated in this study is unique (not all school counseling interventions will or should use the same curriculum), the school counseling vehicle itself is generalizable. Indeed, the basic format of the intervention was modeled after well-established counseling programs (ACSA, 2012). The format was built to allow educators to customize different curricula into the school counseling intervention to address other social or psychological problems. The fact that this school counseling model (which relied on local teachers undergoing short-term training by government officials) had an impact suggests the potential for school counseling to serve as a vehicle for other curricula as well.

More generally, this study shows that supply-side dropout interventions may complement demand-side interventions. In fact, our study is one of the first to rigorously examine the causal impacts of a supply-side intervention (school counseling as opposed to a demand-side intervention such as conditional cash transfers) on reducing dropout and learning anxiety in junior high schools in a developing country. Supply-side dropout interventions complement demand-side interventions because they actually improve the quality of schooling that students experience. Demand-side interventions like conditional cash transfer can incentivize a student to stay in school, but they do not improve the quality of schooling received. If what students experience and learn in school matters as much as staying in school (Pritchett, 2001; Hanushek

and Woessmann, 2012), supply-side interventions like school counseling could be important and complementary approaches to reduce dropout and, in turn, improve economic development.

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Figure 1. Trial Profile

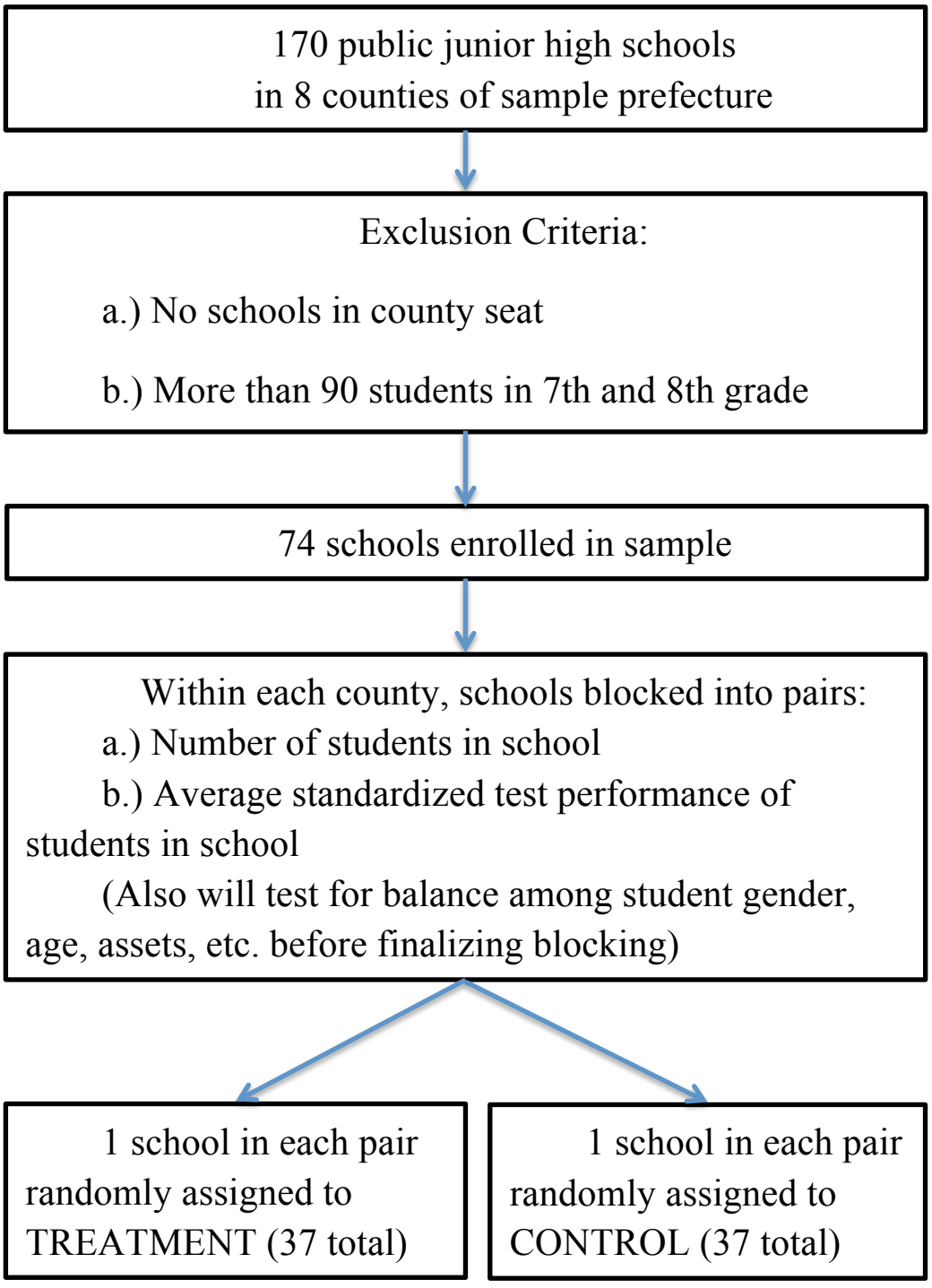
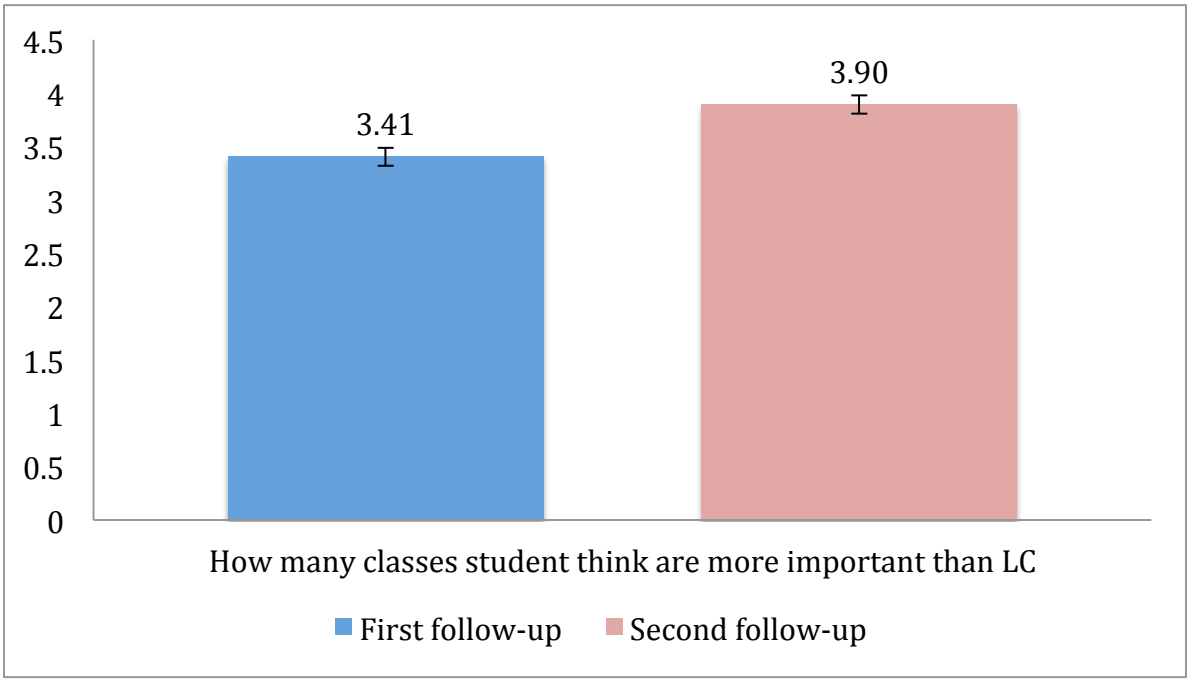


Figure 2. How many classes students think are more important/like more than Life Counseling



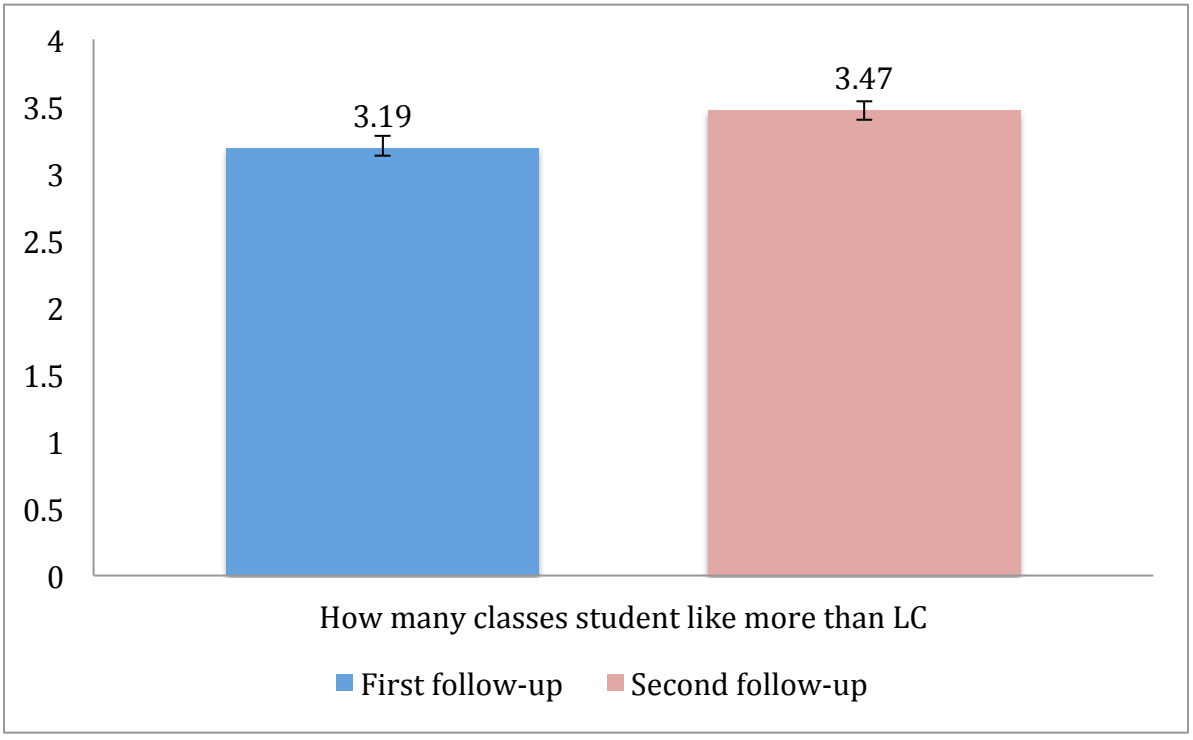


Figure 3. Units for each semester school finished, reported by students

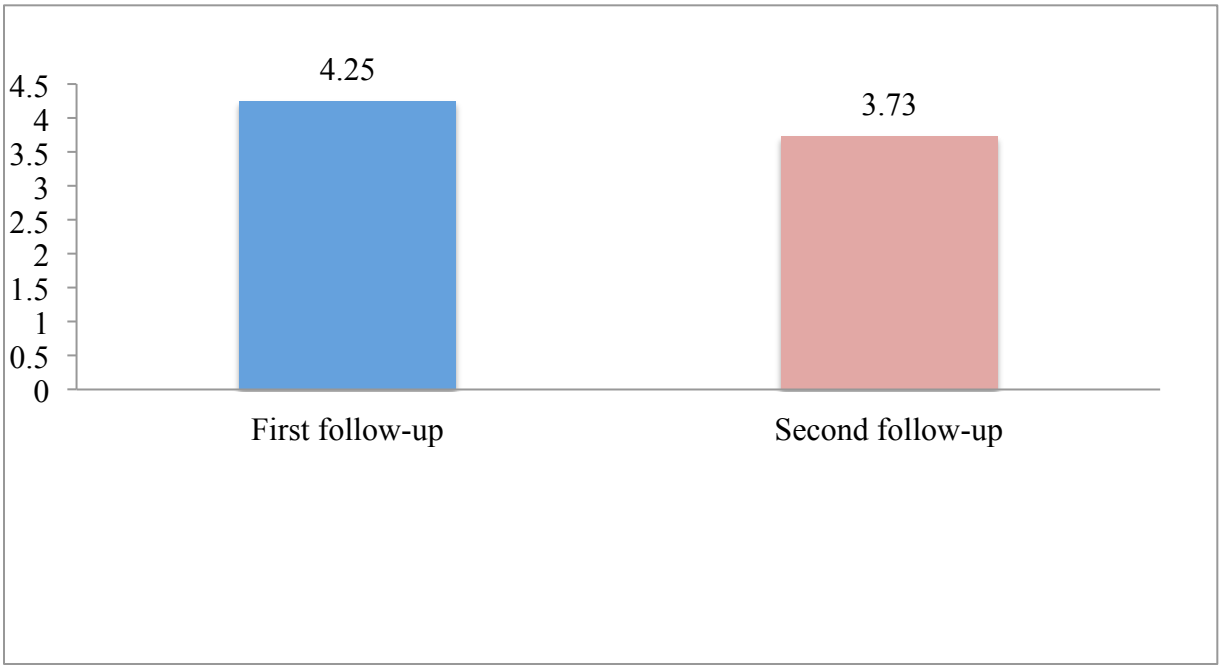


Table 1. Covariate pre-balance test between treatment and control groups

	Treatment group (1)		Control group (2)		Difference (1)-(2)	
Variable	Mean	Sd	Mean	Sd	Mean	Sd
Demographic and Family Characteristics at baseline						
1.Female students, 1=yes	0.46	0.50	0.47	0.50	-0.01	(0.01)
2.Student age, month	180.13	13.20	180.36	13.25	-0.23	(0.68)
3.Grade, 1=8th grade	0.51	0.50	0.53	0.50	-0.01	(0.02)
4.Dad graduated from junior high school, 1=yes	0.44	0.50	0.42	0.49	0.01	(0.02)
5.Mom graduated from junior high school 1=yes	0.25	0.43	0.22	0.42	0.02	(0.02)
6.Dad ever migrated at baseline survey, 1=yes	0.32	0.47	0.32	0.47	0.01	(0.04)
7.Mom ever migrated at baseline survey, 1=yes	0.11	0.31	0.12	0.32	-0.00	(0.02)
8.Number of siblings, person	1.42	1.06	1.44	1.03	-0.02	(0.09)
9.Standardized family asset value at baseline survey	0.01	1.03	0.00	0.97	0.01	(0.14)
Student Characteristics at Baseline						
10.Skip class,1=yes	0.24	0.43	0.25	0.44	-0.02	(0.02)
11.Plan to attend academic high school after JH, 1=yes	0.82	0.39	0.80	0.40	0.02	(0.02)
12.Plan to attend vocational high school after JH, 1=yes	0.70	0.46	0.72	0.45	-0.02	(0.03)
Baseline Measures of Outcome Variables						
13.Standardized math test score	0.00	1.00	0.00	1.00	0.01	(0.08)
14.At risk to facing learning anxiety	0.64	0.48	0.66	0.47	-0.02	(0.02)
15.Number of friends at baseline, person	1.73	1.47	1.73	1.46	0.00	(0.03)
	n=3801		n=3694			

Cluster robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 2 Attrition bias test between treatment and control groups

	(1) Female	(2) Age months	(3) Grade	(4) Dad's edu	(5) Mom's edu	(6) Dad migrated	(7) Mom migrated	(8) #Sibs	(9) Family asset	(10) Skip class	(11) Go Acad. HS	(12) Go Voc. HS	(13) Math 2012	(14) Learning anxiety 2012	(15) #Friends
Panel A: Attrition bias test between treatment and control group in 2013.															
Treatment	-0.07**	-0.42	0.04	-0.02	-0.01	0.05	0.01	0.01	0.04	0.01	-0.01	-0.02	0.01	-0.05	-0.01
	(0.03)	(1.14)	(0.04)	(0.04)	(0.04)	(0.05)	(0.03)	(0.12)	(0.12)	(0.03)	(0.03)	(0.04)	(0.08)	(0.03)	(0.07)
Constant	0.41***	185.82***	0.56***	0.42***	0.27***	0.34***	0.17***	1.50***	0.02	0.31***	0.67***	0.71***	-0.15***	0.68***	1.53***
	(0.02)	(0.84)	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)	(0.09)	(0.08)	(0.02)	(0.02)	(0.02)	(0.06)	(0.02)	(0.04)
Obs	1,090	1,090	1,090	1,090	1,090	1,090	1,090	1,090	1,090	1,090	1,090	1,090	1,090	1,090	1,090
R-squared	0.006	0.000	0.002	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.003	0.000
Panel B: Attrition bias test between treatment and control group in 2014.															
Treatment	-0.03	0.43	0.07*	-0.03	-0.03	0.01	0.00	0.02	0.01	0.02	-0.05	0.00	-0.02	-0.02	-0.04
	(0.03)	(1.20)	(0.04)	(0.03)	(0.03)	(0.05)	(0.03)	(0.11)	(0.12)	(0.03)	(0.03)	(0.03)	(0.07)	(0.03)	(0.07)
Constant	0.37***	185.24***	0.55***	0.43***	0.27***	0.35***	0.16***	1.51***	0.01	0.31***	0.67***	0.73***	-0.14***	0.69***	1.57***
	(0.02)	(0.80)	(0.02)	(0.03)	(0.02)	(0.03)	(0.01)	(0.08)	(0.07)	(0.02)	(0.02)	(0.02)	(0.04)	(0.02)	(0.03)
Obs	1,457	1,457	1,457	1,457	1,457	1,457	1,457	1,457	1,457	1,457	1,457	1,457	1,457	1,457	1,457
R-squared	0.001	0.000	0.005	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000

Cluster robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 3. Balance between treatment and control groups after accounting for missing data

	(1) Female	(2) Age months	(3) Grade	(4) Dad's edu	(5) Mom's edu	(6) Dad migrated	(7) Mom migrated	(8) #Sibs	(9) Family asset	(10) Skip class	(11) Go Acad. HS	(12) Go Voc. HS	(13) Math 2012	(14) Learning anxiety 2012	(15) #Friends
Panel A: Balance between treatment and control group after accounting for missing data in 2013.															
Treatment	-0.00	-0.08	-0.02	0.02	0.03	0.00	-0.01	-0.02	0.01	-0.02	0.02	-0.02	0.00	-0.01	0.00
	(0.02)	(0.68)	(0.02)	(0.02)	(0.02)	(0.04)	(0.01)	(0.09)	(0.14)	(0.02)	(0.02)	(0.03)	(0.08)	(0.02)	(0.03)
Constant	0.48***	179.37***	0.52***	0.42***	0.22***	0.31***	0.11***	1.43***	-0.01	0.24***	0.82***	0.73***	0.02	0.65***	1.77***
	(0.01)	(0.44)	(0.01)	(0.01)	(0.02)	(0.03)	(0.01)	(0.06)	(0.09)	(0.01)	(0.01)	(0.02)	(0.05)	(0.01)	(0.02)
Obs	6,405	6,405	6,405	6,405	6,405	6,405	6,405	6,405	6,405	6,405	6,405	6,405	6,405	6,405	6,405
R-squared	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.000	0.000	0.000
Panel B: Balance between treatment and control group after accounting for missing data in 2014.															
Treatment	-0.01	-0.29	-0.03*	0.02	0.03	0.01	-0.01	-0.03	0.01	-0.02	0.03	-0.03	0.01	-0.02	0.01
	(0.02)	(0.68)	(0.02)	(0.02)	(0.02)	(0.04)	(0.01)	(0.10)	(0.15)	(0.02)	(0.02)	(0.03)	(0.08)	(0.02)	(0.03)
Constant	0.50***	179.14***	0.52***	0.42***	0.21***	0.31***	0.10***	1.42***	-0.01	0.24***	0.83***	0.72***	0.03	0.65***	1.77***
	(0.01)	(0.42)	(0.01)	(0.01)	(0.02)	(0.03)	(0.01)	(0.06)	(0.09)	(0.01)	(0.01)	(0.02)	(0.06)	(0.01)	(0.02)
Obs	6,038	6,038	6,038	6,038	6,038	6,038	6,038	6,038	6,038	6,038	6,038	6,038	6,038	6,038	6,038
R-squared	0.000	0.000	0.001	0.001	0.002	0.000	0.000	0.000	0.000	0.001	0.002	0.001	0.000	0.000	0.000

Cluster robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 4. Average outcomes between treatment and control groups

	(1) All students	(2) Treatment group	(3) Control group	(4) Difference between treatment and control group
Dropout_2013	0.06	0.05	0.07	-0.02
	(0.24)	(0.22)	(0.26)	(0.01)
At risk facing learning	0.63	0.61	0.65	-0.03*
anxiety 2013	(0.48)	(0.49)	(0.48)	(0.02)
Dropout_2014	0.09	0.09	0.1	-0.02
	(0.29)	(0.28)	(0.30)	(0.02)
At risk facing learning	0.61	0.61	0.61	-0.01
anxiety 2014	(0.49)	(0.49)	(0.49)	(0.02)

Cluster robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 5. Impact of School Counseling Intervention on Main Student Outcomes

	Dropout_2013		At risk facing learning anxiety _2013		Dropout_2014		At risk facing learning anxiety _2014	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Unadj.	Fixed	Unadj.	Fixed	Unadj.	Fixed	Unadj.	Fixed
Treatment Variable								
Treatment school, 1=yes	-0.02	-0.02*	-0.03*	-0.03**	-0.02	-0.01	0	-0.01
	(0.013)	(0.009)	(0.019)	(0.012)	(0.017)	(0.008)	(0.018)	(0.011)
Student characteristics controlled		YES		YES		YES		YES
Family characteristics controlled		YES		YES		YES		YES
Block fixed effect		YES		YES		YES		YES
Constant	0.07***	-0.54***	0.65***	0.43***	0.10***	-0.70***	0.61***	0.11
	(0.009)	(0.070)	(0.011)	(0.097)	(0.012)	(0.087)	(0.012)	(0.110)
Observations	7495	7495	6405	6405	7495	7495	6038	6038
R-squared	0.001	0.098	0.001	0.134	0.001	0.132	0	0.126

Cluster robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 6. Heterogeneous effects

	(1)	(2)	(3)	(4)
	Dropout_2013	Learning anxiety_2013	Dropout_2014	Learning anxiety_2014
Panel A: Heterogeneous effects of treatment by age (age16=student older than 16 years)				
Treatment	0	-0.03**	0	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)
Age16	0.13***	-0.04	0.11***	-0.07**
	(0.02)	(0.03)	(0.03)	(0.03)
treatment*age16	-0.09***	0.05	-0.07**	0.07*
	(0.03)	(0.03)	(0.03)	(0.04)
Obervations	7495	6405	7495	6038
R-squared	0.108	0.134	0.137	0.127
Panel B: Heterogeneous effects of treatment by dropout peers (dropout peer=student keeps in touch with the peer who already dropped out of school)				
Treatment	-0.01	-0.03**	0	0
	(0.01)	(0.01)	(0.01)	(0.02)
dropout peer	0.06***	0.01	0.09***	0.02
	(0.02)	(0.02)	(0.02)	(0.02)
treatment*dropout peer	-0.06***	0.01	-0.06**	-0.02
	(0.02)	(0.03)	(0.03)	(0.03)
Obervations	7481	6394	7481	6028
R-squared	0.102	0.134	0.138	0.126
Panel C: Heterogeneous effects of treatment by academic achievement (math poor=math score in lowest 30%)				
Treatment	-0.02**	-0.03**	0	-0.01
	(0.01)	(0.02)	(0.00)	(0.02)
Math poor	0.04***	0.02	0.00*	0.04*
	(0.01)	(0.02)	(0.00)	(0.02)
treatment*mathpoor	0.01	0.01	0	0
	(0.01)	(0.03)	(0.00)	(0.03)
Obervations	7495	6405	6038	6038
R-squared	0.101	0.134	0.005	0.127

Cluster robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Appendix Table 1 Summary Statistics

Variable	N	Mean	SD	Min	Max
Demographic and Family Characteristics at Baseline					
1.Female students, 1=yes	7495	0.47	0.50	0.00	1
2.Student age, month	7495	180.24	13.22	135.00	251
3.Grade, 1=8th grade	7495	0.52	0.50	0.00	1
4.Dad graduated from junior high school, 1=yes	7495	0.43	0.49	0.00	1
5.Mom graduated from junior high school 1=yes	7495	0.24	0.42	0.00	1
6.Dad ever migrated at baseline survey, 1=yes	7495	0.32	0.47	0.00	1
7.Mom ever migrated at baseline survey, 1=yes	7495	0.11	0.32	0.00	1
8.Number of siblings, person	7495	1.43	1.05	0.00	16
9.Standardized family asset value at baseline survey	7495	0.00	1.00	-2.60	3
Student Characteristics at Baseline					
10.Skip class,1=yes	7495	0.25	0.43	0.00	1
11.Plan to attend academic high school after JH, 1=yes	7495	0.81	0.39	0.00	1
12.Plan to attend vocational high school after JH, 1=yes	7495	0.71	0.45	0.00	1
13.Standardized value of teacher care scale	7495	0.00	1.00	-3.60	3
14.Standardized value of self-esteem scale	7495	0.00	1.00	-3.00	3
Baseline Measures of Outcome Variables					
15.Standardized math test score	7495	0.00	1.00	-3.40	3
16.At risk facing learning anxiety	7495	0.65	0.48	0.00	1
Student outcomes at First and Second Follow-up Surveys					
17.Dropped out in 2013	7495	0.06	0.24	0.00	1
18.Dropped out in 2014	7495	0.63	0.48	0.00	1
19.At risk to facing learning anxiety in 2013	6592	0.09	0.29	0.00	1
20.At risk to facing learning anxiety in 2014	6192	0.61	0.49	0.00	1
Treatment assignment					
21.School level treatment 1=treatment 0=control	7495	0.49	0.50	0.00	1