Title: CAN INFORMATION AND COUNSELING HELP STUDENTS FROM POOR RURAL AREAS GO TO HIGH SCHOOL? EVIDENCE FROM CHINA

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Abstract Body
Limit 4 pages single-spaced.

Background / Context:
Description of prior research and its intellectual context.

To sustain its economic growth in the coming years, China will have to increase the country's supply of skilled labor by enabling its workforce to attain to higher levels of formal education. The Chinese economy is projected to experience strong growth through the next decade (Perkins, 2008). Wages, already rising, will continue to increase (Ge and Yang, 2012). The demand for skilled labor will outpace that for unskilled labor as the economy shifts from one based on low-wage industries towards one based on higher-valued industries and services (Zhang et al., 2011). If an individual wants to hold a stable and high wage job in the coming decades, he/she will need to acquire skills (Zhang et al., 2011). To meet this challenge, individuals will need to be equipped with higher levels of schooling.

Unfortunately, when children in poor, rural areas today grow up, they may not be able to enjoy China's future economic prosperity because of their low levels of education. Recent studies have shown that only about two-thirds of the students from poor, rural areas in China finish junior high school and enter high school (Author et al., 2011a; Author et al., 2011b). Instead of continuing their education, most of these children enter the labor market and take unskilled jobs. The low rates of high school matriculation have occurred in spite of the efforts of policymakers to ensure that students from poor, rural areas continue on to high school (MOF and MOE, 2010).

There are a number of reasons why students from developing countries (especially those from poor, rural areas) may attain such low levels of education. Credit constraints combined with the high cost of attending school can induce students from economically disadvantaged households to prematurely leave school (Banerjee et al., 2000). Even when schooling is free, there may be high opportunity costs of going to school (Angrist and Lavy, 2009). The highly competitive nature of education systems in many developing countries can also discourage students in poor, rural areas from continuing their education (Glewwe and Kremer, 2006; Clarke et al., 2000).

Misinformation about the returns to schooling is another important, but less researched, factor that may undermine the likelihood that students continue school. Economists argue that individuals make educational choices based on perceived, rather than actual, economic returns to schooling (Manski, 1993). However, perceived returns may differ from actual returns if individuals have limited or imperfect information. With imperfect information about the returns to schooling, students may choose not to enroll in high school (or their family may choose not to support them) even though increasing levels of schooling will better prepare them to participate in the future economy.

Individuals living in poor, rural areas often are thought to have imperfect information about the returns to schooling because locating reliable information tends to be relatively costly or impossible (Jensen, 2010; Nguyen, 2008). In such circumstances students generally obtain information about the returns to schooling by observing their parents and other members of the community (Jensen, 2010). However, in poor, rural areas parents and community members tend to have relatively low levels of education and work in low skilled industries. As a consequence, students in poor, rural areas tend to underestimate the actual returns to higher levels of schooling, ultimately leading them to leave the educational pipeline early on (Jensen, 2010; Nguyen, 2008).

Imperfect information about the returns to schooling, however, may only be part of the problem. There may be a number of other constraints. First, even if students understand that there are high returns to high school, they may not know how to prepare for high school. For example, students may not know the entrance requirements for attending high school and which types of high schools are available. Second, beyond economic returns, students may not see the links among their own interests and aptitudes, going to high school and the careers options available to them. We use the term *career planning skills* to refer to the knowledge about *how* to attend high school (requirements, options, planning, etc.) and the awareness of the links among one's own interests and aptitudes, high school and future career options.

Unfortunately, students in developing countries rarely have been taught career planning skills. They may, therefore, lack an understanding of their own interests and aptitudes, education and employment options, and an ability to plan for their future (Whiston, 2003; Savickas, 1999; Parsons, 1909). They may also be unsure how to navigate transitions from one level of education to another (Valentine et al., 2009; Vargas, 2004). Students from low-income backgrounds, especially, may not understand how to make the most out of their (often more limited) education and career opportunities (McSwain and Davis, 2007; McDonough, 2004). Because of these reasons, the lack of career planning skills may lead students to discontinue their schooling even if they know the returns to high school are relatively high. If attending high school requires complicated advance planning and preparation, students who know the value of high school may still be overwhelmed by the process and ultimately decide not to attend (or may not be motivated to become engaged in planning and preparation).

Studies from several countries—outside and inside of China—show that providing information about the returns to schooling or teaching career planning skills can be a cost-effective solution to improving the educational outcomes of students (Jensen, 2010, Nguyen, 2008, Author et al., 2009, Castlemana et al., 2011; Koivisto et al., 2010; Whiston et al., 1998; Oliver and Spokane, 1988). In spite of this evidence, no study has, to our knowledge, discussed the impact of offering information on the returns to schooling or teaching career planning skills on the educational attainment/academic achievement of junior high students in China. Furthermore, there have been no known studies in China exploring conditions under which providing information might affect educational attainment and achievement.

Purpose / Objective / Research Question / Focus of Study:
Description of the focus of the research.

The main purpose of this study is to measure the impact of offering information or teaching career planning skills on dropout, academic achievement, and plans to go to high school among grade 7 students in poor, rural areas in China. To meet this overall goal we have three specific objectives. First, we determine the extent to which students are misinformed and lack career planning skills. Second, we analyze the impact of information about returns to schooling and career planning skills on dropout rates, academic achievement, and plans of students to go to high school. In pursuit of this objective, we also seek to determine if there are heterogeneous effects of the interventions on low-achieving, male, or poor students. Third, we explore why information about returns to schooling and career planning skills may or may not be affecting student outcomes in the context of junior high schools in poor, rural counties in China.

Setting:
Description of the research location.

The research sites were rural, public junior high schools in national poor counties in Hebei and Shaanxi provinces, China.

Population / Participants / Subjects:
Description of the participants in the study: who, how many, key features, or characteristics.

The participants of the study were 12,786 first-year (grade 7) students in 131 rural, public junior high schools located in 15 nationally-designated poor counties in Hebei and Shaanxi provinces. In Hebei, our sample covered 10 poor counties, 60 junior high schools, 153 grade 7 classes and 6,491 students. In Shaanxi the sample covered 5 poor counties, 71 junior high schools, 153 grade 7 classes and 6,305 students.

Intervention / Program / Practice:
Description of the intervention, program, or practice, including details of administration and duration.

We conducted a cluster-randomized controlled trial among 131 schools, which were assigned to either one of two treatment arms or to a control arm. In the first treatment arm, professional counselors trained grade 7 teachers how to provide students with information on the net returns associated with different levels of schooling (henceforth called the *information intervention*). In the second treatment arm, professional counselors trained grade 7 teachers how to provide a more comprehensive program on career planning skills (the counseling intervention—which expands on the information intervention) to their students (henceforth called the *counseling intervention*).

In schools that received the information intervention, grade 7 homeroom teachers and their principals came to a central training location (in either Shaanxi or Hebei province). At each location a professional counselor conducted a scripted, half-day training for the teachers and principals. The participants, in turn, learned how to give a scripted 45-minute lesson to their grade 7 students. At the end of the training, each teacher received a teacher's manual with the standardized lesson script, a DVD of the professional trainer giving the lesson, and sufficient student workbooks for all the students in their grade 7 classes. Teachers agreed to conduct the training lesson (that is, the information intervention) with their students during the week of December 20-24, 2010. The counseling intervention was implemented in a similar fashion, but consisted of four lessons.

Research Design:
Description of the research design.

Our cluster-RCT randomly assigned the 131 junior high schools in our sample to one of three groups: an information intervention arm, a counseling intervention arm or a control arm.

Data Collection and Analysis:
Description of the methods for collecting and analyzing data.

We conducted baseline and evaluation surveys of students, teachers, and school principals in October 2010 and May 2011. We also gave students math exams in both stages. We used item-response theory (IRT) to calibrate the scores from the math exams. We could thus directly compare student baseline and evaluation scores (and thus look at student learning gains).

We conducted several types of analyses to measure the causal effects of information and counseling. We first used unadjusted and covariate-adjusted ordinary least squares (OLS) regression analyses to estimate how dropout, academic achievement, and plans to go to high school changed for students in the information and counseling intervention arms relative to

students in the control arm. We also conducted instrumental variable (IV) analyses to account for the fact that about 9% (or 482) of the students assigned to the information and counseling interventions did not attend the information and counseling lessons. We finally ran heterogeneous effects analyses to examine whether the information and counseling interventions affected certain subgroups of students more than others.

We looked at a number of factors along the causal chain that may explain why the information and counseling interventions, as implemented, could have few if any effects on dropout rates, academic achievement, or plans to go to high school. In particular, we discuss two fundamental prerequisites for the interventions to have an impact in poor, rural junior high schools: (a) first, the degree to which different types of students are making achievement gains in seventh grade classes and (b) second, the financial constraints facing students and their families.

Findings / Results:
Description of the main findings with specific details.

Using our baseline data, our descriptive analyses indicate that students from poor, rural junior high schools in China lack information about the returns to schooling and career planning skills. However, evidence from our cluster-RCT suggests that information and counseling have negligible to quite small impacts on the outcomes of the average junior high school student in poor, rural areas.

Conclusions:
Description of conclusions, recommendations, and limitations based on findings.

The lack of significant results from providing information about the returns to schooling stands in stark contrast to the positive effects of providing information about the returns to schooling in developing countries such as the Dominican Republic (Jensen, 2010) and Madagascar (Nguyen, 2010). Changing economic conditions in the last few years in China—in particular, the recent shortage of rural to urban labor which has led to a steep increase in unskilled wages—may make the provision of information on returns less effective than in countries that are not going through a similar economic transition.

We also conclude that providing information and counseling may be less important than improving education quality and ensuring the ability of students to pay for further schooling. Our math achievement data hints that students in our sample received a relatively low-quality education during grade 7 (Figures 4A and 4B). Many students scored the same or even worse on the math exam administered at the end of the year compared to the test administered at the start of the year. If indeed students are really not learning very much in their first year of junior high school, they will gradually lose their confidence in the school system as a whole as well as their sense of academic self-efficacy (i.e. their belief in their ability to do well academically). This in turn would decrease the willingness of students to study hard and stay in school.

The economic situation facing families in poor, rural areas in China is also likely a critical factor in explaining the lack of positive impacts of the interventions. Immediate credit constraints could certainly encourage students to enter the labor market, even after becoming aware of the relatively high wages and low net tuition costs (i.e. tuition prices minus financial aid) associated with higher levels of schooling. In the end, the relatively high tuition fees associated with high school were also a consideration, as attested by studies that found conditional cash transfers increased the likelihood that students would stay in junior high school as well as choose to go to high school (Author et al, forthcoming and Author et al., 2011c).

Appendices

Not included in page count.

Appendix A. References

Angrist, J. D. and V. Lavy. 2009. "The Effect of High-Stakes High School Achievement Awards: Evidence from a Group-Randomized Trial." *American Economic Review* 99 (4): 1384–1414.

Bandura, A. 1977. "Self-efficacy: Toward a unifying theory of behavioral change." *Psychological Review* (84): 191–215.

Banerjee, A., S. Jacob, M. Kremer, J. Lanjouw and P. Lanjouw. 2000. "Promoting School Participation in Rural Rajasthan: Results from Some Prospective Trials." mimeo, MIT.

Behrman, J., and M. Rosenzweig. 2002. "Does Increasing Women's Schooling Raise the Schooling of the Next Generation?" *The American Economic Review* 92 (1): 323-334.

Cai, F. 2009. Wage gap between Chinese college grads, migrants dropping. http://english.peopledaily.com.cn/90001/90776/90882/7207145.html

Castleman, B.L., Arnold, K. and K.L. Wartman. 2012. "Stemming the Tide of Summer Melt: An Experimental Study of the Effects of Post-High School Summer Intervention on Low-Income Students' College Enrollment." *Journal of Research on Educational Effectiveness* 5 (1): 1-17.

Clarke, M., W. Haney, and G. Madaus. 2000. "High Stakes Testing and High School Completion." National Board on Educational Testing and Public Policy 1 (3).

Coleman, J.S., E. Campbell, C. Hobson , J. McPartland , A. Mood, and F. Weinfeld. 1966. *Equality of Educational Opportunity*. Washington, D.C.: National Center for Educational Statistics.

Creager, M.. "Practice and Research in Career Counseling and Development-2010." *The Career Development Quarterly* 59 (6): 482-527

Currie, J., and D. Thomas. 1995. "Does Head Start Make a Difference?" *The American Economic Review* 85 (3): 341-364.

Ge, S.Q. and D.T. Yang. 2012. Changes in China's Wage Structure. Mimeo.

Glewwe, P. and M. Kremer. 2006. "Schools, Teachers, and Education Outcomes in Developing Countries." In E.A. Hanushek and F. Welch, eds. *Handbook of the Economics of Education*. Amsterdam: North Holland, 943-1017.

Hackett, G., and N.E. Betz. 1989. "An exploration of the mathematics self-efficacy/mathematics performance correspondence." *Journal for Research in Mathematics Education* 20: 261–273.

Hailikari, T., Nevgi, A., and E. Komulainen. 2007. "Academic self-beliefs and prior knowledge as predictors of student achievement in mathematics: A structural model." *Educational Psychology* 28: 59–71.

Holland, J. L. 1985. *Making vocational choices: A theory of vocational personalities and work environments* (2nd ed.). Englewood Cliff, NJ: Prentice-Hall.

Imai, K., King, G. and C. Nall. 2009. "The essential role of pair matching in cluster-randomized experiments, with application to the Mexican universal health insurance evaluation." *Statistical Science* 24: 29–53.

Jensen, R. 2010. "The perceived returns to education and the demand for schooling." *Quarterly Journal of Economics*, 125 (2): 515-548.

Koivisto, P., Vinokur, A.D. and J. Vuori. 2011. "Effects of career choice intervention on components of career preparation." *Career Development Quarterly* 59(4).

Kolen, M. J., and R. L. Brennan. 2004. *Test equating, scaling, and linking: Methods and practices* (2nd ed.). New York, NY: Springer.

Manski, C.F., "Adolescent Econometricians: How Do Youth Infer the Returns to Education?" in Studies of Supply and Demand in Higher Education, Charles T. Clotfelter and Michael Rothschild, eds. (Chicago: University of Chicago Press, 1993).

McDonough, P. M. 2004. *The school to college transition: Challenges and prospects*. Washington, DC: American Council on Education.

McSwain, C., and Davis, R. 2007. *College access for the working poor: Overcoming burdens to succeed in higher education*. Washington, DC: Institute for Higher Education Policy.

Ministry of Finance and Ministry of Education. 2010. Opinion about Establishing an Academic High School National Financial Aid System for Students from Economically Disadvantaged Families. Document #356 (in Chinese).

National Bureau of Statistics. 2007. *Household Income and Expenditure Survey.* Beijing: China National Bureau of Statistics.

Nguyen, T. 2008. "Information, Role Models and Perceived Returns to Education: Experimental Evidence from Madagascar," *MIT Working Paper*.

Oliver, L. W., and A.R. Spokane. 1988. "Career-intervention outcome: What contributes to client gain?" *Journal of Counseling Psychology* 35: 447-462.

Parsons, F. 1909. *Choosing a vocation*. Boston, MA: Houghton-Mifflin.

Perkins, D.H., and T.G. Rawski (2008), "Forecasting China's Economic Growth to 2025," in Loren Brandt and Thomas G. Rawski, eds., China's Great Economic Transformation. Cambridge and New York: Cambridge University Press.

Pietsch, J., Walker, R., and E. Chapman. 2003. "The relationship among self-concept, self-efficacy, and performance in mathematics during secondary school." *Journal of Educational Psychology* 95: 589–603.

Savickas, M. L. 1999. "The psychology of interests." In M. L. Savickas and A. R. Spokane (Eds.), *Meaning, measurement, and counseling use of vocational interests* (pp. 19–56). Palo Alto, CA: Consulting Psychologist Press.

Slate, J. R., and C. H. Jones. 2005. "Effects of school size: A review of the literature with recommendations." *Essays in Education*.

The State Council Leading Group Office of Poverty Alleviation and Development (China). 2010. Presentation on Rural Poverty Reduction in China, 2010.09.16.

Turner, S., and R.T. Lapan. 2002. "Career self-efficacy and perceptions of parent support in adolescent career development." *The Career Development Quarterly* 51: 44-55.

Valentine, J., Hirschy, A.S., Bremer, C.D., Novillo, W., Castellano, M., and A. Banister. 2009. "Systematic Reviews of Research: Postsecondary Transitions - Identifying Effective Models and Practices." National Research Center for Career and Technical Education.

Valentine, J., DuBois, D., and H. Cooper. 2004. "The relation between self-beliefs and academic achievement: A meta-analytic view." *Educational Psychologist* 39: 111–113.

Vargas, J. H. 2004. *College knowledge: Addressing information barriers to college*: Retrieved on February 29, 2008, from http://www.teri.org/pdf/researchstudies/ CollegeKnowledge.pdf.

Whiston, S. C., Sexton, T. L., and D. L. Lasoff. 1998. "Career intervention outcome: A replication and extension of Oliver and Spokane (1988)." *Journal of Counseling Psychology* 45: 150-165,

Whiston, S. C. 2003. "Career counselling: 90 years old yet still healthy and vital." *The Career Development Quarterly* 52: 35-42.

Williams, T. and K. Williams. 2010. "Self-Efficacy and Performance in Mathematics: Reciprocal Determinism in 33 Nations." *Journal of Educational Psychology* 102 (2): 453–466.

Xu, B. and Wei L. (2008). "Trade, Technology, and China's Rising Skill Demand." *Economics of Transition* 16 (1): 59-84.

Zhang X.B., Yang J., and S.L. Wang. 2011. China has reached the Lewis turning point. *China Economic Review* 22 (4): 542-554.

Zimmerman, B. J., Bandura, A., and M. Martinez-Pons. 1992. "Self-motivation for academic attainment: The role of self-efficacy beliefs and personal goal setting." *American Educational Research Journal* 29: 663–676.

Appendix B. Tables and Figures

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