Unfulfilled Promise of Educational Meritocracy? Academic Ability and China's Urban-Rural Gap in Access to Higher Education

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Abstract: With the rapid expansion of higher education, educational meritocracy has received both applause and skepticism among scholars, citizens, and policy-makers. Focusing on China's urban-rural gap in college enrollment during the expansion, this study examines the differential effects of academic ability on urban and rural adolescents' college enrollment. Using data from the China Family Panel Studies, the study obtains results showing that the urban-rural gap in attending academic colleges is largest for adolescents who are at the middle ground of the distribution for academic ability, while the gap in vocational college enrollment is greatest for low-achieving adolescents. Compared to their urban counterparts, the positive effects of academic ability on academic college enrollment are stronger for high-achieving rural adolescents. It has little impact on the likelihood of college enrollment for low-achieving rural adolescents. The findings provide important insights for understanding how structural, cultural, and policy factors perpetuate higher education inequality in China.

Keywords: educational meritocracy, higher education expansion, China, urban-rural gap, academic ability, college enrollment

The past several decades have seen tremendous expansion of higher education around the world, accompanied by a growing rationalization of standardized college admission criteria and a hierarchical differentiation of postsecondary institutions (Alon and Tienda 2007; Shavit, Arum, and Gamoran 2007; Schofer and Meyer 2005). From a modernization and industrialization perspective, the massive expansion of diversified postsecondary institutions and increased reliance on meritocratic selection should narrow social group gaps in educational opportunities and foster upward mobility (Kerr et al. 1960; Parsons 1970; Treiman 1970). The widespread meritocratic ideals assume that the contemporary higher education systems are relatively open, and that slots are generally filled based on merit by means of competition in academic ability rather than social origins (Bell 1972; Saunders 1997; Weakliem, McQuillan, and Schauer 1995). Yet, sociologists have long been skeptical about the ideology of educational meritocracy, even though it has gained wide acceptance among scholars, citizens, and policy-makers (Bourdieu 1977; Goldthorpe 2003; MacLeod 1987; Willis 1977). A plethora of international studies continue to demonstrate the persistent impacts of socioeconomic status on college enrollment, revealing that educational inequalities are *maximally* and *effectively* maintained within the increasingly diversified higher education systems (Alon 2009; Lucas 2001; Mare 1980; Raftery and Hout 1993). Thus, a longstanding sociological inquiry has been focused on the question of whether meritocratic college admission processes indeed improve the equality of educational opportunities, or they simply legitimize the existing educational inequalities.

Chinese society deserves special attention for exploring this question given its unique trends in higher education expansion and the historical heritages of meritocracy. First, unlike industrialized western societies, China has experienced unprecedented expansion of postsecondary institutions exclusively under the state policies that channel and control market-

driven forces (Gu 2012; Wu 2017). According to national statistics from China's Ministry of Education, since the launch of the state higher expansion policy in the late 1990s, from 1997 to 2016, the total annual enrollment in postsecondary institutions rose from one million to nearly 7.5 million, and college enrollment rates increased from 9.1 to 42.7 percent. Meanwhile, the number of higher education institutions increased 2.5 times, from 1,020 to 2,596 during the same period. China's higher education expansion policy has allowed an increasing number of youths from diverse social backgrounds to enter college, which facilitates upward social mobility (Liang et al. 2013). However, many empirical studies continue to document growing unequal access to postsecondary institutions across social locations (C. Li 2010, 2014; X. Wu 2010, 2011; Zhou, Moen, and Tuma 1998).

Second, traditional Chinese sociopolitical ideology has long legitimized merit-based inequality (Xie 2016). China's credentialism, rooted in the ancient imperial examination system, emphasizes the importance of intellectual competence in the formation of merit-based social closure, which has had profound and lasting impacts on the development of meritocratic beliefs (Brown 2001; Collins 2009; Ho 1962; Weber 1916/1951; Xie 2016). Since the late 1970s, rapid economic growth, urbanization, industrialization, and massive rural-to-urban internal migration have contributed to the significant shifts in China's class structure (Bian 2002). As individuals and groups began to succeed in a growing market-oriented economy, a common belief is that educational attainment has come to depend more on intellectual ability and less on social origins. This cultural belief is reflected in the highly merit-based model of China's education system. After ten years of disruption in higher education during the Cultural Revolution, the National College Entrance Exam (Gaokao) was restored in 1977 as the fundamental system for sorting and assigning higher education opportunities exclusively based on meritocratic criteria. Ever

since then, individual academic performance has become the most pivotal factor in determining access to higher education (Y. Liu 2013).

Given China's uneven modernization processes and the unbalanced socioeconomic development between urban and rural areas, an important sociological question is how meritocratic selection based on academic ability is related to China's urban-rural gap in college enrollment. However, few empirical studies have examined the differential effects of academic ability on college enrollment across urban and rural contexts, largely because most existing Chinese data sources do not include valid and reliable measures for adolescents' academic ability. Using recent nationally representative and longitudinal data from the 2010 baseline and 2014 follow-up surveys of the China Family Panel Studies (CFPS), this study investigates the heterogeneous effects of academic ability on urban and rural adolescents' college enrollment. Focusing on China's urban-rural gap in access to higher education, this study provides empirical evidence to understand the underlying mechanisms of how structural, cultural, and policy factors reinforce the persistent inequality of higher educational opportunities.

My study extends the current research on China's urban-rural inequality of higher education opportunities in three important ways. First, the empirical evidence provides insights for understanding in which way rural adolescents are less likely to enter postsecondary institutions compared to urban adolescents, accounting for the influences of academic abilities. Second, I focus on the binary spectrum of postsecondary destinations to examine how the varying effects of academic ability on urban and rural adolescents' college enrollment contribute to the horizontal stratification of higher education opportunities. This study focuses on adolescents' enrollment in the four-year full-program academic colleges (*Benke Colleges*) and enrollment in two- or three-year specialized-program vocational colleges (*Zhuanke Colleges*).

Third, the nationally representative and longitudinal nature of the CFPS data adds depth and breadth to our knowledge about China's urban-rural disparities in higher education. Compared to other data sources, the CFPS contains extensive information about both family- and individual-level factors, including comprehensive measures for family backgrounds, academic ability, and college outcomes.

BACKGROUND

Educational Meritocracy in the Era of Higher Education Expansion

Higher education expansion has witnessed a rise in test- and performance-based merit criteria for college enrollment. According to the theory of educational meritocracy, the multidimensional construct of merit (e.g., talent, ability, and effort) can be adequately and accurately measured through professional and scientific assessments (Alon and Tienda 2007; Mijs 2016).[1] Despite the disputed definition of "merit," the use of standardized exams has gained greater acceptance and become the major criterion in college admissions. In China, the National College Entrance Exam (Gaokao) is the most accepted valuable and objective tool to screen increasingly diverse student pools. The rationalization of merit-based college admissions policies reinforces the meritocratic ethos that individual talent and effort play a more important role in determining individuals' placements in educational systems than their social origins (Bell 1972; Weakliem et al. 1995; Young 1958).

[1] As suggested by Mijs (2016), since the meritocratic traits are influenced by non-meritocratic factors, there is no neutral definition of merit. This study cannot rule out the possibility of measurement errors for academic ability and the presented results should be interpreted with caution.

The expansion of higher education is accompanied by differentiation (Gerber and Cheung 2008), which also influences meritocratic beliefs. China's higher education is a binary system that includes two types of institutions: academic and vocational. *Benke colleges* are academically oriented and usually taking four years to finish, while *Zhuanke colleges* are vocationally oriented and typically taking two to three years to complete. However, this binary system has become increasingly diversified during the expansion (Hu and Vargas 2015; Wu 2017). For example, there is substantial variation within China's academic postsecondary institutions. State policy initiatives, including Project 985 and Project 211, have drawn larger public investment in research infrastructure for a small number of first-tier academic and research institutions. Like industrialized Western societies, the growth in China's college enrollment is mainly absorbed by an increasing number of second-tier and less selective institutions (Yeung 2013). Meanwhile, the competition for slots in China's first-tier flagship institutions dramatically increases as economic development and educational expansion facilitate greater demands for high-quality higher education (Wu 2017). Thus, the differentiation among higher education institutions strengthens the meritocratic ideals that the most academically talented students should be enrolled in the most selective institutions regardless of their social backgrounds.

Debate on Educational Meritocracy

The theory of educational meritocracy suggests that socially disadvantaged groups should disproportionally benefit from the expansion, as this provides more opportunities for able and hardworking children from low-status families to move up the social ladder (Bell 1972; Shavit et al. 2007; Saunders 1997; Weakliem et al. 1995). However, critically minded Western theorists of social reproduction have raised concerns about such an optimistic view. For these theorists, the promised fairness of meritocracy does not exist because emissaries of elite classes can intervene

in schooling and maintain greater capability to align with school reward systems and mobilize a variety of resources to transmit advantages to their children (Bourdieu 1977; Bowles and Gintis 1976; Goldthorpe 2003; Goldthorpe and Jackson 2008; Lamont and Lareau 1988; Lareau 2011; MacLeod 1987; Willis 1977). Sociological research has long found that individual ability is a partial reflection of non-meritocratic factors, because the accessibility of economic, social, and cultural capital to cultivate merit is mainly influenced by social environments, families, schools, and peer groups (Blau and Duncan 1967; Boudon 1974; Breen and Goldthorpe 1999; Coleman 1988; Collins 1971; DiMaggio 1982; Lareau 2011; McLanahan and Sandefur 1994; Sewell, Haller, and Ohlendorf 1970).

Stratification research also reveals that a class gap in college enrollment will persist until all members of advantaged groups reach a saturation point in the higher education system, and only then may inequality begin to decline (Raffery and Hout 1993). Moreover, advantaged groups may reproduce their privileged status by securing quantitatively similar but qualitatively superior higher educations (Lucas 2001). For example, since the 1960s, American students from low socioeconomic backgrounds have been much more likely to attend two-year colleges, while their advantaged counterparts typically enroll in prestigious four-year colleges in which class inequalities in access to these first-tier institutions increase (Alon 2009; Beattie 2002; Davies and Guppy 1997; Karen 2002). Thus, educational inequalities are *maximally* and *effectively* maintained despite the expansion and increasing reliance on meritocratic selection based on academic ability.

In contrast to well-documented inequalities in Western higher education systems, recent Chinese empirical findings somewhat support the theory of educational meritocracy. In his book *Silent Revolution*, using data from the student registration cards of two selective academic

institutions (Peking University and Soochow University), James Lee and his colleagues found that student demographic composition became increasingly diverse in terms of social class background between 1949 and 2002. During this period, the proportions of students from worker's or peasants' families were 30 percent in Peking University and 40 percent in Soochow University (Liang et al. 2013). More recent research analyzing data from the Beijing College Students Panel Survey (2009-2014) reports that 22.6 percent of the students were from low socioeconomic families and 16.9 percent were from rural areas in three of the most elite universities (Peking University, Tsinghua University, Remin University of China) (Wu 2017). Yet, only 3.5 percent of students from families who are in the bottom fifth of the income distribution attended elite Ivy League colleges in the US (Chetty et al. 2017). Moreover, using cross-sectional data from the Chinese College Student Survey, J. Liu (2014) found that college students with higher academic ability were much more likely to attend more selective academic institutions net of sociodemographic factors, and that academic ability was the most important factor for determining college destinations compared to other social backgrounds factors.

However, these supports for educational meritocracy in China have received criticisms. From 1949 to 1978, the high share of working class and rural students in the elite institutions was due mainly to a series of social reforms and political campaigns under a radical socialist egalitarianism that emphasized social origins rather than individual ability (Deng and Treiman 1997; Hannum 1999). Eliminating class differences became an essential goal of the communist political agenda on educational reforms during this period (Hannum 1999). Since the economic reform, however, class and urban-rural gaps in college enrollment have been widening during the expansion (Hannum 1999; Hao et al. 2014; C. Li 2010, 2014; J. Liu 2007, 2014; X. Wu and Z. Zhang 2010; Y. Wu 2013; Yeung 2013). For example, for cohorts born after the 1980, the odds

of urban residents attending postsecondary institutions are four times larger than the odds of rural residents, but such a gap was negligible for cohorts born in the 1950s (C. Li 2014). These findings about the growing urban-rural gap in access to higher education have sparked public concerns on the legitimacy of educational meritocracy.

Despite these concerns regarding meritocracy, the widening urban-rural gap in college enrollment documented in prior research may be overrated, because most existing research has paid less attention to the impacts of academic ability mainly due to a lack of appropriate measures in national data (Huang et al. 2015). Acknowledging this limitation, recent studies have examined the effects of academic ability on college destinations focusing on the college student population (J. Liu 2014; Wu 2017). Yet, these studies cannot reveal the actual degrees of selectivity and may overlook the underlying self-selection mechanisms for adolescents with low academic ability who choose not to attend college. Further, these studies concentrate mainly on the variations of college destinations within the first-tier academic institutions (Benke colleges) (J. Liu 2014; Wu 2017). We still have little knowledge about how the binary higher education system assigns adolescents with different academic abilities to the second-tier vocational colleges (Zhuanke colleges). Overall, empirical investigation on the effects of academic ability on college enrollment remains scarce within the Chinese context. Consequently, this may hinder our understanding of the relationship between meritocracy and China's higher education inequality.

Differential Effects of Academic Ability and the Urban-Rural Gap in College Enrollment

The above discussion on meritocracy suggests that the effects of academic ability are greater for enrolling in academic colleges than for enrolling in vocational colleges, and that its effects are stronger than those of any other social factor. However, the greater impacts of

academic ability on college enrollment net of social backgrounds do not suggest equal access to higher education for urban and rural adolescents. Since the structural sources of socioeconomic inequality have been rooted in the traditional urban-rural divided household registration system (X. Wu 2011; Wu and Treiman 2004), urban and rural contexts may alter how academic ability is recognized and rewarded in education systems. It is possible that the magnitude of urban-rural gap in college enrollment may depend on the levels of academic ability. This suggests that returns of academic ability for urban and rural adolescents' college enrollment may vary by different levels of academic ability. Previous research has highlighted at least three theoretical explanations for the differential effects of academic ability on college enrollment and its relations to the persistent urban-rural gap, including *structural inequality*, *cultural exclusion*, and *biased policy intervention*.

First, the persistent urban-rural gap in college enrollment is due mainly to the vast structural disparities in socioeconomic landscapes between urban and rural settings. The divergent urban-rural household registration system reinforces the unequal allocation of educational resources and opportunities in families and schools (Wu and Treiman 2004). Previous research shows that urban families have greater capabilities of financial investment in educational goods and services, as well as the acquisition and activation of cultural and social capital to cultivate skills, habits, and knowledge that are necessary for children's school success (Hu 2017; Li and Feng 2017; Liu and Xie 2015; Y. Wu 2008; Zhang and Xie 2016). For example, urban families have a higher likelihood of private tutoring and higher levels of expenditure on it, which leads to better student verbal and math outcomes (Zhang and Xie 2016). Research also documents that better schools, such as key-point schools with high quality of school facilities and teachers, are more often located in urban areas, while in rural areas, the

deficiency in local public spending on education leads to poor quality of school facilities, declining teacher retention rates, and low teaching quality (Sargent and Hannum 2005; Ye 2015). Since academic ability reflects the urban-rural structural inequalities in family and school contexts, the influences of academic ability on college enrollment will be contingent upon the urban and rural settings. Because of limited educational resources and opportunities, children from underprivileged rural families must expend more effort to reach parity with their urban counterparts, suggesting that academic ability on average serves as a more important predictor of college enrollment for rural adolescents.

Second, cultural exclusion plays an important role in shaping the urban-rural gap in college enrollment. Chinese standardized tests-oriented education systems are designed to recognize and reward high achievers, as teachers, parents, and other institutional gatekeepers systematically favor high-achieving students. For high achievers, going to an elite Benke college is a socially and culturally expected life outcome (Fong 2004). Disadvantaged rural high achievers view a Benke college education as the only pathway leading to upward social mobility. They are highly motivated to study harder and tend to receive preferential treatment from their teachers. Their parents also place high value on education and are willing to make sacrifices for education even with limited resources (Kipnis 2011). On the contrary, rural youths with low academic ability may develop a sense of constraint and marginalization in schooling as they are not favored by teachers and parents, leading to a counter-school oppositional culture that inhibits their educational opportunities (X. Zhou 2011). These cultural barriers have dampened their educational aspirations and led to increasing dropout rates during the middle and secondary school stages (C. Li 2014; Yeung 2013; X. Zhou 2011). In contrast, low-achieving urban adolescents are positioned in the educational pipeline to less selective colleges to meet their

parents' high expectations, and their greater affluence makes it less of a risk. Consequently, we would expect that the urban-rural gap in college enrollment is trivial for high-achieving adolescents, as the returns of academic ability are stronger for rural high achievers, while the gap will be substantial for low-achieving adolescents, since low-achieving rural adolescents are more likely to be culturally self-excluded from higher education opportunities.

Third, prior research suggests that state education policy has unintentionally reinforced the urban-rural gap in access to higher education. Since the economic reform, a series of state policies for decentralization and marketization in education have intensified the dramatic growth of tuition and fees, especially for less selective postsecondary institutions (Liu et al. 2011; Ngok 2007). A large portion of college students were government funded before 1997, but ever since then, all students have been required to be self-financed regardless of their urban or rural origins (Hannum et al. 2011). These policies systematically favor students from advantaged families, who are most likely residing in urban areas but make higher education less affordable for disadvantaged rural students. Given the increasing unemployment rate for recent college graduates and the decline of college wage premiums (Hu and Hibel 2014), rural adolescents and their families may view college attendance, especially vocational education, as a risky, expensive investment that might not pay off. This may be due to socially constructed stereotypes for vocational education, as many urban job opportunities require that only graduates from Benke colleges be considered (Wu 2017). A large group of rural students with relatively low academic ability choose not to attend vocational colleges but migrate to urban areas in search of low-skilled job opportunities (Liang and Ma 2004). The rising urban advantage in higher education expansion mainly results from the exclusive growth in opportunities for vocational colleges among mediocre urban students due to the urban-centered state policy of educational reforms

(Tam and Jiang 2015). Therefore, we would expect that there is a more substantial urban-rural gap in Zhuanke college enrollment than in Benke college enrollment, particularly for students with relatively low academic ability.

In all, these theoretical explanations are not mutually exclusive, but complement each other to guide the empirical investigation presented in this study. All three perspectives suggest that educational meritocracy may appear to be illusory for low-achieving rural adolescents, while for high-achieving rural adolescents, meritocracy ostensibly legitimizes the payoff of their efforts in pursuing elite higher education opportunities leading to upward social mobility. Thus far, I have demonstrated how the effects of academic ability on college enrollment may vary by urban or rural setting and type of postsecondary institutions. This implies an *interaction effect* of the three-way relationship between urban-rural setting, academic ability, and enrollment in Benke and Zhuanke colleges. Below, I examine these associations of academic ability with college enrollment using the CFPS data. I then discuss the implications of the findings for the relationship between meritocracy and the continuing inequalities in China's higher education.

DATA, MEASURES, AND METHODS

Data

Data from the Institute of Social Science Survey (ISSS) of Peking University's China Family Panel Studies (CFPS) is used in the analysis. The CFPS is a longitudinal project that follows the lives of a nationally representative sample of 33,600 adults and 8,990 children living in 14,960 households within 25 provinces. The CFPS uses a stratified multistage sampling design and represented 95 percent of the total population in China when respondents were first interviewed in 2010. This ongoing project has been surveyed five times to date (2010, 2011,

2012, 2014, 2016). The CFPS contains measures of educational attainment, standardized test scores for vocabulary and math, and an extensive set of measures of individuals' and families' sociodemographic characteristics (Xie and Hu 2014). This study is based on a subsample of adolescents who were 16 to 18 years old in 2010. Focusing on this subsample allowed me to track individuals' educational transitions from secondary schools to postsecondary institutions between 2010 and 2014. The total sample size for adolescents from the age 16 to 18 in 2010 was 1,417. Sample attrition reduced this number to 1,020 individuals by the 2014 follow-up survey. To preserve cases, missing values in independent variables were imputed using multiple imputations by chained equations (m = 20) (Royston et al. 2009).[2]

The CFPS has two strengths for the presented analysis. First, compared to other nationally representative data, such as the Chinese General Social Survey (CGSS) and China's census data, the CFPS is the only existing nationally representative data that contains measures for both adolescents' academic ability and college enrollment. Second, since most previous studies on this topic relied on a cross-sectional design and focused only on college students, they could not uncover the causal direction between academic ability and college enrollment. The longitudinal design of the CFPS follows the same adolescent at multiple time points before and after entering college, helping to address the issues of simultaneity and reverse causality. In this study, individual background factors and academic ability measured in the 2010 baseline survey are used to predict adolescents' college enrollment status in the 2014 follow-up survey.

[2] Following von Hippel (2007)'s recommendations, missing cases for the dependent variables were included in imputation equations but excluded from subsequent analyses.

Measures

The dependent variable in this study is *college enrollment*, which is measured by the highest level of higher education that respondents attended between 2010 and 2014.[3] The college enrollment variable is a nominal variable that distinguishes levels of higher education as never attended college, attending a Zhuanke college, or attending a Benke college. One major limitation of this measure is that it cannot capture the diversity of academic institutions because of the sample size restriction. As noted, the initial sample consisted of 1,417 respondents in the 2010 baseline survey. Of these, 397 cases were missing in the 2014 follow-up survey.[4] Thus, the completed longitudinal sample is 1,020. However, I recode 9 respondents who indicated that they were enrolled in colleges in 2010 but missing in 2014. In all, the final analyzed sample for predicting college enrollment is 1,029.

To examine the urban-rural differential effects of academic ability on college enrollment, the first key independent variable is *urban-rural status*. The CFPS includes information on family migration status, residence (urban and rural), and household registration (hukou is urban, rural, unregistered). Urban-rural status is measured by a dichotomous variable capturing whether a respondent lived in an urban or rural locality in 2010.[5] Another key independent variable is *academic ability*. The CFPS has constructed comprehensive cognitive measures for all survey

[3] Because of the data limitation, defining the postsecondary destination as the highest institution attended cannot capture students who transfer from Zhuanke colleges to Benke colleges and those who enrolled in colleges after 2014.

[4] 397 cases account for 27 percent of the initial sample, which may result in sample selection bias. In supplementary analyses, I estimate two separate probit models with sample selection to correct the potential selection bias that may be caused by the missing cases in Benke and Zhuanke college enrollment (Van de Ven and Van Praag 1981). The results yield consistent patterns.

[5] In supplementary analyses, alternative model specification using hukou status to examine urban-rural differences yields similar patterns. These results are available upon request.

respondents aged 10 and above in the baseline 2010 survey (Xie and Hu 2014). These measures include vocabulary and math standardized tests to assess respondents' verbal and math abilities and achievements. Test items are drawn from the standard curriculums in primary and secondary schools. For each test, respondents are scored based on the number of correctly answered questions. Both vocabulary and math achievements are *z*-scored, and the academic ability is measured by a scale summing the *z*-scored vocabulary and math outcomes. A Cronbach's alpha of .79 confirms that combining these variables into a single scale is appropriate.

The following covariates are used to counteract potential confounding in the relationships among urban-rural status, academic ability, and college enrollment. First, a series of regional dummy variables are controlled, including east, central, west, and direct-controlled municipalities (reference group). Second, respondents' individual characteristics are controlled, including gender, ethnicity, age, number of siblings. Third, controls are employed for varying components of respondents' family socioeconomic backgrounds, including parental education (parents' highest levels of educational attainment), family income (annual family net income in logarithm form), and parental educational investment (total expenditure in children's education in logarithm form). Finally, individual educational expectations are measured by years of education a respondent expects to complete in the future.

Analytical Strategy

The data analyses proceed in two stages. In the first stage, the nonlinear relationship between academic ability and college enrollment outcome is estimated using multinomial

logistic regression. [6, 7] I first examine the bivariate association between urban-rural status and college enrollment without controlling for other factors. Next, I include sets of control variables to examine how the relationship between urban-rural status and college enrollment is mediated by background factors and academic ability. More importantly, I add the interaction term of urban-rural status and academic ability to examine the heterogeneous effects of academic ability on college enrollment across urban and rural settings. In the second stage, in order to better elaborate the findings, I calculate the predicted probabilities of enrollment in Benke and Zhuanke colleges for urban and rural adolescents at different levels of academic ability (Long and Freese 2014). I then test the statistical significance of the urban-rural gap in college enrollment. I compute the marginal effects of discrete change in academic ability on Benke and Zhuanke college enrollment at different levels of academic ability to examine the differential effects. I report these results in graphical presentations.

To further examine the robustness of the findings, I carry out auxiliary analyses to account for how school and parenting factors may mediate the relationship between academic ability and college enrollment. Previous studies have shown the significant urban-rural disparities in school and parenting settings, such as enrolling in a key point school, attending a fast-tracking class, and receiving private tutoring (Ye 2015; Wu 2017; Zhang and Xie 2016). These factors also influence adolescents' college enrollment. Therefore, I add additional covariates to control for the influences of home and school learning environments. These added

[6] All reported regression estimates in this study are adjusted by the stratified multistage sampling design of the CFPS.

[7] In supplementary analyses, I employ alternative model specification using spline regression models to estimate the nonlinear relationship between academic ability and college enrollment. The results show similar patterns for the effect heterogeneity at low and high levels of academic ability.

controls include whether students attended a key-point school, enrolled in a fast-tracking class, and received private tutoring. These analyses use a restricted sample for students who enrolled in school in 2010, excluding those adolescents who dropped out of school. The restricted school sample consists of 750 students who reported their college destinations in 2014. In the analyzed restricted school sample, urban students were more likely to enroll in a key point school (32 percent vs. 16 percent), attend a fast-tracking class (32 percent vs. 15 percent), and receive private tutoring (16 percent vs. 5 percent).

RESULTS

Table 1 displays the means and standard deviations for each variable included in the analysis from the total, urban, and rural samples. According to the statistical report of China's National Ministry of Education, 37.5 percent of 18- to 22-year-olds attended colleges in 2014. Resembling the national trends, 40.7 percent of the CFPS respondents who were ages 16 to 18 in 2010 had enrolled in postsecondary institutions in 2014. Rural adolescents show a significantly lower college enrollment rate than urban adolescents (32.4 percent for rural adolescents vs. 49.3 percent for urban adolescents). The urban-rural differences are larger for Benke enrollment rate compared to Zhuanke enrollment rate. The difference in Zhuanke enrollment rate is not significant. Compared to their urban counterparts, rural adolescents tended to have significantly lower academic ability, while the variation in rural adolescents' academic ability was larger than the variation for urban adolescents. These patterns reveal the rural disadvantages in college enrollment and academic ability.

[Table 1 about here]

On average, rural adolescents are younger than urban adolescents in the analyzed samples. Because most ethnic minority groups live in rural areas (Hannum and Xie 1998), rural adolescents are more likely to be self-identified as ethnic minorities. Rural adolescents report having a larger number of siblings compared to urban adolescents, as the one-child policy is most strictly enforced in urban areas (Lu and Treiman 2008). Furthermore, the results reveal a dramatic structural difference in socioeconomic standings between urban and rural families. Rural parents are significantly less educated, have lower family incomes, and invest less economic resources in children's education. However, variations in parental education, family income, and educational expenditure are greater for the rural sample than the urban sample. Rural adolescents also have lower educational expectations than their urban counterparts. In all, these results suggest that substantial disparities exist in background factors between urban and rural adolescents.

Table 2 presents results from multinomial logistic regression on Benke and Zhuanke college enrollment. Model 1 shows that being rural adolescents decreases the odds of enrolling in a Benke college rather than never attended a college by a factor of .46 ($e^{-.778} = .46$, $p < .001$), or 54 percent; and decreases the odds of enrolling in a Zhuanke college compared with never having attended a college by a factor of .54 ($e^{-.625} = .54$, $p < .01$), or 46 percent. In other words, the odds of college enrollment are almost two times larger for urban adolescents than rural adolescents. This shows that rural adolescents have lower rates of Benke college enrollment than Zhuanke college enrollment without accounting for background factors.

[Table 2 about here]

Model 2 adds controls for background variables and academic ability. Most of the effects for background variables are insignificant, but the directionality of associations between these

control variables and college enrollment meet our expectations. Compared to adolescents who reside in direct-controlled municipalities, those from the eastern, central, and western regions tend to have lower probabilities of enrolling in both Benke and Zhuanke colleges. Female adolescents are more likely to go to colleges than their male counterparts. Older adolescents are less likely to enroll in postsecondary institutions, particularly Benke colleges. Ethnic minorities are more likely to attend Benke colleges and less likely to enroll in Zhuanke colleges. Because of government policies, ethnic minorities typically receive additional credits on top of their college entrance exam test scores in academic college admission. Adolescents who have more siblings are less likely to enroll in colleges. Parental education is positively associated with college enrollment, and such association is stronger for Benke college enrollment. The effects of family income have counterintuitive patterns, as it is negatively associated with Benke college enrollment but positively related to Zhuanke college enrollment. Educational investment is also negatively related to college enrollment. This is likely because parents are more likely to compensate children who underperform and feel that they are struggling in school, and these underachieving children may have a lower likelihood of attending college (Zhang and Xie 2016). Finally, consistent with previous research demonstrating the positive effects of educational expectations on educational attainment (Cheng and Starks 2002; Goyette and Xie 1999), the results show that higher educational expectations are significantly associated with a greater likelihood of going to postsecondary institutions.

As shown in Model 2, academic ability is significantly and positively associated with Benke and Zhuanke college enrollment net of other controls. For every one-unit increase in academic ability, the odds of entering a Benke college rather than never having attended college are expected to increase by a factor of 6.78 ($e^{1.914} = 6.78$, $p < .001$), or 578 percent, while the

odds of enrolling in a Zhuanke college compared to never having attended college increase by a factor of 1.82 ($e^{.599} = 1.82$, $p < .01$), or 82 percent. The effects of academic ability are stronger for Benke college enrollment. This suggests that Benke college admission requires higher academic ability than Zhuanke college admission. The results support the hypothesis that academic ability is a stronger predictor for both Benke and Zhuanke college enrollment than other sociodemographic factors. Noticeably, after including background controls in Model 2, the coefficients for rural status decrease in size and become statistically insignificant. These results suggest that the negative association of rural status with Benke and Zhuanke college enrollment is highly mediated by sociodemographic backgrounds and academic ability.

To investigate how the effects of academic ability vary by urban and rural settings, Model 3 includes an interaction term between academic ability and rural status. Both the interaction terms are significant and positive, suggesting that the effects of academic ability on Benke and Zhuanke college enrollment are conditioned upon urban-rural settings. A one-unit increase in academic ability increases rural adolescents' odds of going to a Benke college compared to never having attended a college nearly 18 times, whereas for urban adolescents, academic ability only increases the odds 2.5 times. For Zhuanke college enrollment, the odds for rural adolescents are 2.4 times larger for a one-unit increase in academic ability, while the odds for urban adolescents barely change. These findings demonstrate that the positive effects of academic ability on college enrollment on average are stronger for rural adolescents than for urban adolescents, particularly for Benke college enrollment. After including the interaction terms, the effect of rural status becomes significant, indicating that the urban-rural gap in college enrollment is conditioned upon the heterogeneous associations of academic ability with college enrollment between urban and rural settings.

Since regression coefficients cannot reveal the nonlinear patterns for the effects of academic ability, in Table 3, I calculate the predicted probabilities of Benke and Zhuanke college enrollment and marginal effects of academic ability for urban and rural adolescents at the 10th, 50th, and 90th percentiles of academic ability based on Model 3 as reported in Table 2. Given the substantial differences in the background factors between urban and rural samples shown in Table 1, all control variables are held at their subsample mean values when calculating predicted probabilities and marginal effects.[8] I present the results for testing the significant urban-rural gaps in predicted probabilities and differences in marginal effects at low, middle, and high levels of academic ability.

[Table 3 about here]

As Table 3 shows, at a low level of academic ability, both urban and rural adolescents have low predicted probabilities of entering a Benke college, and the urban-rural gap is insignificant. Although the marginal effects of academic ability are both small for urban and rural adolescents who have low levels of academic ability, the effects are greater for low-achieving urban adolescents. The urban-rural gap in the predicted probabilities of Benke college enrollment becomes statistically significant at the 50th percentile of academic ability. Urban adolescents with middle levels of academic ability have a 20.6 percent chance of enrolling in a Benke college, while their rural counterparts have only an 8.4 percent chance, with a 12.2 percent difference ($p < .001$). The marginal effects at a middle level of academic ability are relatively equal for urban and rural adolescents. At a high level of academic ability, both urban

[8] Supplementary analyses yield consistent patterns as all control variables are held at total sample mean values when calculating predicted probabilities and marginal effects, while the predicted probabilities for rural adolescents are slightly higher in these analyses and marginal effects remain stable.

and rural adolescents have high predicted probabilities for Benke college enrollment, and the probabilities for rural adolescents are even higher. The urban-rural gap, however, is not significant. The marginal effects for high-achieving rural adolescents are much stronger than those for their urban counterparts.

For Zhuanke college enrollment, the patterns are different. At a low level of academic ability, the urban-rural gap is significant and largest among all other comparisons. Low-achieving urban students have 30.3 percent chance for enrolling in a Zhuanke college, while their rural counterparts have only a 4.8 percent chance, with a 25.5 percent difference in predicted probabilities. The marginal effects are positive for low-achieving rural adolescents, while they are negative for urban adolescents. At a middle level of academic ability, the urban-rural gap in Zhuanke college enrollment decreases because of declining predicted probabilities for urban adolescents and increasing probabilities for rural adolescents. The marginal effects on Zhuanke college enrollment are greater for rural adolescents with middle levels of academic ability. For high-achieving adolescents, the urban-rural gap in Zhuanke college enrollment is insignificant. As the predicted probabilities for high-achieving urban adolescents continue to decrease, while the probabilities for rural adolescents continue grow. However, the marginal effects are negative for both high-achieving urban and rural adolescents, suggesting that high achievers are less likely to enroll in Zhuanke colleges.

Figure 1 and 2 present graphical demonstrations with predicted probabilities showing how the effects of academic ability on Benke and Zhuanke college enrollment vary by urban and rural settings. As shown in Figure 1, at a low level of academic ability, both urban and rural adolescents have low predicted probabilities, and academic ability barely influences their Benke college enrollment. However, the positive effects of academic ability on Benke college

enrollment are stronger for high-achieving rural adolescents than for their urban counterparts. In Figure 2, the urban-rural gap in Zhuanke college enrollment is more substantial for adolescents with low academic ability. At a middle level of academic ability, the positive effects of academic ability on Zhuanke college enrollment are stronger for rural adolescents, while the effects are diminishing and even become negative for urban adolescents.

[Figure 1 and 2 about here]

Table 4 presents the results using a restricted school sample with additional controls for school and parenting factors. After controlling for background factors, attending a key-point school is positively associated with Benke college enrollment and negatively associated with Zhuanke college enrollment, but these effects are not statistically significant. Attending a fast-tracking class and receiving private tutoring have significant and positive effects on Benke college enrollment, but not on Zhuanke college enrollment. This suggests that the cultivation of social and cultural capital at home and school is particularly important for access to selective academic postsecondary institutions. The predicted probabilities of Benke and Zhuanke college enrollment have increased for both urban and rural adolescents across different levels of academic ability. The urban-rural gap in Benke college enrollment becomes smaller among students with moderate levels of academic ability. This suggests that schools may serve as an equalizer for closing the urban-rural gap in academic college admissions. The effect of rural status on Benke college enrollment is not significant after controlling for school and parenting factors. However, the magnitude of the gap in Zhuanke college enrollment for low-achieving students drastically increases. Compared to the 25.5 percent difference reported in Table 3, the gap is 37.9 percent in the analyzed school sample. Overall, after including these additional

school and parenting variables using a restricted school sample, the main conclusions remain the same.

[Table 4 about here]

DISCUSSION AND CONCLUSIONS

With the worldwide expansion of higher education over the past decades, meritocratic ideals are deeply ingrained in the public consciousness of modern societies. Educational opportunities should no longer be obtained merely based on social origins, and the key criterion for social selection has to be individual ability and effort. However, there is no clear and consistent empirical evidence that educational meritocracy is achieved in economically advanced Western societies (Goldthorpe 2003). In China, given the rapid pace of economic growth and higher education expansion, empirical studies have documented that the college student population has become increasingly diverse in terms of social background, and that individual ability is the most essential factor determining college admission compared with any other social background factors (Liang et al. 2013; J. Liu 2014). However, prior research finds a growing urban-rural gap in college enrollment during educational expansion (C. Li 2010, 2014; X. Wu 2010, 2011). Limited availability of nationally representative data on academic ability undermines the potential for empirical investigation on the relationship between educational meritocracy and China's higher education inequality. This study contributes to social stratification research and adds significant empirical evidence to studies of China's higher education inequality by examining the heterogeneous effects of academic ability on college enrollment across urban and rural settings.

Using nationally representative and longitudinal data from the China Family Panel Studies, this study demonstrates several key findings. The results show that academic ability has stronger effects on college enrollment than other social background factors, and that its influence is greater on admissions to first-tier academic colleges than to second-tier vocational colleges, generally lending support to educational meritocracy as reported in previous research (J. Liu 2014). However, consistent with prior studies documenting the persistent urban-rural gap in educational attainment (C. Li 2010, 2014), the findings also reveal that after controlling for background factors, rural adolescents on average are less likely to enroll in postsecondary institutions than their urban counterparts. These seemingly contradictory findings raise an important question: if academic ability is the dominating factor for college admissions, why has the urban-rural gap in college enrollment continued during the expansion?

Previous studies hitherto have offered insightful theoretical explanations focusing on urban-biased state policies, structural inequalities in educational resources, and cultural exclusion. Over the past decades, as China's educational systems has been transformed from a socialist egalitarian model to a liberal competitive model, the political agenda on education expansion has been dictated by government investment in educational infrastructure mostly in urban areas (Fang and Feng 2018; Hannum 1999). The urban-centered expansion of postsecondary institutions is attributed to the spatial exclusion of rural students from higher education (Tam and Jiang 2015). Also, the long-standing urban-rural divide in socioeconomic landscapes has reinforced the disparities in school quality and household economic, social, and cultural resources (Y. Wu 2013). Moreover, disadvantaged rural students may underachieve in school and have low aspirations for higher education because of an anti-school oppositional peer

culture due to a lack of emotional and social supports from their parents and teachers (X. Zhou 2011). All these factors explain the persistent urban-rural gap in college enrollment.

This study adds more empirical evidence to help us understand how structural, cultural, and policy factors affect the urban-rural gap in higher education opportunities by examining the unequal returns to individual academic ability between urban and rural adolescents. The findings demonstrate that the urban-rural gap in college enrollment varies by academic and vocational institutions as well as by different levels of academic ability. The urban-rural gap in Benke college enrollment is largest for adolescents at the middle ground of the distribution for academic ability, while the gap in Zhuanke college enrollment is greatest for low-achieving adolescents. In addition, the positive effects of academic ability on Benke college enrollment vary substantially among rural adolescents with different levels of academic ability. Compared to the impact on their urban counterparts, academic ability has little impact on Benke college enrollment for low-achieving rural adolescents, but it has the largest influence for high-achieving rural adolescents. In contrast, urban adolescents seem to benefit more evenly from academic ability for Benke college enrollment. Similarly, the effects of academic ability on Zhuanke college enrollment also differ greatly for rural adolescents. The effects on attending vocational colleges are largest for rural adolescents with moderate levels of academic ability, while academic ability barely affects urban adolescents' enrollment in Zhuanke colleges regardless of their levels of academic ability.

These findings suggest that the major source of China's urban-rural gap in higher education is unequal access to vocational higher education. Consistent with Tam and Jiang (2015), the results suggest that vocational higher education is attractive to urban students because it is mainly an option for low-achieving urban students. In this sense, urban adolescents who do not do well academically may have other resources that reflect their social background rather

than their individual ability available to prevent their downward mobility and increase their chances of enrolling in less selective postsecondary institutions. These findings deliver both pessimistic and optimistic implications for rural adolescents' college enrollment. From a pessimistic perspective, the results imply that low-achieving rural adolescents do not translate their demonstrated academic ability into qualifications for college admission to the same extent as do urban adolescents. On the positive side, the findings suggest that individual talent and effort enable high-achieving rural adolescents to escape from disadvantaged social positions contributing to upward social mobility. Under the holistic ideals of educational meritocracy, it, in fact, legitimizes social inequalities by confronting the upward mobility of high achievers from underprivileged backgrounds, while it conceals the reproduction of social disadvantages for rural low-achieving adolescents due to the lack of family financial, social, and cultural resources. Overall, this possibility raises concerns that the meritocratic legitimation of educational equality appears to be illusory in contemporary Chinese society.

The analyses in this study offer an improvement on prior scholarship on China's urban-rural gap in college enrollment, but the study has several limitations. First, as in other studies using observational data, the present analysis may be affected by omitted variable bias. Although I have examined the impacts of additional school and parenting factors, I cannot rule out the possibility that other unobserved confounders will distort the reported patterns, including the systematic differences in how parents and their children make educational decisions between urban and rural settings. Second, this study is limited in revealing the influences of state higher education expansion policies on the relationship between academic ability and college enrollment. The analyses cannot capture trends in how the effects of academic ability on college enrollment change before and after the implementation of expansion policy. Also, this study

cannot reveal changes of the urban-rural gap in college enrollment over time. Third, due to the size of the analyzed sample, I cannot investigate the regional or provincial variations in the effects of academic ability on college enrollment. Future quantitative and qualitative work might seek to address these limitations with refined research designs and new sources of data to further examine how academic ability matters for college enrollment and through which social mechanisms it produces unequal educational transitions for different social groups.

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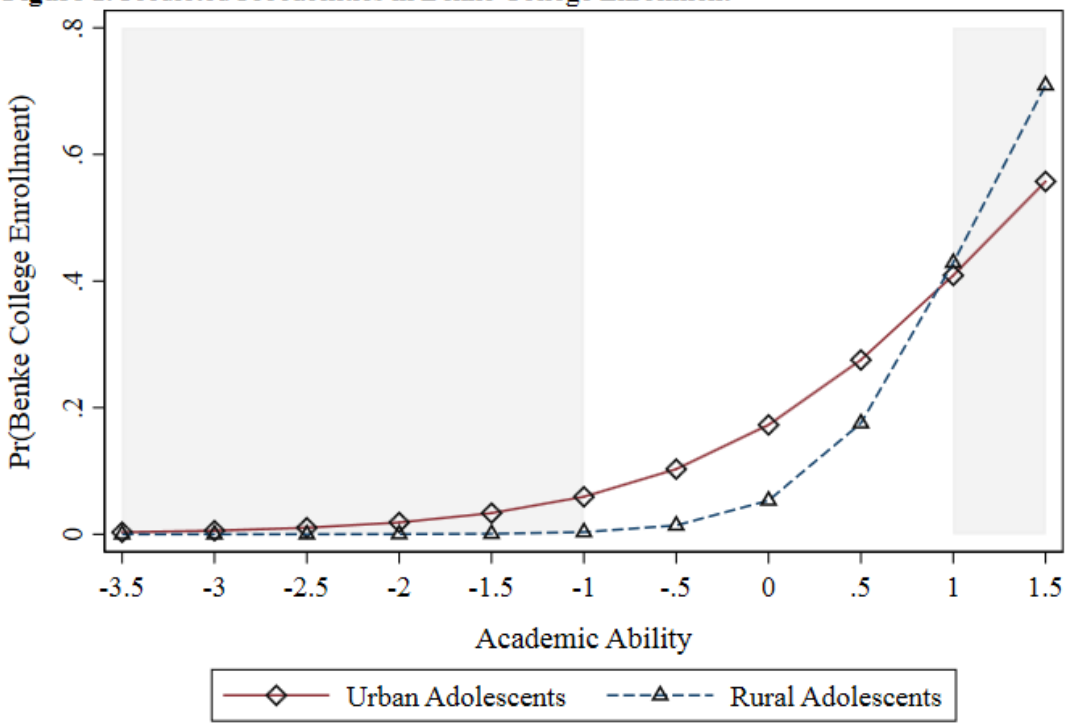
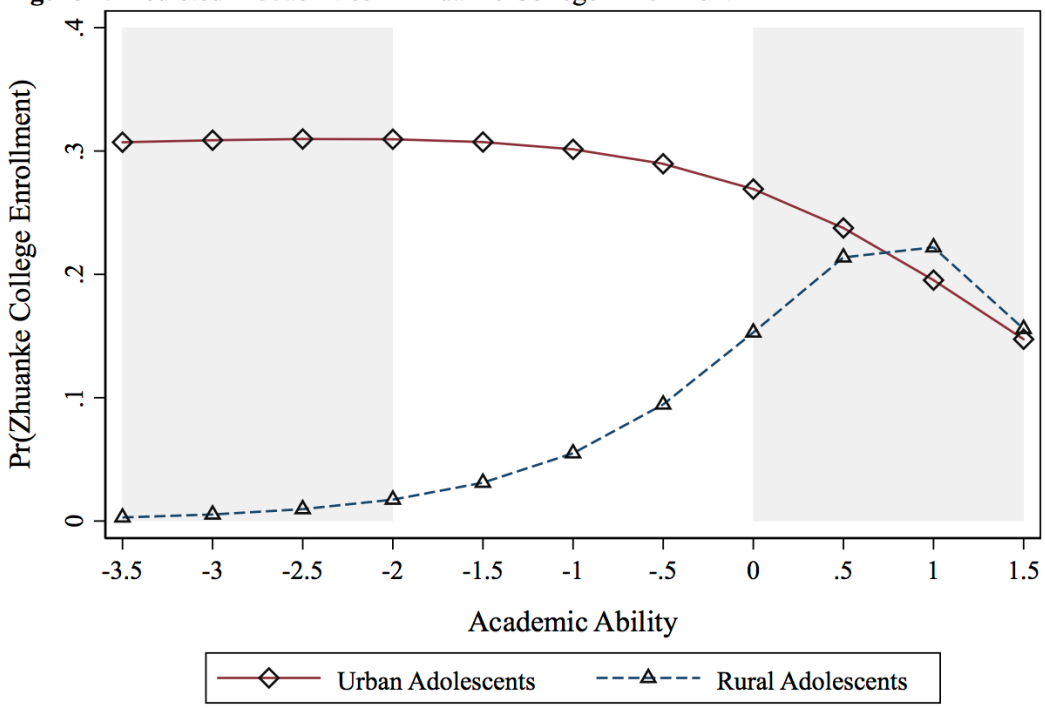
Figure 1. Predicted Probabilities in Benke College Enrollment



Note: Predicted probabilities are calculated from Model 3 of Table 2. All control variables are held at their subsample mean values when calculating predicted probabilities. The shaded areas indicate non-significant urban-rural differences in predicted probabilities at the 95 percent confidence level.

Figure 2. Predicted Probabilities in Zhuanke College Enrollment



Note: Predicted probabilities are calculated from Model 3 of Table 2. All control variables are held at their subsample mean values when calculating predicted probabilities. The shaded areas indicate non-significant urban-rural differences in predicted probabilities at the 95 percent confidence level.

Table 1. Means and Standard Deviations for Variables in the Analysis, Total Sample, Urban Sample, and Rural Sample, CFPS 2010-2014

	Total Sample		Urban Sample		Rural Sample		
	Mean	S.D.	Mean	S.D.	Mean	S.D.	*t*-test
Dependent variables							
Total colllege enrollment	.407	.492	.493	.437	.324	.519	***
Benke college enrollment	.225	.418	.280	.393	.172	.418	**
Zhuanke college enrollment	.182	.386	.213	.358	.152	.398	ns
Key independent variables							
Rural status	.508	.500	-----	-----	-----	-----	-----
Academic ability	.066	.930	.309	.594	-.170	1.185	**
Control variables							
Direct-controlled municipalities[a]	.027	.162	.043	.177	.012	.119	ns
East	.254	.436	.290	.397	.219	.459	ns
Central	.429	.495	.453	.435	.405	.544	ns
West	.290	.454	.214	.359	.364	.534	*
Female	.488	.500	.495	.437	.480	.554	ns
Age	16.964	.819	17.040	.711	16.891	.906	*
Ethnic minority	.116	.319	.059	.205	.172	.417	*
Number of siblings	1.078	1.012	.770	.722	1.376	1.199	***
Parental education in years	6.688	3.689	7.915	3.242	5.499	3.606	***
Family income (ln)	10.045	.875	10.177	.722	9.916	.989	***
Family education expenditure (ln)	7.145	1.845	7.507	1.453	6.794	2.149	***
Educational expectations in years	14.321	2.911	14.848	2.297	13.809	3.403	***
Number of observations	1,029		387		642		

Note: Data are adjusted by the CFPS survey sampling design. Means are from imputed datasets (m = 20) and standard deviations are based on the first imputed dataset (m = 1). Asterisks indicate a statistical significant difference of means between urban and rural samples; ns indicates non-significant difference. [a] Direct-controlled municipalities are the reference
* $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed).

Table 2. Multinomial Logistic Regression on Benke College and Zhuanke College Enrollment

	Model 1		Model 2		Model 3	
	Benke College	Zhuanke College	Benke College	Zhuanke College	Benke College	Zhuanke College
Rural status	-.778 ***	-.625 **	-.045	-.287	-.807 *	-.509 *
	(.247)	(.228)	(.253)	(.242)	(.394)	(.229)
Region						
East			-.440	-.359	-.509	-.437
			(.469)	(.686)	(.517)	(.712)
Central			-.676	-.852	-.688	-.885
			(.450)	(.668)	(.495)	(.693)
West			-.866	-.633	-.903	-.693
			(.536)	(.704)	(.583)	(.731)
Female			.035	.269	.112	.318
			(.234)	(.252)	(.235)	(.243)
Age			-.473 **	-.190	-.502 **	-.198
			(.180)	(.167)	(.178)	(.168)
Ethnic minority			.641	-.833	.706	-.735
			(.631)	(.796)	(.645)	(.781)
Number of siblings			-.203	-.026	-.237	-.049
			(.173)	(.121)	(.177)	(.119)
Parental education			.092 *	.034	.095 *	.039
			(.038)	(.041)	(.039)	(.043)
Family income			-.045	.059	-.064	.056
			(.161)	(.165)	(.167)	(.169)
Family education expenditure			-.067	-.119	-.077	-.130
			(.080)	(.067)	(.081)	(.069)
Educational expectations			.265 ***	.183 ***	.270 ***	.191 ***
			(.058)	(.047)	(.062)	(.049)
Academic ability			1.914 ***	.599 **	1.251 **	.075
			(.402)	(.220)	(.458)	(.269)
Rural status × academic ability					1.706 **	1.148 **
					(.621)	(.360)
Constant	-.593 ***	-.867 ***	3.460	.117	4.439	.399
	(.156)	(.171)	(3.490)	(3.609)	(3.474)	(3.660)
Pseudo R^2	.016		.197		.211	
BIC	76879512.388		62706674.381		61671690.234	

Note: N = 1,029. Never attended college is the base outcome. Standard errors are in parentheses. Data are adjusted by the CFPS survey sampling design. Coefficients are from imputed datasets (m = 20) and Pseudo R^2 and BIC (Bayesian Information Criterion) are from the first imputed dataset (m = 1). Direct-controlled municipalities are the reference group.

* p < .05; ** p < .01; *** p < .001 (two-tailed tests).

Table 3. Predicted Probabilities of College Enrollment and Marginal Effects of Academic Ability at 10th, 50th, and 90th Percentile of Academic Ability Distribution

	Benke College Enrollment			Zhuanke College Enrollment		
	10th	50th	90th	10th	50th	90th
Predicted Probabilities						
Urban adolescents	.052	.206 ***	.431 ***	.303 ***	.259 ***	.188 ***
Rural adolescents	.002	.084 **	.475 ***	.048 **	.177 ***	.216 ***
Urban-Rural Gap	.050	.122 ***	-.044	.255 ***	.082 *	-.028
Marginal Effects						
Urban adolescents	.059 ***	.196 **	.294 *	-.014	-.060	-.094 *
Rural adolescents	.007	.205 ***	.603 ***	.055 ***	.131 *	-.096
Difference in Marginal Effects	.052 **	-.009	-.309 *	-.069	-.191 **	.002

Note: Predicted probabilities and marginal effects are calculated from Model 3 of Table 2. All other control variables are held their subsample mean values when computing predicted probabilities and marginal effects. Discrete change of a standard deviation is specified for the computation of marginal

* $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed tests).

Table 4. Multinomial Logistic Regression on Benke College and Zhuanke College Enrollment Using Restricted School Sample

	Benke College Enrollment		Zhuanke College Enrollment	
Rural status	-.457	(.399)	-.518	(.261) *
Region				
East	-.511	(.569)	-.906	(.768)
Central	-.672	(.548)	-1.173	(.756)
West	-1.186	(.625)	-1.355	(.791)
Female	.063	(.265)	.311	(.249)
Age	-.339	(.192)	.030	(.179)
Ethnic minority	.939	(.773)	-.642	(.831)
Number of siblings	-.189	(.186)	.027	(.129)
Parental education	.089	(.040) *	.044	(.043)
Family income	-.171	(.195)	-.032	(.175)
Family education expenditure	-.170	(.082) *	-.185	(.069) **
Educational expectations	.254	(.071) ***	.174	(.059) **
Attending key-point school	.319	(.358)	-.412	(.420)
Attending fast tracking class	.797	(.257) **	.028	(.290)
Receiving private tutoring	1.329	(.480) **	.759	(.600)
Academic ability	1.060	(.439) *	-.238	(.316)
Rural status × academic ability	1.389	(.597) *	1.131	(.436) *
Constant	3.465	(4.045)	-1.197	(3.877)

Note: $N = 750$. Never attended college is the base outcome. Standard errors are in parentheses. Data are adjusted by the CFPS survey sampling design. Coefficients are from imputed datasets (m = 20). Direct-controlled municipalities are the reference group.

* $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed tests).