Higher Education Admissions in Beijing: Independent Freshman Admissions and the Influence of Family, Schooling, and Gender

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by

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PhD Dissertation Abstract

The sociological study of inequalities has long been concerned with questions concerning the role of education in creating a fairer society and whether it just serves as a means for the advantaged to consolidate pre-existing privileges. This thesis adds to the existing literature by addressing the questions of how family background, types of high school, college entrance scores, and participation in the alternative admissions scheme – Independent Freshman's Admission (IFA) – help structure access to tertiary education in Beijing, China. I examine tertiary education in terms of both university prestige and choice of university major.

Using a mixed methods study, I draw on qualitative data from my fieldwork in Beijing where I interviewed 60 first year students and 2 admissions tutors, drawn from across seven universities of different levels of prestige, with both STEM (Science, Technology, Engineering and Maths) and non-STEM subject majors. I also analyse quantitative data from the 2009 Beijing College Student Panel Study (BCSPS) consisting of 4771 students from 15 universities (3 elite, 6 selective and 6 less-selective universities). First, my qualitative analysis reveals the important role of residential background and *hukou* status, as well as key-point school attendance in university admission of students both through *Gaokao* route and IFA participation. I also explored some of the reasons behind female students' uptake of a STEM degree. Second, using multinomial logit models for analysing BCSPS data, I confirmed the importance of family background, residence of origin and school attendance for access to universities of different levels of prestige. Further, using logistic regression, I showed gender differences in personal attributes relevant to the pursuit of STEM fields, but no associations between different beliefs about marriage and family and educational choices.

Taken, together, these findings uncover the ongoing importance of institutional barriers in accessing elite and selective tertiary education in China and illustrate how the meritocratic policy objectives of IFA were undermined in practice. In moving forwards, now that IFA has been scrapped, my study suggests that, without a marked change of direction, the conflict will continue between meritocratic principles and elitist goals, and the quest to improve equality in region, class and gender will remain elusive.

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LIST OF ABBREVIATIONS

BCSPS	Beijing College Student Panel Survey
GDP	Gross Domestic Product
HE	Higher Education
IFA	Independent Freshman Admissions
IMS	Increasing Merit Selection
MOE	Ministry of Education
PISA	Programme for International Student Assessment
PO	Proportional Odds
PPO	Partial Proportional Odds
PRC	People's Republic of China
PSU	Primary Sampling Unit
SES	Socioeconomic status
SPU	Specialised Publishing University
STEM	Science, Technology, Engineering, and Mathematics
UIT	University of Information Technology
UST	University Specialising in Telecommunications
USCT	University Specialising in Chemical Technology

CHAPTER ONE

INTRODUCTION

SETTING THE SCENE

Every June as the *Gaokao* (China's College Entrance Examination) approaches, conversations about whether '*impoverished families can hardly nurture rich sons*' (寒门难出贵子) dominate the news headlines. In a media conversation held with Xuanang Xiong to discuss the secrets to his success, the 17-year-old, who scored first place on the *Gaokao* in Beijing, spoke frankly.

> 'Both of my parents are diplomats. I was raised in a highbrow family where such an environment cultivated my personality. For me, every milestone is based upon the previous foundation. Therefore, success is *a matter of course.*'
>
> Adapted from Li (2017)

For decades, the *Gaokao* has been regarded as the fairest means for talent selection, as higher education (HE) admissions are based purely on testing. This seemingly fair, meritocratic testing system is often justified by the traditional Confucian concept that 'god helps those who help themselves' (天道酬勤), suggesting that self-fulfilling efforts can override one's family background to produce success. For instance, three months before the *Gaokao*, one display board at Ning Kang Number Two High School became a trending news item on social media. The board stated, 'Without the *Gaokao*, how can you dare to compete with those *fuerdais*' — a Chinese term referring to the children of the nouveau riche in China (as shown in Figure 1.1). The underlying meaning of the above statement frames the *Gaokao* as an equaliser of educational opportunity in the promotion of social mobility, thus delivering a message that diligence can minimise existing family background disparities.

Figure 1.1 A school display board stating, 'Without the *Gaokao*, how can you dare to compete with those *fuerdais*?'

Adapted from Sina.com.cn (2012)

Furthermore, in another incident, a parent in Beijing spent almost 1 million British pounds (equivalent to 9,000,000 RMB) on a 70-square-metre apartment flex space that was built in 1984 to qualify for *xuequfang* [school district housing], as elementary and secondary public schools in China serve predominantly as neighbourhood schools that enrol pupils from designated areas (as shown in Figure 1.2). Hence, through property ownership, moving to a particular neighbourhood to land a seat in a coveted elementary school has become the middle-class modus operandi for obtaining a high-quality education. Does this mean that education has become a quest for positional advantage that only those with the deepest pockets can win for their children to stay ahead of the game?

Figure 1.2 Built in 1984, this 70-square-metre apartment flex space was sold for £1 million due to its proximity to a coveted public school in Beijing.

Adapted from Chen (2020)

The examples cited above illustrate a certain dichotomy. On the one hand, the prevalence of meritocratic discourses in contemporary political debates is being used as a normative validation for stratified societies, where educational meritocracy has been widely applied to justify educational advancement or exclusion. Students are told to work hard because the *Gaokao* is the only means to 'offset' their disadvantaged background. On the other hand, Figure 1.2 also demonstrates the mobilisation of any potential resource by parents to fully support their children's educational advantage. Hence, the overarching question motivating this research is what role does education play in creating a fairer society, or does it only serve as a means for the advantaged to consolidate pre-existing privileges?

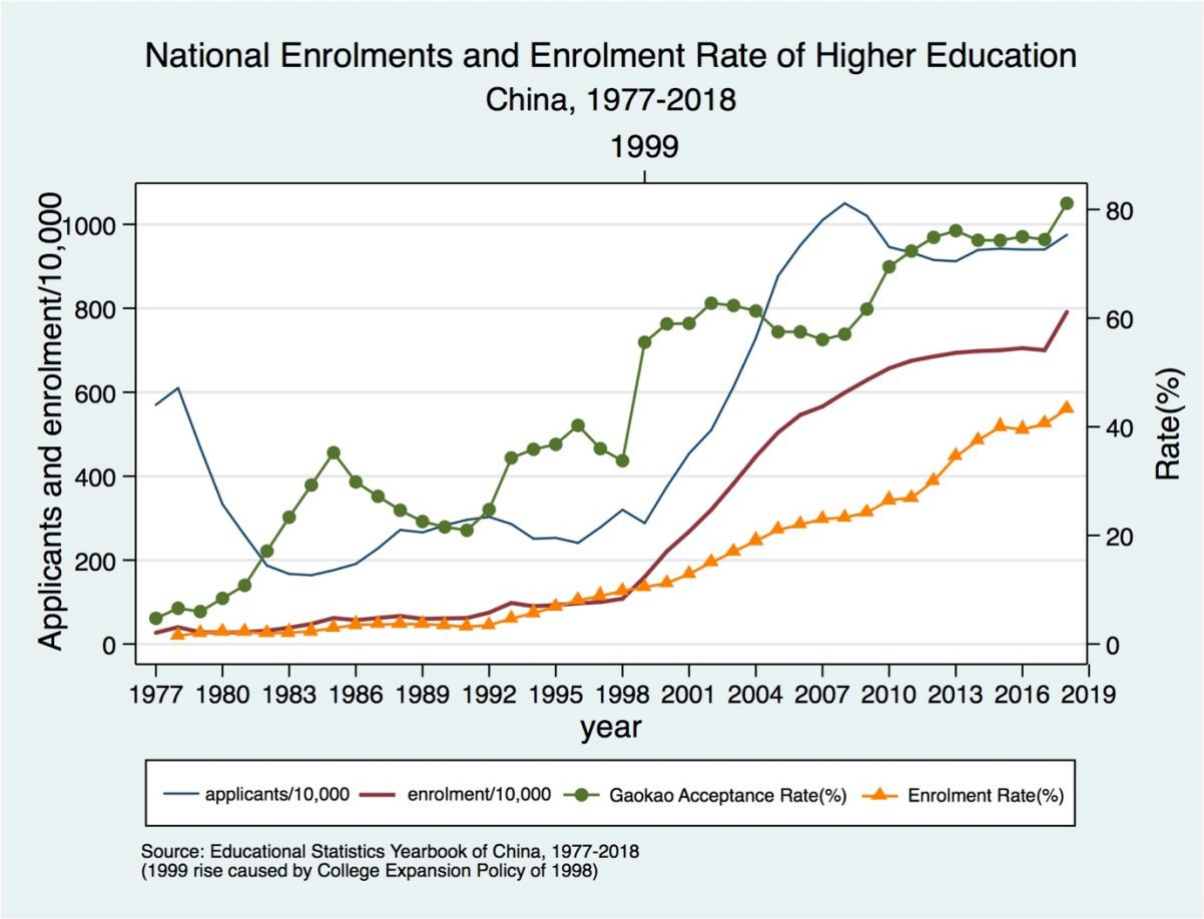


Figure 1.3 National Enrolments and Enrolment Rate of HE in China, 1977-2018

Furthermore, China has witnessed a staggering expansion in postsecondary education, as illustrated in Figure 1.3, with 2956 higher education institutions serving approximately 40 million students (Ministry of Education, 2014; Ministry of Education, 2019). Gross enrolment increased from 9.8% in 1998 to 51.6% in 2019 (ibid). The solid blue line depicts the trend in the number of applicants who participated in the *Gaokao*, whereas the solid red line signifies HE enrolment, which is measured by the number of students recruited to a university. The *Gaokao* was reintroduced immediately after the catastrophe of the Cultural Revolution in 1977, and the system encountered a larger influx of *Gaokao* applicants than it could handle. The enrolment rate increased steadily thereafter until 1998, when the MOE pledged to launch an ambitious college expansion plan titled the 'Education Promotion Plan of Action for the 21st Century', aiming for a 20% increase in college enrolment (Mok & Jiang, 2016; Ministry of Education, 1998). National enrolment then surged from 7.8 million in 1998 to almost 40.02 million in 2019, a more than five-fold increase in two decades

(Ministry of Education, 2019). In addition, the green connected dotted line denotes the *Gaokao* acceptance rate, which is calculated as the percentage of enrolment divided by the number of applicants in the corresponding year. As illustrated in the graph, the *Gaokao* acceptance rate started around 33.86% in 1998 and surged to 55.44% after the college expansion in 2001 (Eol.cn, 2019). From 1995 onwards, the 'unification of the pathways' (*binggui*) policy was introduced, which marked the government's withdrawal from recruitment, fee-charging, and centralised job assignment in higher education (Liu, 2015). As such, by transferring the financial responsibilities for college to individual families, one direct impact of the *binggui* policy was an increase in the *Gaokao* acceptance rate, as demonstrated by the green dotted line. Further, the ferocity of competition for college admission has been metaphorically depicted as 'a stampede of thousands of soldiers and tens of thousands of horses across a single log bridge'. However, as *Gaokao* acceptance currently stands at more than 81.13% in 2018, I would argue that this metaphor no longer holds (Ministry of Education, 2019). Running parallel with this expansion is the emergence of a pyramid-shaped institutional hierarchy in which universities are classified by the state using academic rankings (as illustrated in Figure 1.4), which will be elucidated in Chapter 2 in the section 'Ranking of Universities' on page 19.

Increasingly, concurrent with this unprecedented expansion, the same academic credentials from universities with different levels of prestige carry distinct symbolic meanings, as they are interpreted differently in the labour market. For instance, in 2013, the state allegedly banned employment discrimination against those who did not graduate from Project 985 or Project 211 universities (Gov.cn, 2013). Although discrimination against those with non-elite credentials is officially banned, hidden forms of discrimination may still persist.

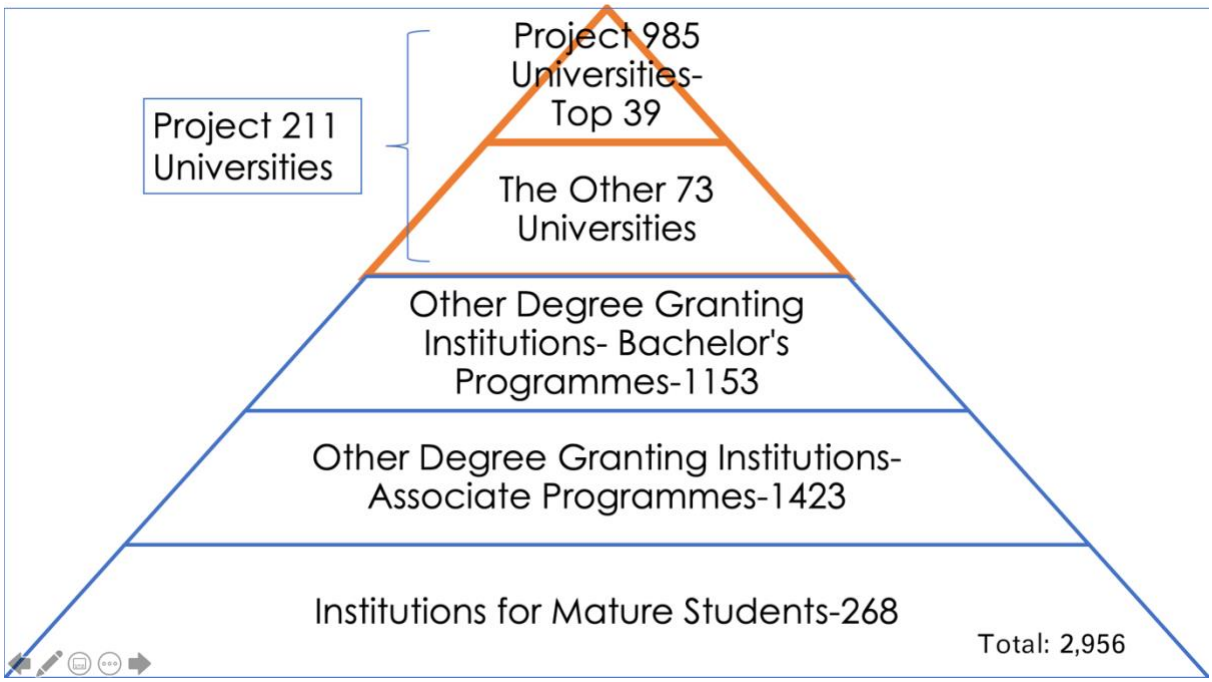


Figure 1.4 Hierarchical Structure of Chinese Universities

Source: Ministry of Education (2019)

I RESEARCH PURPOSE AND RATIONALE

This study addresses the question of how family background, high school type, *Gaokao* score, and preferential recruitment policies work together to influence an individual's access to HE institutions with different levels of prestige as well as students' choices of subject majors. To disentangle the interlinked influences shaping individual educational pathways and college destinations, both familial factors (e.g., parental socioeconomic status) and structural factors (e.g., geographical origin) are identified. Family background gaps in university access are a long-standing, well-documented issue. However, due to China's unique geopolitical environment and because of the rapid development of the country's economy, educational disparities may not always follow the linear trajectories shown in Western-dominated stratification research, which has concentrated mainly on social class, gender, and race. China offers a relevant case for educational stratification research, as the country has undergone dramatic economic, social, and cultural changes. The ambitious college expansion plan launched by the national government in 1998 further boosted national enrolment, as mentioned above. In this dissertation, I draw on mixed-methods evidence. This

consists of qualitative data from fieldwork involving 62 in-depth interviews with students and college admission tutors across 7 universities in Beijing and quantitative data from the 2009 Beijing College Student Panel Survey (BCSPS), which measures the experiences and choices of college students in Beijing. The data are used to shed new light on major geopolitical shifts in China and their implications in the HE realm. This dissertation highlights findings that may be helpful to policymakers dealing with issues of current and future concern, such as levelling out geographical inequalities in access to HE opportunities.

II STRUCTURE OF THIS DISSERTATION

This chapter explains the reasoning for the main focus of inquiry and highlights the relevance of the dissertation topic by presenting a few examples that generated heated discussions in the public sphere. Chapter 2 outlines the social and policy context of this dissertation in greater detail, including China's unique schooling system. Chapter 3 provides the theoretical background, drawing upon Bourdieu's social reproduction theory and the concept of habitus and discussing their adaptability to the Chinese context. This chapter also discusses the concepts of meritocracy and definitions of 'middle class', provides a review of the relevant Chinese and international literature and concludes with the gaps identified for further research. Chapter 4 outlines the mixed methods research methodology and qualitative sampling strategies and introduces the study participants. It also introduces the Beijing College Student Panel Survey (BCSPS), along with its sampling strategies and the rationale for focusing on Beijing college students. Chapter 5 presents the narrative accounts of students' lived experiences. Because these qualitative data are derived from a small-scale convenience sample, the accounts cannot be generalised beyond these respondents. However, some of the mechanisms and processes identified as important for students' choices of university and subject major help shape the models used in the subsequent statistical chapters. Chapter 6 utilises survey data from the BCSPS to demonstrate that even though China has been expanding its HE at an unprecedented rate, men still enjoy considerable advantages in attending well-recognised institutions in better-resourced cities. Additionally, graduating

from an elite state-funded key-point school is found to be closely linked with attending a high-ranked university. Chapter 7 disentangles some of the complexities of the college major choice decision-making model in the Chinese context with respect to STEM subjects (science, technology, engineering, math). By identifying the predictors that shape students' selection of STEM majors, I help elucidate some of the existing sex segregation evident in China. This dissertation concludes with an extrapolation of the findings from both the large-scale survey and the qualitative interviews to create a coherent story about HE admissions in Beijing. Empirical contributions to the field are noted, and areas for future research are identified.

CHAPTER TWO

CONTEXT OF RESEARCH

INTRODUCTION

This study examines the mechanisms of higher education (HE) access in Beijing by focusing on how individual pathways and destinations are embedded within a range of institutional and familial factors that influence education from an early age. My research interest stems from my observations of the distinctive pathways of my peers, who all attended university. An understanding of the nature of China's institutional stratification helps shape the sample used in this analysis. Since the implementation of the open-door policy in the 1980s, Chinese society has undergone dramatic social, economic, and institutional shifts and remarkable globalisation, commercialisation, and urbanisation, and it has seen a marked increase in gross domestic product (GDP), with an annual growth rate of 9.5% since 1978 (National Bureau of Statistics, 2018). China has witnessed a dramatic expansion in postsecondary education with national enrolment surged to 40.02 million in 2019 (Ministry of Education, 2019). Despite these expanded educational opportunities, universities in China are increasingly being 'differentiated qualitatively'; the same academic credentials from universities with different rankings are interpreted differently in the labour market (Arum, Gamoran, & Shavit, 2007). To better understand the structural patterns underlying the welcome expansion of HE, I locate my inquiry of individual pathways and destinations in the context of universities in Beijing, which, as with education reforms in the West, are said to intensify class inequalities (e.g., Reay, David, and Ball, 2005). This chapter describes the development of a project that seeks to examine how changing admission practices in HE are affecting social mobility in China. Part of understanding and questioning educational inequality involves understanding the social, cultural, and economic dynamics that play out in admission practices. In this chapter, in addition to providing a detailed explanation of admission processes, I try to make sense of the changes in admission policies in relation to wider social and historical contexts and forces.

I EDUCATION IN CHINA

Figure 2.1 illustrates the academic progression in China's educational system. Compulsory education in China consists of primary education and lower secondary education; post-compulsory education commences from upper secondary school. Educational advancement to each level is determined by highly competitive standardised testing (Ranson, 1988). The 1986 Law on Compulsory Education designated the first nine years of education (6 years of primary school plus 3 years of middle school) as compulsory and free. However, it was not until 2011 that the goal of universalising compulsory education was accomplished (Ministry of Education, 2012). Post-compulsory education consists of an academic track (senior high school) and a vocational track (e.g., vocational high school, associate school). After the completion of lower secondary education, students who wish to pursue further education must take the *High School Entrance Exam* (*zhongkao*), which is administered annually by the provincial Education Examination Authorities. Restricted by the *hukou* system[1], students can attend only high schools in the area where their *hukou* is registered[2]. Thus, inter-province school transfer is considered unlawful unless one's *hukou* status has been transferred to the designated place first. The *High School Entrance Exam* (*Zhongkao*) is standardised within provinces and determines whether students are eligible for the academic track or the vocational track. The academic track not only requires higher *zhongkao* exam scores for admission but also directly equips students for tertiary education. Therefore, it is widely considered a structural gateway for college (Li 2010; Yang 2006). The vocational track usually emphasises specific technical skills such as nursing, auto repair, and electronic engineering and is the less academic of the two. Typically, students need to complete the academic senior high school track to take the *Gaokao*. Although graduates from vocational upper secondary school are also allowed to sit the *Gaokao* exam if their academic ability is considered to be "equivalent" to senior high school graduates', the proportion of exam takers from vocational schools is small, normally less than 5% (Guo, 2015).

[1] The *hukou* (household registration system) that classifies citizens as urban or rural was imposed by the state government at the founding of the People's Republic of China. One's hukou status is inherited from one's family.
[2] This restriction applies only to state schools

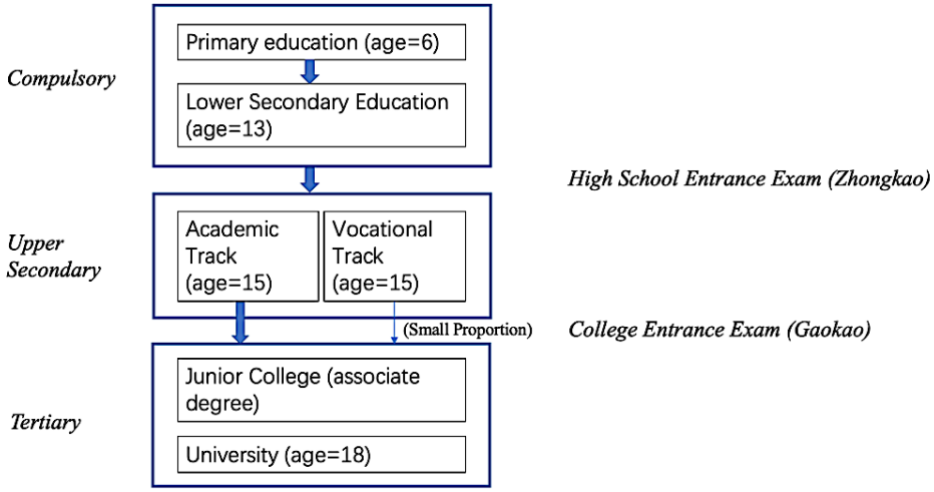


Figure 2.1 The Structure of China's Education System

Source: Adapted from Guo (2015)

Key-Point Schools

In the academic upper secondary track, key-point schools are elite, government-funded schools that are unique within the structure of China's education system. These schools, predominantly located in urban areas, were designated 'key-point schools' by the state government in the 1980s to identify, at an early age, talent that could contribute to the country's socialist development (Hannum, 1999; Murphy & Johnson, 2009). The institutional stratification implied here is not the differentiation between vocational and academic curricula commonly seen in Western education systems; rather, its uniqueness lies in its curriculum and ability groupings solely within the academic track (Iannelli, 2013). As key-point schools receive substantial state subsidies for infrastructure building and quality educational resources, those who are excluded from key-point schools tend to be viewed as scholastically inferior. Given that the key-point schooling system exists across compulsory and upper secondary levels of education, where students are situated in the hierarchy of educational opportunities at each level of education limits their progression to the next stage (Weis & Cipollone, 2013). Within a school, a key-point class consists of students with the highest exam marks, differentiating it from classes with 'average' performance (Kai, 2012; Reay et al, 2003).

'Education for Quality' vs 'Exam Preparation'

Performing well and earning high grades in school are viewed as the primary determinants of success in Chinese society. Traditional Confucianism values the virtue of advancing through diligence, as exemplified by the saying that 'knowledge, like a sea, is boundless; only through hard study can one reach the destination' (*学海无涯，惟勤是岸*). With the market liberalisation in the 1980s, the influx of foreign goods and Hollywood movies that advocate assertiveness and independence, coupled with the ever-increasing competitiveness of the market, transformed youths' value system into one distinct from traditional Confucianism. This societal transformation has driven Chinese society to re-examine the way it views education. In particular, the 'education for quality' (*sushi jiaoyu*) campaign, in opposition to the traditional model of 'education for exam preparation' (*yingshi jiaoyu*), was first promoted by the Ministry of Education in 1999 (Fong, 2007). The campaign continues to have relevance two decades later, serving as one of the guiding principles of education policy in China. Inspired by educational policies in the West promoting the cultivation of a more diverse set of abilities than those measured by standardised tests, the primary purpose of the 'education for quality' campaign is to produce more well-rounded individuals who can meet the demands of global competition (Lou, 2011; Fong, 2007) rather than to train 'bookworms' and 'exam robots' adapted only to memorising text and mechanically answering exam questions. Thus, the 'education for quality' model utilises a 'student-centred' approach that emphasises developing innovation and critical thinking skills via 'learning by doing' (Dello-Iacovo, 2009). These concepts are further illustrated in the 2003-2007 Action Plan for Invigorating Education, the "Project for 'Education for Quality' (*suzhi jiaoyu*) in the New Century" (Ministry of Education, 2014):

> With fostering students' creativity and practical skills as the main focus, it aims to strengthen and further develop moral education in schools; deepen reforms of the curriculum and assessment systems; make real improvements in the physical health, psychological *suzhi* and artistic accomplishment of students; and foster a new generation of well-rounded people developed in morals, intellect, physical health and aesthetic appreciation.

Consequently, the ‘education for quality’ curriculum reforms attempt to cultivate creative and independent thinking skills, integrated practical skills, teamwork and co-operation. At the implementation level, however, although the rhetoric of the ‘education for quality’ campaign is inspiring, the reality is far less optimistic.

Gaokao-based Selection Process

Admission to HE institutions is predominantly determined by students’ performance on the *Gaokao*. Before 2002, the exam was monitored by the National Education Examinations Authorities and was nationally standardised (except for *Shanghai*). Since 2004, a few provinces (including Beijing) have been authorised to make autonomous decisions on the test subjects and exam materials, giving local municipal commissions slightly more flexibility in terms of alignment with the national agenda outlined by the Ministry of Education. College admissions are decided by province based on national enrolment planning. In this sense, it is the educational authorities that have control over yearly national and provincial enrolment for universities. On a yearly basis, the Ministry of Education determines the total college enrolment and the enrolment distribution by province for each university (Dong & Xu, 2009). When applying for college, students submit a list ranking their choices of colleges and majors based on their *Gaokao* scores. The provincial educational authorities then match students to colleges and majors according to their preferences and exam scores in accordance with the provincial enrolment plan (Wang 2012). Each year, the Ministry of Education also determines the exam score cut-off used as the minimum entry requirement for universities and junior colleges in each province (Hannum et al., 2010).

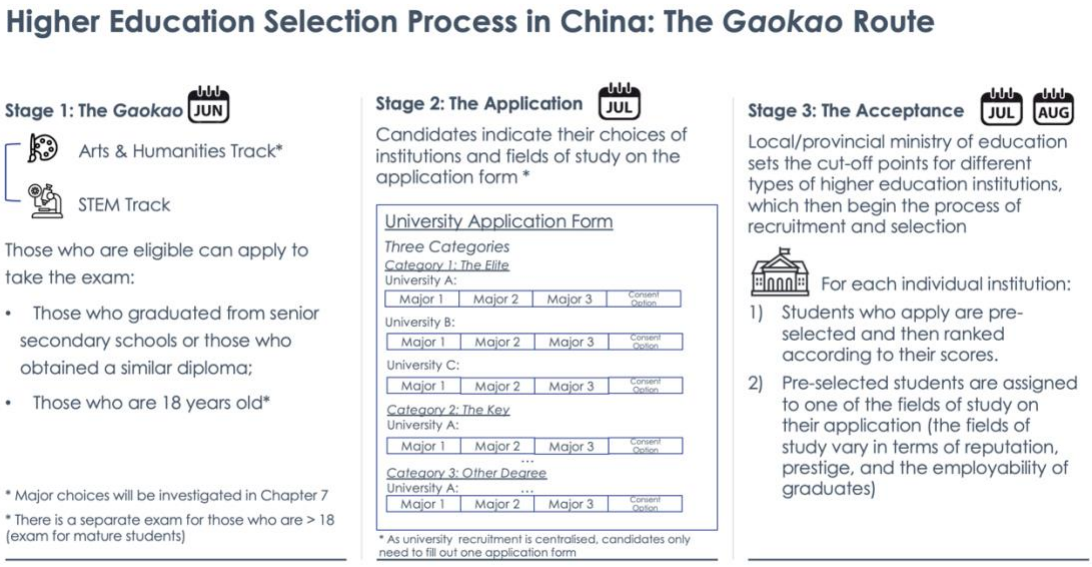


Figure 2.2 *Gaokao*-based Selection Process

Adapted from Liu (2016)

IFA Selection Process

The exam-based admissions policy has remained the predominant way of recruiting talent since the founding of the People's Republic of China in 1949 and has been recognised as a key mechanism for social mobility. For instance, Liang et al. (2013) analyse administrative data from Peking University and Soochow University from 1952-2002 and find that since 1949, a large number of children of middle and lower socio-economic status entered the HE system through *Gaokao*, suggesting the importance of education in promoting social mobility. On the other hand, since the 1990s, the HE system in China has taken an elitist stance to fulfil the immediate need for industrialisation and construction, resulting in an elite-mainstream divide (Yang, 2006). As a result, the influence of family background has continued to rise, and inequality in access to tertiary education has become increasingly evident. In an attempt to research educational inequality based on gender and *hukou* in the context of educational expansion utilising census data, Wu and Zhang (2010) document that although there has been a substantial increase in educational opportunities, educational expansion has mainly benefited females and urban residents.

Moving into the 21st century, the HE realm has been adapted progressively within the context of globalisation, raising the notion of contextualised admissions (CA) in university recruitment. The rationale behind CA is to encourage HEIs to take factors other than prior examination grades into consideration by admitting students who demonstrate the potential to succeed (Zimdars, Moore, & Graham, 2016). This approach could, in principle, boost enrolment for those who are relatively high achieving but may be educationally and socio-economically under-privileged, reducing their chances for university placements (ibid). At the same time, economic development and globalisation have led to the decentralisation of HE controls. Mok and Welch (2003) specify one important reason for this decentralisation as the nation's development goal of cultivating world-class universities. Note that a university's managerial autonomy plays an important role in the review process. Consequently, concurrent with the university recruitment trend as witnessed in the West—where individual-level factors are increasingly taken into consideration rather than a unitary set of scores—the IFA system was established in 2003, whereby the government redistributes some of the centralised admission responsibilities to local universities, serving as an alternative route to postsecondary education. Under the current exam-only route, cut-off points for different types of HE institutions are established centrally by the Ministry of Education, and the institution then ranks the applicants based on their *Gaokao* scores (Liu, 2016). Therefore, individual institutions do not have much voice in recruitment because the process has been standardised.

Though widely regarded as socially legitimate, the *Gaokao* has been heavily criticised for its rigidity and failure to recognise individual student creativity (Wang & Ross, 2013). Some scholars of the history of education have explained China's examination culture as a derivative of Confucian culture, tracing the 'root' of the *Gaokao* back to the imperial examination system (ibid). As the country strives to transform itself into a global economic power, innovation in HE has been valued as part of the national strategy for enhancing student learning and employability. The IFA policy was established in response to the criticism of the *Gaokao* and aimed to explore 'many unusual talents and comprehensive competences that cannot be assessed by standardised tests' (Liu et al., 2014, p. 62; Zhao,

MPhil thesis). This new policy established a multistage strategy for selecting students based on a more holistic package of qualifications (e.g., application materials, recommendation letters, and interview performance), with the aim of evaluating academic talent as a whole rather than based on quantitative measures such as exam scores. To be eligible to apply, candidates must possess national and provincial certificates from the Chinese Academic Olympiads as one of the admission criteria. Other acceptable academic credentials include patents and certificates in national essays in Mandarin and English. Applicants must still take the *Gaokao* to be considered. However, the score alone is not the sole determinant. Applicants with successful interviews are given seats at universities despite relatively low *Gaokao* scores that fall below universities' typical minimum acceptance norms. Figure 2.3 details the admissions process by the IFA route.

Figure 2.3 A Graphical Illustration of the IFA Process
Adapted from Liu et al. (2014)

The acknowledged objective of the IFA system is to 'enhance a sound and diverse enrolment system' that is 'conducive to promoting equal opportunities' (Ministry of Education, 2010, p. 28). Though the system strives for built-in transparency, families and schools sometimes deliberately use IFA as a fast track to admission that bypasses universities' typical minimum acceptance marks. For instance, in 2015, an 18-year-old secured a university seat through the IFA by publishing an article titled *The Immaterial Theory of André*

Gorz in one of the leading journals in China. Analysing the theory of the French social philosopher, the article generated heated discussions about the authenticity of its authorship. It was eventually discovered that the article was co-authored with the girl's mother, who is a university professor (Liu, 2019). Hence, under the broader state political rhetoric of promoting educational equality, a central question remains: for those who take the IFA route, what are some of the strategies and mechanisms used to navigate the system, and what are some of the subsequent consequences for equality of opportunity? This research will provide a deeper and broader exploration of how IFA has worked in practice.

II HIGHER EDUCATION IN CHINA: GENERAL LANDSCAPE AND POLICIES

China's Economic Development and its Effect on Higher Education

Education policies in China were largely shaped during the market reform period in the 1980s and are expected to align with the national agenda set out by the government. After the turmoil of the Cultural Revolution, the government prioritised economic development over social equality in formulating social and economic policies. The economic ideologies of that time were best captured by Deng Xiaoping, the fourth president of the People's Republic of China (PRC), who stated, 'Let some people get rich first'. Consistent with Deng's vision, major cities along the coast formed special economic zones for extensive government subsidies and foreign investment. Deng's statement legitimised a stratified society in the sense that the fruit of China's prosperity would not be shared equally among its citizens. According to Deng, if some people become rich first, this would lead to the nation's overall economic advancement.

In the late 1970s, Deng stressed the importance of progress in science, technology and education to economic development and modernisation. In 1995, Jiang Zemin, then president, pointed out that progress in science and technology was the primary engine for improving productivity, as embodied in the government's '*kejiaoxingguo*' (the strategy of invigorating China through science and education) rhetoric. Jiang said the country should

work to boost education and enhance its ability to commercialise the fruits of scientific and technological research. The state has earmarked funding for this strategy ever since it was included in the five-year plan for 1996-2000 (Ministry of Education, 2015). Hence, the state's preference for natural sciences, technology and engineering became an invisible hand mobilising elite human resources to serve the national development strategy.

During the 2000s, the policy discourse of "building a harmonious society" (*he xie she hui*) became the defining charter under the leadership of President Hu Jintao. Here, education policies were expected to align with state policy to create a harmonious society. In 1999, the State Council approved the Plan of Revitalizing Education in the Twenty-First Century to expand college enrolment (Ministry of Education, 1998). The plan included a wide range of alternatives to encourage colleges to set up multiple campuses and to stimulate the establishment of private colleges (Yeung, 2013). The rationale behind this massive educational expansion was to drive domestic consumption of education and related industries and to enhance the country's international competitiveness through the development of a more skilled workforce (ibid.).

Ranking of Universities

Though a 51.6% gross college enrolment has been achieved, running parallel with this expansion is the appearance of a pyramid-shaped institutional hierarchy in which universities are classified by the state based on academic rankings (as illustrated in Figure 2.4; Ministry of Education, 2019). Project 211 was initiated by the Ministry of Education in 1995 and consists of approximately 100 universities selected for generous financial packages to strengthen their research infrastructure and their international competitiveness and thereby enhance China's development in the twenty-first century (Ministry of Education, 2005). Project 985 was launched in 1999 to further strengthen this commitment to promoting academic excellence and cultivating 'world-class universities.' The name Project 985 denotes the date when this project was initiated—in May 1998, the prime minister, Jiang Zemin, claimed that 'China must have...first-rate universities at the international advanced level' (Ministry of Education, 2006). Thus, 39 prestigious research universities have emerged as

top-tier elite institutions and are categorised as Project 985 schools; these and additional schools that together total approximately 100 selected universities comprise Project 211 universities. Below these in the hierarchy are a vast number of recently designated universities that constitute a new layer of teaching-only institutions (Wu, 2008).

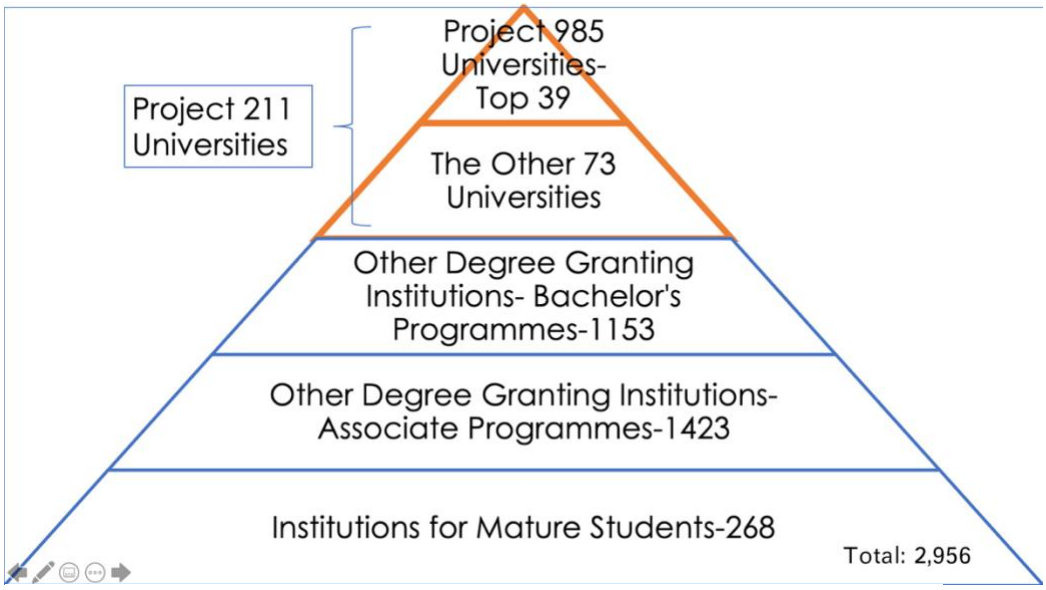


Figure 2.4 Hierarchical Structure of Chinese Universities

Source: Ministry of Education (2019)

Contemporary HE hierarchies were largely shaped during the market reform in the 1980s, when economic development was prioritised over social development in formulating the government's policy agendas (Hannum, 1999). The HE policies at that time were subsumed by the economic disposition of 'giving priority to efficiency with due consideration to fairness' (*效率优先，兼顾公平*) (Yang, 2006). Specifically, this principle was first raised at the Third Plenary Session of the 14th National Congress and specified in The Decision for the Establishment of a Socialist Market Economic System. The principle has largely taken on an elitist paradigm that prioritises the rapid development of social productivity for the nation's rejuvenation (Zhang & Chang, 2015). Consequently, education has become an avenue for channelling individuals to their designated positions while cultivating those with talent to meet the immediate needs of industrialisation and national building, resulting in an elite-mainstream divide. Under this elitist paradigm, the *Gaokao*, as an ostensibly fair standardised testing system, functions as 'an efficient system that sorts

individuals for positions of leadership in order to maximise the average level of well-being in a society' (Lim, 2013, p. 3).

III GEOGRAPHY AND EDUCATION

Decentralisation Leads to Uneven Regional Spending on Education

Economic development and globalisation have also led to the decentralisation of HE control. In addition to the expansion of enrolment and the development of non-state institutions, the central government has redistributed some management responsibilities to the local authorities. This change has forced funding for education to be more closely tied to local economic circumstances, exacerbating existing regional disparities. For instance, research has identified that the highest provincial primary education expenditures per student, in Shanghai, are now ten times larger than the lowest, with this gap almost doubling in the 1990s (Li, Park, Wang & Jin, 2007). Illustrating the rising geographic disparity in expenditure with a framework adopted from Liu (2013), Table 2.1 presents comparative data on educational expenditure by region in 2019. This table lists the two main sources of education funding, namely, government appropriation and tuition fees. This table adopts the general convention used in other studies by using the city of Beijing as the benchmark (Hannum & Wang, 2006). Funding levels above 1.0 indicate higher governmental spending and tuition contributions than in Beijing, while funding levels below 1.0 suggest lower spending levels and a lower level of private contributions than in Beijing. While most governments in eastern provinces spend more on education than Beijing, western provinces show significantly lower government investment in education (the only exceptions being Yunnan and Sichuan, which achieved similar levels of spending on education to those in Beijing). In addition, private contributions to education in the central region are found to be much higher than in Beijing. Data suggest that provincial governments in western provinces generally spent much less on education than the Beijing government. For instance, the government in Tibet invested only approximately 20% of Beijing's government appropriation levels. Regarding tuition fees, a pattern similar to those observed for appropriation levels was revealed: the majority of western provinces exhibit much lower levels of private

contributions than Beijing. One possible conclusion is that geographic inequality in education appears susceptible to educational decentralisation and regional economic disparities, potentially reinforcing social reproduction and exclusion by placing responsibility on individual students and their parents.

Table 2.1 Snapshot of Education Spending by Provinces in 2019

	Provinces/cities	Government Appropriation	Tuition Fees
Eastern	Beijing	1.000	1.000
	Shanghai	0.915	1.187
	Tianjin	0.456	0.544
	Liaoning	0.713	1.238
	Shandong	1.822	2.502
	Jiangsu	1.928	2.817
	Guangdong	2.650	5.895
	Hebei	1.231	1.615
	Zhejiang	1.469	2.798
	Fujian	0.839	1.268
	Hainan	0.251	0.332
Central	Henan	1.551	2.802
	Anhui	1.049	1.403
	Hunan	1.091	1.942
	Hubei	1.016	1.658
	Jiangxi	0.907	1.172
	Heilongjiang	0.605	0.623
	Jilin	0.507	0.638
Western	Sichuan	1.454	2.083
	Yunnan	1.058	0.942
	Shanxi	0.653	0.902
	Guangxi	0.913	1.180
	Shannxi	0.776	1.243
	Xinjiang	0.725	0.217
	Inner Mongolia	0.621	0.428
	Chongqing	0.699	1.046
	Guizhou	0.901	0.819
	Gansu	0.587	0.377
	Ningxia	0.183	0.153
	Qinghai	0.196	0.078
	Tibet	0.217	0.015

Framework adapted from Liu (2010) and National Bureau of Statistics (2019)

Hukou and Geography

The household registration system that classifies citizens as urban or rural, known as *hukou,* was imposed by the state government at the founding of the PRC. One's *hukou* status is inherited from one's family. Wu and Zhang (2010) argues that this institutional division results in 'differentiated citizenship' by distinguishing two classes of citizens in terms of job assignments, educational opportunities, pensions, and healthcare benefits. In addition to assigning people either agricultural or non-agricultural status, the *hukou* carries symbolic relevance across regions. For example, a non-agricultural *hukou* holder from a capital or provincial city ranks higher than a rural *hukou* holder. The institutional rationale for establishing the *hukou* system, according to Harvard sociologist Whyte (2010), was to effectively bind the rural population to the soil so that 'China's cities could remain lean demographically and economically' (p. 184). As such, discrimination based on *hukou* status was legitimatised in labour market prospects.

The *hukou* system has profoundly exacerbated existing educational inequalities. Under the current scheme, the *hukou* system together with educational meritocracy are widely applied to justify educational advancement or exclusion. Wu and Zhang (2010) identified three sources of upward *hukou* mobility: education, party membership, and military participation. Successful matriculation in designated tertiary institutions carries with it an entitlement to urban *hukou* status (ibid). Due to the potential transferability of *hukou* status, *hukou* registration status does not need to be identical to residential location (ibid). Table 2.2 depicts the percentage distribution of the population by geographic residence and *hukou* status from 1982 to 2010. In 1982, over 92% (74.8/81.0) of rural *hukou* holders resided in rural areas (Wu & Zhang, 2010). However, that percentage has changed as a substantial number of rural residents have moved to cities for better employment opportunities. However, because of *hukou,* these migrants are systematically denied access to urban and education facilities designated for 'urban' *hukou* dwellers, resulting in a call to fundamentally reform the *hukou*-based system. Because the *hukou* system requires rural students to attend schools in their local area and these schools are educationally inferior to their urban

counterparts both in terms of academics and resources, these students are hardly upwardly *hukou* mobile.

Table 1.2 Rural-Urban Residence and Hukou Registrations in China, 1982-2010

Residence *(De Facto)*	*Hukou* Status *(De Jure)* (%)		
	Rural	Urban	Total
1982			
Rural	74.8	4.4	79.2
Urban	6.2	14.6	20.8
Total	81.0	19.0	100.0
1990			
Rural	64.1	2.5	66.2
Urban	15.5	18.3	33.7
Total	79.5	20.5	100.0
2000			
Rural	60.2	3.0	63.2
Urban	15.0	21.9	36.8
Total	75.2	24.9	100.0
2005			
Rural	52.5	1.9	54.4
Urban	21.4	24.2	45.6
Total	73.9	26.1	100.0
2010			
Rural	47.4	2.1	49.5
Urban	23.5	27.0	50.5
Total	70.9	29.1	100.0

Adapted from Wu & Zhang (2010) and National Bureau of Statistics 2010

While a great deal of attention has been paid by sociologists to *hukou*-related urban privilege and rural stigma (Tang, 2015), there are intra-provincial variations related to the prestige of one's *hukou* status. Often, one's *hukou* prestige is strongly associated with the relative ease of entering a university. Table 2.3 presents the recruitment patterns of Project 985 institutions by province in 2016. Specifically, the acceptance rate is the percentage of the number of students (in a given province) admitted to these prestigious Project 985 institutions divided by the total number of *Gaokao*-takers in that province. An acceptance rate of 5.9

from Tianjin signifies that for every 100 exam-takers from Tianjin (or with a Tianjin-registered *hukou* status), 6, on average, are admitted to Project 985 institutions. This is in sharp contrast with Hebei, a populous province with 0.4 million exam-takers competing ferociously for a university placement, where the Project 985 institution acceptance rate is 1.7. In a similar vein, the localisation rate was calculated as the number of newly admitted home students divided by the total number of incomers. A localisation rate of 8.18% for Shanghai signifies that for every 100 new entrants admitted to Project 985 institutions in Shanghai, 8 are Shanghai-local (or hold a *hukou* registered in Shanghai). It is also worth mentioning that because Project 985 institutions are predominantly located in financially prosperous provinces, some provinces do not have a localisation rate. This *hukou*-related regional variation in recruitment patterns is in direct contrast to the political discourse. For example, Chinese premier Keqiang Li repeatedly asserted the government's commitment to 'ensuring equality of educational opportunity' as it 'is the cornerstone of social equality, and it is a key mechanism of social mobility and social justice' (Ministry of Education, 2015).

Table 2.2 A Glance Over the Recruitment Patterns of Project 985 Institutions by Province in 2015

	Provinces/Cities	Number of *Gaokao*-takers (in ten thousand)	Acceptance rate	Localisation rate	Number of Project 985 Institutions
Eastern	Beijing	6.8	4.3	5.7	8
	Shanghai	5.1	5.5	8.18	4
	Tianjin	6.2	5.9	16.3	2
	Liaoning	22.5	2.3	15.6	2
	Shandong	57.9	2.1	10.7	2
	Jiangsu	39.3	1.8	21.1	2
	Guangdong	75.4	1.4	47.7	2
	Hebei	40.5	1.7	—	—
	Zhejiang	28	2.5	40.1	1
	Fujian	18.9	2.0	25.2	1
	Hainan	6.2	1.8	—	—
Central	Henan	77.2	1.2	—	—
	Anhui	53	1.2	12.3	1
	Hunan	39	1.8	9.5	3
	Hubei	36.8	2.5	23.0	2
	Jiangxi	35.4	1.5	—	—
	Heilongjiang	19.8	2.2	12.5	1
	Jilin	13.8	3.6	19.9	1
Western	Sichuan	57.6	1.5	21.8	2
	Yunnan	27.2	1.4	—	—
	Shanxi	34.2	1.5	—	—
	Shannxi	34.4	2.1	23.02	3
	Guangxi	31	1.4	—	—
	Xinjiang	16.1	1.8	—	—
	Inner Mongolia	18.4	1.7	—	—
	Chongqing	25.5	2.2	24.7	1
	Guizhou	33.1	1.2	—	—
	Gansu	30.1	1.6	19.7	1
	Ningxia	6.8	2.2	—	—
	Qinghai	4.3	3.0	—	—
	Tibet	2.1	1.7	—	—
Total		902.6			39

Source: Adapted from Xiong et al., 2019

IV UNIQUENESS OF BEIJING

Universities in Beijing

The provision of HE opportunities is still subject to severe geographical inequality. Both Figure 2.5 and Table 2.4 below illustrate the geographical stratification of HE institution distribution across provinces in China. Specifically, keys in Figure 2.5 refers to the number of universities in that region. It is clear from the table that the majority of Project 985 universities are concentrated in Beijing, Shanghai and other eastern provinces. Specifically, 8 of the 39 Project 985 universities are located in Beijing, and another 4 institutions are located in Shanghai. Eastern provinces host 24 of the 39 Project 985 universities. In contrast, 7 Project 985 institutions are located in Western China. Regarding the total number of HE institutions, more than 1255 out of 2956 HE institutions are concentrated in eastern provinces (Ministry of Education, 2019). As such, the distribution of educational resources reflects the imbalance in economic development. In addition to experiencing the unequal distribution of educational resources, students from less advantaged areas also face the 'local effect' in college admissions: universities favour applicants from within their province, so students need higher examination marks to enrol in a university outside their province of residence (Liu, 2016).

As the capital of and the most modern metropolis in contemporary China, Beijing is privileged outright. With 116 postsecondary institutions located in one city, Beijing is an ideal centre for conducting education-based stratification-related research because of its high concentrations of tertiary educational institutions (Ministry of Education, 2016). Specifically, institutions in Beijing account for 14.8% of the nation's graduate student intake, with nearly 160,000 undergraduate students graduating from institutions in Beijing each year (Li, 2014).

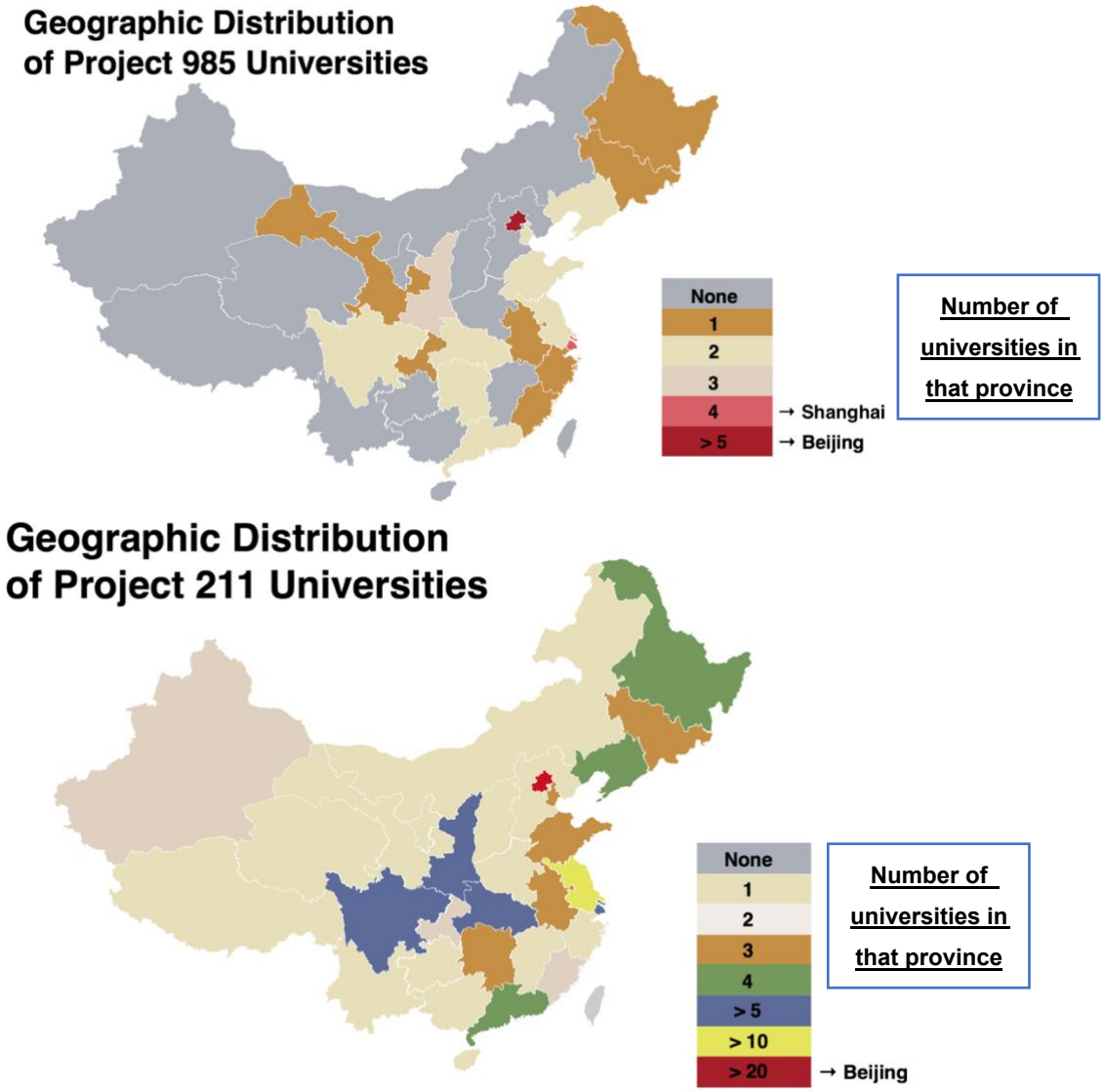


Figure 2.5 Geographic Distribution of Project 985 and Project 211 Universities
Source: Ministry of Education (2005-2006)

Table 2.4 The List of Higher Education Institutions with Four-year Undergraduate Programmes

	Provinces/Cities	Project 985 Univ.	Project 211 Univ.	All types of HIEs
Eastern	Beijing	8	23	116
	Shanghai	4	10	78
	Tianjin	2	3	70
	Liaoning	2	4	133
	Shandong	2	3	157
	Jiangsu	2	11	175
	Guangdong	2	4	168
	Hebei	—	1	128
	Zhejiang	1	1	116
	Fujian	1	2	93
	Hainan	—	1	21
Subtotal		24	63	1255
Central	Henan	—	1	151
	Anhui	1	3	126
	Hunan	3	4	137
	Hubei	2	7	142
	Jiangxi	—	1	111
	Heilongjiang	1	4	97
	Jilin	1	3	76
Subtotal		8	23	840
Western	Sichuan	2	5	141
	Yunnan	—	1	83
	Shanxi	—	1	92
	Shannxi	3	8	109
	Guangxi	—	1	82
	Xinjiang	—	2	60
	Inner Mongolia	—	1	55
	Chongqing	1	2	69
	Guizhou	—	1	75
	Gansu	1	1	54
	Ningxia	—	1	20
	Qinghai	—	1	14
	Tibet	—	1	7
Subtotal		7	26	861
Total		39	112	2956

Source: Ministry of Education, 2019; Ministry of Education, 2005-2006

In Chapter 3, I present the adoption of a conceptual framework drawing upon Bourdieu's social reproduction theory and habitus with a discussion of relevant educational stratification in the West and in China.

CHAPTER THREE

THEORY & LITERATURE REVIEW

INTRODUCTION

This study intends to answer the question of how family backgrounds, types of high schools, college entrance exam scores, and preferential recruitment policies (e.g., IFA) work together to influence students' access to tertiary education institutions with different levels of prestige. To disentangle the interlinked relationships of influence shaping individual educational pathways and destinations, one needs to identify both aggregate (e.g., meritocracy) and individual constructs (e.g., social class). This chapter begins with a look at the history and unique qualities of the Chinese meritocracy and its impact on education. Then, I detail the adoption of a conceptual framework drawing upon Bourdieu's social reproduction theory and habitus with a discussion of the framework's adaptability to the Chinese context. From there, the focus moves to concepts and definitions regarding the complexities between social class and attainment in contemporary educational settings, including issues of gender. This chapter examines the local literature on higher education (HE) in China and highlights a research lacuna in relation to university access. I also examine issues raised in the Western literature and explore their relevance for studying social stratification in the local context. Finally, I point out the contributions of this study in light of the issues highlighted in this literature review.

I THE MYTH OF THE EDUCATIONAL MERITOCRACY

Meritocracy is a debated concept of sociology. It is drawn from the classic satire of Michael Young, The Rise of Meritocracy (1958), which postulates meritocracy as "insight and effort" (p. 94). It also describes a hypothetical dystopian future in the United Kingdom in which knowledge and competence have become the basic pillars

of the world, thus abolishing the former distinctions of social status and creating a society divided between the well-deserved elite in authority and the underclass of the less-deserving. The article criticised the trilateral education system applied during the period. Subsequently, Bell (1973) understood the phrase as "educational achievements." Notwithstanding its satirical essence, meritocratic ideology, with its potential benefits, has been embraced by mainstream political contexts as well as contemporary culture in many nations. For instance, the elements of competitiveness and stratification of meritocratic philosophy are legitimate from the point of view of Singapore Prime Minister Goh Chok Tong, who outlined: "If there are socio-economic inequalities and unfair rewards, 'those with initiative and expertise' will lose the opportunity to make the most of their contribution to the economy. As such, everyone is going to be poorer" (Lim, 2013, p.3). Therefore, meritocracy is used to by the state government to associate the values of nationalism with contemporary spiritualism (Liu, 2013). In particular, the common ideas of "socialist screwing" [3] and "adding bricks and tiles for socialist building" in the 1960s encouraged a powerful meritocratic and collectivist ideal by mobilising people to strive together to realise material prosperity. Likewise, the Chinese dream, described as a modern "political manifesto" of the state government, resembles meritocracy. Xi argued that the 1.3 billion Chinese nationals ought to be mindful about the task and unite as an unstoppable force full of strength and knowledge (Wang, 2014). Xi sought to persuade citizens of the importance of the Chinese dream as a stimulus to accomplish individual dreams (ibid.).

By promising material wealth, the state government has presented a clear meritocratic ideology to the Chinese people by mobilising them to strive together for the realisation of the Chinese dream. Even so, the issue of whether the Chinese dream is a real target or just a mere myth is influenced by a myriad of factors. Thus, the

[3] A socialist concept articulated by Lei Feng, who was a model soldier in the People's Liberation Army of China in the 1960s. Through the campaign of "Learn from Lei Feng", Mao encouraged the masses to emulate Lei's words and actions for his selflessness, modesty, and devotion to Mao (Steen, 2014).

meritocratic political philosophies embraced by China's state government represent a peculiar type of meritocracy, namely, Chinese meritocracy, whose origin in Confucianism sets it apart from Western meritocracy.

Given the prominence of meritocratic discourses as normative validation for stratified communities in contemporary political discussions, the meritocracy of education has been commonly used to explain the progress or exemption of education. Alon and Tienda (2007) have shown that selective post-secondary schools largely depend on standardised tests and ranks (as indicative of excellence) to shortlist candidates. The scholars raised concerns that over-dependence on test scores in HE admissions is detrimental to those who have little resource endowment and represents those who have the "authority to control the way excellence is described" (p. 507). Broadening this hypothesis to the Chinese setting requires an analysis of certain factors. Education policies in China pursue an elitist approach in line with national political discourses.

Contemporary HE strategies were primarily developed during the market reform of the 1980s, when economic growth was prioritised over social development in the formulation of national policy objectives (Hannum, 1999). In an effort to reconcile the declining illiteracy rate and the implementation of mandatory policies of education with the development of collective abilities to promote the massive industrialisation of the country, China's education policies have taken an elitist approach to meet the urgent necessity for industrialisation and state development, leading to an elite-mainstream split. Eventually, meritocracy has been applied in China's education system as a method of selecting and positioning, contributing to the justification of an unfair allocation of wealth within and outside the system of education (ibid.).

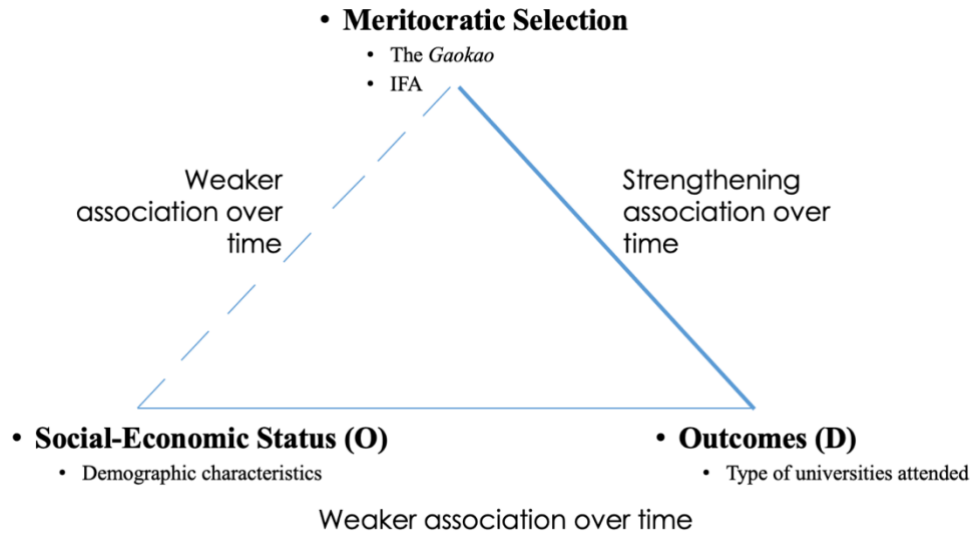


Figure 3.1 The Hypothesis of Increasing Merit Selection (IMS)

Adapted from Liu (2016)

Figure 3.1 suggests a triangular relationship between class origin, meritocratic selection, and class destination. In the fairly equal meritocratic examination method, the correlation between SES and meritocratic selection decreases, while the correlation between educational achievement and class destination seems to improve, reflecting the Chinese philosophy that education has the capability of changing one's life direction. Ultimately, the explanation also projects a dwindling association between destination and class origin (Brown, 2013). Therefore, the system of meritocracy presumes "a beneficial association between excellence and such frequently desired ideals as wealth, authority and reputation" and implies that rivalry for "financial and symbolic benefits" includes "honestly won, well-deserved awards" since "excellence" is the main predictor of educational achievement (Krauze & Slomczynski, 1985, p. 623; Bell, 1973, p. 453). However, research findings do not justify these arguments. In particular, Soutou-Otero (2010) argues that educational meritocracy is "flawed both in empirical and logical ways" (p. 11). Hypothetically, educational credentials are not simply a measure of one's skill and hard work. Instead, they represent various factors used by middle-and upper-class households to affirm and maintain privilege for the next generation. Research in sociology has repeatedly

demonstrated that candidates from established families join elite schools, explicitly undermining the ideals of meritocracy (Basit & Tomlinson, 2012).

Historical and philosophical origins of Chinese meritocracy

During the Sui dynasty (AD 581-618), the Emperor at that time implemented the first national exam of its kind in Chinese history, the Imperial Exam, or *Keju*, as the predominant means of meritocratic social selection to select civil servants. The exam covered mainly rote memorisation and interpretations of classic Confucian literature. The legacy of *Keju* created a political merit system in which "social prestige and official appointment depended for the most part on written examinations for educational credentials" (Elman, 2000, p.47). By exhibiting consistent systematic social selection through "merit", subsequent emperors adopted the system of *Keju* for 1,300 successive years (Zhao, 2009).

Even though the purported imperial ideal of "open competition" and the fact that such a recruiting system promoted a model that promised upward mobility for those heavily invested in education, the reality was that given the absence of any "public schools" at that time, education in the classics could occur only through private means. Consequently, *Keju* and, thus, education became a vehicle for transmitting and securing the family privileges of the elite, resulting in the formulation of the "literati-scholar class" (Elman, 2013, p. 47). Elman (2013) argues that preparation for the *Keju* requires substantial cultural training through which "most students mastered written classical Chinese, whose terseness, thousands of unusual written classical Chinese, and archaic grammatical forms required memorisation and constant attention from childhood to manhood" (p. 25). Given the demanding nature of the exam, the Chinese have long believed in obtaining educational qualifications and thus social positions through assiduous effort, as exemplified in the statement "diligence is the path to the mountain of knowledge; hard work is the boat in the endless sea of learning" (*书山有路勤为径，学海无涯苦作舟*). Such an approach to meritocracy is quite distinct from Western theorisation, in which meritocracy is legitimised through the alignment of

educational opportunity with natural ability, as embodied in the rapid development of mental testing techniques in educational selection (Goldthorpe, 1995). Despite distinct conceptualisations of 'achievement'—whether acquired through innate ability or through diligence—a hierarchical society with a literati-scholar class becomes justified and defended (Liu, 2016).

II THEORETICAL PARADIGMS AND UNDERPINNING ASSUMPTIONS: BOURDIEUSIAN SOCIAL REPRODUCTION THEORY

The theory of social reproduction by Bourdieu stresses the significance of class-based family capital's contributions to educational differentiation (Bourdieu & Passeron, 1990; Dumais, 2002). The theory has gained massive support from research in China. A number of social stratification studies have employed Bourdieu's theory to explain how shifting geopolitical structures and policies affect educational achievement (e.g., Wu, 2008). In this study, Bourdieu's theoretical methods are especially useful for exploring the finesse of family functioning that leads to university enrolment. For example, the present IFA framework seeks to enrol learners on the basis of their intelligence and ability (*zong he su zhi*), which may not be adequately illustrated by structured *Gaokaos*.

Chapter 5 outlines that the ownership of cultural and social resources is always presumed in the IFA process, as shown by the admissions procedures. Bourdieu's theory is important for identifying the sources of social and cultural resources used by my respondents as frameworks for their educational movement. While China's scholarly community has widely adopted Bourdieusian models, I express concern over the applicability of Bourdieu's techniques to the Chinese setting through transparent examinations.

Many Chinese sociologists depend on Bourdieu's theory to document the association between family capital and distinction in education, but conceptual tools

from the Chinese background are somewhat lacking. The majority of social differentiation studies undertaken in China have not addressed the adaptability of Bourdieusian concepts to a foreign setting (Wu, 2008). Bourdieu's hypothesis originated from his study of the strategic and institutional dynamics of France at that period. As pointed out by Connell (2007), "social science must be interpreted in its three perspectives of culture, politics and economics" (p. 6). For example, Bourdieu and Passeron (1990) contrasted Parisian students and provincial students in an attempt to demonstrate the distinction of residences in explaining the possession of linguistic resources. As a consequence, a concern arises as to the validity of specifically applying Bourdieusian principles to China. Bourdieu's theoretical resources were indeed influenced by his field encounters in Algeria and by his consequent reflections on French society, including the cultural heritage of modern colonialism and imperialism as well as the attendant structures of power (Connell, 2007). I therefore propose that the field reassess trust in context-specific intelligence by recognising and using the cognitive insights of residents.

In addition to promoting geopolitical and contextual distinctions, I offer the claim of Lareau and Horvet (1999) regarding the disadvantages of Bourdieu's theory. Specifically, "he has not often been adequately conscious of the differences in the manner in which organisational players legitimise or reject people's attempts to enable their tools" (p. 33). A basic principle underlies the validity of Bourdieusian theories: differences in social and cultural capital are important for the task of achieving sustainable educational systems. Simply put, within the context of a highly sustainable system of education (institutional factor), Bourdieu relates divergence in learning achievement to the ownership of diverse family assets in the form of social and cultural resources. Nonetheless, in a hierarchical school system such as China's, where the state systematically distributes educational resources among diverse school categories, the influence of structural factors on educational achievement may exceed that of family factors. As Baker and LeTendre (2000) point out,

> "In developed countries, family factors significantly outweigh school factors in predicting between students' variation in achievement. However, in less developed countries the reverse is true—school factors outweigh family factors" (p. 349).

Therefore, Bourdieusian ideas are utilised appropriately in the Chinese sense in this thesis. I discuss Bourdieu's ideas in the Chinese setting while at the same time elaborating the multi-dimensional essence of the ways in which social powers and constructs create a framework for investigating patterns of achievement.

Habitus and Operationalising Habitus

In addition to Bourdieu's theory of social reproduction, this study builds on Bourdieu's idea of habitus "as a set of provisions for a particular activity, an empirical justification for normal behaviour patterns and therefore for the consistency of practice patterns" (Bourdieu, 1990b, p.77). As such, habitus is defined by Bourdieu and Wacquant (1992) as:

> The habitus acquired by the family is at the basis of the structuring of school experience. […] The habitus transformed by the action of the school, itself diversified, is in turn at the basis of all subsequent experience […] and so on, from restructuring to restructuring.

Habitus comprises family and institutional elements. Family habitus constitutes a person's educational and life experiences alongside family powers, while institutional habitus involves "the incorporation of the social composition of schools as an intrinsic element to understand their practices, regulations and forms of organization" (Tarabini, Curran, & Fontdevila, 2017, p.1178). The integration of family and institutional habitus, alongside the near synergy between them, promotes the comprehension of the interventional essence of the family and of education as a whole and their profound effect on individual admissions to learning institutions.

I visualise three broad-based factors that influence university admissions: family habitus, institutional habitus, and the interaction between them. In particular, family

habitus is “a profoundly rooted web of common viewpoints, memories and predispositions of family members” (Reay et al., 2005, p.61). It is a mixture of beliefs, behaviours, and information that a family shares with regard to HE (ibid.). In relation to institutional habitus, Reay (1998) claims that “learning institutions share recognisable institutional habitus and [use] a definition to show how the organisational cultures of these learning institutions are connected to larger socio-economic cultures by mechanisms through which the learning institutions and their catchments form and redefine one another” (p. 36). The preceding chapter outlines the institutional disparities of China's existing system of education (for instance, key-point schools) and delineates these disparities within the larger geopolitical background. Key-point schools establish a special institutional habitus since they acquire large support from the provincial government and have superior educational services. In addition, their learners have better academic qualifications as well as access to university recruiters. This institutional polarisation exempts many who are not enrolled in key-point schools. One component of my research explores the institutional habits of these key-point schools in an effort to understand processes and techniques that promote or degrade learners with regard to university enrolment.

Bourdieu's theory of social reproduction and the concept of meritocracy represent two school of thought, both of which aim to describe the role of education in explaining social processes. Social reproduction, as an antonym of social mobility, refers to the mechanisms by which parents pass on their SES advantages and disadvantages to the next generation. Hence, in this sense, education serves as an instrument to reproduce social relations and class structures (Collins, Collins, and Butt, 2015). While the classic “origins-education-destinations” undoubtedly remains influential, past evidence has shown that the direct link between social origins and destinations cannot be elucidated solely by educational attainment (Breen & Goldthorpe, 2001; Sullivan et al., 2018). In contrast, the concept of meritocracy entails that the knowledge and skills gained through receiving an education can impact social mobility in an “open, meritocratic system” (Young, 1971). The

processes and outcomes that are tied to social mobility and education are indeed a complex conundrum. While children from advantaged families are more inclined to be successful at reaching their educational goals, it appears that a broad range of factors can contribute to their success rather than just their parents' socioeconomic status (Collins, Collins, and Butt, 2015). This research advances earlier research on how Bourdieu's theory of social reproduction applies in China by accounting for the familial and institutional mechanisms (e.g., key-point schooling) by which families and individuals may increase their odds of enjoying a privileged socioeconomic position in society.

III CONTEMPORARY DEFINITIONS OF SOCIAL CLASS

Social class, according to Ball (2003), is both an identity and a lifestyle. However, these notions of identity and lifestyle are completely different in China than in the West. As noted by Sheng (2014), US sociologist Wright (1997) once argued that the Chinese middle classes "do not conform to the commonly recognised image of their middle-class counterparts of the West in terms of a stable lifestyle, mainstream values and active political participation" (p. 11). This is because China is still a developing country, with its middle classes still in the process of accumulating wealth and attaining status (ibid).

The term "middle class" has a paradoxical inference in prominent contemporary discussions in China. The state government has long detested the term for its "capitalist connotations", having originated in the West based on labour divisions in Western social structures. Under Mao's totalitarianism and idealism regime, leadership claimed the existence of only three social strata: "workers, peasants, and a small 'intermediate stratum' consisting primarily of intellectuals' aiming to establish a 'classless society' as described by Marxist's utopia" (Li, 2010, p.57). After a careful analysis of contemporary Chinese scholarship examining the middle class, Li (2010)

contends that research on the middle class was prohibited until the late 1980s, when industrialists and private enterprises started to emerge.

Relative class permeability

The class landscape of China was largely shaped during the market reform period in the 1980s. In line with the discussions of elitism in the previous sections, the economic ideologies of that time are well captured by a statement from Deng Xiaoping, the fourth president of People's Republic of China (PRC): "Let some people get rich first". Coupled with Deng's vision, major cities along the coast formulated special economic zones to draw extensive government subsidies and foreign investment. These zones marked a turning point in China's national building project. Deng's quote legitimised a stratified society in the sense that it acknowledged that the fruit of China's prosperity would not be shared equally among its citizens. According to Deng, if some people became rich first, this would facilitate the nation's overall economic advancement. However, the system allowed the people who "got rich first" to be the major beneficiaries of China's increasing market economy and to formulate a new bureaucratic middle class that consisted of "managers, professionals, and private entrepreneurs, party and government officials, managers, professional and technocrats" (Sheng, 2014, p.182). Li and Li (2007) identify three channels through which individuals can obtain a middle-class status, namely, "power-based executive-type access" (*行政型进入*), "market-driven access" (*市场型进入*), and "social network-linked access" (*社会网络型进入*). Such categorisation echoes what Wright (1977) depicts as "the permeability of class boundaries" (p. 79). Unlike with the rigid class structure witnessed in Western capitalist societies, where people find it increasingly harder to avoid the "opportunity trap" (Brown, 2013), Chinese society has some relative class permeability due to the nature of its emerging economy. Thus, this new class of bureaucrats has been able to take advantage of state policies to obtain privileges for themselves and their families, thereby exacerbating the class divide (Zhou, Moen, and Tuma, 1998).

A myth that we can all become xiaokang

Despite recent Chinese scholarship on the middle class, the state government continues to eschew the dominant sociological definition of the "middle class" while insisting on calling it the "middle-income stratum" (Li, 2010). In fact, Jiang Zemin, the secretary general of the state government, promoted the expansion of the middle-level-income group as a political goal in the Sixteenth National Party Congress (p. 6). Further, the state government envisioned "establishing an all-around well-off (*xiaokang*) society" by 2020 (Lu, 2010). According to Lu (2010), *xiaokang* characterises a prominent population with midlevel income, "a realistic and competitive society, in which all members and their families own their private resources and live a life based on law and governed by elites" (p. 109). However, contrary to the fantasy that Chinese society is on its way to achieving *xiaokang*, a recent study conducted by Xie and Zhou (2014) noted that "China's income inequality since 2005 has reached very high levels, with the Gini coefficient in the range of 0.53-0.55" (p. 6928).

As the term "middle-income stratum" implies, level of income has become the sole indicator for social class categorisation applied by the Bureau of Statistics in population censuses. Jie Chen (2013) argues that relying merely on momentary rewards in categorising class in practice has serious drawbacks since, although both entrepreneurs and bureaucrats may enjoy a high standard of living, there is a difference in how these two groups achieve their standard of living. Whereas entrepreneurs pay for it, bureaucrats gain it through government perks and administrative power. However, neither group is comfortable or used to claiming this wealth, as evident by the pervasiveness of tax evasion despite the revised law on income tax enacted in the 1980s.

While categorising class formation goes beyond simplistic occupational positions, the existing categorisations largely ignore intraclass differences. Robson and Butler (2001) argue that one can better understand the formation of middle-class groups from the "dialectical interplay of varying forms of social, economic and cultural capital and habitus on the one hand, and the distinctive opportunities of—across a range of fields—offered by metropolitan marketplaces on the other" (p. 71).

IV CONTEMPORARY DISCUSSIONS ON STRATIFICATION RESEARCH IN EDUCATION

Studies of stratification in the HE realm in China have attested to a rapid increase in such stratification, and a variety of explanations of this have been put forward. This section starts with an examination of literature in the West juxtaposed with international evidence from research conducted on similar topics in China to document congruences and dissonances due to China's unique geopolitical environment. In the UK, in examining the relationship between household income and university entry, Anders (2012) found that universities do not discriminate against students from less advantaged backgrounds. Instead, such students are less likely to apply. In exploring why poorer students are less likely than their richer counterparts to end up at university, Crawford et al. (2016) suggested the crucial importance of prior attainment for university entry. Analysing data on US American youth from the National Longitudinal Survey of Youth, Belley and Lochner (2007) found a strong link between household circumstances and educational success, noting that SES differences in the likelihood of university attendance are stark. While the relationship between family SES and children's academic achievement has been well documented in the literature in the West, cross-country comparative studies tell a different story. In analysing nationally representative surveys in China, the USA, and Germany, Lyu, Li, and Xie (2019) revealed that while SES factors exert much stronger positive effects on children's academic attainment in the USA and Germany than in China, structural factors play much more significant roles in China—hence shedding light on the

distinct roles of social determinants of academic success in different geopolitical arrangements.

In applying cultural capital theory to China, the evidence suggests that the effects of cultural capital on educational attainment vary with the changing geopolitical arrangements in different historical periods in China. For instance, Wu (2008) observed that cultural capital had no effect on children's educational advancement to the college level during the Maoist era (1949-1976), while cultural capital regained its importance during the post-Maoist period (1977-1996), implying the vulnerability of the effect of cultural capital to state intervention. Further, in studying educational stratification in China, some evidence indicates that children holding rural-*hukou* status have become more entrenched than their urban peers, and the effects of their father's SES on school enrolment have become stronger. Hence, rural-urban inequality was enlarged in the 1990s as a consequence of educational expansion; it is mainly female and urban residents who have benefitted from HE massification (Wu & Zhang 2010; Wu, 2010). Similarly, analysing data from the China Social General Survey, Guo (2015) documented increasing educational inequality and declining social mobility in the college premium in the era of HE massification (1981-2010).

Recent studies have also highlighted the important role of structural factors on educational selection in contemporary China (Liu, 2013; Liu, 2015; Li, 2019). Li (2019) notes that the major source of China's urban-rural gap in HE is unequal access to higher vocational education, while higher vocational education is regarded as an option for low-achieving *urban* individuals. Liu's (2013) work indicates that sociodemographic factors (e.g., geographical origin and gender) rather than SES factors appeared to be more significant in mediating students' HE opportunities. In another study, Liu (2015) identifies how geographical inequalities between affluent regions and disadvantaged regions are being legitimised through seemingly meritocratic HE selection mechanisms.

V SYNTHESIS OF FIELDS: LIMITATIONS AND UNSOLVED ISSUES

Despite a notable amount of research documenting the extent of educational inequalities in HE in China, there are still essential themes that must be addressed. To date, very few studies have empirically examined the subtleties of how structural and familial factors support or undermine educational mobility. For instance, though Li (2019) depicts the fact that low-achieving urban youths utilise vocational HE as a means to avoid downward mobility, he does not examine the existing stratification within academic institutions where academic institutions are increasing becoming "differentiated qualitatively" (Arum, Gamoran, & Shavit, 2007). In addition, educational stratification research in China often uses small-scale convenience samples or census data aggregated at the provincial/regional level, therefore hindering generalisability (e.g., Wu & Zhang, 2010). Further, outside of Liu's (2016) field work, factors such as forms of social and cultural capital and educational strategies poorly empirically identified in the more dominant economic-driven quantitative studies conducted on admission policies in HE in China. Hence, under the broader state political rhetoric of promoting educational equality, the central question remains: what are some of the strategies and mechanisms used to navigate the HE recruitment system, and what are the subsequent consequences for opportunity equality? Due to the lack of locally originating sociological theories, this literature review draws upon theorists from industrialised countries who have attempted to contextualise some of the inequality patterns observed in developed countries. Although some empirical patterns can be observed in China, throughout this chapter, I have attempted to further contextualise and extend these existing theoretical frameworks in relation to China's geopolitical and cultural situation. Therefore, my research formulates new theoretical explanations for the empirical variations in the field. Indeed, neither opportunity expansion (as demonstrated in HE massification) nor recruitment channel expansion (e.g., IFA) can ensure educational equality. I argue that disparities within the current educational system result from both institutional and cultural arrangements that

benefit a small fraction of students and depress quality overall. Thus, greater research attention to these issues is warranted.

CHAPTER FOUR

METHODOLOGY

INTRODUCTION

In my research, I examined how family background, type of high school, college entrance exam scores, and independent freshman admission (IFA) policies work together to influence students' access to tertiary education institutions with different levels of prestige. To examine this issue, I employed a mixed methods design. In this chapter, I first discuss the rationale for adopting a mixed methods approach to my research question. Then, I describe my use of qualitative and quantitative approaches in detail. With regard to qualitative approaches, I first describe my sampling strategy, the sample composition and how I conducted qualitative interviews with students. I also describe how I conducted a thematic analysis of my data and reflect on the implications of my active role in the production of knowledge in the study. Regarding the quantitative approaches, I introduce the Beijing College Student Panel Survey (BCSPS) and its sampling strategies. I do not include discussion of the survey measures and the quantitative analytical approach as this information is presented in the relevant empirical chapters (Chapters 6 and 7).

I MIXED METHODS DESIGN: METHODOLOGICAL FRAMEWORK

My research interests stem from my observation of the relatively limited amount of research examining how familial and structural patterns of class differentials are produced through educational practices at the micro level in the local context. Drawing on Bourdieu's work on habitus and social reproduction theory, in this study, I focused on how individual pathways and destinations are embedded within a range of familial and structural factors that influence education from an early age. Gender and geographical locations were also considered to understand how advantage/disadvantage is generated in cultural capital processes. This study challenges not only complacency regarding the feminisation of HE but

also the influence of geographic location on access to certain cultural capital. Most contemporary research on HE and social stratification has documented the existence of inequalities but has provided little explanation of how students navigate the admissions process and follow their selected routes. As China embraces globalisation and the rigidity of exams, only the *Gaokao* route to admissions is receiving criticism (Ross & Wang, 2013). This criticism is also concerned with whether the outcomes of IFA recruitment strategies are consistent with the goals for educational opportunities established by the scheme, which is an under-examined topic in the sociology literature. To address this gap in the literature, this study aimed to capture how the issues of SES and prior educational opportunities are integrated into the admissions processes and how they serve to give students an advantage or disadvantage in HE competition. As such, I employed a sequential exploratory design in which the first phase was a qualitative exploration of how current students described their schooling experiences and family influences on their choices of university and subject area (Chapter 5). The findings presented in Chapter 5 help to provide some understanding of the topics explored by the subsequent quantitative chapters, which use representative data from the Beijing College Student Panel Survey. The quantitative chapters describe the formal tests of the association and predictive power of background and structural factors on the different admission routes and major choices.

I started my research by conducting preliminary quantitative data testing that involved testing the usability of the BCSPS dataset and identifying the preliminary themes that could be explored in my subsequent fieldwork, which involved 62 qualitative interviews. An interview approach allowed me to probe for nuances in student experiences and outlooks When I returned from the field, I transcribed parts of my interviews and undertook thematic analysis. Figure 4.1 illustrates the methodological framework in detail.

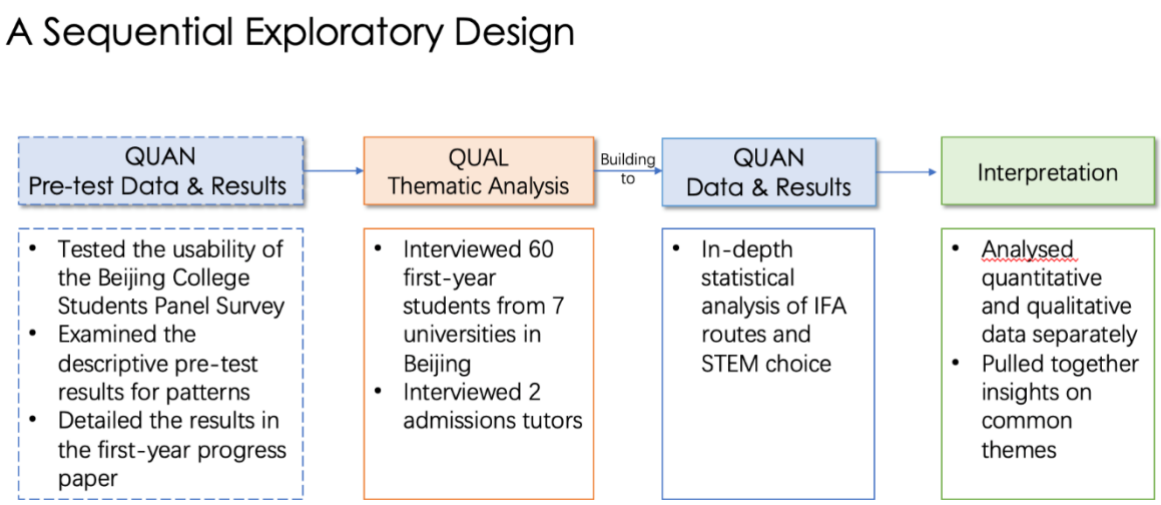


Figure 4.1 The Methodological Framework

II DATA INTEGRATION

Qualitative and quantitative research are often presented as two fundamentally distinct paradigms with contradictory epistemological assumptions, theoretical approaches and methods (Brannen, 2005). As a researcher, I reflected on different kinds of "truth" or "validity" and how different types of data are constituted by the assumptions and methods that elicit them (ibid.). My use of different datasets varied according to the phase of research. Mixed methods research can be complementary: qualitative research explores similarities and differences between different individuals' attitudes and behaviours, whereas quantitative research is able to identify patterns that can be generalised to the wider population (e.g., regional, class or gender differences).

The qualitative and quantitative data used in this dissertation were not collected from the same participants. However, both types of data involved examining students who were currently enrolled in higher education in Beijing. The findings from my qualitative sample are limited by the types of universities where the fieldwork was performed and the students with whom the research was conducted. The qualitative findings cannot be generalised beyond this particular sample.

III QUALITATIVE RESEARCH DESIGN AND METHODS

Sampling Strategy and the Sampled Students

To provide a more detailed, nuanced contextualisation beyond enrolment statistics and to explore the complex institutional hierarchy of China's schooling system and possible class advantage behind the rhetoric of IFA recruitment, I aimed to recruit a diverse sample of first-year students from various backgrounds who were attending universities in Beijing. This strategy prevented me from accessing families and teachers, whose perspectives and actions influence the ways that students mobilise cultural capital. However, as discussed in Chapter 5, these individuals were frequently brought up in interview conversations, which offered information on the real-life contexts and interpersonal dynamics in which students' educational practices were embedded.

Due to the limited time available in the field, I selected 7 universities as the research sites. As mentioned in Chapter 2, Chinese universities are classified by the state according to their academic rankings (see Figure 2.4). Given the issues related to access, the 7 selected universities collectively best represented the hierarchical nature of the existing system (as shown in Table 4.1). Notably, due to the limited scope of this doctoral dissertation, I focused only on universities that grant bachelor's degrees in Beijing and excluded those that offer associate programmes. Both the universities and the candidates are given pseudonyms to maintain research ethics.

Table 4.1 Sampled Universities

University Tier	*Name of the University*	*# of Participants Interviewed*
Elite	Elite Comprehensive University	23
Selective	Minority Ethnic University	6
	University Specialising in Telecommunications	6
	University Specialising in Chemical Technology	11
	Institute Specialising in Information Technology	1
	University of Information Technology	3
Less Selective	Specialised Publishing University	10
Total # of students interviewed		60

Regarding the sampling approach, because my research was concerned with identifying the mechanisms by which students make choices about university and major selection, I designed the study with a focus on diversifying the sample by choosing students across a wide range of backgrounds and majors. My original plan was to interview 60 students, i.e., 20 from elite universities, 20 from selective universities, and 20 from less-selective universities, with an even gender distribution. However, I encountered several methodological challenges. One challenge was that all participants from the less-selective university were female. This was because my contact from the Specialised Publishing University introduced me to a student club that runs university magazines, and such student clubs mainly attract the participation of female students pursuing printing-related (non-STEM) majors.

Unfortunately, recruiting all female participants from this university hindered a clear comparison across the STEM vs. non-STEM spectrum. Hence, a convenience sampling approach was adopted. A similar challenge was that among the 60 students I interviewed, 9 female students were enrolled in a STEM course while 15 male students were enrolled in a STEM course, thus hindering a comparison between STEM and non-STEM students by gender. However, each of the participants' educational histories was investigated in detail to identify their choices and strategies in navigating the HE recruitment system.

With regard to participant selection, efforts were made to ensure a relatively balanced representation of gender, place of origin (avoiding the overrepresentation of local students), age, and major via purposeful sampling (Lincoln & Gubam, 1985). To be eligible for the study, participants had to meet the following general criteria: a) currently enrolled full time as a first-year student, (b) between the ages of 18 and 27 years, and (c) admitted to the college via the *Gaokao* or IFA route. All my key personal informants from the 7 universities where the fieldwork was conducted were recruited from my extensive family/friend network. On some occasions, snowball sampling technique was applied. For instance, the woman who works for the Student Affairs Office for the Specialised Publishing University is a family friend, and she introduced me to one of the Student Affairs Officer for the Minority Ethnic University. Overall, I worked closely with my key personal contacts to identify and recruit participants. I first drafted my research brief and selection criteria, and my contacts helped me disseminate the recruitment information to freshman social media chat groups. Interested participants were contacted individually to schedule a time and location for an interview. Because certain universities predominantly recruit students within the region, efforts were made to recruit students who came from outside the Beijing region. Furthermore, I attempted to recruit a sample that represented diverse majors. A detailed illustration of the sample demographics is presented in Table 4.2. A list of respondents can be found in Chapter 5, Table 5.1.

Table 4.2 Sample Demographics

Sample size: 60

Gender Breakdown				
Elite University n=23		Selective Universities n=27		Less-Selective University n=10
17 women	6 men	14 women	13 men	10 women

Geographical Breakdown			
Northeast	Central	East	West
5	10	35*	10

** Includes 17 students from Beijing*

Exam Route Breakdown

Gaokao	IFA
49	11

Choice of Major			
STEM n=24		Non-STEM n= 36	
9 women	15 men	32 women	4 men

Conducting the Interviews

One-on-one interviews were selected because these focused discussions allowed for in-depth conversations that provided detailed information on each individual's lived experiences and perspectives on the individual's recruitment journey (Rubin & Rubin, 2001). I regard the various interviewing approaches as falling on a continuum rather than occupying neatly predefined categories. In particular, the first part of the interviews collected detailed accounts of participants' previous schooling experiences through open-ended, loosely scripted questions rather than eliciting brief or generalised answers (Riessman, 2008). Hence, through detailed and vivid descriptions of the participants' educational trajectories and information on their educational experiences, I was able to make inferences based on the respondents' comments in relation to their selection of universities.

Based on a semi-structured design, the questions were pre-scripted and sequenced to focus on core issues regarding the participants' schooling experiences, but they also allowed for adaptation and customisation (Maxwell, 2012). Midway through my research, I reviewed my questions based on my previous interviews. For instance, I discovered a recurring pattern of place of origin; thus, I determined that participation in key-point schools is relevant to admission processes and to students advantages or disadvantages in HE competition. Thus, I added interview questions that asked participants to give detailed descriptions of their high school, high school performance, academic position in school, and activities and structured training in preparation for IFA recruitment. Before entering the field, I anticipated that family forces (e.g., social and cultural capital) would be important but overlooked the importance of structural inequalities in mediating university admissions. Thus, the blended interview format

enabled constant reflection on and adaptation of the interview guide. Throughout the entire interview process, I assumed the role of an active listener and avoided interrupting the participants' stories until they reached a natural conclusion (see Appendix I for a list of interview protocols). All participants signed the informed consent form before the interviews took place, and they were told that the data would be reported in an aggregated, anonymised format.

In total, I conducted 62 one-to-one interviews with 60 university students and 2 interviews with admissions tutors that averaged approximately one hour each. Subjective accounts offer an important means for respondents to interpret and reinterpret their experiences and reflect on how these interpretations inform their behaviours and actions.

Data Analysis

Maxwell (2012) highlighted the significance of engaging in early and ongoing data analysis throughout every aspect of the research process. One of the crucial aspects of the data analysis process is the development of codes. I kept a fieldwork journal throughout my time in the field in which I reflected on emerging themes, updated my interview protocol as needed, and began to identify emerging codes as "conceptual buckets" for my coding scheme (Miles & Huberman, 2014). This approach to preliminary data analysis enabled me to develop a broad understanding of the findings and to identify emerging codes, which helped to shape my subsequent analysis. These codes reflected the most crucial issues identified in the students' conversations.

All of my interviews were translated, transcribed, and coded, with minimum effort dedicated to tidying up the language and grammar of the interview conversations. As illustrated in Figure 4.2, the analytic process began with a careful examination of the "field texts" and narratives to identify relevant trends, or coding (Clandinin & Connelly, 2000). Most of my engagement with the participants began with explorations of their upbringing, descriptions of their high school education, and discussions about how these early schooling experiences shaped their university recruitment experience. Given the chronological nature of

my interview process, I selected highlights from the narrative analysis by considering each participant's biographical account as a unit of analysis (Riessman, 2008). This process involved "gathering narratives and reconstructing and rearranging participants' narratives in a chronological framework" (Creswell, 2012, p.189; Zhao, 2016, MPhil Thesis). Then, I engaged in meaning condensation and interpretation by dividing the stories into thematic areas that specifically pertained to the participants' familial and institutional habitus (as exemplified in Table 4.3). As I completed more coding, I started making connections among the text segments from different interviews. During the preliminary analyses of the interview data, it became apparent that structural factors (for example, geographical area of origin) exerted a powerful influence on students' university admittance. I did not anticipate that distinctions among provinces beyond the simple categorisation of the urban-rural dichotomy would contribute to the allocation of HE opportunities (another gap in the literature), which was an important theoretical basis that I missed in the initial literature review. Consequently, I revisited the literature to better theoretically position my findings by engaging with contemporary discussions on structural inequalities and by examining how my data resonated with or refuted some of these discussions.

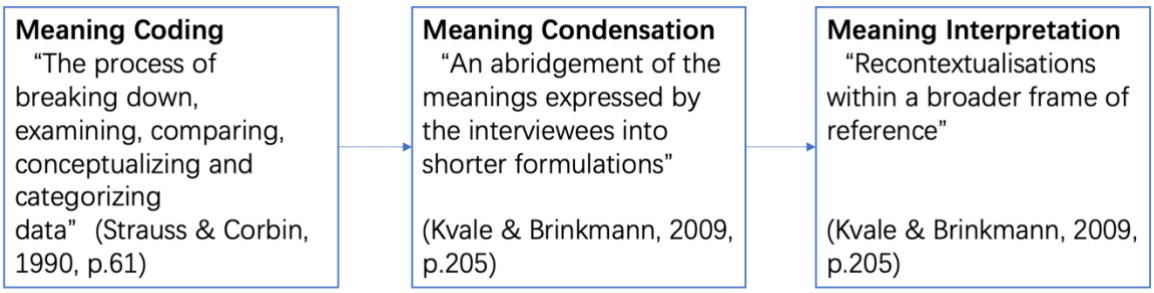


Figure 4.2 The Coding Process

Adapted from Kvale and Brinkmann (2009)

With respect to the issue of translation, the conventional approach has involved the interviewer transcribing and translating all interviews verbatim into English (as shown in Lam, 2013). As with all translation, there is a risk that certain culturally bounded information may be lost (Skukauskaite, 2006). Thus, to maintain the subtlety of language and ideas and to

best represent and recognise the participants' voices, I analysed the data in Chinese and then translated into English only the excerpts that were significant to my analyses to best ensure that "meanings are carried across languages in ways that reflect" different viewpoints (Temple, 2008).

Table 4.3 An Example of Meaning Interpretation: Reassembling Interview Data for Broader Contextualisation

Preliminary Inductive Codes	*Examples*	*Categories*	*Themes & Patterns*
Geography	*1）高考按照地理位置所在地分为三个等级。这三个等级的难度分别为：地狱级，噩梦级，困难级。* *The Gaokao comes with three levels of difficulty based on geography. These levels are (in order of increasing difficulty) the "difficult" level, the "nightmare" level, and the "hell" level.* (Yuan, Participant #38) *2）我们省是应试教育的典范* *My province is an exemplary model for implementing the "education for exam preparation" system.* (Xu, Participant #25)	Geographical Influences	• Resonation with Liu (2017) • Uneven access to resources based on geography
Family's cultural and social capital	*我妈为了帮我办理各种证件一个礼拜没上班。 我没有时间。* *My mom took one week off in order to help me gather all of the documents needed for IFA. I don't have time anyway.* (Zishu, Participant #2)	Parental Support Familial Habitus	A sense of naturalness and entitlement in having her mother take care of the IFA application; assumes that college admission is a shared responsibility among family members.

IV QUANTITATIVE RESEARCH DESIGN AND METHODS

The quantitative study relied on data collected for the BCSPS in 2009. The BCSPS was conducted annually from 2009 to 2013 through collaboration between *Renmin* University of China and Hong Kong University of Science and Technology. The general response rate for the BCSPS over the five-year period was as follows: 2009, 93.55%; 2010, 92.77%; 2011, 89.52%; 2012, 84.75%; and 2013, 54.56%. Due to the drastic drop-out rate, the 2009 data were employed in this study with the aim of investigating how demographic factors (e.g., family background) and structural factors (e.g., type of high school) work together to help shape access to tertiary education in Beijing. The BCSPS is one of the most comprehensive, large-scale social surveys conducted among college students in China and offers the most up-to-date publicly released survey data that document trends in the perceptions, behaviours, and experiences of contemporary college students in Beijing.

Furthermore, the BCSPS employs the probability proportional to the size sampling method with the university as the primary sampling unit (PSU). The sample was additionally stratified by major as the secondary sampling unit. Among the PSUs, 15 universities were selected and categorised into six strata based on their hierarchies and jurisdictions[4]. In particular, the first three top universities, which are under the jurisdiction of the central government and are categorised as "elite universities", namely, Peking University, *Renmin* University, and Tsinghua University, each constituted its own stratum with fixed samples of 20 students for each of the 25 selected majors. For the remaining three strata composed of 12 universities, 15 majors were selected from each university, and 20 students were randomly selected from each major (Wu, 2016). I provide a detailed description of the BCSPS university strata and selected majors in Table 4.4.

[4] Because colleges and universities in China are mostly state funded, the BCSPS surveyed only public universities.

Table 4.4 Breakdown of Universities by Stratum

Stratum	University Categorisation	Number of Freshman + Junior Year Students (Total)	Sample	Sample at Each University
1	Peking University	5,626	25 Majors	25 Majors× 20 Students
2	Renmin University	5,069	25 Majors	25 Majors× 20 Students
3	Tsinghua University	5,651	25 Majors	25 Majors× 20 Students
4	Other Project 211 universities under the MOE (n=4)	87,305	6 Universities × 15 Majors	90× 20 Students
5	Other non-Project-211 universities under the MOE (n=2)	21,708	2 Universities × 15 Majors	30× 20 Students
6	Under the jurisdiction of the Beijing Municipal Government (n=4)	60,937	4 Universities × 15 Majors	60× 20 Students
Total		**186,296**	**255**	**5100**

Source: Wu (2013)

Rationale for Researching Beijing College Students

The 2009 BCSPS surveyed 15 universities in Beijing, the capital and most modern metropolis of contemporary China. With 116 postsecondary institutions, Beijing is an ideal centre for conducting education-based stratification-related research because of its high concentration of tertiary educational institutions (Ministry of Education, 2019). Specifically, institutions in Beijing account for 14.8% of the nation's graduate student intake, and nearly 160,000 undergraduate students graduate from institutions in Beijing each year (Li, 2014). Furthermore, among the 4771 students who were surveyed in the 2009 BCSPS survey, 3438 came from places outside of Beijing and thus represented a broad range of student populations. In addition, universities in China are highly hierarchical. Figure 4.4 illustrates the structure of the HE system in China with regard to the jurisdictions and levels of

prestige[5]. The numbers in red denote the number of each type of university included in the BCSPS sample. As seen in the chart, the BCSPS included universities positioned in a wide range of hierarchies, which enables researchers to compare educational attainment across universities with different levels of prestige.

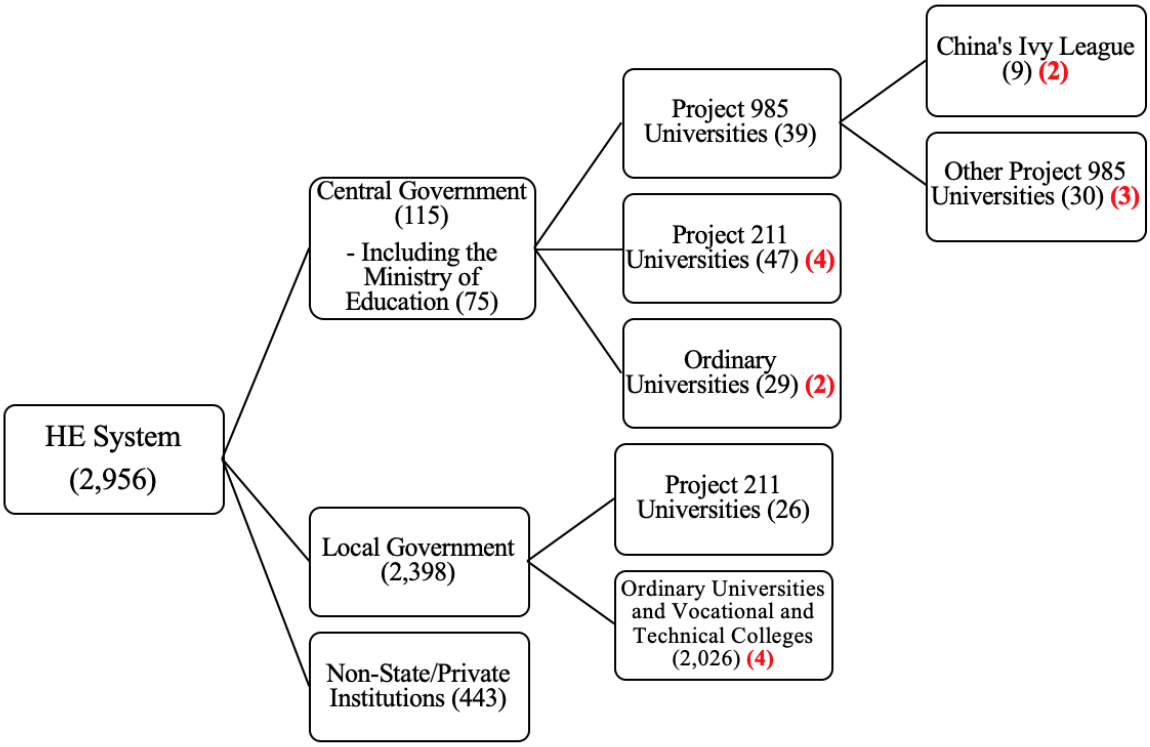


Figure 4.3 The Structure of HE in China

Source: Ministry of Education (2019)

Aligning the University Sampling Strategies Used in Quantitative and Qualitative Research

In a concurrent mixed methods design, it is sometimes preferable to include the same individuals in the samples for both qualitative and quantitative research to make the data and results more comparable (Creswell, et al., 2008). However, this approach is usually neither feasible nor desirable. Most surveys wish to protect their participants' anonymity and protect them from "respondent fatigue". However, as the BCSPS was conducted in 2009, it was not

[5] There are 115 universities under the direct jurisdiction of the central government, 75 of which are regulated by the Ministry of Education.

feasible to select the same survey respondents for my interviews. Hence, efforts were made to select universities that best reflected the hierarchical nature of the Chinese university system. As such, 5 universities were sampled in both the BCSPS and the qualitative study. In the final chapter (Chapter 8), I discuss how the qualitative and quantitative data provide complementary and distinctive insights into different aspects of the inequalities of higher education in China.

In Chapter 5, I present the exploratory results from my qualitative data on how students make choices about their degree major and the university to which they will apply and how geography, social class and gender influence their subjective accounts of the process.

CHAPTER 5

Geography, IFA, and Making University Choices: A Qualitative Exploration of Students' Accounts

INTRODUCTION

高考按照地理位置所在地分为三个等级。这三个等级的难度分别为：地狱级，噩梦级，困难级。

The Gaokao comes with three levels of difficulty based on geography. These levels are (in order of increasing difficulty): the 'difficult' level, the 'nightmare' level, and the 'hell' level.

- Excerpt from Yuan (#38), one of the participants who attended the University Specialising in Chemical Technology and identified himself as taking the 'nightmare' level of the *Gaokao*.

Every year as the *Gaokao* approaches, conversations about education equality and social congestion dominate the news headlines. In the summer of 2018, as illustrated in Figure 5.1, crowds queued up to fill out their *hukou* applications at the Service Centre of Tianjin as early as 7 am after the city government announced a talent acquisition plan called the 'Haihe Talent' plan in May. Under the proposed plan, university graduates under the age of 40, master's degree holders under 45, and advanced degree candidates would be eligible to apply and have their *hukou* registered in Tianjin. Statistics show that more than 300,000 people downloaded the *hukou* application form in the first 24 hours after the policy was released, and tickets for high-speed trains from Beijing to Tianjin were sold out for those days (Ge & Xie, 2018). When applicants were asked about their intentions, they virtually unanimously noted the relatively 'relaxed' *Gaokao* environment in Tianjin, where the competition for university placement has been moderate compared with that in other populous provinces. For instance, statistics show that in 2018, approximately 55,000 students signed up to take the *Gaokao* in Tianjin, whereas in Hebei, where one-sixth of my participants were from, the number of *Gaokao* takers amounted to 559,600, almost ten times that in Tianjin. As it is the responsibility of each provincial government to establish quotas for different types of

institutions, the phenomenon of more pupils taking the *Gaokao* in some provinces than others indicates that there are relatively fewer spots available for each exam taker per university in certain provinces. This heated competition is in direct contrast with statements made as part of the official political discourse; for example, the Chinese premier, Keqiang Li, has repeatedly voiced the Party's conviction of 'ensuring equality of educational opportunity', as 'it is a key mechanism of social mobility and social justice' (2015).

Figure 5.1 Crowds Queueing up to Complete their *Hukou* Applications

Source: Adapted from Xinhuanet.com (2018)

The relationship between housing prices and school characteristics has been well documented in the developed world, where much research has shown that having an outstanding school in a neighbourhood increases housing prices (e.g., Kane, Riegg & Staiger, 2006). For instance, research conducted in New Zealand indicated that potential house buyers were willing to pay a premium of over $130,000 to reside in the enrolment zone of popular secondary schools (Gibson et al., 2005). By using a district sample from Chicago, Downes and Zabel (2002) further argued that holding all other factors equal, house buyers were willing to pay for a house close to a school with higher standardised test scores relative to those of other schools. However, the *hukou* system adds another layer of complexity to this dynamic, as it requires a pupil to attend a public school in the province where his or her *hukou* is registered.

This chapter presents accounts of 60 first-year students attending universities in Beijing. The geographical origins of the participants span 15 of the 23 provinces and 2 of the 4 municipalities in China. The research sites were carefully selected based on their jurisdictions and the position of their schools within the HE hierarchy; the sites include 7 universities with different levels of prestige, including 3 Project 985 Universities, 3 Project 211 Universities, and one less-selective university that is under the jurisdiction of the Beijing Municipal Government. As such, this chapter aims to disentangle some of the complexities regarding how place of residence and *hukou* affect admission processes. Direct quotes from 20 participants (with a further 19 respondents referred to by participant numbers) were selected to represent key themes and indicate differences in individual experiences. Another purpose of this chapter is to probe for nuances in student experiences and outlooks that may not be captured by a quantitative survey. Table 5.1 presents the details of the sixty first-year students included in this study.

Regional and spatial stratification in China has been both under-researched and under-theorised in studies of social stratification. Most contemporary research on HE and social stratification has documented the existence of inequalities with little nuanced explanation of how students navigate the admissions process and ultimately enter their selected institutions. Traditionally, Western-dominated stratification research has concentrated mainly on social class, gender, and race. While it is evident that the unequal development of China's economy has implications on the outcomes of people of different geographic origins, it is still unclear what institutional arrangements underpin the persistent patterns whereby more wealthy regions continue to improve in educational attainment while financially disadvantaged regions stagnate or decline. Moreover, the study of how geography intersects with other factors, such as socioeconomic status and gender, lacks systematic investigation.

This chapter examines how geographical place of residence and *hukou* permits are relevant in admissions processes and how they give students an advantage or disadvantage in HE competition. Thus, the first part of this chapter examines how geographic origin is an important aspect of stratification in the race for HE admissions in China. Regional differences

add another strand to the more traditional stratification based primarily on class, gender, and race. In part, the role of regional differences in HE stratification is due to the way admissions are structured in China—the very strong links between class and educational attainment that have been documented in the West are less clear cut in China, and to some degree, admissions in China do promote a greater 'meritocracy' than admission in the West. However, as I show later, the distinctive features of the Chinese educational system, especially regarding how the centralised college entrance exam is administered and delivered, shape capital mobilisation in different ways than the Western education system and in such a way that injects indeterminacy into class processes. To some extent, meritocratic ideals are subverted by the presence of different rules for different regions, as well as different opportunities for men and women in the selection of their major disciplines.

The introductory section presented the heated competition for a Tianjin-registered *hukou* to illustrate how place of residence and *hukou* affect admission processes. Section I examines the geographical factor in detail. Specifically, the implementation of two high school curriculum models based on geography, the Hengshui model, and *Gaokao* migrants are explored. In addition, China's hierarchical schooling structure is analysed in relation to independent freshman admission (IFA) recruitment in Section II. Section III outlines research findings in relation to STEM major choice and gender. Interview data are used to illustrate participants' experiences of geographical inequalities in securing university placement and to examine how the meritocracy has been curtailed by the decentralised process through which reforms have been implemented.

Table 5.1 List of Respondents

Participant #	Name of Participant*	Gender	Major	*Gaokao*/IFA Route	Geographic Location
Elite University					
Project 985 University: Elite Comprehensive University					
1	Siyao	F	Communist History	IFA	Hubei
2	Zishu	F	Communist History	IFA	Beijing
3	Jiaming	F	Law	*Gaokao*	Fujian/Beijing[6]
4	Yiman	F	Business Administration	*Gaokao*	Guangzhou
5	Jian	M	Environmental Sciences	*Gaokao*	Guizhou
6	Xianyu	F	History	IFA	Liaoning
7	Shuhan	F	Law	*Gaokao*	Liaoning
8	Jiarui	F	Law	*Gaokao*	Shanxi
9	Wei	M	Environmental Sciences	*Gaokao*	Gansu
10	Shan	M	History	IFA	Sichuan
11	Zhoufei	M	Art	*Gaokao*	Hebei
12	Lanyi	F	Environmental Sciences	*Gaokao*	Shanxi
13	Jieluan	F	Business	*Gaokao*	Hebei
14	Xueyu	F	Humanities	IFA	Sichuan
15	Wen	M	Environmental Sciences	RPR*[7]	Henan
16	Xuerong	F	Information Technologies	*Gaokao*	Jiangsu
17	Ziyue	F	Chinese Studies	IFA	Hebei
18	Yingyao	F	Business	*Gaokao*	Hebei
19	Fuhan	F	Marxism	IFA	Zhejiang
20	Han	M	Law	*Gaokao*	Hunan
21	Mengling	F	Business	*Gaokao*	Sichuan
22	Yingyu	F	Accounting	*Gaokao*	Fujian
23	Chuping	F	Law	PRP*	Heilongjiang
Selective Universities					
Project 211 University: University Specialising in Telecommunications					
24	Hongjie	M	Electrical	*Gaokao*	Hebei

[6] Jiaming's *hukou* was originally registered in Fujian, but she later transferred to Beijing.

[7] This refers to students who were admitted through the Rural Preferential Recruitment programme. The Ministry of Education requires China's top 100 universities to specifically allocate 2% of their recruitment plans to disadvantaged rural youth.

			Engineering		
25	Xu	M	Electrical Engineering	*Gaokao*	Hubei
26	Fanyi	F	Computer Science	*Gaokao*	Beijing
27	Hanming	F	Electrical Engineering	*Gaokao*	Heilongjiang
28	Shasha	F	Information Technology	*Gaokao*	Fujian
29	Meiling	F	Information Technology	*Gaokao*	Heilongjiang
Project 985 University: Minority Ethnic University					
30	Ming	F	Law	*Gaokao*	Hebei
31	Tiange	F	Sociology	*Gaokao*	Hebei
32	Feng	M	Law	*Gaokao*	Hunan
33	Pei	F	Law	*Gaokao*	Ningxia
34	Panling	F	Law	*Gaokao*	Hebei
35	Mengyu	F	History	*Gaokao*	Hebei
Project 211 University: University Specialising in Chemical Technology					
36	Xiulei	M	Mechanical Engineering	*Gaokao*	Hunan
37	Xiaoyu	F	Accounting	*Gaokao*	Hebei/Tianjin[8]
38	Yuan	M	Mechanical Engineering	*Gaokao*	Jiangxi
39	Rui	M	Chemical Engineering	IFA	Hebei
40	Yuxi	F	Chemical Engineering	*Gaokao*	Beijing
41	Jiarui	M	Chemical Engineering	*Gaokao*	Xinjiang
42	Xialei	M	Chemical Engineering	*Gaokao*	Gansu
43	Zijian	M	Physics	*Gaokao*	Anhui
44	Ruohan	F	Business	*Gaokao*	Xinjiang
45	Haofeng	M	Mechanical Engineering	*Gaokao*	Beijing
46	Wenhao	M	Mechanical Engineering	*Gaokao*	Ningxia
Project 985 University: Institute Specialising in Information Technology					
47	Xingyue	F	Aerospace Engineering	*Gaokao*	Fujian
Project 211 University: University of Information Technology					

[8] Xiaoyu's original *hukou* was registered in Hebei, a high-pressure admission region. She later transferred her status to Tianjian, a lower pressure admission region. Her tale will be presented in later sections.

48	Ziyi	M	Information Technology	IFA	Beijing
49	Jiaxiang	M	Software Engineering	IFA	Beijing
50	Zhenyu	F	Architecture	IFA	Beijing
Less-Selective University					
Specialised Publishing University					
51	Xu	F	Digital Publishing	*Gaokao*	Beijing
52	Zhen	F	Advertising	*Gaokao*	Beijing
53	Yu	F	Industrial Design	*Gaokao*	Beijing
54	Chang	F	Painting	*Gaokao*	Beijing
55	Xin	F	Editing and Publishing	*Gaokao*	Beijing
56	Dikun	F	Digital Publishing	*Gaokao*	Beijing
57	Ying	F	Digital Publishing	*Gaokao*	Beijing
58	Kerong	F	Animations	*Gaokao*	Beijing
59	Ruizi	F	Industrial Design	*Gaokao*	Beijing
60	Jiayu	F	Editing and Publishing	*Gaokao*	Fujian
Admission Tutors					
	Name of Participants	Gender	University	Post	Years in the Post
61	Qing	M	Project 985 University	Former Deputy Head of Admissions	20+ Years
62	Xiangqian	M	Project 211 University	Admissions Tutor	9 Years

** To protect confidentiality and anonymity, all names are pseudonyms.*

I GEOGRAPHY

1.1 Discovering that Geography Matters

Table 5.2 Profiles of Participants Quoted in Section 1.1

Project 211 University: University Specialising in Telecommunications (UST)						
Participant #	Name of Participants	Gender	Major	Geographic Origins & # of Exam-takers in Participants' Province[9]	Exam Marks[10]	Self-identified Admissions Culture[11]
24	Hongjie	M	Electrical Engineering	Hebei-559,600	647/750	High
28	Shasha	F	Information Technology	Fujian-207,800	580/750	Low

My understanding of the intensity of regional and spatial stratifications in HE admissions resulted from conversations with Shasha and Hongjie. Although the university they attended is not a comprehensive university, its engineering department has been consistently ranked as one of the top in the nation. Shasha was a first-year female student from Fujian (a province with a moderately relaxed *Gaokao* environment) majoring in STEM. My conversation with Shasha followed my interview with Hongjie from Hebei, a populous province that experienced a 'stampede' of half a million aspiring high school graduates 'across a single log bridge' in 2018 and that thus had the nation's fifth largest[12] population of *Gaokao* takers. After I heard about the dreadfully long hours and endless mock exams that Hongjie had been through, Shasha's high school experiences seemed pleasant. When I asked Shasha the score that she had received on the *Gaokao*, she answered with some embarrassment:

> Shasha: I got a 580[13]. I did not do well on the *Gaokao*; I scored 30-40 marks less compared with my performance on the mocks.
> Bo: The boy I spoke to previously is from Hebei, and he scored 647.

[9] This is calculated as the number of exam-takers in the participants' provinces in 2018
[10] I am juxtaposing Hongjie and Shashas' *Gaokao* marks because they took the same set of exams, thus making the marks comparable.
[11] There are vast regional variations in terms of access to HE opportunities. This was asked of participants to determine whether they are from high/medium/low-pressure admission regions.
[12] The ferocity of competition for college admission has been metaphorically depicted as 'a stampede of thousands of soldiers and tens of thousands of horses across a single log bridge'.
[13] While varying slightly among provinces, the total possible *Gaokao* is 750.

Shasha (with astonishment): A 647 could bring him to Tsinghua[14] in Fujian!

Shasha's narrative provides a glimpse of how geographical inequalities influenced the lives of ordinary students who take the *Gaokao*. Although Shasha and Hongjie completed the same set of exams, they managed to secure the same university placement with vastly different exam marks, which seemed quite ironic under the supposedly 'fair' meritocratic testing system. A quick review of the cut-off points for Tsinghua and UST by province in 2017 indicates that Shasha's comment was mostly correct (as shown in Table 5.3). If Hongjie had taken the *Gaokao* in Fujian instead of Hebei, he could have landed a place at Tsinghua if he had managed to answer one more multiple-choice question correctly (a multiple-choice question is worth 2 marks). Later, I approached Hongjie about his view on the current admissions system; Hongjie answered with a deep sigh, 'There are many students rushing for the *Gaokao* in Hebei. What can you do about it?'

Table 5.3 Cut-off Points for Tsinghua and UST in Hebei and Fujian[15]

	Tsinghua University	UST
Hebei	691	637
Fujian	649	568

Source: Tsinghua admissions (2017) and UST admissions (2017)

As I spent more time in the field, there were many similar instances when I was deeply struck by how geographic mobility forms a crucial part of the stratification in HE admissions in China. As the paragraphs in the following sections reveal, the race for university placements begins long before the day when students take the exam. I witnessed participants' seemingly 'polarised' schooling experiences that differed based on their place of origin; their attendance or non-attendance of high schools with a 'memorisation boot camp' style where students engage in non-stop for *Gaokao* preparations (e.g., Hengshui High); and for only a privileged few, their ability to switch their *hukou* status to a region with low-pressure

[14] Tsinghua University is the nation's best university, tantamount to Cambridge or Oxford University in Britain.
[15] Both of the cut-off scores were for the STEM route.

admissions hoping to boost their chances of admissions into a top university (i.e., *Gaokao* migrants).

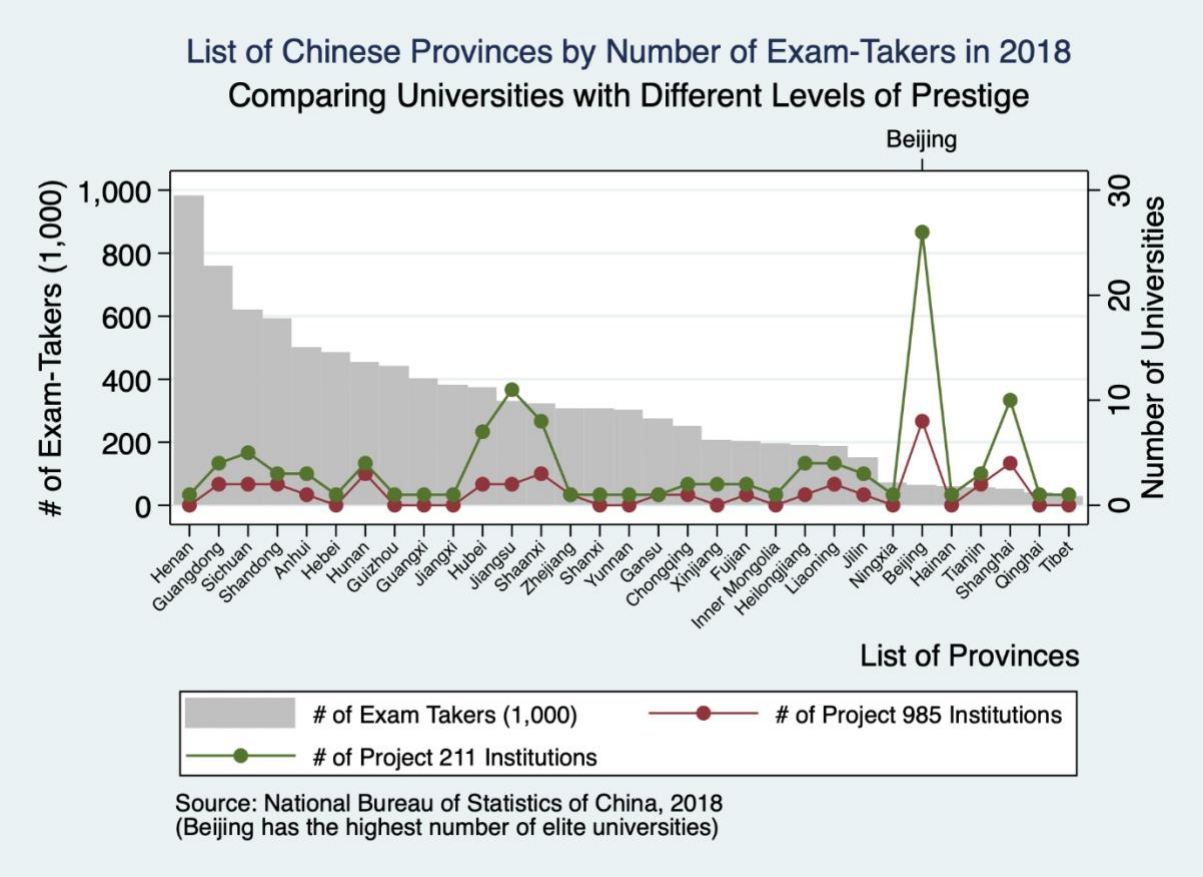


Figure 5.2 List of Chinese Provinces by Number of Exam Takers in 2018

Figure 5.2 presents the national data on the number of *Gaokao* takers by province in 2018. As the government redistributes some of the centralised admission responsibilities to local universities, each province is given responsibility for its own HE recruitment planning, which is performing through the establishment of a basic entry level to HE as well as various entry requirements for different types of institutions, even though the *Gaokao* is a unified examination system. Hence, each institution proposes a recruitment plan based on its own capacity, and there are quotas across different regions. Such policies have resulted in cut-off points that tend to favour students who take the *Gaokao* in their home provinces. Students from municipal cities such as Beijing, Shanghai, and Tianjin appear to benefit from the geographical distribution of well-recognised institutions.

1.2 'Education for Quality' vs 'Exam Preparation'

Table 5.4 Profiles of Participants Quoted in Section 1.2

Participant #	Name of Participants	Gender	Major	Geographic Origins & # of Exam-takers in Participants' Province	Exam Routes	Self-identified Admissions Culture
Project 211 University: University Specialising in Telecommunications						
24	Hongjie	M	Electrical Engineering	Hebei-559,600	*Gaokao*	High
25	Xu	M	Electrical Engineering	Hubei-384,000	*Gaokao*	High
Project 211 University: University of Information Technology (UIT)						
49	Jiaxiang	M	Software Engineering	Beijing-59,000	IFA	Low

我们省是应试教育的典范。

My province is an exemplary model for implementing the 'education for exam preparation' system.

-Excerpt from Xu (#25), who attended the University Specialising in Telecommunications and commented on the curriculum model at his high school

The focus of this section is the nuances of participants' 'polarised' schooling experiences that varied by their place of origin. During my time in the field, I witnessed a consistent pattern of participants' receiving two different, seemingly 'polarised' high school curricula based on their province of residence, which completely altered how students navigated the HE admissions processes. Before presenting excerpts from my participants, as detailed in Chapter 2, it is worth briefly reviewing the broader societal and cultural shifts that have led to the separation of the two curriculum models. While the 'education for quality' model utilises a 'student-centred' approach that emphasises the development of innovation and critical thinking skills via 'learning by doing', with a focus on innovation and critical thinking (Dello-Iacovo, 2009), the 'education for exam preparation' model involves student studying non-stop for the notorious *Gaokao*; students who attended schools with the latter curriculum

model were convinced that the *Gaokao* 'determines one's life'. For instance, based on the assumption that students would not study at home, Hongjie's high school kept the students at school for self-study sessions during holidays:

> Hongjie: For the final year, we literally got 3 days off for the winter break and 5 days off for the summer vacation. We were kept at school for self-study sessions for the remainder of the time.
> Bo: I bet it must be *very very* difficult to secure places out of your province of residence.
> Hongjie: Well, I got used to it, just like everybody else in my province.

Hongjie's narrative illustrates the extreme end of the 'education for exam preparation' model. Rather than challenging the biased policy and unfair governance, he perceived the current admissions system to be 'fair' and 'meritocratic' because 'everybody else' in his province studied under the same curriculum model and were judged solely by objective test scores. Similarly, Xu, a classmate of Hongjie from Hubei, described being assigned many mock exams that he could hardly complete:

> Xu: My three years in high school were entirely immersed in finishing up exam papers. During my final year, the general frequency is two sets of English practice exams plus one math practice exam per day[16] and one set of *lizong*[17] practice exams every two days.

Xu went on to describe how the 'education for exam preparation' model negatively impacted his college readiness and that he had to devote extra hours to catch up with his peers who were educated under the 'education for quality' paradigm; thus, he doubted the value of the education on 'learning to fill out exam papers' that he received. Specifically, the fact that Xu was already behind his peers in computer programming, which is a foundational course, was worrying because he had to 'learn it from scratch', in contrast to his peers, who picked up the skills during their high schools' computer classes. Xu felt that he needed to devote extra efforts to self-studying to keep up with the pace; as he described, 'I fell short at the beginning'.

[16] The practice exam that Xu referred to is a full-length 2-hour mock exam. In the actual *Gaokao*, both English and math are given two hours to complete. In principle, two English practice exams plus one math practice exam would require 6 hours of input.
[17] *Lizong* is a comprehensive exam with topics including physics, chemistry, and biology. It is one of the compulsory exams that a student must complete to pursue a STEM major.

The findings from this chapter echo themes raised by traditional stratification research on first-generation students in the West. For instance, Collier & Morgan (2008) examined qualitative data to identify the difference between first-generation students and traditional students with more educated parents. They found that cultural capital, particularly the possession of tacit knowledge, allowed students with high-SES backgrounds to have more pattern-recognition skills that could help them better conceptualise the university's expectations of students and better respond to faculty's expectations. In the case of China, instead of traditional factors such as forms of social and cultural capital, regional disparities by institutional arrangements conceal geographical inequalities.

Further, regarding the individuals who are instructed under the 'education for quality' model, the excerpts below shared by Jiaxiang indeed corroborate Xu's observation. Jiaxiang was a first-year Beijing local who majored in software engineering at University of Information Technology (UIT). Jiaxing attended a key-point school in Beijing and was one of the participants I interviewed who had gone the IFA route. My conversation with Jiaxiang revealed a completely different schooling experience oriented towards cultivating well-rounded individuals, as emphasised by the 'education for quality' model. The conversation started with Jiaxiang listing the different extra-curricular activities offered at his school; his involvement with the projects he carried out with the radio communications club made him win second place in the Provincial Adolescents Sciences & Technology Innovation Contest, which eventually allowed him to obtain an entrance ticket to UIT. Notably, Jiaxiang did not fully commit to studying for the *Gaokao* until his final year of high school. When asked how he felt about his current coursework, Jiaxiang replied as follows:

> Jiaxiang: I guess I am satisfied with my current progress. For me, I majored in software engineering…and I started learning it in high school. The computer science class back then taught Visual Basic (VB), which progresses nicely with what I am learning now.

Thus, Jiaxiang's story shows that receiving education under the 'education for quality' model provides students with many opportunities to realise their full potential, and the

Gaokao certainly is not the *only* way to gain entrance tickets to college. His tale was also corroborated by Ziyi (#48), Zishu (#2), and Zhenyu (#50), all of whom are local to Beijing and share similar schooling experiences as that of Jiaxiang.

Before entering the field, I anticipated the importance of family forces (e.g., social and cultural capital) and attendance at key-point schools but overlooked the importance of geographical inequalities in mediating university admissions. By juxtaposing Hongjie's and Xu's stories with the themes identified by Jiaxiang, I discerned a distinct set of instruction models. On the one hand, the 'education for quality' model emulates developed world educational models that aim to spark students' interest in various disciplines and to produce well-rounded citizens that are equipped to compete in a global economy (Fong, 2007). At the other end of the spectrum, students educated under the 'education for exam preparation' model are subjected to a ruthless cycle of lessons and mock tests. The pressure that these students have to endure is endure; as Xu's noted, 'I can hardly endure one more day'.

1.3 The Hengshui Model

Table 5.5 Profiles of Participants Quoted in Section 1.3

Participant #	Name of Participants	Gender	Major	Geographic Origins &# of Exam-takers in Participant's Province	Exam Routes	Self-identified Admissions Culture
Project 985 University: Minority Ethnic University						
30	Ming	F	Law	Hebei-559,600	*Gaokao*	High

我选择衡水是因为我还不够自律。
I choose Hengshui because I am not self-disciplined enough to compete.
-Excerpt from Ming (#30), who credited her alma mater because she 'could not have imagined going to the university [she is] attending now'.

The Hengshui model is an extreme example of an 'education for exam preparation' model. This model is characterised by military style schooling, with pupils spending 12 hours a day studying, attending up to 13 classes per day, and taking just a 15-minute break for each meal (Yan, 2017). Despite often being depicted as 'China's top cram school' and described as employing 'memorisation boot camps' in the public media, in 2017, Hengshui High had 139 pupils make it into Peking University and Tsinghua University, which are tantamount to Oxbridge in Britain. Of all the schools in the province, Hengshui graduates have managed to secure the most places at China's top universities for 15 consecutive years (Davision, 2015). The Hengshui model seems to be successful when only the admission figures and has thus been adopted by other high schools operating under the same curriculum model. I met with 5 first-year students who graduated from Hengshui. My conversations with them helped me uncover the *real* Hengshui, rather than the image portrayed in public media. Additionally, it was not until I met Ming and had conversations with and heard stories shared by her fellow high school classmates from Hengshui that I realised how profoundly place of origin impacts access to HE opportunities in China.

Talking to Hengshui graduates made me very conscious of how gruelling the experiences of the memorisation boot camps were. However, the 5 students unanimously spoke highly of and expressed profound appreciation for their school (Yingyao, #15; Ming, #30; Tiange, #31; Panling, #34; Mengyu, #35). All of them acknowledged that without the seemingly relentless mock exams they completed at Hengshui, they would not have been admitted to the universities where they were currently studying; hence, the school provided a means for upward social mobility. For example, Ming, who self-identified as a 'mid-achieving' student at her school and was pursuing a degree in law at one of the Project 985 universities at the time of the study, voiced her view about the Hengshui model:

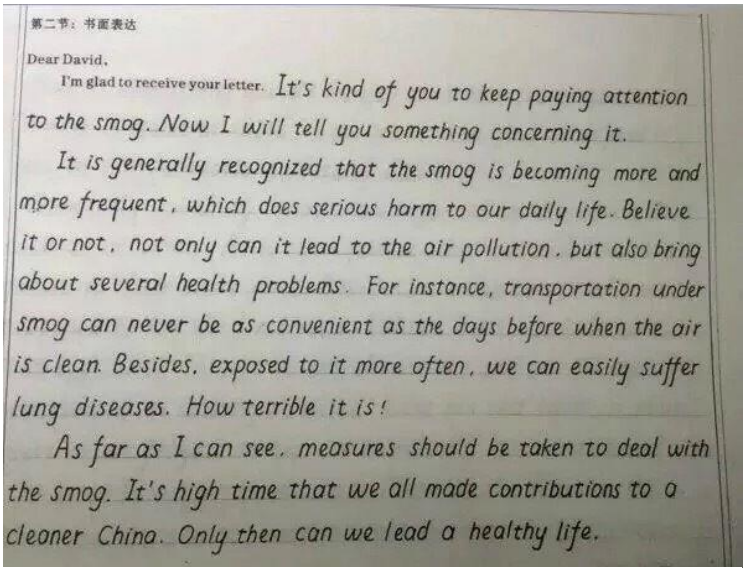
> Ming: I really appreciated my school. For someone like me who comes from a family background of no repute, I am not a *Fuerdai* (a Chinese term that refers to the children of the nouveau riche in China) or a *Guanerdai* (refers to the decedents of party members in China), I might lose the game from the onset. Thus, despite all the criticisms, I still appreciate the current exam model, the *Gaokao*, as well as my high school, because it provides a means to potentially change my fate…I think Hengshui is the best under the

> current HE admissions model. I sometimes do miss the time I spent in Hengshui–I think I probably will not study that hard again in my entire life after leaving Hengshui.

Later, Ming shared with me a picture of her daily schedule when she was in Hengshui, as depicted in Figure 5.4. As illustrated in the figure, students' daily activities were carefully planned from 05:30 until 22:10, and mealtimes were hurried. During our conversation, Ming meticulously recounted some of the details that Hengshui addressed, e.g., having all the mock exams mimic the *Gaokao* format (including the use of the same fonts, styles, and even quality/brand of the paper as the *Gaokao* exam). Even more extreme, school administrators invented so-called *Hengshui fonts* and required the students to imitate them, with every English letter faultlessly printed (as seen in Figure 5.3). Ming admitted that in retrospect, the school policies that she had once thought were 'obscure' she now positively regarded as 'sophisticated'. 'They just want us to score 1 more point', Ming said with pride. In this light, attendance at Hengshui High leads to the formation of an institutional habitus by which lessons are passed on only within the network. School administrators' meticulous development of the policy coupled with the cram teaching model enables graduates to gain an advantage for college entrance, even if by 'scoring 1 more point' on the exam.

起　床	5:30
早　操	5:50
早　读	6：05—6：30
早　饭	6：30—7：10
早预备	7：10—7：35
第一节	7：45—8：25
第二节	8：35—9：15
第三节	9：25—10：05
课间操	10：05—10：30
第四节	10：30—11：10
第五节	11：20—12：00
午　饭	12：00—12：45
午　休	12：45—13：45
第六节	14：05—14：45
第七节	14：55—15：35
眼保健操	15：35—15：55
第八节	15：55—16：35
第九节	16：45—17：25
第十节	17：35—18：15
晚　饭	18：15—18：50
看新闻	18：50—19：10
晚　一	19：15—20：00
晚　二	20：10—20：55
晚　三	21：05—21：50
晚　休	22:10

Figure 5.4 Ming's daily schedule at Hengshui with 10 formal classes and three 45-minute self-study sessions



第二节：书面表达

Dear David,

I'm glad to receive your letter. It's kind of you to keep paying attention to the smog. Now I will tell you something concerning it.

It is generally recognized that the smog is becoming more and more frequent, which does serious harm to our daily life. Believe it or not, not only can it lead to the air pollution, but also bring about several health problems. For instance, transportation under smog can never be as convenient as the days before when the air is clean. Besides, exposed to it more often, we can easily suffer lung diseases. How terrible it is!

As far as I can see, measures should be taken to deal with the smog. It's high time that we all made contributions to a cleaner China. Only then can we lead a healthy life.

Figure 5.3 The Hengshui fonts used to teach students to write elegantly in hopes of conveying a positive first impression to exam markers

1.4 Gaokao Migrants

Table 5.6 Profiles of Participants Quoted in Section 1.4

Participant #	Name of Participants	Gender	Major	Geographic Origins & # of Exam-takers in participants' province	Exam Routes	Self-identified Admissions Culture
Project 985 University: Elite Comprehensive University						
3	Jiaming	F	Law	Fujian/Beijing	*Gaokao*	Low
Project 211 University: University Specialising in Chemical Technology						
37	Xiaoyu	F	Accounting	Hebei/Tianjin	*Gaokao*	High/Low

'*Gaokao* migrants' is a term that refers to students who register to take the exam in a province other than their home province in hopes of boosting their chances of admission into a top university (Wei, 2019). In China, as citizens are bound by their household registration

documents, they have to attend public schools in the province where their *hukou* was registered. Furthermore, university enrolment in China is based on students' relative rankings at the provincial level, not at the national level, meaning state demographics can greatly affect how well the students in each province perform. In the past few years, some students have managed to obtain fake household registration documents, and parents have invested in real estate in a different province so that their children could take the exam in that province to give their children an advantage in their education. In my sample of 60 participants, only 2 could be categorised as *Gaokao* migrants (e.g., Jiaming, #3; Xiaoyu, #37). This number may seem very small, but it offers a snapshot of the deployment of strategies by parents to fight for privileged positions for their children to climb the educational ladder. The first narrative was provided by Jiaming Li, a law major and high-achieving student who was raised in Fujian and later transferred to a high school in Beijing; the narrative portrays her experience of attending high schools in two cities:

> Bo: There is a rumour saying that it is easy for Beijing local students to attend universities in Beijing. Based on your experience, what's your view on that?
> Jiaming: While it is *easier*, if you were to say it is easy to get into Tsinghua or Beida (Peking University), I would doubt it. For example, for subjects like math and physics for which the answers are standardised, I would say the exam papers in Beijing are much easier than the national one. However, usually the last two questions are extremely difficult. So, it's all about strategy. I managed to get the easiest ones correct.

Jiaming's narrative adds another dimension to the existing complexity of geographic inequalities. While the *Gaokao* is centrally administered, Beijing is one of the four areas that independently manages the content of the *Gaokao* exam papers, which gives the Beijing Municipal Commission of Education slightly more flexibility than commissions in other areas in terms of content not necessarily aligning with the national agenda outlined by the Ministry of Education. The province from which Jiaming came (Fujian) is well known for its small student population and high enrolment quota. Jiaming relocated to Beijing because her father received a job offer in Beijing. She was then transferred to a high school in Beijing because one of her father's friends worked at that school and managed to secure her a place. As a high-achieving student who had already studied in the best-performing school in her hometown, Jiaming described coming to Beijing as 'adding wings to a tiger', which has a

similar meaning to the English idiom of 'going from strength to strength'. When asked about whether she thought she would still have been able to make it into the same university without being a *hukou* migrant, Jiaming answered with some hesitation: 'I think I could still have made it, but maybe not to the law school[18]. In this sense, Jiaming acknowledged that as a high-achieving student, even without altering her *hukou* status, she could still have made it into Elite Comprehensive University but not into the law school (which requires a high entrance mark).

While Jiaming was an unconventional '*Gaoka*o migrant' because she already excelled, Xiaoyu was a more traditional *Gaokao* migrant. Originally from Hebei and majoring in accountancy at University Specialising in Chemical Technology at the time of the study, Xiaoyu migrated to Tianjin when she was 14. Having been educated in both provinces, Xiaoyu was eager to describe to the differences:

> Xiaoyu: The differences were quite substantial. When I was in Hebei, the first year in middle school, we usually got out of class at 7 pm or 7:30 pm. But in Tijian, the final year in high school, we got out at 6:30 pm. After that, we had other extra-curricular activities to participate in…we had musical festivals, art festivals…we could also learn to operate all sorts of machinery, such as for laser cutting, 3D printing, etc., all sorts of good stuff for you to explore.

As exam regulations in most provinces state that all *Gaokao* candidates with nonlocal household registrations must provide proof of residence in the province for the previous three years, and given that Xiaoyu was transferred to Tianjin during the penultimate year of middle school, Xiaoyu and her parents managed to adhere the exact required timing for the transfer, walking along the boundary of the law. Consequently, Xiaoyu's parents' decision to deploy strategies to transfer here to a sparely populated city where competition was less fierce helped their daughter gain an advantage over other contestants with similar scores who would take the *Gaokao* in Hebei rather than in Tianjin. Xiaoyu was somewhat reluctant to share how she managed to work around the *hukou* system and be transferred, as the competition to have

[18] Law schools typically require a higher exam mark to enter than the university in general. The fact that Jiaming took the exam in Beijing give her an edge to get into the law school.

one's household certificate registered in Tianjin can be fierce, as corroborated by description of the heated competition for a Tianjin-registered *hukou* certificate at the beginning of the chapter.

1.5 Stories at a Lower-Tiered University

In addition to the Project 985 and Project 211 universities quoted above, I visited one of the lower-tier universities in Beijing, the Specialised Publishing University (SPU). The SPU is located in the suburbs of Beijing and has a student population of approximately 8,000. Because it is under the jurisdiction of the Beijing Municipal Government, the SPU predominately recruits students who are local to the Beijing area (similar to some state universities in the US). The university currently offers 27 majors, and as the name indicates, all majors are related to printing, media, and journalism. I obtained this fieldwork opportunity from a family contact who has been working as an administrator at the SPU for more than 15 years. After explaining to her my research intention and gaining her approval of my intended list of interview questions, Shan then introduced me to a chat group with more than 30 student members working for the university magazine. Half of the members of that chat group were first-year students, and I then contacted them individually to invite them to be interviewed. I interviewed 10 students, all female. This does not reflect the gender breakdown of the incoming Class of 2019, in which 65% of the 1,580 incoming students are female. If we evaluate data on gender-specific major choices, the official figures demonstrate that male students are more likely to study electromechanical engineering and automation at the SPU whereas females predominately major in sectors within the traditional printing industry such as industrial design, digital printing, and visual communication.

Table 5.7 Profiles of Participants Quoted in Section 1.5

Specialised Publishing University (SPU)					
Participant Number #	Name of Participants	Gender	Major	Geographic Origins	Exam Routes
55	Xin	F	Editing and Publishing	Beijing	*Gaokao*
51	Xu	F	Digital Publishing	Beijing	*Gaokao*
59	Ruizi	F	Industrial Design	Beijing	*Gaokao*

Because the printing industry was not a popular career choice compared with accountancy and engineering, the conversation started with reasons why Xin decided to pursue an unpopular college major.

> Bo: Why don't we start by why you end up studying the major you choose today? Do you have family members working in the printing industry?
> Xin: No, not at all…I chose SPU and Editing and Publishing because it is the only programme that accepted me.
> Bo: What else did you apply?
> Xin: I pretty much applied to every possible programme that would take my score. I applied for mathematics in a college in Hebei, studying accountancy in Southwestern University of Finance and Economics in Szechuan. I am open to all choices.

Compared with the students I met from the Project 985 and Project 211 universities, Xin did not have a clear strategy for major selection, and she entered the printing industry without any prior knowledge about the industry. When assessing major selection, she exhibited the habit of 'shooting-off': she simply applied for every possible programme for which she was eligible. Growing up in the Daxing county where the university is located, Xin had never heard of the SPU until she came across it in the 'university application booklet' issued by her high school. Xin is not the exception; her response was echoed by 5 other respondents sampled from the SPU (Zhen, #52; Yu, #53; Dikun, #56; Ying, #57; Jiayu, #60), except for Chang (#54) and Kerong (#58), who studied Painting and Animations, respectively. As colleges and universities in China are increasingly being 'differentiated qualitatively', holding the same level of academic credentials from universities with different rankings

carries distinct symbolic meanings because these will be interpreted differently in the labour market (Arum, Gamoran, & Shavit, 2007). Low-achieving students like Xin seek every possible opportunity that would enable them to secure a place at *any* university studying virtually *any* major, aiming to determine a job later.

In another example, a nineteen-year old girl who grew up in the adjacent areas where the university is located had a more personal story to tell. Just like Xin, she attended the SPU because it was the only university that admitted her. Fearing the decline of the traditional printing industry, she chose to major in Digital Publishing. During the conversation, she expressed her anxieties about her future job prospects:

> Bo: Would you explain to me what does digital publishing do?
> Xin: Frankly speaking, I am still exploring…you know, I am just in my first year and when you are in your first year, you haven't specialized yet. So we just taking classes with those students who choose traditional printing (e.g., Editing and Publishing). We will not specialise until our 3rd year.
> Bo: Do you know any recent graduates who had been to your programme, where have they been?
> Xin: I've heard some of the recent graduates has been to the traditional press, but you know, most publishing houses in China are stated owned- meaning you need to rely on *guanxi* (connections) to get into; and in terms of the area of New Media Operation, there are lots of uncertainties and I am still exploring…

Xin's tale expressed a sense of worry about her future. The fact that she had no other connections in the family made it harder for her to get a real sense of how the printing industry works in practice. Similar concerns were expressed by Ruizi (#59), who commented that the lectures were too 'theoretical' and difficult for someone who lacked industrial knowledge to grasp. The digitalising of the printing industry altered the traditional rules of the game, and these students, who studied printing and publishing by coincidence, lacked proper guidance in terms of their career choices. Based on the fact that 9 out of 10 of my participants from the SPU were from Beijing (except for Kerong, #58) and because they already hold a *hukou* from Beijing, they are able to work legally in Beijing. Indeed, with economic reform and China's 'opening up', higher education in China has experienced

unprecedented massification and subsequent feminisation. This large-scale, state-led expansion is illustrated in Figure 5.5, which demonstrates the growth of the number of higher education institutions from 1998 to 2016. The figure demonstrates that although the number of regular higher education institutions has increased, the quantity of colleges for mature students (colleges granting associate degrees only) has been diminishing – implying that a substantial number of associate degree-granting institutions are seeking to become comprehensive universities, which is where significant massification occurs. The SPU is one of the many colleges that experienced transformations when it became a comprehensive university in 2006. Although these results require further validation via a national representative sample, the preliminary findings gathered from the reporting of ten first-year students from the SPU point to the mechanism of how gender plays into the geographic influence focus on less-selective universities, which is predominately a female route of entry. It remains unclear what a degree in the printing industry can do for these students.

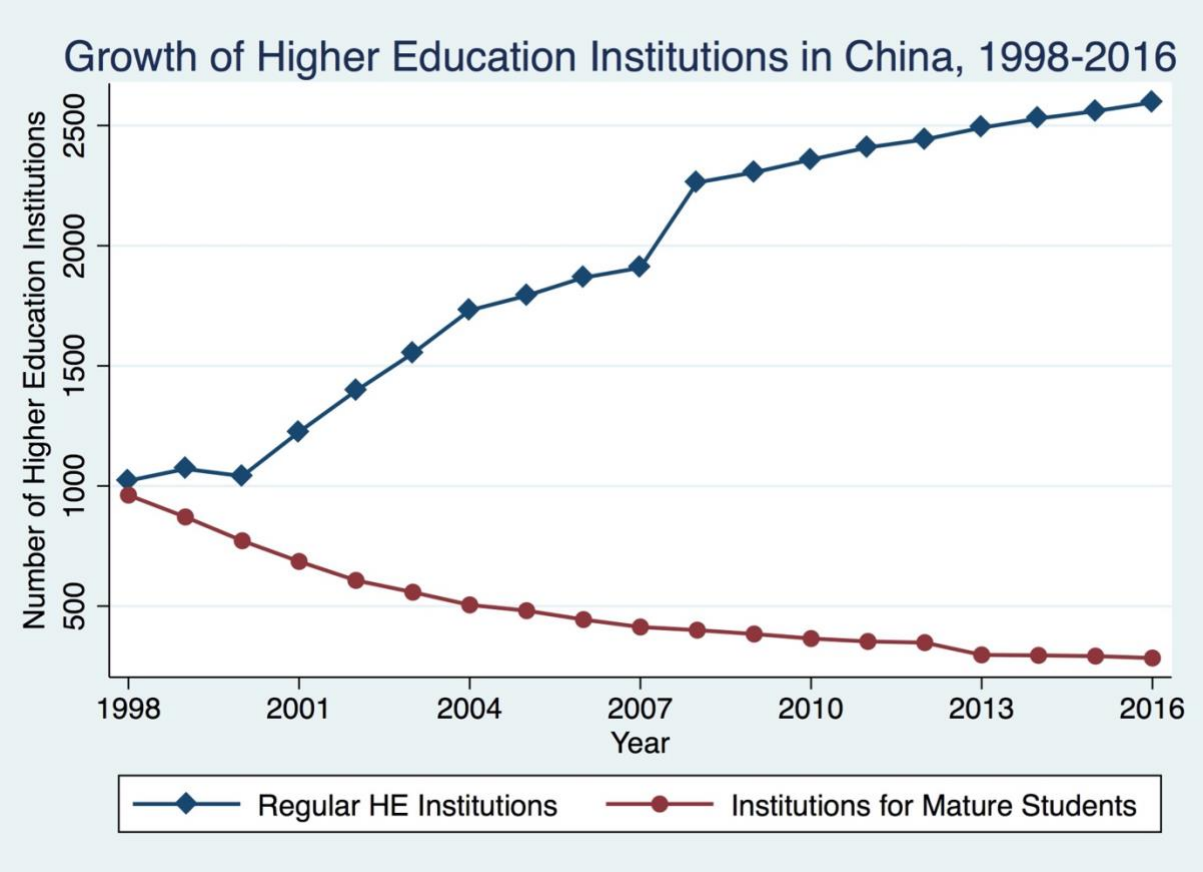


Figure 5.5 Growth of Higher Education Institutions in China

Ministry of Education, 2016

II THE STORY OF INDEPENDENT FRESHMAN ADMISSIONS (IFA)

As I demonstrated in the last section, geography shapes and mediates students' experience navigating the HE admissions system in China at a macro level. Drawing upon the reports of 11 first-year IFA students across three universities in Beijing, this section focuses on one preferential admissions policy, the IFA policy. I aim to explore the process by which the IFA policy supports the recruitment of students from privileged schools and backgrounds. Students' reports are further supplemented by two admission tutors' views exploring whether the outcomes of IFA recruitment strategies are in line with the goals of the equality of opportunity under the scheme. I then juxtapose participants' narratives with the official IFA policy to investigate similarities and differences in the way that educational equality and social mobility are addressed in this political rhetoric.

2.1 Attendance at Key-Point High Schools

Table 5.8 Profiles of Participants Quoted in Section 2.1

Participant #	Name of Participants	Gender	Major	Geographic Origins & # of exam-takers	Exam Routes	Self-identified Admissions Culture
Project 985 University: Elite Comprehensive University						
2	Zishu	F	Communist History	Beijing-59,000	IFA	Low
19	Fuhan	F	Marxism	Zhejiang-320,000	IFA	Medium
Project 211 University: University of Information Technology						
48	Ziyi	M	Information Technology	Beijing-59,000	IFA	High/Low

我们班主任曾经这样说过，自主招生是锦上添花，而不是雪中送炭。

My home teacher once said to us, 'IFA is "the icing on the cake"'.

This metaphor indicates that IFA (the icing) is for those who already have high achievement (the cake). Although meant to be a way to promote meritocracy, IFA is actually another route for those who are already advantaged.

-Excerpt from Zishu (#2), an IFA participant who is now studying communist history at the Elite Comprehensive University

This section addresses how attendance at well-resourced high schools forms an institutional habitus that is a key variable in contributing to successful college admission. In the forthcoming paragraphs, I draw on discussions and analyses that have contributed to current debates about class strategies, including Bourdieu's concepts of social and cultural capital, and in particular, my understanding of how institutional and structural factors shape students' opportunities to navigate the IFA system. As described by Reay et al. (2010), an institutional habitus 'constitute[s] a complex amalgam of agency and structure and could be understood as the impact of a cultural group or social class on an individual's behaviour as it is mediated through an organisation' (p.36). Applying this concept of institutional habitus to IFA, I discovered that admittance to a university through the IFA route was, to a great extent, dependent on the type of secondary school that a student attended. In this line of argument, I categorised two possible ways to gain eligibility for IFA. The first way is through the 'competition' route, which is the route that 7 of my participants followed, for which candidates must possess national and provincial certificates from the Chinese Academic Olympiads and other recognised competitions as one of the admission criteria. Other acceptable academic credentials include patents and certificates from national essays in Mandarin and English. Most participants had learned about these competitions from their schools. Teachers offered critical insider knowledge about university applications. Thus, attendance at key-point schools constitutes an important aspect of institutional habitus through which schools provide opportunities to participate in types of national and international competitions that can eventually lead to recruitment to a university through IFA. For example, Ziyi (#48) won first place in the National Flight Simulation Competition, hosted by the Chinese Society of Aeronautics and Astronautics, and spoke proudly about his involvement with the National Flight Simulation Competition:

> Ziyi: It was my homeroom teacher who informed us about these competitions…we have a group of enthusiasts who are keen on participating in these science competitions…almost all of us in the group signed up for that one [the National Flight Simulation Competition]. We worked together under the supervision of our physics teacher.
> Bo: Did you have any prior knowledge about building a flight simulation system?
> Ziyi: No, not at all. I like to play computer games and like to build stuff. When my homeroom teacher informed us about these competitions, I simply signed up out of curiosity.

> Later, I learned that I could use these certificates to apply for IFA; that was a story that came later.

Many of my participants spoke in a similar manner as Ziyi (e.g., Jiaxiang, #49; Zhenyu, #50; Xianyu, #6; Xueyu, #14; Siyao, #1). They seem to share a collective persona of being a 'model student' that is cherished in society; they grew up in an urban neighbourhood with middle-class parents, were high-achieving students in a key-point school, and can manage extra-curricular activities outside the existing normal workload. Thus, attendance at a key-point school provides students with many opportunities to realise their full potential. The resources that are available at these schools constitute another integral component of institutional habitus that is closely linked with a school's position in the educational hierarchy. In this light, although national science competitions appear to be open to everyone, as structured tutoring for science competitions is available only in selected key-point schools, students from lower-resourced schools have limited opportunities to participate. They suffer from a systemic denial of opportunity for recruitment through IFA. This situation can persist and lead to greater divergence of opportunities as they advance to adulthood.

Further, admittance into a key-point school not only offers students many opportunities to participate in national competitions but also provides them an advantage in their interactions with IFA recruiters through summer camps. For example, Zishu (#2), who majored in Marxism at a highly selective university in Beijing, described her experience of participating in a summer camp during her penultimate year of high school:

> Bo: Would you describe your experience with the summer camp?
> Zishu: I attended the arts & humanities summer camp. It was more like a 'summer school' so to speak. We gathered on the university campus where classes taught by university professors were taken, and at the end of the programme, we had an assessment. I managed to pass the assessment and got to get some discounts.
> Bo: How did you know about these summer camps?
> Zishu: I usually ranked around the fifth in my grade. I remembered one time my homeroom teacher called us to a small meeting room where we got to meet the local admission staff from X university. He pretty much introduced us to the summer camp opportunities and encouraged us to apply for it. I went back home that day and just applied online.

Such close alignment between school and university resonates well with Reay et al.'s (2005) concept of 'degree of coupling' as a 'manifestation of educational status' (p.47). Zishu's story illustrates the strong degree of coupling between high schools and HE institutions. Through such coupling, universities and schools are linked as an institutional habitus through which information is passed on and advantages are delivered within the network. In addition, key-point schools also have their own alumni networks, through which students can take advantage of 'hot knowledge' that can be seen as 'more salient' than official information (Ball, 2003, p.162; Reay et al., 2003). At key-point schools, students can obtain 'hot knowledge' from others who have previously undertaken the same path. One student described this process as follows:

> Last year, Wuhan University recruited several students from my high school…right before the IFA application, these graduates returned to my high school and joined these recruitment events…they all had been through the process, and they wanted to pay back…I found out that universities with prior experience taking our students are the ones that are of the greatest interest…(Excerpts from Fuhan, one of the IFA students studying Marxism at an elite university in China).

2.2 Utilisation of a Paid IFA Agency

Table 5.9 Profiles of Participants Quoted in Section 2.2

Participant #	Name of Participants	Gender	Major	Geographic Origins & # of exam-takers	Exam Routes	Self-identified Admissions Culture
Project 211 University: University Specialising in Chemical Technology (USCT)						
39	Rui	M	Chemical Engineering	Hebei-559,600	IFA	High

Thus far, much of this analysis has been devoted to discussions of the partnership between key-point schools and universities to achieve academic distinction and exclusivity. I would like to highlight the distinctive experience of Rui, who paid for a service agency to help him apply for IFA based on his publication of an article about detergents in a science

journal. Originating from Hebei Province, which has approximately half a million students wanting to take the *Gaokao* annually, Rui managed to find a way to take the exam, and he is now a freshman studying chemical engineering at a major engineering university, University Specialising in Chemical Technology (USCT). When asked why he did not take the standard Academic Olympiads route, Rui acknowledged that 'it was too difficult for him'.

> Bo: How did the idea of publishing a paper come to mind?
> Rui: Through tutoring classes where they introduced the IFA agency to me. It was a paid service agency that helped students get through the IFA application.
> Bo: Do you mind sharing with me what kind of service they provided?
> Rui: They will provide you with a 'supervisor' who will teach you some basic knowledge about academic writing and assist you with the publication process. The article can be found on CNKI (the Chinese version of Google Scholar).

Rui's narrative provides a compelling illustration of how parents draw on a wide range of strategies to support their children to gain an advantage for college entrance. The minimum acceptance mark for USCT was 607, and with his published article, he managed to be admitted with a *Gaokao* mark of 567, i.e., a 40-point decrease in the necessary score, even though there were nearly half a million students competing for college entrance in Rui's province. Notably, Rui framed IFA recruitment strategies as 'short-cuts'; his family found a way to utilise the service provided by the paid agency to compensate for a relatively lower score on the *Gaokao*. In addition, for Rui and his parents, the concern was not whether Rui could get into a university but rather whether they were aiming for a 'selective' university. Regarding his university choice, Rui mentioned that one of the primary reasons he chose USCT was because it was a Project 211 university, and he believed his money would be spent wisely. Based on this narrative, I argue that Rui and his parents were well aware of the potential market congestion that Rui will face upon entering the job market. Consequently, Rui's parents' decision to deploy strategies to help Rui get into a recognised university was vital, as possessing an academic credential from a 211 university will help their son gain an advantage over other contestants with the same level of qualifications. In this way, Rui's family was adept at making the most of the opportunities offered by college entrance policies to support their son's college admittance, and ultimately, they were able to play the

educational game more effectively than others.

2.3 Views of Two Admissions Tutors

Table 5.10 Profiles of Participants Quoted in Section 2.3

Name of Participants	Gender	University [19]	Post	Years in the Post
Xiangqian	M	Project 985	Former Deputy Head of Admissions	20+ Years
Qing	M	Project 211	Admissions Tutor	9 Years

2.3.1 The General Trend of Moving Away from the One-Size-Fits-All Exam Model

Gaining access to admissions tutors was one of the most difficult fieldwork challenges. Most of the time, I lacked the necessary contact person who would allow me to gain access to these admission tutors, and research on issues related to social stratification has always been sensitive. My meeting with Xiangqian was arranged by a family contact, Xiaogang, who worked for the same institution as an art professor. The admissions office had undergone major transformations when Xiangqian's predecessor was involved in a massive bribe scandal in 2013 and admitted to accepting $3.6 million in bribes from 44 prospective students seeking admission to his institution from 2005 and 2013, which created enormous public outrage (Ramzy, 2013). Therefore, meetings with admissions tutors are better kept private to avoid misunderstanding.

As a policy enactor, Qing was familiar with the development of HE policies. After hearing my research topic, he recounted the development trajectories of *Gaokao* policies since the 1900s and his observation of the shift from a 'one-size-fits-all' model to a 'multi-channel recruitment model', which has been practised in the West.

> Qing: In China, there are lots of policies that are coming from the top aiming to address issues like this. The *Gaokao* policy certainly changed a lot since I have worked in this job

[19] The name and the universities of the two admission tutors have been de-identified.

> for 9 years. For example, in Zhejiang, students can take certain subject tests twice a year and just take the three core subjects[20] during the *Gaokao*. Such changes are unthinkable, and the traditional belief regarding the *Gaokao* as the 'exam that determines one's fate' has got to change.
> Bo: So just like the SATs in America, which you can take all-year-round.
> Qing: Exactly. One of the major trends in HE admissions that I have witnessed is in 'multi-channel recruitment' (*多元录取*), where students are not solely coming from the *Gaokao* route. Essentially, we are looking to the West, but with caution.

Speaking to the question of whether the outcomes of IFA recruitment strategies are in line with the goals for the equality of opportunity of the scheme, surprisingly, rather than adhering to the official discourses, Qing admitted, 'I won't call it fair. '

> Qing: IFA…I won't call it fair. Just look at the sorts of students who are recruited [under IFA]; they are students who possess unusual talents in a particular subject. What does it mean? It means they are stellar in one subject on top of mastering the existing lessons (*学有余力*). You can hardly find a kid in rural areas, right? In this sense, the IFA kids are not normal kids. They perform exceptionally in class while having the ability to compete in all sorts of competition on top of their intense schoolwork…

This theme was also echoed by Xiangqian, who commented that as a policy enactor, he recognized that the university faced a conundrum of maintaining its academic distinctions while ensuring balanced geographic representation, as explained below:

> Xiangqian: As [an admissions tutor at] a university that is directly under the Ministry of Education, I have very limited control over the number of students I want to recruit from each province. The quota is centrally planned. From the university's perspective, I want to get the best minds coming to my university, and often the times, the best minds are coming from the students from the eastern areas [where the economy is booming]. But because the quota for each province is centrally planned, I need to recruit students from impoverished regions, like Tibet, Xinjiang, etc. That's the Ministry's talent acquisition strategy.

It was quite surprising to hear both admissions tutors say the IFA policy does not hold up to its ideal of ensuring educational equality and equal access to educational opportunities. My argument is that in terms of the HE admissions reform, the government has found itself in a conundrum. On the one hand, the government has actively looked to the West by gradually introducing flexibility rather than relying on a one-size-fits-all, centralised exam model. For

[20] The three core subjects are Chinese literature, English and math.

instance, a new *Gaokao* reform policy in 2019 introduced the '3+1+2' model, by which students can choose the combination of exams they would like to take (currently being pilot tested in 8 provinces). Under the new policy, students still need to take the three core subjects for the *Gaokao*, namely, Chinese literature, math, and English. For the '1', students can choose between either history or geography, and for the '2', students can choose to have their exams in 2 of the following 4 subjects: chemistry, biology, political science, and geography. Previously, students were diverted into either the liberal arts/humanities route or the STEM route during the second year of high school (age=17). As such, under the old scheme, a student who opted for the STEM route could not take history for the *Gaokao*, and vice versa. In this sense, the '3+1+2' model is somewhat modelled on the British A-levels in giving students the opportunity to choose which subjects they want to take for the *Gaokao*. However, unlike universities in the West, where individual universities and professors have a say in student recruitment, the Chinese government also wants to uphold its meritocracy ideal in terms of maintaining the 'subjectiveness' of an admissions system with built-in transparencies and minimum 'human interactions'. Introducing more flexibilities may create uncertainties. During our conversation, Qing also complained to me that what was once considered the 'simplest' IFA interview would now require a panel of professors and lecturers in a group interview format with the whole process videotaped. 'The University wants to maximise procedural fairness and doesn't want to ruin its reputation because a student gets the spot because of his/her acquaintance with a professor.'

III STEM AND MAJOR CHOICES

A critical concern that continues to plague international researchers and educators is the persistent underrepresentation of women in STEM fields. In China, after examining 2020 *Gaokao* scores from 1078 high school seniors of three Wuhan high schools, Tsui (2007) reported no gender differences in mean college entrance examination math scores among high school seniors. In a similar vein, with the aim of investigating the gender achievement gap in the *Gaokao* in a typical municipality in China, Zhang and Tsang (2014) revealed that although the gender difference was generally not significant in mathematics, male students were predominant at the top of the mathematics score distribution. Although East Asian students excelled on international assessments, McGee et al.'s 2007 study investigated a group of Asian STEM college students that reported having endured 'the burden of being 'model students'' for the societal normalisation of successful Asian STEM students (McGee et al., 2017). STEM majors are more likely to receive higher salaries than other disciplines, and the lack of women in these majors strengthens occupational and income inequalities in society. In my sample of 60 students, 24 students opted for a STEM degree, including 9 female students. In the following section, I shift the focus of inquiry to explore some of the reasons behind female students' uptake of a STEM degree. Please note that some of the factors mentioned are applicable to men as well. The focus of inquiry is investigating reasons why women take up a STEM degree, not exploring gender disparities in STEM uptake.

3.1 Reasons behind female students' uptake of a STEM degree

Table 5.11 Profiles of Participants Quoted in Section 3.1

Participant #	Name of Participants	Gender	Major	Geographic Origins	Exam Route	# of Exam-takers in Participants' Province
Project 211 University: University of Information Technology						
50	Zhenyu	F	Architecture	Beijing	IFA	
Project 985 University: Elite Comprehensive University						
12	Lanyi	F	Environmental Sciences	Shanxi	*Gaokao*	
16	Xuerong	F	Information Technologies	Jiangsu	*Gaokao*	

3.1.1 Family influences

In the following section, I analyse familial factors and try to identify some of the ways in which familial habitus and cultural and social resources help shape students' decision-making process. Traditional Confucius culture expects intergenerational transmission of career choice. Along these lines, Zhenyu (Participant #50) portrays her decision in majoring in architecture:

> Zhenyu: I literally grew up in my mom's *danwei* where I knew all the architects…I participated in their projects as a 'shadow' intern almost every summer break and that is where I got acquainted with architecture.

Zhenyu's words convey a sense of natural transition in following her mother's career path to major in architecture. For her, majoring in architecture is a decision made long before her choice of major on the University Application Form. Rather, it was a cumulative process, and her interest in the subject piqued gradually as she deepened her involvement in architecture projects. Zhenyu later revealed that a private conversation with one of the senior architects in the studio arranged by her mother further convinced her that architecture was the field she wanted to devote herself to. This senior architect had helped design the Beijing National Aquatics Centre for the Olympics in 2008 and eventually wrote her a letter of recommendation for her acceptance into the programme. Zhenyu's case illustrates the effects

of family influences and family networks and how these advantages are reflected in major selection decisions.

3.1.2 Attending a high school that is STEM-driven

This section addresses how type of school attended as a form of institutional habitus can help shape students' major decision-making process. As previously documented in Chapter 2, after the first year of high school, students are sorted into two different academic tracks-namely the arts & humanities track and STEM track. For Lanyi (Participant #12), the STEM-oriented high school she enrolled in helped her make the decision to major in STEM, as shown in the excerpt below:

> Lanyi: My high school places an 'overemphasis on science and neglect of arts'. Plus, I am doing well in STEM subjects; therefore it is sensible for me to choose a STEM major.

A STEM-driven key-point high school signifies that significant resources are allocated to cultivating future engineers and scientists instead of training future historians. For instance, Lanyi commented on the abundant resources of her high school, which is one of the few schools in her province that owns 3D printers and laser-cutting machines, with the aim of cultivating students' creative and innovative skills. She admitted that she would not have access to the same level of resources if she had chosen the arts & humanities track. For her, majoring in STEM is considered 'taken for granted' and 'always assumed' because the school has an unspoken norm that only 'incompetent students' will choose the alternative track.

3.1.3 Major as assigned

Xuerong's experience represents a special major selection case that may not be found in the Western education system. As mentioned in Chapter 2, after indicating a preference for a particular university placement on the University Application Form, students then need to rank their choice of majors in order of preference; each major has slightly different acceptance marks. For Xuerong, her primary choice of major was Economics. Her marks

were a few points lower than the minimum acceptance marks for Economics, and she was instead allocated to Information Technologies[21], her second choice. In explaining why she signed up for Information Technologies in the first place, Xuerong acknowledged that she was still 'exploring' it:

> Xuerong: I think the name — 'Information Technologies' was quite a hot topic nowadays. I thought it is related to statistical analyses to some extent. So I put it as my secondary choice.

By the time the interview was conducted, Xuerong was still in the process of figuring out what her major constituted. Xuerong was fortunate to be accepted into her second choice. On a typical University Application Form, students have the option to be 'allocated to a major' voluntarily if one's exam marks fails to meet any given major preferences on the form. This would mean that the student is open to any major available as long as he/she secures a placement from that university. As such, major selections require making decisions strategically, balancing university prestige against major preference. Consequently, to a certain extent, major selections can be 'involuntary', and such actions may have implications for students' college readiness, as they may need to acquire knowledge that they did not receive in high school.

3.2 A case study of Meiling and Shasha: 'I scored too many points on the Gaokao'

Table 5.12 Profiles of Participants Quoted in Section 3.2

Participant #	Name of Participants	Gender	Major	Geographic Origins	Exam Route	# of Exam-takers in Participants' Province
Project 211 University: University Specialising in Telecommunications (UST)						
28	Shasha	F	Information Technology	Fujian	*Gaokao*	Fujian- 207, 800
29	Meiling	F	Information Technology	Heilongjiang	*Gaokao*	Heilongjiang- 204, 000

As an extension of the previous discussion exploring some reasons why females select

[21] Information Technologies is open to students in both the STEM and Arts & Humanities tracks.

STEM, this section addresses some of my respondents' encounters once they are enrolled in a STEM programme. Here, I focus on responses from Meiling and Shasha, who represent a group of female students that has been not been sufficiently documented in the literature. Their strong *Gaokao* performances in STEM subjects secured them places in a leading information technology programme that was ranked 2nd in the nation, and yet even in their first year, they were already lagging behind their male counterparts and explored the option of switching to a less STEM-driven major. They felt that they could not keep up with the lessons being taught in class. The accounts given by Meiling and Shasha must be viewed cautiously as an exploratory attempt to investigate the link between schooling and STEM preparation for female students who are already enrolled in an accredited STEM programme. I acknowledge that their lack of college readiness may have resulted not from being female but rather the intersection of other demographic and structural factors. For this chapter, I frame the scope of inquiry to female students undertaking a STEM course. I aim to disentangle possible reasons why once high-achieving female students suffer as STEM majors in college, and I find that they have neither the motivation nor a particular interest in the subject.

> Meiling: I was quite desperate to be honest…the professors went through these programming lessons so quickly, and I constantly got stuck in my homework…I want to ask for the boys for help, but I am somewhat hesitant because I don't want to be perceived as 'stupid'…
> Bo: Why do you think the boys are better than you?
> Shasha: They learned about these programming languages in their school! Or they taught themselves.
> Bo: Have you tried to study it by yourself?
> Shasha: It has been difficult…[the coding languages] give me a headache whenever I looked at them…Personally speaking, I don't have that much of an interest compared to the boys…

Shasha's and Meiling's lack of prior knowledge about programming languages put them at a disadvantage. Their inability to adjust from being at the top of their classes to this new reality crippled their confidence; as Shasha said, 'We don't want to be perceived as incompetent'. Her pride prevented her from asking for help and support from lecturers and students. Meiling's growing frustration with her course was rooted in her background and the type of education she received. The following excerpt provides an example:

> Meiling: For someone who comes from Daqing, like me, we are strictly [educated] under the cram learning model…to be honest, I *never* used a computer during my high school, so I now don't how to either make Excel models or draft PowerPoint slides. No one in my school uses a computer because a smart phone is sufficient. It took me a week to teach myself Excel.

Her narrative illustrates the frustrations involved in moving on from her learning habits acquired in secondary school. She clearly lacked confidence in extending her skills and transferring her learning abilities to a different subject. As such, Meiling described having to take 'a giant leap' from being someone who had never been exposed to Excel to being 'thrown' into the programming classes. Her lack of prior interaction with the subject, which was particularly relevant to her field of study, reduced her ambitions and aspirations to achieve what she planned. As she noted, 'I fell short at the beginning'.

In discussing the reasons why she signed up for an information technology programme in the first place, Meiling acknowledged that her family played a large role in choosing the major, which she only vaguely knew about. Majors are often chosen based on a match between the candidate's *Gaokao* scores and the best available university/programme that one can get into with that score. Furthermore, not only her lack of prior exposure to the subject matter but also her struggle to adapt her learning style from a cram learning style to an independent learning style that made her fall behind. This frustration was not only a consequence of the cram teaching and learning strategies adopted by most secondary schools, where the core focus was the *Gaokao* rather than college readiness. The following excerpts provides further detail:

> Meiling: Yeah, but being good at STEM subjects does not translate…that success does not translate into college. It was a totally different scenario.
> Bo: Could you explain a bit further what you did in high school and how it is different from college?
> Meiling: In high school, STEM subjects are relatively easy because we got a whole year of preparation and repetition. It is less about creativity and your actual abilities but rather about repetition and practice. But when you came to college, it's really about your natural aptitude and your abilities. It is a totally new mode of learning.

Meiling (sighs): I scored too many points on the *Gaokao*!

Meiling's last statement implies that she should have scored fewer points and pursued a business degree that would have been less quantitatively driven. Her narratives illustrate a sense of college unreadiness, and she blamed herself and her background for the disadvantages she experienced. Excelling on a STEM exam that resulted in a significant amount of repetition and memorisation did not translate to succeeding in STEM subjects in college. Similar experiences were reported by Fanyi (#26) and Hanming (#27). The narratives of Meiling and Shasha elucidate the inequalities between students taught under different pedagogy models, which may transcend gender issues. This section can only be exploratory regarding the group of respondents cited in this dissertation; whether this experience is common would require quantitative analyses with a representative sample. These inequalities resulted in a sense of vulnerability when students educated under the 'exam preparation' model compared themselves to others educated under the 'education for quality' model.

IV CONCLUSION

This chapter investigates the geographical inequalities in HE opportunities in China. National evidence on the distribution of HE institutions reveals a clear pattern of regional disparity. Moreover, evidence on the differentiated selection criteria across provinces suggests that the state's policy of decentralisation, with devolution of funding and planning power to the local and institutional levels, has increased inequality between regions. As such, more contextualised explanations are required to account for the geographical inequalities in access to HE in China. The *Gaokao*, with its meritocratic promise of selecting and rewarding talent, derives symbolic power from its association with the notion of the equality of opportunity. This association could be used to conceal the growing geographical inequalities that have arisen during the market transition through decentralisation policies and the implementation of two curricula under one system. Such inequalities have resulted in a sense of vulnerability and an acceptance of inequality, for which students blame themselves rather than challenging the biased policy and unfair governance. The desire for upward social mobility contributes to students' acceptance of their disadvantage due to residing in provinces that follow the 'education for exam preparation' model, fuelled by the Confucian teaching that 'god helps those who help themselves' (*天道酬勤*).

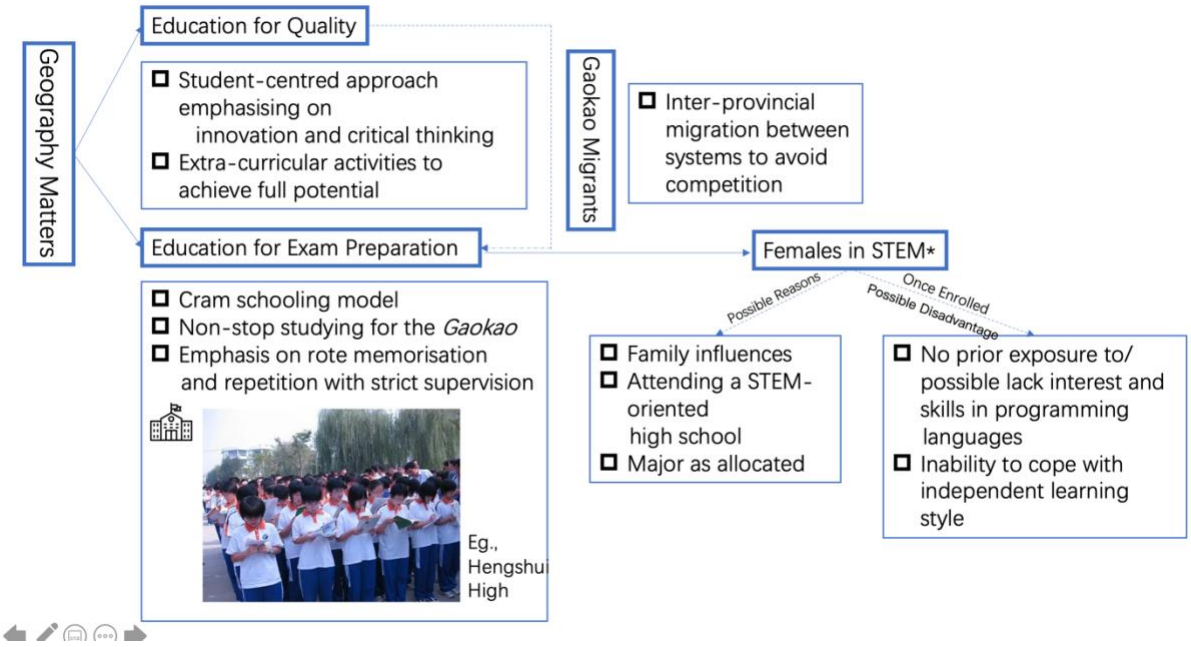


Figure 5.6 An illustration of how geography matters

As shown in Figure 5.6, a central thread across this chapter is the importance of geography, yet this issue has been overlooked in traditional stratification research. While the uneven distribution of educational resources and infrastructure has certainly had direct impacts on educational attainment, the reasons for geographical inequalities in China are more than just economic. The coupled effects of the *hukou* permit and place of residence have led to differentiated cut-off points and quota policies that have undermined the meritocracy and exacerbated geographical inequalities in opportunity structures. In effect, the state's economic aims to accumulate human capital for nation-building through the meritocratic expansion of HE have been compromised by the growing power of the eastern provinces in supporting preferential access to HE for their local populations. Furthermore, quota policies and different criteria by area have influenced concerns about interprovincial migration. Those who are advantaged manage to register to take the exam in a different province to improve their prospects, which is evident from the *Gaokao* migrants' narratives.

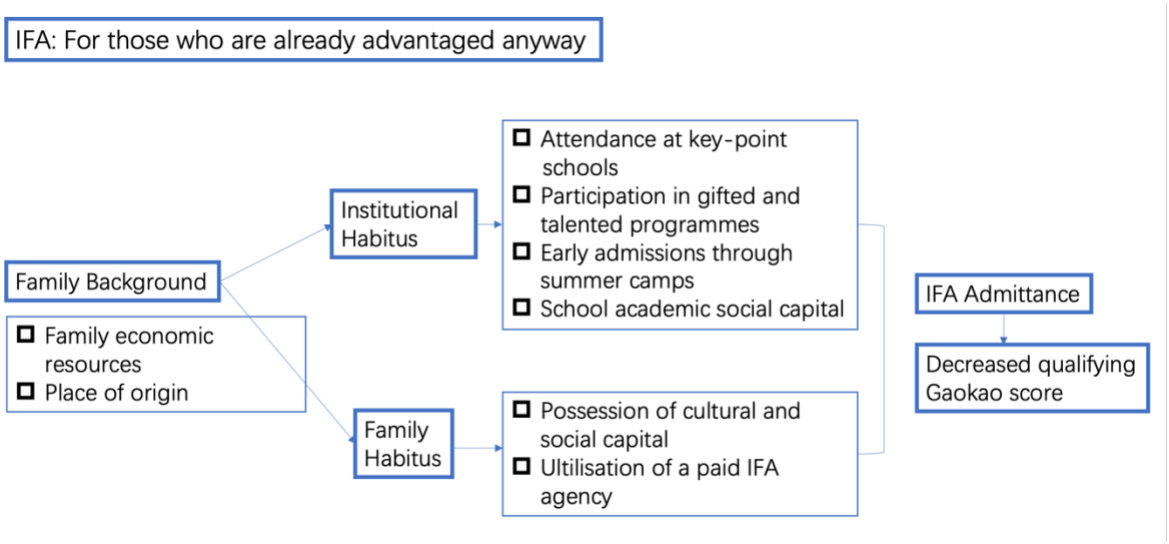


Figure 5.7 University Admissions via IFA

Another strand of this research is the evaluation of the educational equality of IFA. Only China's top one hundred universities have been granted permission to conduct IFA recruitment; Olympiad certificates and IFA recruitment itself, as well as the possession of the economic, cultural, and social capital that is generated by middle-class family habitus, have been identified as classed strategies that support students' educational mobility. Although the official policy discourses claim that the structure of the HE system provides equal opportunity for students all social origins, the results of this study demonstrate that students of higher SES are better able secure an advantage in the competition for HE opportunities. As shown in Figure 5.7, my research has shown that a student's ability to be admitted via IFA is decided long before their submission of their application materials. Rather, one's eligibility for undertaking the IFA route has already been determined by institutional factors, e.g., the attendance of key-point schools where a student receives structured training in Academic Olympiad preparation. In addition, I also witnessed students' families' mobilisation of social, cultural, and financial assets to fully support their children's educational trajectories to help them stay ahead in the race, which directly contests the 'equal access to education' principle that is outlined by the government's rhetoric.

The findings of this study must be viewed cautiously because this is a qualitative exploration of how existing students described their schooling experiences and family influences on their choice of university and subject area. Limitations exist regarding the types

of universities and students where the field work was performed, and bias is possible because this chapter only focuses on success stories- those who were successfully placed in universities. Geographical representation is limited to Beijing, and this may present an additional point of caution given that only high performers are able to study in the city; therefore, the study population may be different than those in other regions of China. Replication of this study in other Chinese metropolitan areas is necessary to test and compare the findings. Future areas of research should therefore continue to engage in in-depth field work among different populations of students across a geographical spectrum and at all types of university rankings to ascertain if and how the mechanisms and strategies that I have identified play out in other contexts. Both intra and inter-class differences in the utilisation of social and cultural capital should be thoroughly investigated in future research.

CHAPTER SIX

Independent Freshman Admissions in China: Assessing Familial and Structural Factors

INTRODUCTION

Higher education (HE) has dominated the news in recent years. In the spring of 2015, as illustrated in Figure 6.1, parents from prosperous coastal cities in China set off a flurry of protests demanding greater ‘educational equality’ in response to the government’s plan to establish quotas for students from traditionally impoverished regions to be admitted to top colleges. Under the centralised quota HE admission system, this plan was designed to reduce the proportion of established students who gain university placement. Specifically, the recruitment quota for 2015 was set by the Ministry of Education (MOE) to reallocate approximately 140,000 places, approximately 6.5 percent of placements at top-tier institutions, to students from traditionally underprivileged areas (Hernandez, 2016). The parents were protesting against this rationale of protectionism—requesting a seemingly ‘fairer’ and ‘meritocratic’ university placement system based purely on examination scores.

Demonstrators in Zhengzhou protested in May over what they said was a lack of university student placements in Henan Province. They held signs reading, "Fairness in education."
Chinatopix, via Associated Press

Figure 6.1 Parents Protest for 'Fairness in Education'

Source: Adapted from Hernandez, 2016

About the Study

HE has been valued as a national strategy to support China's national development and is a key force in transforming the country into global economic power (Yang & Welch, 2012; Yeung, 2013). One of the strategies developed to broaden access to HE was the introduction of the Independent Freshman Admissions (IFA) in 2003 to find students who normally would have been left out of HE under the exam-only entrance model but who have the potential to develop 'exceptional talents or professional skills' (Ministry of Education of China, 2010). While the acknowledged objective of the IFA system is to offer more opportunities for college admissions, very few studies have investigated the effects of this policy since it was introduced in 2003. Therefore, a systematic study that evaluates the sociological impact of the IFA policy is urgently needed. As such, this study fits into a broader perspective, as the national government strives to promote equal access to education 'as a major cornerstone of

social justice' despite the little empirical support for its effectiveness. From an empirical perspective, although the focus here is on China with its distinctive socio-political context, this project fits into a wider theoretical debate over how although education can be seen as a path to social mobility, it also reproduces and legitimises existing educational inequalities.

In this study, I pay attention to how individual pathways to university education are embedded within a range of familial and structural factors that influence education from an early age. I hope to explain some of the complexities in HE opportunities in China. In the literature review, I strive to identify the processes that hinder equality of opportunity. Understanding the nature of China's institutional stratification helps shape the sample used in this analysis. In my methodology section, I describe how the Beijing College Student Panel Survey (BCSPS) uses the relative standing of universities as a principle sampling unit. Ultimately, through this research, I hope to contribute evidence relating to discussions on the role of education in creating a more equal society.

I REVIEW OF THE LITERATURE

1.1 Family Transmissions of Advantage

Sociological research consistently documents the persistent effect of the family environment on children's learning attainment. As noted in Chapter 3, Bourdieu attributes differentiation in learning attainment to the available amount of family financial, social, and cultural capital (Bourdieu & Passeron, 1990). In a survey of approximately 960 first-year students in Anhui and Zhejiang, Liu (2013) found that parental educational level significantly influences students' academic outcomes. Indeed, parental educational levels and implicit knowledge about college application processes can contribute to a process of reproduction, whereby parents from a privileged background maintain their privilege for the next generation. Furthermore, in an international comparative study, Lyu, Li, and Xie (2019) revealed that family socioeconomic status exerts much stronger positive effects on children's academic achievement in the US and Germany than in China. It is debatable whether family income and university admittance always exhibit a linear relationship or whether the relationship may be complicated by other factors, such as gender and geography. Finally, previous studies have documented that those who enrolled in elite universities are more likely to be party members and/or leaders of student unions in college (Li, et al., 2002). However, it is unclear how political capital (party membership) is brought into the admissions processes as a criterion for further distinction (Wu, 2017).

Hypotheses associated with the effects of family on students' access to different tiers of universities

> *Hypothesis 1*: The impact of family background on children's college admittance will be greater as children move up the university hierarchy. In particular, advantaged students come from higher socioeconomic backgrounds, have college-educated parents, grow up in wealthier families, and have a family member serving in the Communist Party.
>
> > *Hypothesis 1a*: Students who have higher SES parents are more likely to attend elite universities.

Hypothesis 1b: Students with college-educated parents are more likely to attend elite universities.
Hypothesis 1c: Students who grow up in wealthier families are more likely to attend elite universities.
Hypothesis 1d: Students who have a parent serving in the Communist Party are more likely to attend elite universities.

Hypotheses associated with the effects of family on the likelihood of participating in IFA

Hypothesis 2a: Students who have college-educated parents are more likely to participate in IFA programmes.
Hypothesis 2b: Students who grow up in wealthier families are more likely to participate in IFA programmes.
Hypothesis 2c: Students who have a parent serving in the Communist Party are more likely to participate in IFA programmes.

1.2 Gender Difference

Gender is a social construct affecting individual agency that is far more complex than a biological attribute (Symonds, Galton, & Hargreaves, 2014). Concurrent with the trend witnessed in industrialised countries, China has also been experiencing the 'feminisation of HE' (Leatherwood & Barbara, 2009). Women began outnumbering men in undergraduate programme enrolment in 2006 and in master's programme enrolment in 2009 (as shown in Figure 6.2).

While a narrowed gender gap in HE attendance in China has been documented on the surface, empirical research on HE and gender inequality has been lacking. Notably, utilising data from the Chinese General Social Survey, Yeung (2013) notes that even though the gender gap in college attendance has been reversed, the female advantage is more significant in attending colleges offering shorter degree programs (e.g., colleges offering associate degrees) rather than 4-year academic colleges. My study takes Yeung's study one step further—it focuses on 4-year academic colleges in Beijing by investigating the gender gap in HE attendance from the perspective of the relative standings of universities.

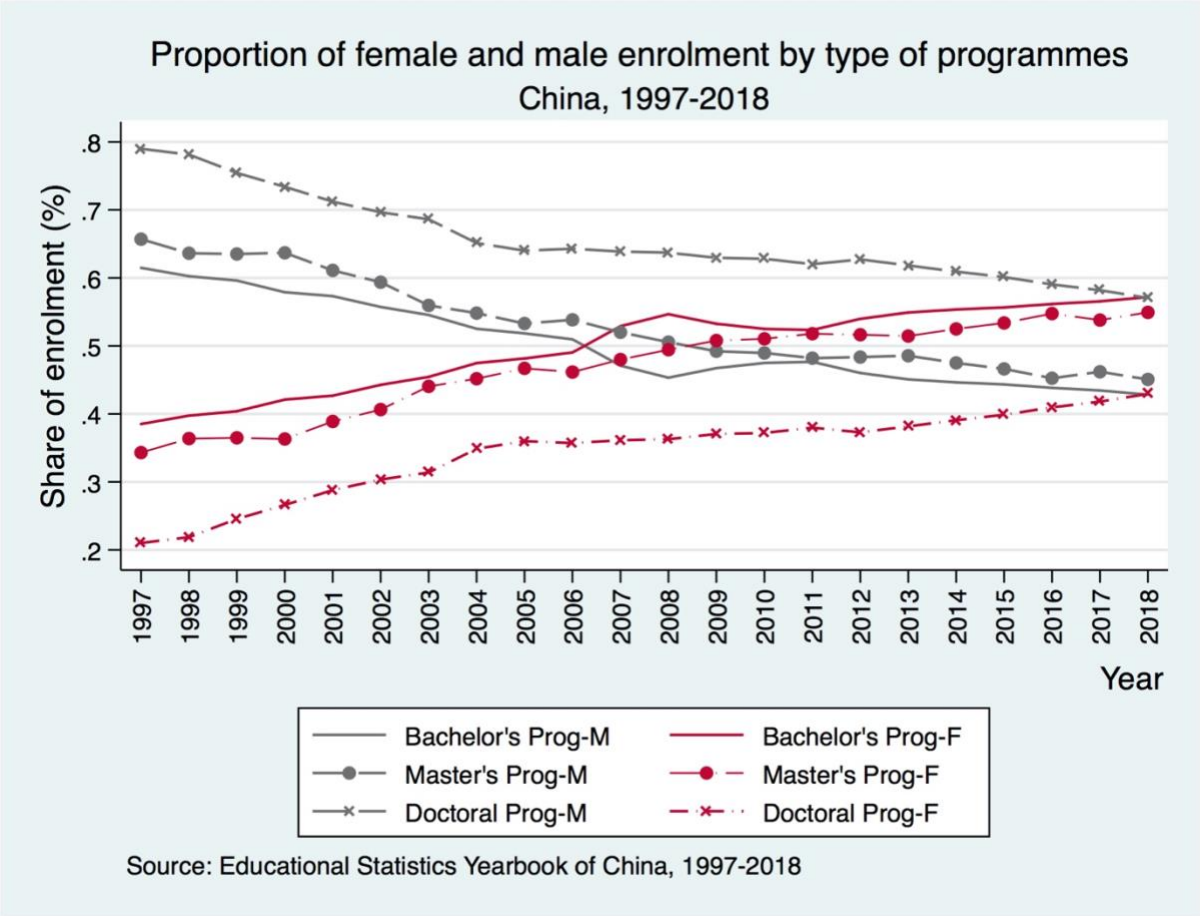


Figure 6.2 Proportion of female and male enrolment by type of program in China, 1997–2018

Hypotheses associated with the effect of gender on students' access to different tiers of universities

Hypothesis 3a: Gender imbalances exist in university admissions such that female students are more likely than males to be clustered in less-selective universities.

Hypotheses associated with the effect of gender on the likelihood of participating in IFA

Hypothesis 3b: Male students are more likely than female students to be enrolled in an IFA programme.

1.3 Geographical Differences and Urban-Rural Disparities

Regional differences within countries seem to attract less attention in sociological research in the West. In America, residential contexts (e.g., neighbourhood effects) rather

than geographical differences have attracted attention when documenting inequalities (Sharkey & Faber, 2014; Harding, 2010). As such, the distribution of educational resources clearly echoes the imbalance in economic development. Moreover, Figure 6.3 illustrates the geographical stratification of the distribution of HE institutions in China in relation to provincial GDP. The distributions of both Project 985 universities and Project 211 universities are clearly stratified according to the economic status of provinces. Among the 39 Project 985 universities, Beijing is home to 8 (the highest concentration of Project 985 universities in the nation); Beijing also hosts 23 universities that are classified as Project 211 universities (of the 112 in total). Furthermore, considering provincial GDP per capita (as shown in Figure 6.4), the first ten provinces on the chart account for 61.5% of Project 985 universities and 59% of Project 211 universities. This implies that in addition to the unequal distribution of educational resources, students from less advantaged areas also face an institutional 'local effect' in college admissions whereby universities favour applicants from their own local provinces, which means that a student would need to possess higher exam scores to enrol in a university outside the student's residential province (Liu, 2015). As previously emphasised, the impact of regional variation has been underinvestigated in survey research. How geography intersects with other variables, such as family background and gender, remains an open question.

Hypotheses associated with the effects of geography on students' access to different tiers of universities

Hypothesis 4a: Students who grew up in Beijing are more likely to attend elite universities.

Hypotheses associated with the effect of geography on the likelihood of participating in IFA

Hypothesis 4b: Students who grew up in Beijing are more likely to participate in IFA programmes.

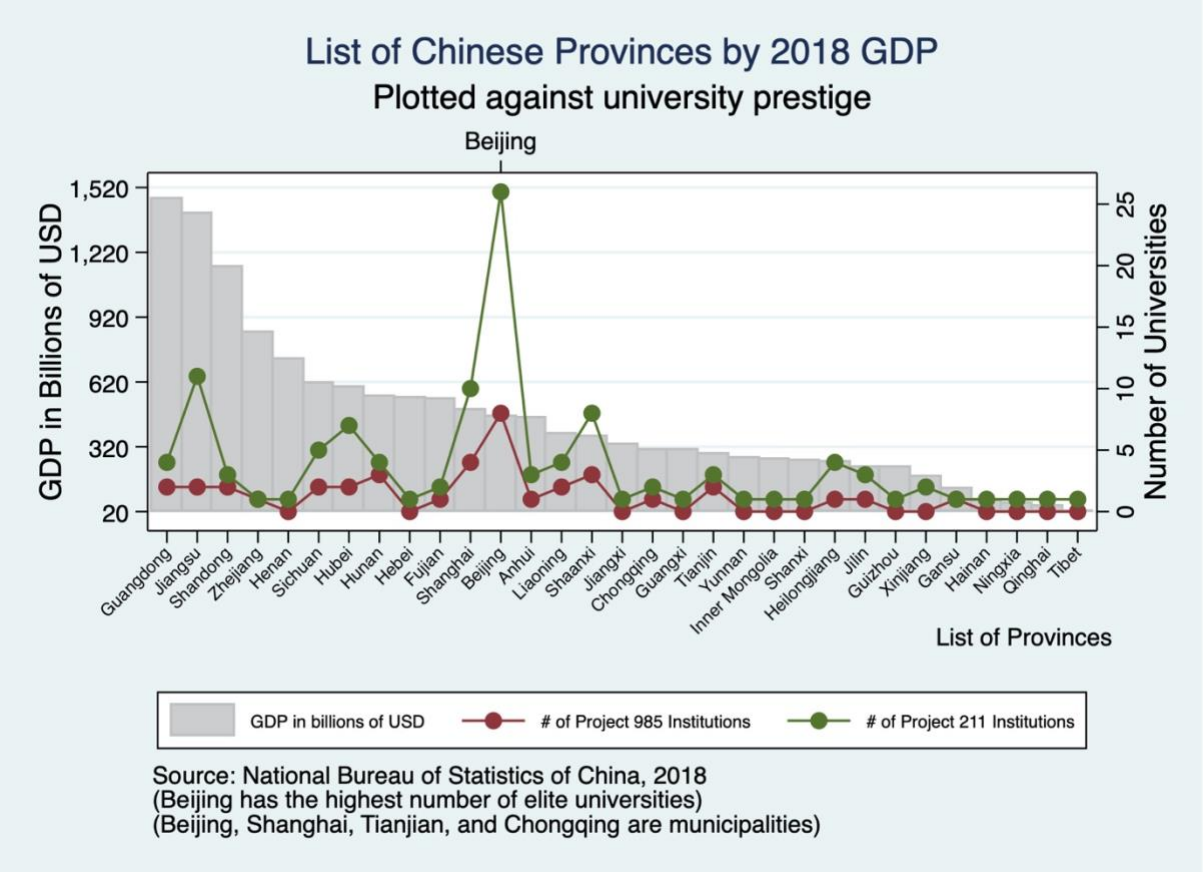


Figure 6.3 List of Chinese Provinces by 2018 GDP

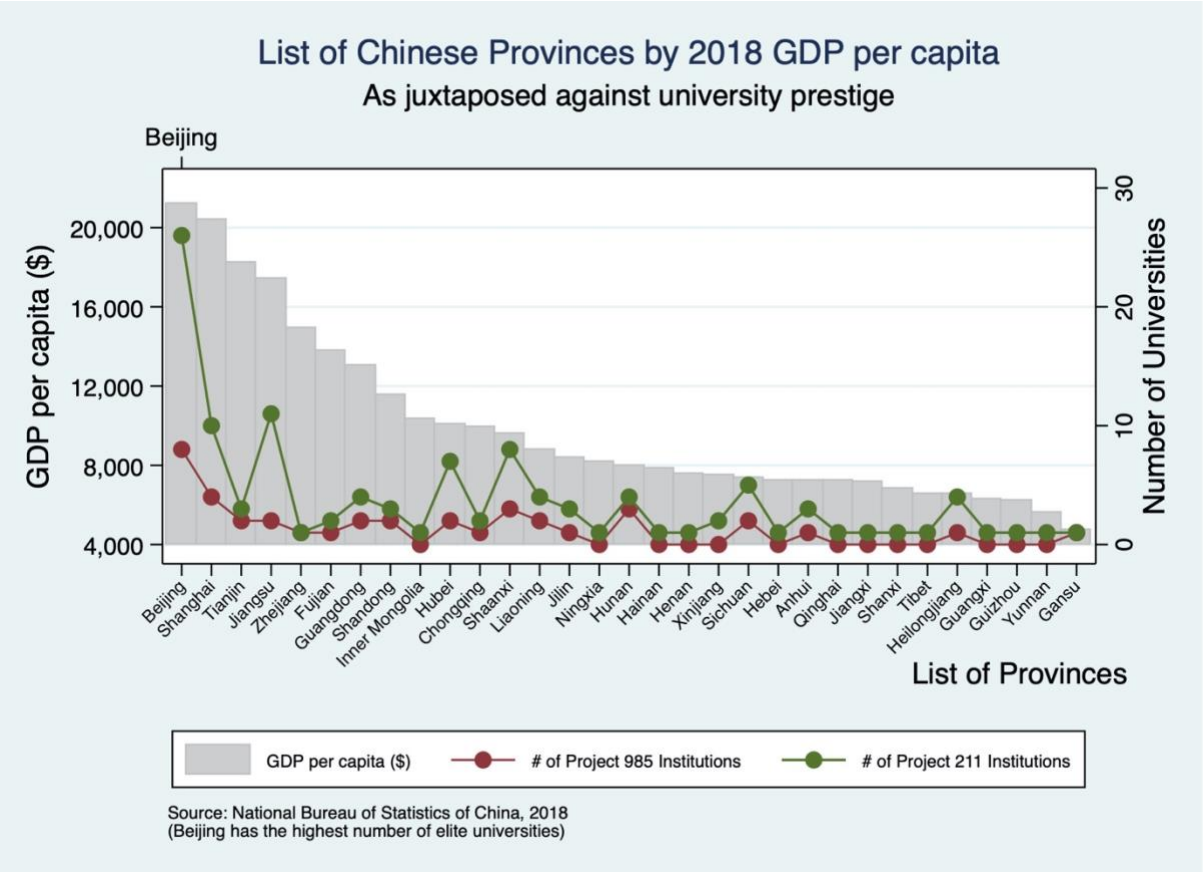


Figure 6.4 List of Chinese Provinces by 2018 GDP per capita

1.4 Structural Differentiation in Secondary Schooling due to an Urban-biased Policy

An integral part of China's precollege education system is the key-point schooling system, as discussed in Chapter 2 and illustrated in Figure 2.1. Using a representative sample from ten cities in China, Yang (2006) reports socioeconomic variations in key-point school participation. In particular, key-point school attendance was strongly associated with fathers of higher occupational status. For children from working-class families, examinations accounted for over ninety percent of admittance to key-point schools. In contrast, the children of entrepreneurs and middle-management cadres had a relatively high likelihood of being admitted via social connections and private means. Utilising the 2008 Chinese General Social Survey, Ye (2015) discovered spatial distinctions in key-point school attendance. Students who attended key-point schools were less likely to be of rural *hukou* origin, meaning that key-point schools tended to recruit students from urban and suburban areas. Thus, for the dominant social classes, key-point schools become a means to sustain and transmit their class advantage.

Hypotheses associated with the effect of key-point schools on students' access to different tiers of universities

Hypothesis 5a: Students who graduate from national/provincial-level key-point schools are more likely to attend higher-status universities than those from normal high schools.

Hypotheses associated with the effect of key-point schools on the likelihood of participating in IFA

Hypothesis 5b: Students who graduate from national/provincial-level key-point schools are more likely to be admitted to IFA programmes than those from normal high schools.

1.5 Expanding Beyond the Exam-Based Admissions Route: Independent Freshman Admissions (IFA)

The exam-based admissions policy (*Gaokao*) has remained the predominant way of recruiting talent since the founding of the People's Republic of China in 1949 and has been

recognised as a key mechanism for social mobility. In terms of the IFA, while the acknowledged objective frames the IFA as an equaliser of educational opportunities by making allowances for those whose competencies may not present well in a standardised national examination, very few studies have empirically examined whether the policy has held up its meritocratic ideal. In a study on the IFA of Peking University, Liu et al. (2014) report that the interview assessment in IFA favours those from high SES families among students with similar *Gaokao* scores. Wu et al. (2019) analyse subsample data from three national elite universities (Peking University, Tsinghua University, and *Renmin* University of China) from the BCSPS to examine the consequences of the IFA programme for educational equity and outcomes. However, it is not only elite universities that take IFA students; 90 universities in the country are eligible for IFA recruitment, and their recruitment patterns and student body characteristics may be different from those of the elite universities. Consequently, although some of these studies seem to show that IFA is not correcting existing inequalities and does not provide a route for people who are talented but lack the background to advance, these studies are too small scale to be generalisable and leave many unanswered questions. Therefore, the present analysis will be a deeper and broader exploration of how IFA has worked in practice.

Hypotheses associated with the effect of IFA on students' access to different tiers of universities

Hypothesis 6a: Successful IFA participants are more likely to end up in top-tier universities than those who choose the normal admissions route.

Hypotheses associated with the effect of Gaokao on the likelihood of participating in IFA

Hypothesis 6b: As successful IFA applicants are given seats despite having *Gaokao* marks that are below universities' typical minimum acceptance score, those admitted through IFA have lower marks on the *Gaokao* than those admitted through the normal route.

Hypothesis 6c: As candidates must possess certificates from the Chinese Academic Olympiads as one of the admission criteria (see Ch. 2, page 15), there is a significant predictive relationship between STEM uptake and IFA admittance. Those admitted through IFA are more likely to have been enrolled in STEM courses.

II DATA AND MEASURES

As indicated in the methodology chapter, this study is based on the data collected for the BCSPS in 2009. The survey was conducted in collaboration between Renmin University of China and Hong Kong University of Science and Technology. The BCSPS is one of the most comprehensive, large-scale social surveys conducted in China on college students, offering the most up-to-date publicly released survey data documenting trends in perceptions, behaviours, and experiences of contemporary college students in Beijing.

Measures

Dependent Variable

Category of university attended. The current 2009 BCSPS surveyed 15 universities in Beijing with 6 strata. I further collapsed the 15 universities into three manageable categories by prestige, as detailed below (see Table 6.1):

Exploratory Variables

Parental Educational Level. Information on the mother's and father's highest educational attainment level was gathered at baseline in 2009. Specifically, parental education was measured by the parent with the highest educational attainment (1= less than secondary schooling, 2= completed secondary schooling, 3= associate's degree, 4= bachelor's degree or higher).

Parental Socio-economic Status. Item I9–10 on the BCSPS questionnaire illustrates a list of parental occupations for students to identify. I9–10 is translated in Figure 6.5.

Table 6.1 List of Universities by Status

Status of University	Name of the University
Elite Universities (3 universities; 1,500 sampled; 1,404 completed)	1) Peking University 2) *Renmin* University 3) Tsinghua University
Selective Universities (6 universities; 1,800 sampled; 1,680 completed)	1) *Beihang* University 2) University of Science and Technology Beijing 3) Communication University of China 4) Beijing University of Chemical Technology 5) *Minzu* University of China 6) Beijing University of Posts and Telecommunications
Less-selective Universities (6 universities; 1,800 sampled; 1,687 completed)	1) North China University of Technology 2) Beijing Institute of Petrochemical Technology 3) Beijing University of Agriculture 4) Beijing Language and Culture University 5) Capital University of Economics and Business 6) China University of Mining and Technology

09_10
01. Peasants
02. Industrial workers
03. Commercial and service workers
04. Professionals (eg., teachers, doctors, and engineers)
05. Sales and service professionals
06. Office workers
07. Primary, secondary, and kindergarten teachers
08. Faculty members in postsecondary institutions
09. Artisans, audio-video technology and communications, and athletes
10. Mid-managerial and professionals
11. Administrative personnel of state and social affairs-middle and lower level professionals
12. Administrative personnel of state and social affairs-higher and middle level professionals
13. Small proprietors
14. Private entrepreneurs
15. Military personnel
16. Unemployed

Figure 6.5 List of Parental Occupations in the BCSPS questionnaire

In this study, parental occupational prestige is measured by a categorical measure of class status based on Lu Xueyi's (2010) conceptualisation in his Research Report on Social Strata in Contemporary China. Specifically, I code parents' occupation into a manageable 4-category version of Lu Xueyi's original classification, which was previously applied in China (Lu, 2010; Liu, 2016). Table 6.2 presents the comparison between the 10-category classification proposed by Lu (2010) and the BCSPS's categorisation of occupational levels.

Table 6.2 The Ten-Category of Lu Xueyi's Schema

Lu Xueyi's Occupational Schema	**BCSPS's classification**
I. Administrative personnel in state affairs and social affairs/Leading cadres 国家与社会管理者阶层	10
II. Governmental officials and managerial personnel 经理人员阶层	10; 12
III. Private entrepreneurs 私营企业主阶层	14
IV. Professionals and technical personnel 专业技术人员阶层	04; 08; 07; 09;11
V. Clerical workers 办事人员阶层	03; 06; 15
VI. Self-employed 个体工商户	13
VII. Commercial and service workers 商业服务业员工阶层	05
VIII. Industrial workers 产业工人阶层	02
IX. Peasants 农民阶层	01

X. Unemployed 城乡无业、失业、半失业者阶层	16

Source: Lu (2010); Chen (2013)

Consequently, in this research, I conceptualise parental occupational prestige by grouping Lu Xueyi's occupational schema into four categories, as illustrated below.

Table 6.3 Operationalisation of Social Class in China

New classification	Lu Xueyi's Occupational Schema	BCSPS's classification
Managerial=4	I, II., iii	10; 12; 14
Professional=3	IV.	04; 08; 07; 09;11
Working class=2	V, VI. VII., VIII.	03; 06; 15; 13; 05; 02
Agricultural working class/Unemployed=1	IX., X.	01, 16

Party membership. In addition to classifying social class along occupational lines, due to China's distinctive geopolitical and institutional arrangement, parental party membership status is worth addressing. Being an insider of the Communist Party has important implications, as "those positioned in the core of the government system usually enjoy [more substantial] socio-political and economic privileges than those positioned outside the political system" (Chen, 2013, p.9). As such, parental party membership status was coded as 1= being a member of the party and 0=not being a member of the party.

Parent income. Parent income was reported by the student in wave 1 (2009) and was measured at the gross household level, which includes capital income and labour earnings (Chetty, et al., 2017). Parental income was transformed to make it normally distributed by taking the log transformation, and it was measured on a continuous scale.

Urbanicity. Another crucial categorisation in addition to *hukou* status is geographic location. Due to China's rapid urbanisation in the past three decades, *hukou* is no longer an absolute indication of respondents' actual residence before college. Hence, urbanicity is

coded as 4= provincial cities, 3= Beijing, 2=other urban cities, and 1=rural villages to capture the complexities of China's geopolitical landscape (Liu, 2016).

Status of secondary school. As discussed earlier, key-point schools are government-funded elite schools and are predominantly located in urban areas. Status of school is coded as 3=national/provincial level key-point school; 2= city/county level key-point school; and 1= normal secondary school.

Gaokao performance. Because students are required to take the *Gaokao* in their hometown where their *hukou* status is registered and the *Gaokao* has not been a unitary set of tests across the nation, there are regional differences when comparing *Gaokao* scores at the national level. Consequently, *Gaokao* scores are standardised as follows: standardised *Gaokao* score= (One's *Gaokao* score - provincial cut-off points 1st tier)/(provincial cut-off points 1st tier - provincial cut-off points 2nd tier) (Wu, 2017).

Participation in IFA recruitment. In the 2009 BCSPS, respondents were asked whether they had participated in IFA recruitment at the university they were attending. As such, IFA is a dummy variable, where 1= has participated in the IFA and 0= has not participated in the IFA.

Gender. Gender is coded as a dummy variable, 0=male, 1=female.

Choice of Major. To keep the data manageable, subjects are broadly grouped by their divisional association within the structure of universities in China. I code 1=STEM and 0=non-STEM. The exact categorisation of majors will be detailed in Ch.

Additional Covariates

Ethnicity. A total of 88.34% of respondents in BCSPS 2009 were *Han*. Given that the majority of the surveyed population self-reported being Han, I code 0=Han, 1=Other ethnic minorities.

Number of siblings. Due to the implementation of the one-child policy starting in the 1970s, 62.40% of respondents indicated being the only child in the family. I code 0= only child in the family, 1=having siblings

Hukou status. *Hukou* status is a dummy variable that is inherited from one's family origin and is coded as 1=urban, 0=rural. Successful matriculation in designated HE institutions carries with entitlement to urban hukou status; consequently, this study sought to use students' *hukou* status before they attended college (Wu & Zhang, 2010).

Data Handling Strategy

The BCSPS dataset was first downloaded from the National Survey Research Centre at Renmin University of China. Due to the incompatibility of the computer software, data were then decoded – transferring garbled characters into correct format. To construct the analytical sample, I focused on respondents with valid data on key variables. An initial extraction of key variables along with scrutiny of the data was applied. I then excluded cases with multiple missing data on key variables through listwise deletion (e.g., removing respondents reporting annual household income below 100 RMB, tantamount to approximately 10 GBP, with multiple information on key indicators missing). No significant correlation was found between missing data and major demographic characteristics. With respect to the 19 participants who attended private schools, accounting for 0.398% of the sample, because one of the primary aims of this research was to gauge the influence of government-designated key-point public schools (structural factors) on attending different tiers of universities, I excluded the 19 cases who attended private schools. For the 257 participants (accounting for

5.38% of the whole sample) who opted to take the *Gaokao* but still made universities via various routes, their *Gaokao* score was reassigned manually based on the minimum accepted scores in their provinces. Therefore, the final analytical sample comprised 4,704 participants.

Analytic Strategy

Data analysis will include both descriptive and inferential statistical methods appropriate to test the study hypothesis. Hypotheses H1, H3a, H4a, H5a, and H6a are tested by using precollege independent variables to perform regression with the category of college attended as the dependent variable. An ordinal logistic regression model is used to estimate the category of university. In addition, a similar study conducted by Wu (2017) using the same datasets employs multinomial logistic regression models predicting the category of college attended. However, in comparison with the ordinal logit model, multinomial logistic regression models are considered to be a lower resolution model because the dependent variable is ordered to reflect the hierarchical nature of China's university system. In particular, with colleges and universities in China being 'differentiated qualitatively', holding the same level of academic credentials from universities with different rankings carries distinct symbolic meanings that will be interpreted differently in the labour market (Arum, Gamoran, & Shavit, 2007). Consequently, an ordinal regression model is more appropriate given the research context. A hierarchical regression method was applied to add factors in four separate blocks to evaluate the predictive relationship on students' category of college attended. The purpose of this method was to identify whether a particular grouping of variables has a collective impact on the category of college attended. In each model, additional factors were included in the regression model, and the change in the odds ratios was noted. Model 1 was fitted using demographic variables (familial factors). Structural factors, such as the secondary school status predictor (Model 2) and *Gaokao* performance (Model 3), are added to the model. Readers should look for directionality and magnitude of change in odds ratio (familial factors) from Model 1 as structural factors are being added into

the model. Model 2 adds the secondary school status predictor variable to the existing set of predictors in Model 1. Model 3 adds *Gaokao* performance measured by the standardised *Gaokao* score predictor variable, and Model 4 further introduces IFA participation status as a binary predictor variable. The results are presented on the following page.

One of the assumptions of the ordered logit model is the parallel regression assumption (also frequently referred to as the proportional odds (PO) assumption) (as illustrated in Figure 6.6), which assumes that the slope coefficients are constant across each regression. A Brant test was then applied to test the parallel regression assumption for each variable. The PO assumption has been violated, and the effect of a few predictor variables is not constant across each dichotomisation of the dependent variable. One possible alternative to address such a problem would be switching to a nonordinal model such as a multinomial logit. However, a multinomial logit is considered a less parsimonious model with extraneous parameters. In such cases, a partial PO model was fitted, as the PO assumption was selectively relaxed for some explanatory variables while being maintained for others. To carry out the analyses for the partial proportional ordered (PPO) logit, a user-written command gologit2 developed by Sociologist Richard Williams from Notre Dame University was then applied.

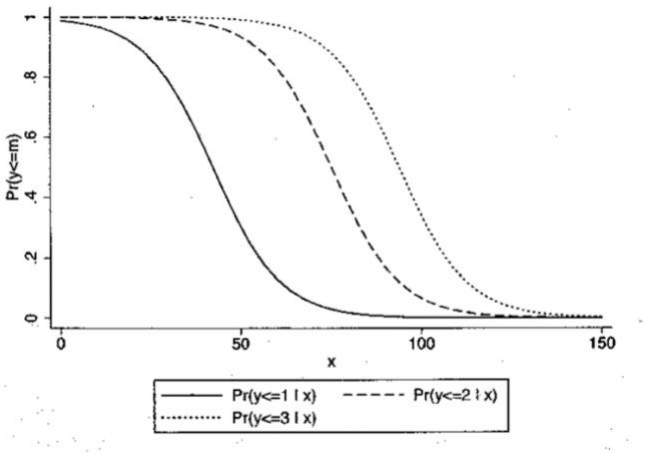


Figure 6.6 A Graphical Illustration of the Parallel Regression Assumption

Source: Long and Freese, 2006

To address the second aspect of the analyses, binary logistic regression is used to predict the likelihood of a student being recruited into an IFA programme. Specifically, H2, H3b, H4b, H5b, H6b, and H6c are tested using binary logic. Model 1, which consisted of demographic factors with institutional factors (e.g., status of secondary school, standardised *Gaokao* score, and major), was introduced into Model 2. For all models, variance inflation factor (VIF) tests were performed to ensure that there were no noticeable multicollinearity issues among the predicted variables. The test results largely confirmed that the VIF values for the predicted variables were fairly low (e.g., approximately 1 for each variable, which is well below the threshold), indicating a low degree of multicollinearity among the variables (O'Brien, 2007).

III RESULTS

Descriptive Statistics and Bivariate Analysis

Table 6.4 summarises the cross-tabulations of each of the categorical predictor variables and the dependent variable of university status attended. This table also provides a summary of the results of the chi-square test of bivariate association between predictors and category of university. These bivariate analysis results confirm the pairwise association of the gender, family background, status of secondary school, *Gaokao* performance and IFA participation status variables with the dependent variable of status of university attended. Among the 15 universities, 29.43% attended elite universities, 35.21% attended selective universities, and 35.36% attended less-selective universities. Elite colleges have the largest share of children from managerial families (38.77% of the elite university sample) in comparison with other occupational statuses. Regarding the gendered aspects of attending different tiers of universities, a greater proportion of women (40.82%) ended up in less-selective universities than their male counterparts (30.02%). In the elite universities, students were found to have better educated parents (40.98% of respondents from elite universities had parents with at

least a bachelor's degree). In terms of secondary school status, 39.09% of sampled students who graduated from a key-point school at the national/provincial level ended up in elite colleges.

Table 6.4 Cross-Tabulations of Categorical Predictor Variables by Status of University Attended

		Category of University Attended						
		Less-Selective (29.43%)		Selective (35.21%)		Elite (35.36%)		
Variable	Category	n	%	n	%	n	%	χ^2
Parental SES	Agricultural	368	42.15	348	39.86	157	17.98	188.73**
	Working	625	42.07	481	33.15	435	23.78	
	Professionals	411	26.92	568	37.20	548	35.89	
	Managerial	266	30.33	271	30.90	340	38.77	
Parent Education	Less than secondary	352	39.91	347	39.34	183	20.75	204.13**
	Secondary	628	42.90	526	35.93	310	21.17	
	Associate	296	35.41	281	33.61	259	30.98	
	Bachelor	404	25.83	519	33.18	641	40.98	
Party Membership	Yes	994	40.08	910	36.69	576	23.23	101.06**
	No	690	30.28	769	33.74	820	35.98	
Urbanicity	Rural	325	30.86	487	46.25	241	22.89	
	Urban	349	20.96	711	42.70	605	36.34	
	Beijing	888	64.82	144	10.51	338	24.67	
	Provincial	125	15.10	338	40.82	365	44.08	
Gender	Male	762	30.02	978	39.04	765	30.54	60.58**
	Female	925	40.82	702	30.98	639	28.20	
Secondary School	Private	8	42.11	5	26.32	6	31.58	621.04**
Status	Non-key-point	362	69.22	116	22.18	45	8.60	
	Key-point county	648	67.89	480	35.48	225	16.63	
	Key-point national	665	23.29	1074	37.62	1116	39.09	
Gaokao	Participated	1650	36.56	1646	36.47	1217	26.97	241.57**
	Did not participate	37	14.40	34	13.23	186	72.37	
IFA	Participated	54	10.15	120	22.56	358	67.29	426.59**
	Did not participate	1633	38.52	1560	36.80	1046	24.68	
Ethnicity	Han	1534	36.35	1398	33.13	1288	30.52	70.10**
	Non-Han	153	27.77	282	51.18	116	21.05	
Siblings	Have sibling(s)	651	37.56	707	40.80	375	21.64	83.68**
	Only child	1036	34.11	973	32.04	1028	33.85	

*** p<0.01, ** p<0.05, * p<0.10

Table 6.5 presents ANOVA results for household income and standardised *Gaokao* performance score across categories of university status attended. As expected, income and standardised *Gaokao* performance differ across tiers of universities, with students attending elite universities reporting the highest mean and higher mean standardised *Gaokao* scores than those attending selective or less-selective universities.

Table 6.5 Descriptive Statistics of Continuous Variables by Status of University

		n	Mean	SD	F
Log of Gross Household Income-reported by students	Less-Selective	1687	10.564	1.089	72.23**
	Selective	1680	10.446	1.125	
	Elite	1404	10.914	1.107	
Standardised *Gaokao* score	Less-Selective	1687	-0.270	1.611	428.48**
	Selective	1680	0.779	1.784	
	Elite	1404	1.579	1.916	

*** p<0.01, ** p<0.05, * p<0.10

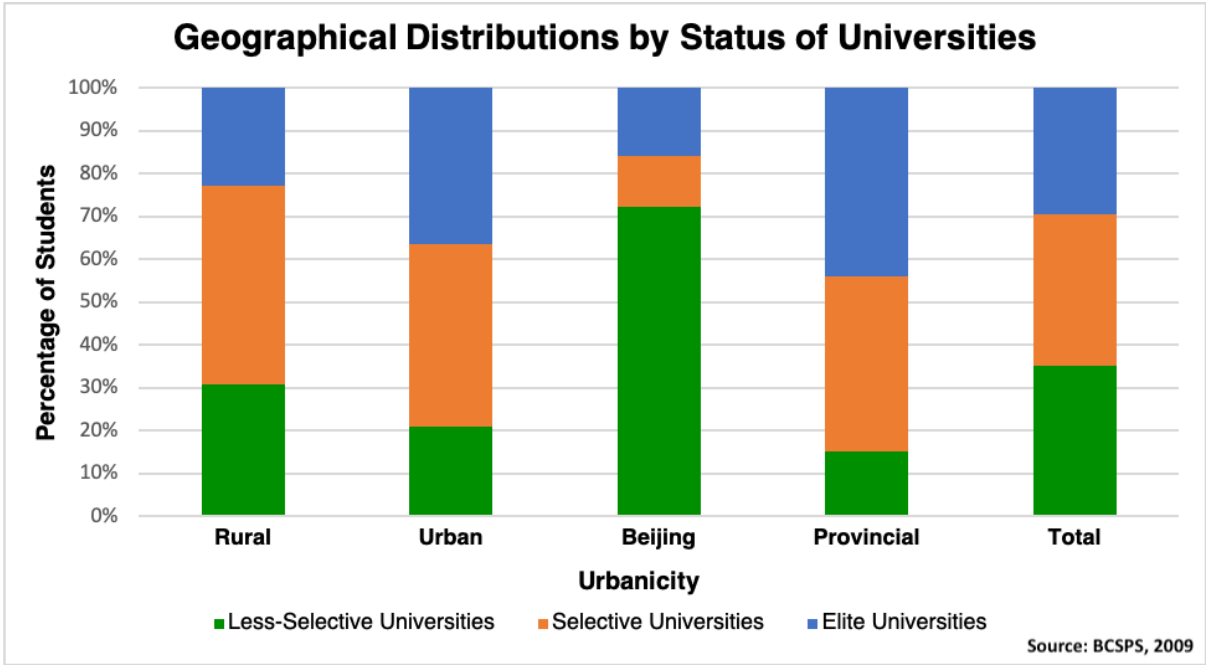


Figure 6.7 Geographical Distributions by University Status

Figure 6.7 plots the distribution of geographic origin by tier of university attended. A total of 72.38% of students who are Beijing locals attended less-selective universities that are under the jurisdiction of the Beijing municipal government. This finding suggests the potential for local effects in college admissions whereby universities favour applicants from their own provinces (Liu, 2015). Among students from provincial cities, 44.07% ended up at elite universities, and 40.9% went to selective universities. The same phenomenon can be observed for those from urban cities, with 39.2% attending elite universities and 42.92% attending selective universities.

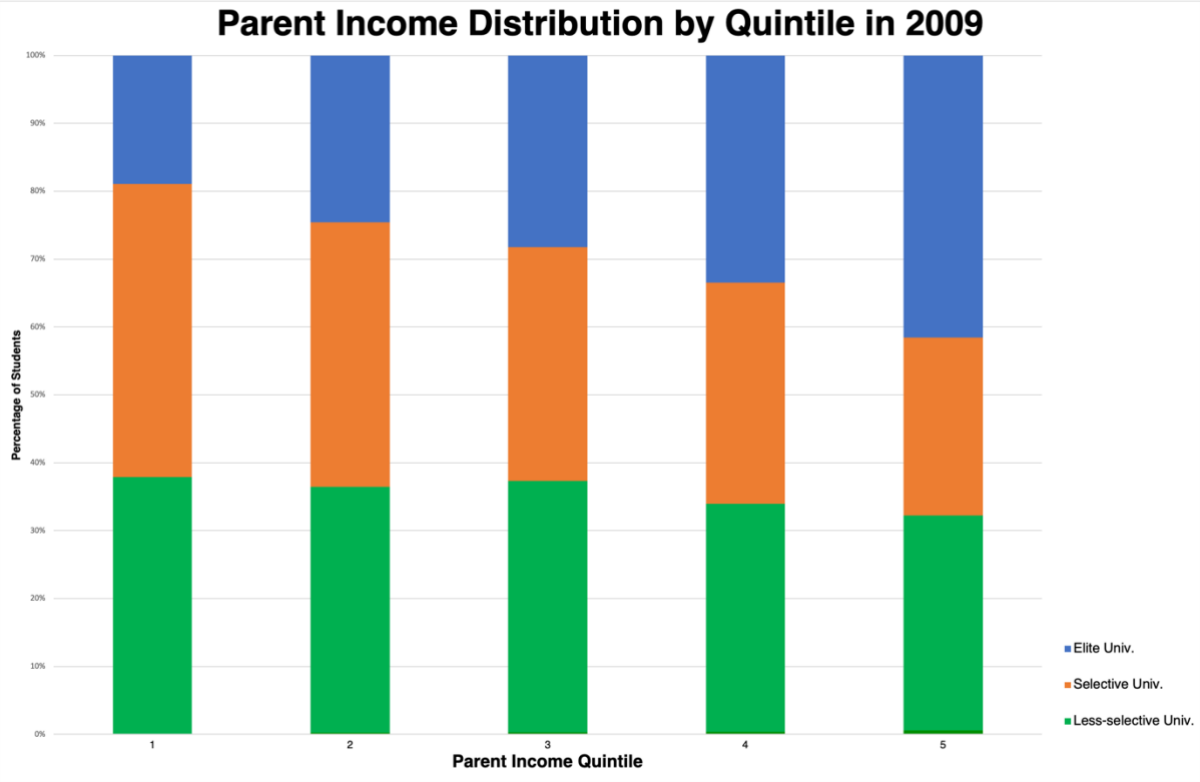


Figure 6.8 Parental Income Distribution by Quintile in 2009

Figure 6.8 presents the distribution of parental income differentiated by the tier of university attended. Although 12.55% of students with parents in the bottom quintile attended elite universities, these universities predominantly recruited students from wealthier families (52.58% of students who attended elite universities were from families in the top two income quintiles). The inverse pattern is found for parental income and university admittance to

selective colleges, whereas less-selective university enrolment is fairly similar across income percentiles.

Table 6.6 Cross-tabulations of Categorical Predictor Variables by Participation Status of Independent Freshman Admissions (IFA)

		IFA Participation				
		Not Participated		Participated		
Variable	Category	n	%	n	%	χ^2
Parent Education	Less than secondary	845	95.80	37	4.20	168.57**
	Secondary	1357	92.69	107	7.31	
	Associate	753	90.07	83	9.93	
	Bachelor	1264	80.82	300	19.18	
Parental SES	Agricultural	837	95.88	36	4.12	92.91**
	Working class	1316	90.69	135	9.30	
	Professionals	1329	87.03	198	12.97	
	Managerial staff	721	82.21	156	17.79	
Party Membership	Yes	1952	85.65	327	14.35	46.93**
	No	2279	91.90	201	8.10	
Hukou	Agriculture	141	94.00	9	6.00	4.17*
	Urban	4081	88.66	522	11.34	
Urbanicity	Rural	999	94.87	54	5.13	108.24**
	Urban	1456	87.34	209	12.55	
	Beijing	1118	91.49	104	8.51	
	Provincial	666	80.43	162	9.57	
Gender	Male	2218	88.54	287	11.46	0.499
	Female	2021	89.19	245	10.81	
Secondary School	Private	17	89.47	2	10.53	109.35**
Status	Non-key-point	483	92.35	40	7.65	
	Key-point county	1293	95.57	60	4.43	
	Key-point national/provincial	2429	85.08	426	14.92	
Gaokao	Participated	4062	90.01	451	9.99	113.68**
	Did not participate	176	68.48	81	31.52	
University Major	STEM	2151	90.04	238	9.96	6.69*
	Non-STEM	2063	87.68	290	12.32	
Ethnicity	Han	3731	88.41	489	11.59	7.04**
	Non-Han	508	92.20	43	7.80	
Siblings	Have siblings	1637	94.46	96	5.54	86.05**
	Only child	2602	85.68	435	14.32	

*** p<0.01, ** p<0.05, * p<0.10

Table 6.7 Descriptive Statistics of Continuous Predictor Variables by Participation Status in IFA

	IFA	n	Mean	SD	t
Household Income	Did not participate	4239	10.576	1.120	8.745**
	Participated	532	11.023	1.066	
Standardised *Gaokao* Score	Did not participate	4239	0.644	1.816	0.137
	Participated	532	0.633	2.587	

*** p<0.01, ** p<0.05, * p<0.10

Table 6.6 reports cross-tabulations of IFA participation status and each of the categorical predictor variables. Table 6.7 reports descriptive statistics of the continuous predictor variables of income and standardised *Gaokao* performance score across participation status of IFA. The results indicate a significant difference in mean income between those who participated and those who did not participate in IFA (t (4771) = 8.745, p = <.001). Specifically, those participating in IFA (M = 11.023) report significantly higher mean income than those who did not participate in IFA (M = 10.576). However, no significant difference in the mean standardised *Gaokao* score was observed between those who participated and those who did not participate in IFA (t (4771) = 0.1369, p = .891).

Hypothesis Testing and Multivariate Analysis

Using Pre-College Variables to Predict the Category of College Attended (Hypotheses 1–7)

Turning to the multivariate results, the PO ratios of different models with a hierarchy of predictor variables were first entered into the ordered logistic regression model (see Appendix III). However, one of the underlying assumptions of an ordered logit model is the parallel regression assumption, whereby coefficients should hold constant in each dichotomisation of the cumulative logistic regressions, and it is frequently dismissed in empirical research (Long & Freese, 2006; Williams, 2016). The Brant test of proportionality of odds is significant (Pro>chi2=0.000), which provides evidence that the parallel regression assumption has been violated (Brant, 1990) (see Appendix IV). Violation of the parallel regression assumption renders traditional ordinal logit estimation inadequate. To address this

problem, a PPO logit model was then selected, and the model "selectively relaxes the assumptions of the order logit model only as needed" without the need to switch to a less parsimonious multinomial logit model with extraneous parameters (Williams, 2016). The estimates for the PPO model are presented in Table 6.8. It is evident that there are clear parallels with the bivariate results but also marked and important distinctions. For instance, parental SES, party membership, and *hukou* status all meet the proportionality of odds assumption, and their p values are virtually identical to the PO model and can be interpreted in the same way. However, for variables that violate the proportionality of odds assumption, two variables are shown in the same cell: [a] the coefficient for enrolment status at less selective universities compared to selective universities and [b] the coefficient for enrolment status at selective universities compared to elite universities. As such, the PPO model (Table 6.8) is the main model for hypothesis testing.

Table 6.8 gives the PPO ratios of different models with a hierarchy of predictor variables entered into the ordered logistic regression model. The results of Model 1 with family background predictor variables yield odds ratios on students' university attendance conditioning on family background factors. Model 2 adds the secondary school status predictor variable to the existing set of predictors in Model 1. Model 3 adds *Gaokao* performance measured by the standardised *Gaokao* score predictor variable, and Model 4 further introduces IFA participation status as a binary predictor variable. With additional predictors being added to each model, the regression coefficients and odds ratios slightly change between the models due to the potential associations among the predictor variables. A series of bivariate correlations were conducted to examine the absence of multicollinearity between the predictor variables. Categorical variables were recoded into a series of dichotomous variables to examine the two-way association between the variables of interest. Upon further examination of the bivariate correlations (see Appendix V, on page 195), there was no apparent evidence of multicollinearity. Cohen's standard (Cohen, 1988) was used to evaluate the correlation coefficients to determine the strength of the relationship, where

coefficients between .10 and .29 represent a small association; coefficients between .30 and .49 represent a medium association; and coefficients above .50 represent a large associate or relationship. However, there were moderate associations among the predictor variables of interest, which could cause changes to the regression coefficients between the models. All other correlations were below .80, indicating that there was not a high association among the predictors (Pallant, 2020). The results are presented in page 195.

For the first model, as presented in Table 6.8, the family background predictors were entered into the regression. The results indicate that 13.9% of the variance in students' category of college attended could be explained by the family background predictor variables. The findings indicated that having parents working in the managerial category of social class significantly improves the chances of attending any of the three categories of universities compared to those whose parents are in agriculture or are unemployed ($p = <.05$) (***hypothesis 1a was supported***). With respect to parental educational level, the effect for students with parents having a bachelor's degree differs across categories of university status attended. Specifically, compared with those having parents with less than secondary schooling, the odds of entering a selective university compared with a less-selective university for those who have college-educated parents is 2.078 ($=e^{0.731}$) times the odds and 1.540 ($=e^{0.431}$) times the odds of attending an elite university instead of a selective university, respectively. Household income shows a similar pattern. The results suggest that the estimated effect for entering a selective university compared with a less-selective university is 0.084 ($p<.05$), and the estimated effect for enrolling in an elite university rather than a selective university is 0.224 ($p<.01$) (***hypotheses 1b & 1c were confirmed***). The model suggests that party membership has no significant effect on the status of university attended (***hypothesis 1d was rejected***). Regarding gender issues, the odds of enrolling in a selective university compared with a less-selective university are 0.633 ($=e^{-0.457}$) smaller for a female student ($p<.001$), and the odds of enrolling in an elite university rather than the selective university are 0.855 ($=e^{-0.123}$) ($p<.01$). The results imply that greater gender skew with

university admittance has been observed between selective universities and less-selective universities. The results support ***hypothesis 3a***.

In Model 2, secondary school status is introduced into the model. The results indicate that 15.9% of the variance in students' category of college attended could be explained by the family background and secondary school status predictor variables. Although it slightly decreases the coefficients for household income and parental educational level (≥ *Bachelor's degree*) in the model, both are still significant at the 0.001 level. These findings reveal that family wealth facilitates attending more prestigious universities. The PPO model further suggested that household income exhibits no significant impact when comparing the likelihood of attending a selective university with a less-selective university. However, the odds of enrolling in an elite university compared with a selective university are 1.206 times larger given a one-unit increase in household income ($p<.001$). Furthermore, as proposed in ***hypothesis 5a***, on average and net of controls, the odds of being admitted to a higher ranked university are 1.749 ($=e^{0.559}$) larger for those attending a county-level key-point high school and 3.683 ($=e^{1.304}$) larger for those attending a provincial- or national-level key-point high school than those attending a regular high school ($p<.001$).

Table 6.8 Partial Proportional Odds Ordered Logit Models Predicting Student's Category of College Attended												
	Model 1: Family Background			Model 2: Status of Secondary School			Model 3: Standardised *Gaokao* Score			Model 4: Preferential Recruitment Policies		
Predictor	Coef.	s.e.	$e^{coef.}$	Coef.	s.e.	$e^{coef.}$	Coef.	s.e.	$e^{coef.}$	Coef.	s.e.	$e^{coef.}$
Parent SES (Ref :Agriculture / Unemployed												
Working Class	0.051	(0.111)	1.053	0.015	(0.112)	1.015	0.093	(0.116)	1.097	0.109	(0.117)	1.115
Professional	0.177	(0.127)	1.193	0.144	(0.139)	1.155	0.158	(0.132)	1.171	0.224*	(0.134)	1.251*
Managerial	0.288**	(0.140)	1.334**	0.216	(0.142)	1.241	0.288**	(0.147)	1.333**	0.298**	(0.150)	1.347**
Parent Education (Ref : Less than secondary school)												
Secondary School	-0.045	(0.093)	0.956	-0.062	(0.095)	0.940	-0.042	(0.097)	0.959	-0.085	(0.098)	0.981
Associate's Degree	0.103	(0.124)	1.109	0.043	(0.126)	1.044	0.069	(0.130)	1.071	-0.008	(0.132)	0.993
Bachelor's Degree	0.731 [a] ***	(0.134)	2.078***	0.639***	(0.137)	1.894***	0.660***	(0.142)	1.934***	0.499***	(0.145)	1.647***
	0.432 [b] ***	(0.130)	1.540***	0.354***	(0.132)	1.425***	0.356***	(0.137)	1.427***	0.135***	(0.141)	1.145***
Household income	0.084 [a] **	(0.037)	1.088**	0.035	(0.038)	1.036	0.017	(0.040)	1.017	0.007	(0.041)	1.007
	0.234 [b] ***	(0.037)	1.264***	0.188***	(0.038)	1.206***	0.193***	(0.039)	1.213***	0.189***	(0.041)	1.208***
Party membership (Ref :Yes)	0.075	(0.069)	1.078	0.087	(0.070)	1.091	0.030	(0.072)	1.031	0.027	(0.074)	1.027
Gender (Ref : Female)	-0.457 [a] ***	(0.069)	0.633***	-0.439***	(0.071)	0.644***	-0.346***	(0.075)	0.708***	-0.346***	(0.077)	0.707***
	-0.123 [b] *	(0.068)	0.885*	-0.079	(0.069)	0.924	0.055	(0.072)	1.056	0.079	(0.075)	1.082
Urbanicity (Ref : Rural village)												
Urban	0.027	(0.100)	1.027	0.059	(0.101)	1.060	0.092	(0.104)	1.096	0.085	(0.105)	1.089
Beijing	-2.333 [a] ***	(0.115)	0.097***	-2.063***	(0.118)	0.127***	-1.912***	(0.124)	0.148***	-1.920***	(0.126)	0.147***
	-1.199 [b] ***	(0.124)	0.302***	-0.928***	(0.128)	0.395***	-0.773***	(0.134)	0.462***	-0.793***	(0.139)	0.452***
Provincial City	0.244**	(0.114)	1.277**	0.168	(0.115)	1.183	0.220*	(0.120)	1.245*	0.170	(0.121)	1.185
Secondary school status (Ref : Non-key-point school)												
Key-point county				0.559***	(0.119)	1.749***	0.247**	(0.125)	1.279**	0.301**	(0.127)	1.352**
Key-point national				1.304***	(0.115)	3.683***	0.875***	(0.121)	2.398***	0.842***	(0.122)	2.321***

Standardised *Gaokao*							0.471***	(0.023)	1.602***	0.509***	(0.024)	1.664***
IFA (Ref: Yes)										1.876***	(0.113)	6.525**
Control Variables												
Ethnicity (Ref : Non-han)	0.324 [a] *** -0.456 [b] ***	(0.113) (0.116)	1.383*** 0.634***	0.447*** -0.366***	(0.115) (0.118)	1.564*** 0.694***	0.660*** -0.265**	(0.122) (0.122)	1.935*** 0.767**	0.699*** -0.191	(0.123) (0.124)	2.011*** 0.826
Sibling (Ref : Only Child)	-0.196***	(0.074)	0.822***	-0.140*	(0.075)	0.870*	-0.142*	(0.077)	0.868*	-0.088	(0.078)	0.916
Hukou status (Ref : Urban)	-0.017	(0.169)	0.983	-0.051	(0.173)	0.950	-0.062	(0.178)	0.940	-0.042	(0.178)	0.959
Constant	0.236 [a] -3.322 [b] ***	(0.397) (0.399)	1.266 0.036***	-0.284 -3.850***	(0.417) (0.418)	0.832 0.021***	-0.0637 -4.161***	(0.438) (0.437)	0.938 0.016***	-0.101 -4.352***	(0.446) (0.450)	0.904 0.013***
Pseudo R^2		0.139			0.159			0.211			0.242	
Observations		4,704			4,704			4,704			4,704	

Standard errors in parentheses

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

Dependent variable coding: (1) less-selective universities; (2) selective universities; (3) elite universities. For variables that violate the proportional odds assumption: [a] Coefficient for enrolment status at non-selective compared to selective universities. [b] Coefficient for enrolment status at selective universities compared to elite universities. Due to formatting issues, only coefficients in Model 1 were labelled. The rest of the variables follow the same logic.

In Model 3, even after controlling for the status of secondary school and standardised *Gaokao* scores, having university-educated parents continues to mean that a student is more likely to be recruited into better positioned universities relative to peers with parents who have less than secondary schooling. Furthermore, as a merit indicator, on average and holding other variables at their overserved values, for a standard deviation increase in *Gaokao* score, the odds of attending a higher ranked university increase by a factor of 1.602.

Model 4 introduces the indicator of preferential recruitment policies (IFA) on university attendance. Note that when secondary school status, *Gaokao* score, and IFA were introduced into the model, no apparent gender skew was observed when comparing elite and selective universities. Nevertheless, the odds of enrolling in a selective university compared with a less-selective university are 0.707 ($=e^{-0.347}$) times smaller for a female student than for her male counterparts ($p<0.01$), holding all other variables constant. Regarding household income and students with parents having a bachelor's degree, the effects differed in different parts of the outcome distribution. Specifically, it seems that having college-educated parents matters more for enrolling in a selective university than for a less-selective university, as opposed to being accepted by an elite college versus a selective college. Furthermore, the pattern exhibited by household income is the opposite. Household income matters more for entry into an elite college versus a selective college than for the other pair. One possible explanation is that the survey respondents had all made it to college by the time they were surveyed in 2009, and students had already been preselected during the transition to senior secondary schooling; thus, the vast majority who were economically disadvantaged had already been filtered out of the sample. Finally, the results show the strong skewness of IFA recruitment policies in attending better positioned institutions. In particular, the odds of ending up at a higher ranked institution were 6.525 ($e^{1.876}$) times larger for those who participated in IFA than for those who participated in the *Gaokao* route, holding all other variables constant ($p<.001$). ***This pattern supports Hypothesis 6a***.

Speaking to the impact of geographical stratification on access to HE in contemporary China, I observe the ***opposite trend*** from that expected from ***Hypothesis 4a***. Rather, the results from the analyses revealed that coming from Beijing makes one *less* likely to attend higher positioned universities in Beijing ($p<0.01$). Consistent with the bivariate statistics, 72.4% of students who are Beijing locals attended less-selective universities, possibly skewing the sample. Furthermore, Beijing hosts 116 postsecondary institutions and attracts students from across the country to apply. Students who are Beijing locals and have average exam marks will apply for less prestigious universities in Beijing, which will end up in the sampling design, as the survey only samples universities in Beijing. The following section will partly adopt the analytical framework developed by Wu (2017), where the author removes the sample taken from universities under the jurisdiction of the Beijing municipal government (4 less-selective universities) and reruns the regression models.

Table 6.9 presents the refitted PPO ratio from ordinal regression models excluding universities that are under the jurisdiction of the Beijing municipal government. Nevertheless, except for urbanicity, the findings from Table 6.9 are largely consistent with those from Table 6.8 in terms of the directionality of odds ratios. The deviations in the pseudo R^2 can be attributed to the lower sample size used in the regression model examined in Table 6.9. Notably, I observe that students' college attendance has been positively skewed towards those who graduated from government-funded key-point schools, excelled on *Gaokao* exams, and participated in the IFAs.

Note further that all possible interaction terms were added and subsequently tested during the model specification processes. However, virtually none of the factorial interaction terms was significant (except for interactions between parental education and geography), and these terms are therefore excluded. For interactions between parental education and geography, when the PPO model was fitted, the Brant test of the parallel regression assumption revealed that the PO assumption was violated (Prob > chi2 = 0.0000). In this

sense, I could not adjust to maintain the PO assumption even after I applied gologit2; therefore, the interaction terms were subsequently omitted.

Table 6.9 Partial Proportional Odds Ordered Logit Models Predicting Student's Category of College Attended (Restrictive Sample)												
	Model 1: Family Background			Model 2: Status of Secondary School			Model 3: Standardised *Gaokao* Score			Model 4: Preferential Recruitment Policies		
Predictor	Coef.	s.e.	$e^{coef.}$	Coef.	s.e.	$e^{coef.}$	Coef.	s.e.	$e^{coef.}$	Coef.	s.e.	$e^{coef.}$
Parent SES (Ref :Agriculture / Unemployed												
Working	-0.086	(0.127)	0.918	-0.101	(0.128)	0.904	-0.033	(0.189)	0.967	-0.020	(0.130)	0.980
Professional	-0.102	(0.143)	0.903	-0.113	(0.144)	0.893	-0.076	(0.146)	0.927	-0.013	(0.147)	0.987
Managerial	0.030	(0.159)	1.030	0.004	(0.160)	1.004	0.087	(0.162)	1.091	0.010	(0.164)	1.105
Parent Education (Ref : Less than secondary school)												
Secondary school	0.083	(0.105)	1.008	-0.020	(0.107)	0.981	-0.008	(0.108)	0.992	-0.040	(0.108)	0.961
Associate	0.117	(0.140)	1.124	0.069	(0.141)	1.071	0.088	(0.143)	1.092	0.034	(0.145)	1.034
Bachelor's Degree	0.578***	(0.167)	1.783***	0.521***	(0.169)	1.683***	0.543***	(0.171)	1.720***	0.410**	(0.172)	1.508**
	0.326**	(0.146)	1.385**	0.277*	(0.146)	1.319*	0.299**	(0.149)	1.349**	0.126	0.151	1.134
Household income	0.055	(0.048)	1.056	0.048	(0.049)	1.049	0.036	(0.050)	1.037	0.011	(0.050)	1.011
	0.237***	(0.039)	1.267***	0.203***	(0.040)	1.225***	0.208***	(0.041)	1.231***	0.209***	(0.042)	1.232***
Party membership (Ref :Y)	0.134*	(0.077)	1.143*	0.146*	(0.078)	1.157*	0.010	(0.079)	1.108	0.096	(0.080)	1.101
Gender (Ref : Female)	-0.541***	(0.094)	0.582***	-0.502***	(0.095)	0.606***	-0.461***	(-0.096)	0.631***	-0.470***	(0.097)	0.626***
	-0.064	(0.072)	0.938	-0.027	(0.073)	0.973	0.075	(-0.075)	1.078	0.091	(0.077)	1.095
Urbanicity (Ref : Rural village)												
Urban	0.080	(0.111)	1.083	0.094	(0.112)	1.098	0.096	(0.113)	1.101	0.084	(0.114)	1.088
Beijing	0.238	(0.147)	1.269	0.285*	(0.148)	1.330*	0.155	(0.149)	1.168	0.081	(0.152)	1.084
Provincial City	0.288**	(0.125)	1.333**	0.221*	(0.126)	1.247*	0.214	(0.127)	1.239	0.171	0.129	1.186
Secondary school status (Ref : Non-key-point School)												
Key-point county				0.115	(0.156)	1.122	-0.084	(0.159)	0.919	-0.020	(0.158)	0.980
Key-point national				0.430***	(0.162)	1.538***	0.201	(0.166)	1.222	0.350**	(0.151)	1.425**
				0.709***	(0.155)	2.031***	0.476***	(0.159)	1.609***			
Standardised *Gaokao*							0.209***	(0.029)	1.232***	0.230***	(0.029)	1.263***
Score							0.362***	(0.029)	1.436***	0.405***	(0.030)	1.500***
IFA (Ref: Yes)										1.600***	0.118	4.938***

Control Variables												
Ethnicity (Ref : Non-Han)	0.596***	0.161	1.815***	0.628***	(0.162)	1.873***	0.732***	(0.165)	2.080***	0.780***	(0.165)	2.182***
	-0.512***	0.118	0.599***	-0.437***	(0.120)	0.646***	-0.336***	(0.123)	0.714***	-0.276**	(0.125)	0.759**
Sibling (Ref : Only child)	-0.217***	(0.082)	0.805***	-0.180**	(0.083)	0.836**	-0.190***	(0.084)	0.827**	-0.134*	(0.085)	0.874*
Hukou status (Ref : Urban)	0.117	(0.188)	1.125	0.085	(0.191)	1.089	0.043	(0.193)	1.044	0.051	(0.193)	1.052
Constant	0.956*	(0.510)	2.602*	0.747	(0.531)	2.110	0.882	(0.538)	2.415	0.900*	(0.543)	2.470*
	-3.240***	(0.426)	0.039***	-3.400***	(0.451)	0.034***	-3.703***	(0.464)	0.025***	-3.861***	(0.473)	0.021***
Pseudo R^2		0.044			0.050			0.080			0.108	
Observations		3,586			3,586			3,586			3,586	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Testing for Effects on Likelihood of Participating in IFA

Table 6.10 reports the odds ratios of predictor variables on the likelihood of participation in IFA. Model 1 was developed and fitted using demographic variables. Model 2 is developed by adding the institutional factors of major, *Gaokao* performance and status of secondary school to the existing set of predictors in Model 1.

The party membership status of parents had a significant bivariate association with IFA participation. However, party membership status did not exhibit a significant predictive effect on the likelihood of participation in IFA (p = >.05) (***hypothesis 2c was rejected***). The predictive relationship of party membership may be minimised due to the incorporation of additional predictors in the regression model. No other independent variables were impacted by the examination of multiple predictors in the regression model. In particular, and **supporting *hypothesis 2a***, parents' education exhibited significant effects (p = <.05). Specifically, students with a parental education level of secondary schooling or higher reported a significantly higher likelihood of participation in IFA than those whose parents had educational attainment less than secondary school. The same pattern can also be observed to ***verify hypothesis 2b***, as household income is a significant and positive predictor of participation in IFA programmes. This significant effect and its direction did not change when the institutional factors of major, secondary school status and *Gaokao* performance were added. Gender in Model 1 did not exhibit a significant effect on the likelihood of participation in IFA. However, when institutional factors were added to the model, gender exhibited a significant effect, with males reporting a significantly higher likelihood of participating in IFA than females (***hypothesis 3b was confirmed***). Similarly, people residing in urban cities and Beijing reported a significantly higher likelihood of participation in IFA than those living in rural villages. This effect pattern did not change when institutional factors were added in Model 2 (***hypothesis 4b was supported***).

In Model 2, with the addition of the institutional factors of major, *Gaokao* performance and secondary school status, the pseudo R squared value increased from 0.075 in Model 1 to 0.092 in Model 2. The model reveals that attending a key-point school is a significant and positive predictor of participating in an IFA programme (***hypothesis 5b was confirmed***). The findings also indicate that performance on the *Gaokao* is negatively and statistically significantly associated with IFA recruitment ($\beta = 0.943$. $p = <.001$). This is not unreasonable, as IFA applicants with successful interviews are given seats at universities despite having *Gaokao* marks that are below universities' typical minimum acceptance norms (***hypothesis 6b was supported***). One unexpected finding is that students taking STEM majors in universities reported a significantly *lower* likelihood of participating in IFA than those with non-STEM majors. One important academic credential for students to be considered for IFA participation is participation in Olympiads exams. As Olympiads exams focus exclusively on STEM subjects, a plausible justification is that students may not pursue the same major as they originally identified on their Olympiad test. These results indicate that ***hypothesis 6c was rejected***. Once again, the regression results remained virtually constant after taking out the sample of students who attended local Beijing universities under the jurisdiction of the Beijing municipal government.

Table 6.10 Odds Ratios from Binary Logistic Regressions Predicting IFA Participation				
	Full Sample		Without Beijing Universities	
	Model 1: Demographics	Model 2: Institutional factors	Model 1: Demographics	Model 2: Institutional Factors
Parents' education (Ref : less than secondary schooling)				
Secondary school	1.474*	1.536**	1.362	1.414
	(0.206)	(0.212)	(0.221)	(0.226)
Associate Degree	1.540*	1.621**	1.399	1.501
	(0.237)	(0.242)	(0.252)	(0.257)
Bachelor's Degree	3.006***	3.090***	2.527***	2.655***
	(0.226)	(0.232)	(0.242)	(0.248)
Household Income	1.149***	1.088	1.150**	1.103*
	(0.052)	(0.054)	(0.055)	(0.056)
Party Membership (Ref : Y)	0.996	0.999	1.009	1.017
	(0.112)	(0.114)	(0.118)	(0.120)
Gender (Ref : Female)	0.866	0.803**	0.915	0.830*
	(0.096)	(0.105)	(0.101)	(0.111)
Urbanicity (Ref : rural village)				
Urban City	1.178**	1.137	1.220	1.175
	(0.187)	(0.189)	(0.196)	(0.198)
Beijing	0.734	0.793	1.724**	1.759***
	(0.203)	(0.210)	(0.230)	(0.233)
Provincial City	1.687***	1.476*	1.702**	1.529**
	(0.198)	(0.200)	(0.208)	(0.210)
Secondary School Status (Ref : Normal secondary school)				
Key Point County		0.572**		0.529**
		(0.220)		(0.277)
Key Point National		1.513**		1.174**
		(0.191)		(0.245)
Standardised *Gaokao* Score		0.943***		0.934***
		(0.022)		(0.237)
Major (Ref : STEM)		0.807**		0.799**
		(0.107)		(0.113)
Control Variables				

Ethnicity (Ref : Non-Han)	0.719* (0.170)	0.739* (0.172)	0.652** (0.184)	0.671** (0.186)
Siblings (Ref : Yes)	0.607*** (0.138)	0.638*** (0.139)	0.582*** (0.147)	0.613*** (0.148)
Constant	4.108*** (0.548)	3.548*** (0.548)	3.992*** (0.573)	3.356 (-0.626)
Pseudo R^2	0.075	0.092	0.074	0.090
Observations	4,704	4,704	3,586	3,586

Standard errors in parentheses

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

Estimates are presented as the odds of coefficient: $e^{coef.}$

IV DISCUSSION AND CONCLUSIONS

This study adds an empirical perspective on gender to current debates over the diminished gender gaps in educational attainment and the so-called 'female advantage'. National statistics gathered by the MOE showed that women started to outnumber men in bachelor's programmes in 2006 and eventually exceeded men in master's programmes enrolment in 2009, as previously illustrated in Figure 6.2. However, the empirical results from BCSPS 2009 seem contrary to the national descriptive data. One possible explanation for this contradiction is that the survey focused exclusively on students who attended universities in Beijing. As the capital city of the country and hosting 116 postsecondary institutions, colleges in Beijing attract students nationwide to apply. However, compared with those who are Beijing locals, those who are from outside Beijing would need to possess higher *Gaokao* marks to be recruited by a university in Beijing. The results are in accord with Liu (2015), who reports geographic disparities and regional variations in cut-off points for university entry. In this sense, the desire for university placement in Beijing already distinguishes it from the rest of China. Additionally, the study also demonstrated that lower positioned universities are predominantly attended by female local students. Therefore, this analysis offers an important contribution to the literature on finding gender skewness in college attendance in the Chinese city with the most educational resources, Beijing. One possible conclusion that can be drawn from this empirical research is that although women appear to exceed their male counterparts in enrolment in bachelor's and master's programmes at the national level, a potential hidden gender stratification and differentiation might have been established, with men still enjoying considerable advantages in attending *well-recognised* postsecondary institutions in *better-resourced* cities. Such results have crucial implications for scholarship on school-to-work transitions. As 80% of the graduates indicate securing a job *in* Beijing as their primary career goal, such gender differentiation might have been carried into students' postuniversity transitions (e.g., gender earning gaps).

Furthermore, the results of ordinal logistic regression of students' college attendance highlight a strong statistical significance of secondary school status on university enrolment. The results are in accord with those of Ye (2015), who reports that attending a key-point school has a significantly positive impact on entry into tertiary education. This study takes Ye's study one step further. Particularly, graduating from a key-point high school is found to be positively related to attending an elite university. As government-funded elite public schools are unique to the arrangement of China's schooling system, key-point schools exist across compulsory and secondary levels of education. Consequently, students' positions in the hierarchies of the educational ladder at each level of education limit their progression to the next stage (Weis & Cipollone, 2013). As the traditional Chinese saying goes, *"one false move may lose the game"* (一着不慎满盘皆输). As such, parents will mobilise any potential resource to secure the entry of their children into key-point schools long before secondary school. To a certain extent, China's hierarchical schooling system has fed into the stratification of university entrances. The findings of this study corroborated those from Lyu, Li, and Xie (2019), who observe that compared with the US and Germany, the influence of family SES is less differentiated in exerting positive effects on children's academic achievements. Rather, structural factors (measured by location and urban/rural residence) affect children's academic performance. This is a direct consequence of the government's attempt to fulfil the immediate need for industrialisation and national development, resulting in an elite-mainstream divide. Under the elitist paradigm, meritocracy, as demonstrated in the form of an ostensibly fair standardised testing system, functions as "an efficient system that sorts individuals for positions of leadership in order to maximise the average level of well-being in a society" (Lim, 2013, p.3). In China, elementary and secondary public schools serve predominantly as neighbourhood schools that accommodate families in adjacent areas. As such, despite children's academic merit, owning a property within a key-point school district strongly determines the likelihood of attending a key-point school. Consequently, it is becoming increasingly the case that wealthy families can afford to live in areas served by high-achieving key-point schools, resulting in residential segregation by income. To some

extent, HE admissions in China have simply become extensions of China's stratifying educational hierarchies.

This chapter began by reviewing the policy intentions beyond IFA recruitment and calling for a comprehensive empirical study that could attempt to review the role of IFA in HE in China and to critically examine the extent to which the empirical data support the political rhetoric of "[enhancing] a sound and diverse enrolment system" that is "conductive to promoting equal opportunities" after the policy has been in place for more than a decade (Ministry of Education, 2010, p.28). The results of binary logistic regression of students' participation in IFA recruitment reveal that coming from a college-educated family provides an advantage for IFA placement; this result is significant for both sexes. As the BCSPS tracked two cohorts of college students who entered colleges in Beijing in 2006 and 2008, it is reasonable to speculate that their parents were predominantly born in the 1960s during the era of the Cultural Revolution (1966–1976), which resulted in a massive disruption of education in which *Gaokao* ceased and universities nearly stopped recruiting students for more than a decade. The *Gaokao* was then resumed in 1977, which was the period when the sampled students' parents were about to enter college. The tertiary gross enrolment rate was 0.653 in 1977 and increased steadily to 3.125 in 1989 (UNESCO Institute for Statistics, 2016). Consequently, having college-educated parents can be viewed as a rare resource for the cohort of students who were born in the 1980s and 1990s. The results of this research agree with dominant sociological research in the field, where college-educated parents accumulate HE-related values, attitudes, and knowledge bases both passively and actively (Reay et al., 2005). Unlike *Gaokao*, which has been standardised nationwide, the IFA is intended to recruit students based on their intellectual breadth and potential and assessed in the form of admissions interviews. Hence, having parents who have gone through the college process would provide students with insider knowledge about university applications. It has become a form of a classed strategy to gain positional advantage for college seats.

In addition, note that previously in the literature review section, I document the fact that to be eligible to be considered for IFA, candidates must possess national and/or provincial certificates from the Chinese Academic Science Olympiads as one of the admission criteria. However, the empirical data fail to provide a sufficient sample size of Olympiad exam participants to yield a compelling statistical analysis (e.g., among the 167 who reported participating in the Olympiad exam, only 24 were female). In future studies, it would be helpful to include participation in the Olympiad exam as a measure to disentangle how precollege characteristics impact IFA recruitment.

In terms of examining how the stated objectives of the IFA scheme in terms of equality of opportunity correspond with actual empirical findings, my study suggests that successful applicants are admitted despite their lower *Gaokao* marks as intended by the policy. However, contrary to the official policy discourses claiming to structure a system with equal opportunity for all social origins, the results of this study demonstrate that those who are male, attend key-point schools and come from wealthier families with college-educated parents are more likely to seek university placement via IFA. In this sense, IFA recruitment began with good intentions by introducing more opportunities to compensate for the rigidity of the *Gaokao*, but its implementation does not translate into more equality.

This finding has important implications for policy makers. A national achievement of 23.3% college enrolment does not mean an egalitarian educational paradigm; it is crucial to note that equity initiatives will have limited impact if they operate *only* in the HE arena (Ministry of Education, 2008). Achieving equal access to schooling would require the allocation of educational resources to traditionally underrepresented, nonkey-point schools and communities to establish a fair starting point for those who are entrenched to catch up with their urban counterparts.

One weakness of the current study is that because of data limitations, I investigated only the success cases within colleges in Beijing. The respondents of the BCSPS had already secured a university placement by the time they participated in the survey, thus filtering out the majority who were not successful in attending college. Hence, the competition to attend universities of different statuses becomes a 'secondary selection', during which prior precollege characteristics are maintained and reproduced (Liu, 2013). Future studies may broaden the sample size to a national scale (e.g., sample different populations of students across ranges of geographical areas) to ascertain whether and how the mechanisms and characteristics that I have identified play out in other contexts. Nevertheless, this study attempts to offer a snapshot of how structural inequality in secondary education and family background has been folded into HE admissions, enabling children of advantaged classes to reaffirm and reproduce their advantages in competition for IFA opportunities for students attending colleges in Beijing.

CHAPTER SEVEN

Choice of STEM Majors by College Students in Beijing: The Influence of Gender, Family Background, Personal Aptitudes, and Family Plans on Choosing Math and Science Fields

INTRODUCTION

With economic reform and China's 'opening up', HE in China has experienced unprecedented massification and subsequent feminisation. Notably, in 1998, there were 7.8 million students enrolled in HE. A recent report published by the Ministry of Education (2019) indicated that this number reached 40.02 million in 2019, an almost fivefold growth in enrolment. As described in Chapter 5, there was a large-scale, state-led expansion of HE institutions from 1998 to 2016. In particular, as shown in Figure 5.5, the scale of HE massification increased steadily from 1998 until the 2000s, when the Ministry of Education pledged to launch an ambitious college expansion plan titled the 'Education Promotion Plan for the 21st Century' that aimed for a 20% increase in college enrolments (Ministry of Education, 1998). The same figure showed that while the number of regular HE institutions increased, the number of colleges for mature students (colleges granting only associate's degrees) decreased, implying that a substantial number of associate-degree-granting institutions are seeking to become comprehensive universities. Concurrent with the global trend witnessed in OECD countries, in China, as outlined in Chapter 6, women have increasingly begun to outnumber men in accessing tertiary education (see Figure 6.2).

Although gender differences in access to postsecondary education are declining, the sex segregation of college major persists. By utilising published data on gender distributions across fields of study from UNESCO and the TIMSS from 44 countries, Charles & Bradley (2009) found that the sex typing of curricular fields is particularly prominent in more economically advanced contexts than in developing countries, partially due to the efforts of policy makers to increase the supply of scientific and engineering labour forces, as these

fields are recognised as the main driving force of national economic revitalisation. Paradoxically, the authors found that China is an exception, showing different trends than other developing nations. While there is a lack of national data on the exact proportion of women in science, the global trend data published by UNESCO (2019) captured some of the nuances regarding the share of women among the total number of researchers by country (as illustrated in Figure 7.1 below). The pattern demonstrated in China indicates that there are a disproportionate number of women pursuing STEM fields. According to the terminology used by Charles & Bradley (2002), sex segregation in college major choice can be seen as one aspect of the intensifying, hidden form of horizontal educational stratification that warrants constant scholarly attention.

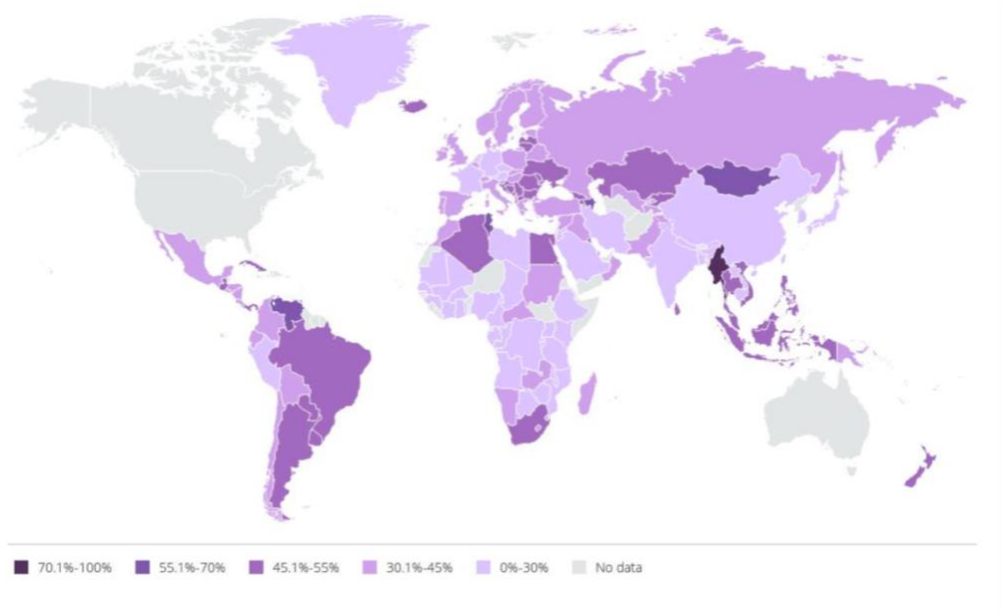


Figure 7.1 The Gender Gap in Science

Source: UNESCO (2019)

As China is one of the world's largest developing countries, the Chinese government has invested much effort in expanding, cultivating, and retraining the supply of engineering and scientific labour because these fields have been judged to be critical to the nation's economic competitiveness. For instance, the Fifteenth National Congress of the Communist Party of China mapped out the 'Action Scheme for Invigorating China through Science and Education' (*科教兴国*) to fulfil the immediate task of 'socialist modernisation' (Ministry of Education, 1998). In a similar vein, the conventional wisdom that *you will face no trouble*

navigating the world once you've mastered mathematics, physics, and chemistry (*学好数理化，走遍天下都不怕*) that received wide popularity in the 1980s still prevails today. The relative prestige of STEM subjects in society was also echoed by Deng Xiaoping, the fourth president of the People's Republic of China, who stated, 'science and technology constitute the primary productive force' (*科学技术是第一生产力*). Furthermore, by utilising the Chinese General Social Survey 2003 in an attempt to contextualise the horizontal stratification of HE in urban China, Hu and Hibel (2015) found that on average, STEM majors are more lucrative than non-STEM majors in reform China and that STEM graduates receive significantly higher median earnings than non-STEM graduates. Despite the recognition of the importance of STEM, gender disparities in fields of study are mirrored in the labour market, where one well-known cause of sex segregation is discrimination (Charles, 2011).

In particular, these gender disparities cause under-represented individuals to be vulnerable to gender-biased discrimination and reinforce gender stereotypes that position STEM disciplines as masculine fields (Charles & Bradley, 2009). Additionally, gender differences in college majors contribute to the gender pay gap in the earnings of college graduates (Charles, 2011). A large amount of literature in the West has attempted to elucidate the persistent gender segregation in field choices. Researchers outside China have identified gender differences in school engagement, self-concepts, motivational beliefs, and academic attainment (Symonds, Galton, and Hargreaves, 2014; Jerrim and Schoon, 2014; Parker, Nagy, Trauwein, and Ludtke 2014); and gender-specific trends in science-related aspirations over time (Bagnoli, Demey and Scott, 2014); course-taking during high school (Anders et al., 2018); and professional role confidence (Cech, et al., 2011), as possible explanations. While these studies recognised the importance of individual-level characteristics resulting in the sex typing of curricular fields, there is less research on how the multidimensionality of familial and contextual mechanisms influence subject choice. For instance, as China is a country that embraces collectivism and filial piety, it is reasonable to expect a tendency for intergenerational transmission of career choice (*子承父业*). In a similar vein, as the schooling system in China is hierarchical, there are vast differences in resource allocation

between the few government-designated key-point high schools and 'average' schools. The results of previous interview studies have demonstrated that there are few government-designated elite high schools in China where the school cultivates creative and innovative skills and forms youth teams to compete in various international scientific competitions (Zhao, MPhil Dissertation, 2016). As such, several questions emerge: How does a person's family influence his or her college major choice? How do individuals from various positions on the social ladder select their major? The answers to these questions will help illuminate the underlying motivation behind the choice of a college major (Ma, 2009, p.213) and the potential influence of sex segregation on the major selection process.

China's labour market prospects have important implications for students' major selection, not only because labour market returns vary by discipline but also because the labour market has experienced a 'supply shock' and 'credential inflation' as a result of HE expansion (Knight, Deng, & Li, 2017). By utilising census data from 2000 and 2005, Li, Whalley & Xing (2014) found that China's expansion policy has sharply increased the employment rate among college graduates, especially for college graduates from non-coastal regions. This is partially due to the uneven distribution of HE institutions across China, where the government prioritises subsidy allocation to universities in coastal regions and the mobility of students into coastal areas. Non-coastal universities also face an institutional 'local effect' in college admissions whereby these universities predominantly recruit students from their own local provinces, where the college premium is lower than that of coastal regions (ibid). Furthermore, human capital theory suggests that people choose the field of study that will maximise their 'future discounted life earnings' and increase their 'marketability' in the labour market (Gerber & Cheung, 2008). To use the terminology of Brown (2013), in an environment of positional competition and social congestion, individual merit and advancement are increasing determinants of one's future career, and the selection of college fields of study might become a strategy to stay ahead in the educational race.

Further, a similar line of research in the West has examined specific combinations of course choices that eventually lead to major selection (Anders et al., 2018). While an

individual's course-taking during high school has been studied by Western researchers, this is not a relevant research topic in China, as students do not select their own individual courses; instead, students are required to enrol in broadly defined tracks of either science (*理科*) or liberal arts (*文科*), which each have mandatory sets of courses, by the second year of high school. The college major selection process is complex; in China, the decision to pursue a college major is made long before students enter college. Figure 7.2 shows the timeline of the track selection process for a typical high school student.

1st Year of High School (age≈16)

Students are informed that they must enrol in either of the broad tracks of liberal arts (*文科*) or STEM (*理科*). They must inform their school of their choice of track by the beginning of the second school year.

2nd Year of High School (age≈17)

Students are channelled into different routes where they take different sets of subjects.

Liberal Arts Track (文科)	STEM Track (理科)
Core: Mathematics*	Core: Mathematics
Mandarin Literature	Mandarin Literature
English	English
History	Biology
Political Science	Physics
Geography	Chemistry

3rd Year of High School (age≈18)

Students take the National College Entrance Exam and s and submit their college applications.

Major Choices for the Liberal Arts Track (文科)	Major Choices for the STEM Track (理科)
Arts & Humanities	Natural Science
Social Science	Engineering
Law*	Medicine
Economics & Management*	Agricultural Science

Figure 7.2 Timeline for Track Selection[22]

[22] While mathematics is compulsory for both tracks, students who pursue the liberal arts track take less advanced mathematics courses. Law, economics, and management may count for the STEM track for certain institutions.

Research on college major choice in China has been relatively sparse mainly because of the lack of quantitative survey data. As the individual major selection process starts before college application, it is important to pay attention to how a variety of institutional, demographic, and familial factors impact individual pathways. Though my research, I hope to disentangle some of the complexities of the college major decision-making process in the Chinese context. From a policy perspective, this study fits into a broader framework, as a more skill-intensive and technology-centred form of the knowledge economy is seen as vital to the country's economic revitalisation. From an empirical stance, this research contributes to the broader horizontal stratification literature on family and institutional influences in relation to educational attainment.

In the literature review section of this chapter, I strive to identify the mechanisms underlying students' major selection framework. Understanding China's particular cultural characteristics (e.g., collectivism) will help elucidate the existing sex segregation to some extent, as shown in Figure 7.1. By examining the literature, I present the role of HE in creating and hindering the creation of an equitable society. In the subsequent methodology section, I introduce the Beijing College Student Panel Survey (BCSPS) and define variables for the subsequent multivariate analysis.

I REVIEW OF THE LITERATURE

1.1 Family Influence on College Major Choice

In an environment where individual choices are largely respected, field-of-study choices appear to be a personal matter. However, in an environment that emphasises collectivism, it is plausible to speculate that college major choices might become a joint decision. Compared to individual-level factors, family influences on subject choices have received relatively scant research attention. For instance, Correll (2011) argued that family socioeconomic status (SES) plays a negligible role in gender differences in entry into STEM professions because 'males and females are distributed roughly equally across these groups' (1694). In a similar vein, Cech's (2013) work indicated that occupational sex segregation is reinforced to a large extent through individuals' gendered, self-expressive career decisions. While Cech's (2013) research is applicable to the American context, the college major decision-making framework of Chinese students is much more complex; especially under the circumstances of the one-child policy, it is reasonable to expect a greater extent of parental involvement in decision-making.

International studies have yielded mixed evidence for the association between family background and subject choice. Leppel et al. (2001) noted that family SES had an asymmetrical effect on college major choice for male and female students. While women from advantaged families were less likely to pursue a lucrative major such as business, the opposite held true for males from comparable family backgrounds. The authors argued that this was probably because women from wealthier families feel more financially secure about their future careers and thus are more willing to explore majors that offer less monetary returns. Furthermore, sociologists have not yet reached consensus on whether college major choice reinforces or weakens the intergenerational transmission of existing inequalities. Using the National Child Development Study in the UK, Werfhorst et al. (2003) observed that children who grew up in culturally rich families were more likely to choose prestigious subjects such as medicine and law. The authors found that children took their parents' social

positions as a point of departure when making their own major choices and were guided mainly by the amount of economic and cultural capital that was available within the family. In this sense, parental SES and cultural climate contribute to children's affirmation and maintenance of their parent's privilege, supporting Bourdieu's social reproduction theory (Bourdieu, 1990). Conversely, Ma (2009) posited that college major choice actually *weakens* the intergenerational transmission of existing inequality because it offers a venue for students from modest family origins to maximise their return on their college education by pursing majors with high financial returns. In this light, Ma (2009) argued that if a lucrative college major choice yields high returns for college students, then students from modest backgrounds should seek those advantages more than students from advantaged backgrounds, thus enabling them to move up the social ladder. Hansen (2001) made a similar observation of greater variations by social-class origin in the 'soft' rather than 'hard' educational fields.

In the Chinese context, where the intergenerational transmission of career choices has been embraced (*子承父业*), it is plausible that disparities in STEM uptake based on social position reflect such intergenerational transmission of major choices. Using primary survey data collected in Beijing, Sheng (2017) showed that students from working families opted to choose a lucrative major at a *lower* ranked university, which could potentially lead to secure labour market prospects. Hu and Wu (2017), in an analysis of the BCSPS data, also found that those growing up in a climate rich in cultural capital demonstrated a preference for majoring in liberal arts rather than in technical subjects. Their research had clear strengths, including its indication of how cultural capital is linked not only to study field preferences and performance on the national college entrance exam but also to 'non-cognitive habitus' such as self-efficacy and self-esteem. Because the survey was conducted after students were admitted to college, the authors based their arguments on the assumption that an individual's self-efficacy and self-esteem remained constant from before to after their admission. However, according to Bandura's theory (1995), self-efficacy is largely shaped by mastery experiences. In this sense, being accepted to a highly ranked university would help boost an individual's self-efficacy. A similar effect would also apply to self-esteem. Hence, the assumption that one's self-efficacy and self-esteem are independent of academic success is

problematic. In addition, this assumption fails to sufficiently consider the inherent stratified nature of China's HE institutions and the potential gender difference in STEM uptake. Overall, studies both inside and outside China have found that disparities in subject choice by SES do not follow predicted patterns.

Hypotheses associated with the effect of family background in predicting an individual's choice of a STEM versus non-STEM college major

Hypothesis 1a): Role modelling: Having a parent with a professional or executive occupation affects the choice of major. The influence of parental occupation on field selection is greater for girls than for boys.

Hypothesis 1b): Children of working-class origin are more likely than middle- or upper class children to select STEM majors with secure labour market prospects and high financial returns to maximise their returns on education.

Hypothesis 1c): Students who grow up in wealthier families are more likely to choose non-STEM majors.

Hypotheses associated with the effect of objectified cultural capital in predicting an individual's choice of a STEM versus non-STEM college major

Hypothesis 2a): Students with a computer at home are more likely than those without a computer to choose a quantitative major.

Hypothesis 2b): Students with greater exposure to cultural capital (e.g., newspaper subscriptions and the presence of more than 50 books and collections of classics at home) gravitate more towards liberal arts subjects to cultivate the characteristic values and propensities of these fields compared with those with little exposure.

1.2 Prior Attainment and Major Selection

Human capital theory implies that people choose the field of study that will yield the maximum labour market returns (Gerber & Cheung, 2008). The belief that intellectual aptitude can affect career choices has been widely supported. The results from the Programme for International Student Assessment (PISA) test demonstrated that gender differences vary substantially across countries. In particular, the results from the PISA test

(OECD, 2012) showed that while boys outperformed girls in mathematics in 38 participating countries, the average girl in Shanghai, China, performed on par with her male classmates in mathematics and attained higher scores than the average boy in every other country that participated in PISA. The results from the PISA test (OECD, 2015) also confirmed that the gender differences in science performance among Chinese participants were both negligible and statistically nonsignificant.

Furthermore, a widely shared cultural stereotype is that girls and boys have their own unique strengths and weaknesses, namely, that girls possess stronger verbal and interpersonal skills (Charles, 2011) and that, since boys outscored girls by a small margin for top performance in science (PISA, 2015), boys are more adept at abstract thinking. Such patterns lead gender essentialists to suggest that women and men are 'naturally and fundamentally different, with women better suited to nurturance and human interaction, and men better suited to technical tasks and abstract calculation or analysis' (Charles & Bradley, 2006, p.185). Gender essentialist beliefs can be traced back to the 'nature verses nurture' debate in gender studies. In particular, Penner (2008) used genetic theory to extrapolate three mechanisms of gender differences in mathematics achievement: genetic, hormonal, and cerebral mechanisms. The author concluded that the heritability of intelligence is likely to be influenced by national contexts. Nevertheless, gender essentialism has been normalised and leads to the broad acceptance of the view that science is a masculine subject, thereby further entrenching the gender labelling of fields (Charles, 2011). However, there is a body of research examining how quantitative abilities can be improved through training (e.g., building with Legos and playing computer games have been shown to improve 'mental rotations') (Quaiser-Phol, Geiser, & Lehmann, 2006). An emphasis on aptitude seems to be less applicable in China, where traditional Confucianism values diligence; as the saying goes, '*If you work at it hard enough, you can grind an iron bar into a needle*'. In this sense, academic achievement in China has been perceived more as a product of efforts rather than innate abilities (Tsui, 2007).

Research outside of China has yielded similar findings. Specifically, using the dataset provided by the Welsh Joint Education Committee, Gorard, Rees, & Salisbury (2001) concluded that there were few significant gender differences in mathematics and science attainment. Evidence from the United States showed similarity in math and science course-taking patterns and achievement in high school between male and female students (Wang & Kenny, 2014). In particular, using data from the Michigan Study of Adolescent Life Transitions, the authors of the previous study determined that it is not the lack of quantitative abilities that stop women from pursuing STEM careers but rather the abundance of choice. Women with more balanced ability profiles can consider both STEM and non-STEM college majors, independent of their actual quantitative aptitude (Wang & Kenny, 2014).

Recent studies in China have come to the similar conclusion that prior attainment cannot explain gender disparities in STEM uptake. Using primary data from a 1998-1999 survey of 1,040 eighth graders in Wuhan, China, Tsui & Rich (2002) showed equally high educational aspirations and mathematical performances by both male and female only children. In trying to further understand the issue, the authors noted that an unintended consequence of the one-child policy is has been it has helped to 'ameliorate' intra-family gender discrimination in urban settings in China. In rural settings, the results from the Gansu Survey of Children and Families yielded similar findings. The results showed that girls outperformed boys in academic performance and school engagement (Hannum, Kong, & Zhang, 2009).

Hypotheses associated with the effect of prior attainments in predicting an individual's choice of a STEM versus non-STEM college major

Hypothesis 3a): Students who graduate from national/provincial-level key-point schools are more likely to major in STEM subjects than those who graduate from normal high schools.

Hypothesis 3b): Students who achieve a higher score on *Gaokao* are more likely to major in STEM subjects than those who have a lower score.

Hypothesis 3c): Students who attend elite universities are more likely to major in STEM subjects than those attend less prestigious universities.

1.3 Gender Socialisation and Gender Role Beliefs

Due to the lack of empirical research on gender disparities in college major choice, I first present research conducted in the West on this topic and then make inferences about the Chinese context. First, Cech (2013) identified three gender schema dimensions: 1) gender role beliefs, 2) gender essentialist beliefs, and 3) gender category beliefs. Cech (2013) stated that gender category beliefs are the 'beliefs people hold about the characteristics that define members of their gender category' (p.756). In an empirical study drawing on data from the National Educational Longitudinal Study conducted in 1988, Correll (2001) found that individuals' assessments of their own mathematical competence was congruent with broader framework of gender category beliefs, which led to gender differentials in embarking on a STEM career path. Compared with female students, male students tended to overestimate their mathematical competence, but the extent to which students believed they were skilled at math largely depended on the internalisation of the gender labelling of different fields. Similar gender category beliefs were also embraced by female scientists. Rhoton's (2011) study of 30 women scientists who held faculty positions in STEM subjects at a university in the United States found that these women distanced themselves from 'femininity' to 'adhere to cultural ideas, demonstrating solidarity within the culture' (p. 699). The women scientists in the study internalised the existing gender category beliefs that science was a 'masculine' subject and believed that not engaging in stereotypical feminine behaviour would bolster their acceptance in the science culture (ibid). The argument was congruent with the observations made by Charles and Bradley (2006), who contended that gendered cultural stereotypes 'label abstract math, natural science, and engineering pursuits as masculine, and more expressive, human-centred fields as feminine', reinforcing the existing sex typing of curricular fields. Overall, sex segregation of different fields of study is gendered and maintained through resilient, internalised gender category beliefs about the innateness of gender differences, which encourages individuals to act within the prescribed gender boundaries.

Furthermore, Cech (2013) categorised gender role beliefs as 'cultural models' about the 'proper relational dynamics' between men and women, which often include 'beliefs about the division of paid work and family responsibilities' (p.755). Scott (2004) analysed data from the British Household Panel Survey 1994-1999 and found that girls as young as 11 were aware of the potential conflict between career development and family care, including future motherhood, indicating that resilient, taken-for-granted gender role beliefs are embedded and widely accepted and thus influence an individual's schooling choices and preferences from a young age. Regarding whether family planning deters women from aspiring to a STEM career, empirical results from the West are rather mixed. Cech et al.'s (2011) work in the United States indicated that family planning did not interfere once women had entered engineering training. This finding might initially seem to be at odds with the dominant family planning explanations, which suggest that the prioritisation of family care prevented women from pursuing careers in male-dominated disciplines (Eccles, 1987). In this sense, Cech et al. (2011) further argued that family planning may have a 'later effect' on women's career planning but not divert them from pursing their STEM degrees. There is evidence that young women are more likely to be aware of the seeing imbalance between family life and a STEM career, whereas such considerations do not apply for young men (Bagnoli, Demey, & Scott, 2014). Gender role beliefs in the United States have been depicted as 'egalitarian essentialism'; they constitute a hybrid of 'previous conflicting frames of feminism and traditional familism and thus provide support for a return to traditional gender roles while denying any implications of lower status or power for women' (Cotter, Hermsen, & Vanneman, 2011, p.20).

Regarding the Chinese context, before the Communists took over in 1949, Imperial China operated as a purely patriarchal society, with women restricted to domestic affairs that were considered inferior by men. At that time, society operated under an 'agrarian patriarchal' model in which men ruled outside the home and women ruled inside the home (*男主外，女主内*) and were responsible for running all aspects of the household (Stockman, 1994). Furthermore, a married daughter was depicted as 'spilled water' to discourage parental

investment in her pedagogical education (*嫁出去的女儿泼出去的水*). After the rise of the Communist Party in 1949, to further indoctrinate communist ideologies and increase the party's political power, women were encouraged to 'hold up half of the sky', and female labour models were admired as civic models and 'revolutionary icons' (Shu & Zhu, 2012).

During the initial three decades under communist rule when the economy was centrally planned, virtually all Chinese urban workers (regardless of gender) were mandated to be allocated to a nationalised work unit called *danwei* (Stockman, 1994). During that period, women's participation in the labour force reached a climax in the history of China. As the country progressed into the market reform era of the 1980s, there were signs of a moderate decline in market work (Shu & Zhu, 2012). From an individual perspective, the removal of formal *danwei* and the introduction of the 'market economy' gave individual families more latitude in negotiating their respective roles, as women were no longer mandated to be members of the bureaucratic *danwei* system. Consequently, the choice to withdraw or continue as part of the workforce became voluntary. Analysing pooled data from the World Values Survey-China Survey 1995-2007, Shu and Zhu (2012) discovered that there was widespread support for women's participation in the labour force and contribution to the household. However, while holding egalitarian attitudes towards labour force participation, nearly half of the surveyed respondents still clung to the notion that men deserved prioritised access to work opportunities and political leadership positions (ibid). Indeed, sex segregation mirrors societal changes, whereby teenagers respond to shifts in the market landscape when making college major choices.

In an attempt to understand the persistence of gender inequalities in the domestic sphere, another important line of research in the gender role socialisation process is the gendered patterns of children's housework time. Hu's (2015) work indicated that in regard to housework, it is the daughter rather than the son who serves as a substitute for the mother, thereby influencing the gender role modelling that underlies inequalities in the domestic sphere. While there is no direct research linking children's housework time with their eventual major selections, it can be seen that the resiliency of gender role beliefs is often

internalised by children from a young age and could be taken into consideration when they make field-of-study decisions.

Hypotheses associated with the effect of gender-role beliefs in predicting an individual's choice of a STEM versus non-STEM college major

> ***Hypothesis 4:*** Young women with family plans (i.e., getting married and raising children in early adulthood) are less likely to participate in STEM majors than women without such marital and child-bearing aspirations, whereas the same is not true for young men.

In summary, Xie et al. (2015) proposed a 'decomposition' approach to understanding STEM education in which the authors first identified the social determinants and processes that affect educational attainment in general and then specifically explained how these mechanisms and processes affect the attainment of STEM education relative to non-STEM education. My previous chapter concerned the identification of mechanisms that would impact HE access in China in general, and this chapter focuses on disentangling the social determinants of STEM versus non-STEM in education. In this chapter, my discussion highlights the theoretical pathway from family background and individual motivational beliefs to eventual college major choice via the choice of track selection and *Gaokao* performance. In this section, I strove to identify the mechanisms underlying students' major selection framework to help elucidate the existing sex segregation in STEM uptake to a certain extent. The section began with a review of the relevant literature in the field exploring whether family influences can explain major uptake; consensus has not yet been reached on whether college major choice strengthens or weakens the intergenerational transmission of advantage. I also discussed whether prior attainment and personal aptitude patterns can explain gender disparities in STEM disciplines. Then, I reviewed the concepts and definitions that shed light on some of the complexities between gender socialisation/gender role beliefs and STEM uptake in an attempt to elucidate how gender role beliefs are often internalised by children from a young age and taken into consideration when students make field-of-study decisions. Overall, this analysis helped identify the different strands of the literature relevant to college major selection. The next section proposes relevant hypotheses and measures for this investigation.

III MEASURES

Dependent Variables

Choice of major. As mentioned in Figure 7.2, high school students in China are required to enrol in one of two broadly defined tracks, either science (*理科*) or liberal arts (*文科*), and each has a mandatory set of courses associated with it. As such, track selection was retrospectively coded as a dummy variable, where 1=participation in the science track and 0= participation in the liberal arts track. The exact classification of majors can be found in Appendix VI. Specifically, categories 7, 8, 9 , and 10 are classified as STEM.

Table 7.1 Classification of Majors by Gender

Track selection \ Gender	Male	Female	Total
Liberal Arts	686	1,364	2,050
STEM	1,524	631	2,155
Total	2,210	1995	4,205

Pearson $chi^2(1) = 450.209$ Pr=0.000

Explanatory Variables

Parental educational level. Information on the mother's and father's highest educational attainment level was gathered at the baseline investigation in 2009. Specifically, parental education was measured for whichever parent had the highest educational attainment level (1=less than secondary schooling, 2= completed secondary schooling, 3= associate's degree, 4= bachelor's degree or higher)

Parental socioeconomic status. In line with the categorisation proposed in the preceding chapter, parental occupational prestige was a categorical measure of class status based on Lu Xueyi's (2002) conceptualisation in his Research Report on Social Strata in Contemporary China. Thus, occupations for both of the parents were coded as follows: 5=managerial staff,

4=professionals, 3=white-collar office workers, 2=working class, and 1=agricultural working class/unemployed.

Household income. Income was self-reported by participants and was measured at the gross household level, including capital income and labour earnings (Chetty, et al., 2017). Household income was log transformed to make it normally distributed, and it was measured on a continuous scale.

Geographical locations. Geographical locations were coded as 5=Beijing, 4=provincial cities, 3=urban cities, 2=suburban, and 1=rural villages to capture the complexities of China's geopolitical landscape (Liu, 2013).

University attended. Continuing with the groupings of the 15 surveyed universities made in Chapter 6 (see Table 6.1), universities were divided into three categories based on the level of prestige: 3=elite universities, 2=selective universities, and 1=non-selective universities.

Cultural Capital Measures

Possession of a computer at home. As Bourdieu did not define 'cultural capital' in precise terms, subsequent researchers have latitude in operationalising the concept to be suitable for their own research purposes. Previous studies have adopted parental reading behaviour and high-brow cultural participation activities as proxies for cultural capital. In this research, due to my interest in the role of 'objectified' cultural capital in forming preferences for educational specialisation, I employed the measure of possession of a computer at home (Wu & Hu, 2017). In essence, a computer is a necessary tool to perform well in mathematics and computing and thus can impact an individual's ability in STEM subjects. Consequently, the possession of a computer at home was coded as a dummy variable, where 0=not having a computer at home and 1=having a computer(s) at home. Other cultural capital measures were similarly coded as dummy variables.

Gender. Gender was coded as a dummy variable, where 0=male and 1=female.

Marriage plan and family plan. Marriage plan was coded as a dummy variable, where 1= will get married by the target age and 0= will *not* get married by the target age. Family plan was coded as 1=will have children by the target age and 0= will *not* have children by the target age. Specifically, although the legal age for marriage in China is twenty for women and twenty-two for men, the most desirable age for marriage for both men and women is before thirty years old. Young adults aged over thirty are considered to have passed the age limit for a desirable match or are stigmatised as 'left-over women' or 'left-over men' and face discrimination in finding a desirable marriage partner (Shi, 2011; Fincher, 2016).

Analytical Strategy

To test the proposed hypotheses, a series of logistic regression analyses were utilised to examine group differences in the likelihood of selecting college majors in STEM versus non-STEM fields. Individual models were run to separately examine the findings for male and female students. The first model was fitted with family background indicators, school type, and students' prior academic attainment. The second model included a series of cultural capital indicators, and the third model included students' self-reported family plans. Furthermore, all possible interaction terms were added and subsequently tested during the model specification process. However, virtually none of the factorial interaction terms were significant, and these terms were therefore excluded. Statistical tests of the normality of residual and multicollinearity were also conducted to ensure that the use of logistic regression was appropriate.

The proposed strategy for running the regression models posed some limitations. First, the independent variables predominantly consisted of categorical and ordinal variables. Continuous predictors are preferable in linear and logit models because they provide more precise variations in beta values and odds ratios. MacInnes (2017) stated that caution should be used in the comparison of regression models because new variables may have

relationships with the existing variables and the observed heterogeneity is reduced when additional variables are included.

Mood (2009) argued that in the comparison of the results from different groups or samples, the differences in terms of unobserved heterogeneity between these groups is unknown. However, MacInnes (2017) noted that comparing regression models across groups is not as problematic because the differences in unobserved variables are properties of the groups being compared. Therefore, readers should be cautious in the interpretation of the regression models due to the potential limitations.

IV RESULTS

Descriptive Statistics and Bivariate Analysis

Table 7.2 summarises the cross-tabulations of each of the categorical predictor variables and dependent variables of the selection of STEM or non-STEM college majors. This table also provides a summary of the results of the chi-square test of the independence of attributes. Participants who did not provide data for any of the independent or dependent variables for inferential analysis were removed through listwise deletion. Through the bivariate analyses, I found pairwise associations of gender differences in family background, geographic location, and cultural capital. Among the sampled students, 47.50% of the sample was female, and 52.50% of the sample was male. Among the sampled female students (N=1995), 31.63% chose to pursue a STEM degree; on the other hand, a similar percentage of their male counterparts chose to pursue a non-STEM degree (31.04% of the sampled male students chose to pursue a non-STEM degree, while 68.96% of them took a STEM degree). More closely examining the female students, I observed that girls who chose to pursue non-STEM majors had better educated, higher-status parents, while this pattern was less consistent in males. With regard to geographic location, for male students, 32.09% of those who majored in STEM came from rural areas (echoing previously discussed research findings, e.g., Leppel et al. (2001)), while 29.59% of male non-STEM majors were Beijing local students. Furthermore, regarding the series of cultural capital indicators, Pearson's chi-square test demonstrated a significant association between the cultural capital indicators and major choice for the female sample (e.g., for newspaper subscriptions, $\chi 2 = 15.18$, $p < .001$). In contrast, I did not find differences in college major selection for male students with respect to either having a computer or having internet at home. Finally, the pairwise associations of marriage plans and family plans with college major selection were found to be nonsignificant in both groups.

Table 7.2 Descriptive Characteristics of the Sample Population by Gender and College Major Choice

		Female (N=1995)			Male (N=2210)		
		STEM	Non-STEM		STEM	Non-STEM	
Variable	Category	n (%)	n (%)	χ^2	n (%)	n (%)	χ^2
Parent Education	< Secondary Schooling	119 (40.20)	177 (59.79)	12.77***	388 (73.90)	137 (26.10)	9.75**
	Secondary Schooling	195 (31.50)	424 (68.50)		521 (70.31)	220 (29.69)	
	Associate's Degree	114 (28.72)	283 (71.28)		221 (65.58)	116 (34.42)	
	Bachelor's Degree	203 (29.72)	480 (70.28)		421 (66.40)	213 (33.60)	
Parental SES	Agricultural Working Class	125 (42.37)	170 (57.63)	31.74***	395 (74.11)	138 (25.89)	13.94***
	Working Class	190 (28.96)	466 (71.04)		432 (68.03)	203 (31.97)	
	Professionals	229 (34.13)	442 (65.87)		478 (69.18)	213 (30.82)	
	Managerial Staff	87 (23.32)	286 (76.68)		219 (62.39)	132 (37.61)	
Geographic Location	Rural	133 (39.70)	202 (60.30)	16.89***	489 (75.23)	161 (24.77)	35.59**
	Urban	231 (32.35)	483 (67.65)		496 (67.76)	236 (32.24)	
	Beijing	170 (26.90)	462 (73.10)		301 (59.72)	203 (40.28)	
	Provincial	97 (30.98)	217 (69.11)		238 (73.46)	86 (26.54)	
Univ. Level of Prestige	Less-Selective	226 (26.84)	616 (73.16)	68.70***	446 (64.27)	248 (35.73)	112.88***
	Selective	279 (44.22)	352 (55.78)		746 (80.74)	178 (19.26)	
	Elite	126 (24.14)	396 (75.86)		332 (56.08)	260 (43.92)	
High School Characteristics	Non-Key Point County	73 (31.47)	159 (68.53)	0.23	146 (61.09)	93 (38.91)	7.78**
	Key Point County	207 (32.34)	433 (67.66)		440 (70.18)	187 (29.82)	
	Key Point National	351 (31.26)	772 (68.74)		938 (69.79)	406 (30.21)	

Newspaper Subscription	Y	369 (28.63)	920 (71.37)	15.18***	765 (66.06)	393 (33.94)	9.54***
	N	262 (37.11)	444 (62.89)		759 (72.15)	293 (27.85)	
More Than 50 Books in the Home	Y	381 (29.79)	898 (70.21)	5.58**	866 (66.36)	439 (33.64)	10.06***
	N	250 (34.92)	466 (65.08)		658 (72.71)	247 (27.29)	
Computer at Home	Y	414 (28.47)	1040 (71.53)	24.70***	897 (67.09)	440 (32.91)	5.52
	N	217 (40.11)	324 (59.89)		627 (71.82)	246 (28.18)	
Internet Connection at Home	Y	377 (28.43)	949 (71.57)	18.69***	800 (67.00)	394 (33.00)	4.58
	N	254 (37.97)	415 (62.03)		723 (71.23)	292 (28.77)	
Classic Books at Home	Y	507 (30.27)	1168 (69.73)	3.937***	1164 (68.55)	534 (31.45)	0.57
	N	124 (38.75)	196 (61.25)		360 (70.32)	152 (29.69)	
Marriage Plan	Will get married by the target age	198 (31.53)	430 (68.47)	0.01	1006 (69.19)	448 (30.81)	0.10
	Will *not* get married by the target age	433 (31.70)	933 (68.30)		518 (68.52)	238 (31.48)	
Family Plan	Will have children by the target age	365 (32.47)	759 (67.53)	0.85	756 (68.66)	345 (31.34)	0.09
	Will *not* have children by the target age	266 (30.54)	605 (69.46)		768 (69.25)	341 (30.75)	

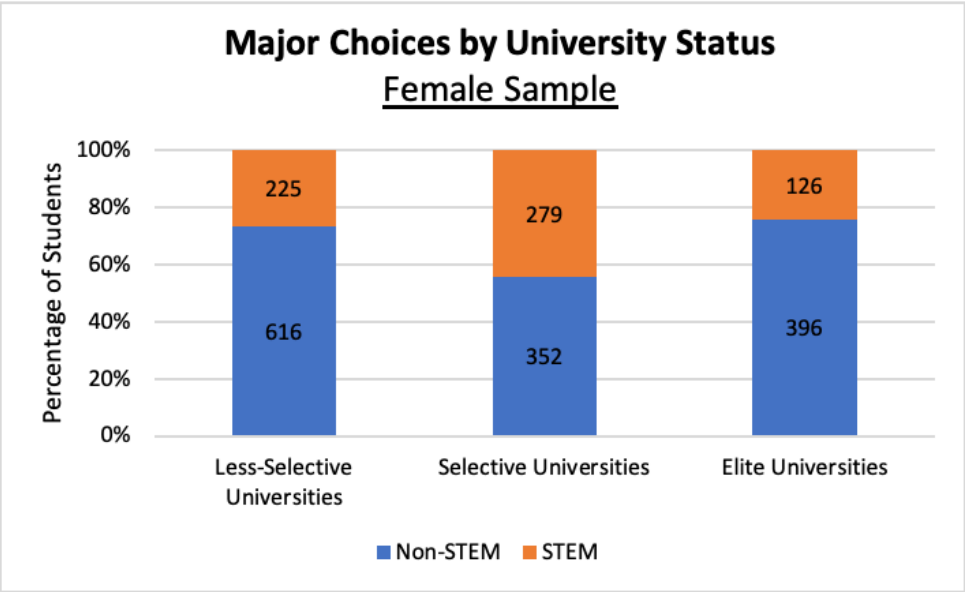
*** p<0.01, ** p<0.05, * p<0.10

Table 7.3 Descriptive Statistics of Continuous Variables by Choice of Major

		Female (N=1995)			Male (N=2210)		
		n	Mean (SD)	t	n	Mean (SD)	t
Log of Gross Household Income Reported by Students	STEM	631	10.464 (1.097)	5.694***	1524	10.459 (1.139)	4.249***
	Non-STEM	1364	10.762 (1.078)		686	10.683 (1.168)	
Standardised *Gaokao* Score	STEM	631	0.801 (1.904)	5.387***	1524	1.115 (1.427)	10.011***
	Non-STEM	1364	0.335 (1.531)		686	0.176 (2.983)	

*** p<0.01, ** p<0.05, * p<0.10

Table 7.3 reports descriptive statistics of the continuous predictor variables of family income and standardised *Gaokao* performance scores for both STEM and non-STEM majors and both males and females. The results of independent sample t-tests are also reported. For both sexes, t-tests indicated a significant difference in mean income between male students who pursued STEM and those who did not (t(1995)= 5.694, p= < .001); a similar result was obtained for females (t(2210)= 4.249, p= < .001). Additionally, students pursuing a STEM degree (M=0.801 for females; M=1.115 for males) reported significantly higher *Gaokao* scores than those who did not (M=0.335 for females; M=1.176 for males).



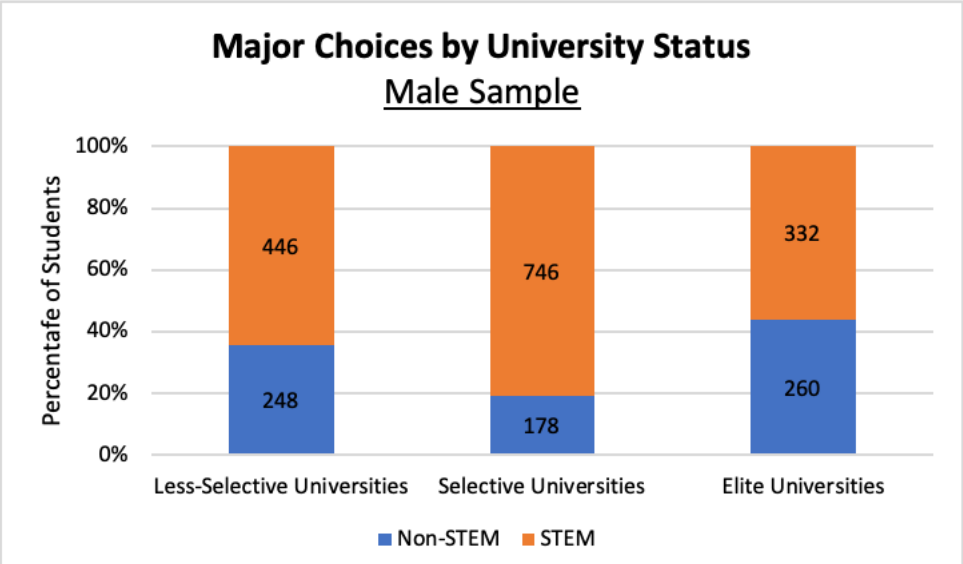


Figure 7.3 Major Choices by University Status

Figure 7.3 plots the distribution of major choices by university status for female and male students. For students enrolled in less-selective universities, 64.27% of male students opted for a STEM degree, whereas 26.75% of female students opted for a STEM degree. Among those from selective universities, 80.74% of male respondents and 44.22% of female participants were enrolled in STEM programmes. A similar trend was observed for students at elite universities, where 56.08% of students chose to enrol in STEM majors, and 24.14% of female respondents were admitted to STEM majors. I observed the greatest gender disparities in STEM uptake in less-selective universities.

Hypothesis Testing and Multivariate Analysis: Gender Differences in STEM College Major Selection

Logistic regression analysis was used to examine group differences in the likelihood of selecting STEM versus non-STEM college majors. The comparison of gender differences was tested using two methods. The first method involved creating interaction terms between all the independent variables and gender. The second method involved running separate models for males and females and comparing the results of the regressions.

The examination of the interaction terms did not reveal that gender moderated the relationship between family background, cultural capital, family plans, and the selection of a STEM college major. None of the non-significant predictors in the non-interaction model emerged as significant interactions with gender (as reported in Appendix VII). I then attempted to run separate regression models for male and female students.

The standard errors (*SE*) for the regression predictors were similar between the regression models comparing males and females. In addition, the *SE* values were relatively low, which provides reliability in comparing the regression coefficients between the models. The first model included family background indicators, school type, and students' prior academic attainment (as shown in Table 7.4). The result of Model 1 indicated that the model as a whole had significantly better fit than an empty model (Pearson $chi^2(15) = 156.56$ Pr=0.000 for the female sample; Pearson $chi^2(15) = 301.59$ Pr=0.000 for the male sample), indicating that these explanatory variables collectively predicted STEM vs non-STEM selection. The second model additionally included a series of cultural capital indicators, and the third model included students' self-reported family plans. I found no discernible relationship between parental SES and male students' choices of STEM majors (***hypothesis 1a was rejected***). This was unexpected since Hypothesis 1 predicts a tendency for the intergenerational transmission of career choice. For girls, the relationship was less clear. The model also suggests that girls who were born into working-class and managerial-class families were more likely to select non-STEM college majors than those who were born into

white-collar and professional families, whereas the effects of parental SES were not evident for males (***hypothesis 1b was rejected***). As ***hypothesised*** in ***1c***, household income was related to females' and males' major choices (female college major: β=-.188, *SE*=.060, *p*<.001, odds ratio =.829; male college major: β=-.106, *SE*=.056, *p*<.1, odds ratio =.900). This finding indicated that students from affluent families were more likely to pursue a non-STEM major irrespective of gender differentials, and this effect was stronger in the female sample. This is probably because women from wealthier families felt more financially secure about their future career prospects and thus were more willing to explore majors that offered fewer financial returns. Moreover, the model suggests that key-point school status has no significant effect on predicting STEM versus a non-STEM major (***hypothesis 3a was rejected***). ***As hypothesised in 3b***, for every one-unit change in *Gaokao* score, the log odds of selecting a STEM major (versus a non-STEM major) increased by 0.248 for female students and by 0.422 for male students. Furthermore, the prestige of universities was related to students' choices. Both females and males who attended selective universities were more likely to select college majors in STEM, while the opposite was true for elite universities. This pattern ***disproves hypothesis 3c***.

A series of cultural capital measures was introduced in Model 2. Although the inclusion of these indicators slightly decreased the coefficients for household income, both coefficients were still significant. These findings revealed that family wealth facilitated the selection of non-STEM majors in college. Contrary to the original hypothesis, I found no discernible relationship between the cultural capital measures and major choices for either female or male students (***hypotheses 2a & 2b were rejected***). This was unexpected since Hypothesis 2 suggests that having a computer and internet at home would stimulate aspirations for a STEM degree and that the number of books in the home and newspaper subscriptions (an indicator of parental reading habits) would encourage the uptake of a non-STEM degree. Exploring the influence of cultural capital on major choice was difficult with this dataset using quantitative measures, as the survey consisted of only self-report measures of the indicators such as the numbers of books at home. Thus, the survey lacked measures such as a measure of parental

beaux arts participation or a cultural knowledge test as used in previous studies (e.g., De Graaf et al., 2000; Zimdars et al., 2009).

Table 7.4. Logistic Regression Analysis Predicting Individual STEM Versus Non-STEM College Major Based on Family Background and Aptitude, Cultural Capital, and Family Plans

	Female (N=1995		Male (N=2210)		Female (N=1995)		Male (N=2210)		Female (N=1995)		Male (N=2210)		Female (N=1995) Male (N=2210)	
	Selection of STEM college major				Selection of STEM college major				Selection of STEM college major					
	Model 1: Background and qualifications				**Model 2: Cultural capital**				**Model 3: Family Plans**				**Final Model**	
Predictor	β *(SE)*	$e^{coef.}$	β *(SE)*	$e^{coef.}$	β *(SE)*	$e^{coef.}$	β *(SE)*	$e^{coef.}$	β *(SE)*	$e^{coef.}$	β *(SE)*	$e^{coef.}$	Final Model (Female)	Final Model (Male)
Family Characteristics														
Parent SES (Ref: Agricultural Working Class)														
Working Class	**-0.322* (0.192)**	0.725	0.020 (0.169)	1.020	-0.259 (0.196)	0.772	-0.020 (0.173)	0.980	-0.315 (0.193)	0.730	0.019 (0.169)	1.019	**-0.322* (0.192)**	0.020 (0.169)
Professionals	-0.036 (0.223)	0.964	0.103 (0.201)	1.109	0.037 (0.228)	1.038	0.073 (0.204)	1.075	-0.030 (0.223)	0.971	0.102 (0.201)	1.108	-0.036 (0.223)	0.103 (0.201)
Managerial Staff	**-0.495* (0.247)**	0.610	-0.112 (0.228)	0.894	-0.413 (0.253)	0.662	-0.149 (0.233)	0.861	**-0.488** (0.247)**	0.614	-0.114 (0.228)	0.892	**-0.495* (0.247)**	-0.112 (0.228)
Household income	**-0.188*** (0.060)**	0.829	**-0.106* (0.056)**	0.900	**-0.167*** (0.061)**	0.846	**-0.122** (0.059)**	0.885	**-0.189*** (0.060)**	0.828	**-0.104* (0.057)**	0.901	**-0.188*** (0.060)**	**-0.106* (0.056)**
Aptitude at 12th grade														
High school characteristics (Ref: Non-key-point school)														
Key Point County	-0.275 (0.177)	0.759	0.001 (0.175)	0.999	-0.281 (0.177)	0.755	-0.031 (0.176)	0.969	-0.288 (0.177)	0.750	-0.001 (0.176)	1.001	-0.275 (0.177)	0.001 (0.175)
Key Point National	-0.254 (0.177)	0.776	0.032 (0.175)	1.032	-0.235 (0.178)	0.790	0.023 (0.176)	1.023	-0.269 (0.177)	0.764	-0.036 (0.175)	1.036	-0.254 (0.177)	0.032 (0.175)
Standardised *Gaokao*	**0.248*** (0.039)**	1.281	**0.422*** (0.040)**	1.525	**0.249*** (0.040)**	1.283	0.421*** (0.040)	1.524	**0.247*** (0.040)**	1.281	**0.422*** (0.040)**	1.524	**0.248*** (0.039)**	**0.422*** (0.040)**
Univ. Strata (Ref: Less-selective universities)														
Selective Univs.	**0.660*** (0.133)**	1.917	**0.260* (0.140)**	1.297	**0.636*** (0.134)**	1.888	**0.275* (0.141)**	1.317	**0.653*** (0.133)**	1.920	**0.259* (0.140)**	1.296	**0.660*** (0.133)**	**0.260* (0.140)**
Elite Univs.	**-0.482*** (0.162)**	0.617	**-1.364*** (0.161)**	0.256	**-0.494*** (0.163)**	0.611	**-1.351*** (0.162)**	0.259	**-0.486*** (0.163)**	0.615	**-1.368*** (0.161)**	0.255	**-0.482*** (0.162)**	**-1.364*** (0.161)**
Possession of Cultural Capital														
Newspaper Subscription					0.117 (0.131)	1.124	0.126 (0.130)	1.135						
More than 50 books in the home					-0.076 (0.135)	0.927	0.181 (0.137)	1.198						

Computer at Home			-0.032 (0.199)	0.969	-0.118 (0.185)	0.889						
Internet Connection at Home			0.205 (0.212)	1.228	-0.176 (0.196)	0.839						
Classic Books at Home			0.166 (0.157)	1.181	-0.202 (0.145)	0.818						
Family Plan												
Marriage Plan												
Will get married by the targeted age							-0.127 (0.147)	0.881	0.034 (0.143)	1.035		
Family Plan												
Will have children by the targeted age							-0.172 (0.138)	1.188	-0.084 (0.135)	0.919		
Additional Covariates												
Parent Education (Ref: Less than secondary school)												
Secondary school	-0.260 (0.162)	0.771	-0.083 (0.150)	0.920	-0.232 (0.164)	0.793	-0.091 (0.151)	0.913	-0.261 (0.162)	0.771	-0.082 (0.150)	0.912	-0.260 (0.162)	-0.083 (0.150)
Associate's Degree	-0.303 (0.204)	0.739	-0.147 (0.204)	0.863	-0.248 (0.209)	0.781	-0.164 (0.210)	0.849	-0.304 (0.204)	0.738	-0.151 (0.205)	0.860	-0.303 (0.204)	-0.147 (0.204)
Bachelor's Degree	-0.199 (0.206)	0.820	-0.043 (0.199)	0.958	-0.117 (0.216)	0.889	-0.068 (0.207)	0.934	-0.201 (0.206)	0.818	-0.046 (0.199)	0.955	-0.199 (0.206)	-0.043 (0.199)
Geographic locations (Ref: Rural village)												
Urban	0.156 (0.184)	1.168	-0.204 (0.160)	0.815	0.217 (0.189)	1.242	-0.238 (0.164)	0.788	0.155 (0.185)	1.167	-0.206 (0.160)	0.814	0.156 (0.184)	-0.204 (0.160)
Beijing	0.240 (0.190)	1.271	-0.282 (0.177)	0.755	**0.331* (0.200)**	1.392	-0.352* (0.184)	0.703	0.242* (0.190)	1.274	-0.285 (0.177)	0.752	0.240 (0.190)	-0.282 (0.177)
Provincial City	0.053 (0.211)	1.055	0.160 (0.195)	1.173	0.134 (0.218)	1.143	0.125 (0.200)	1.133	0.050 (0.212)	1.052	0.154 (-0.196)	1.166	0.053 (0.211)	0.160 (0.195)
Constant	1.473** (0.586)		2.038*** (0.558)		0.984 (0.674)		2.322*** (0.657)		1.481** (0.591)		2.041*** (0.560)		1.473** (0.586)	2.038*** (0.558)
Pseudo R-squared	0.063		0.110		0.065		0.113		0.064		0.110		0.063	0.110

Notes: β(SE)= standardised coefficient (standard errors); STEM= science, technology, engineering, and mathematics (0=non-STEM college major, 1=STEM college major); *** p<0.01, ** p<0.05, * p<0.1. Significant findings are highlighted in bold.
Model 1(F): Overall model fit: Pearson $chi^2(15)$ =156.56 Pr=0.000, -2 log likelihood = 2333.37
Model 2 (F): Overall model fit: Pearson $chi^2(20)$ =160.75 Pr=0.000, -2 log likelihood = 2329.18

Model 3 (F): Overall model fit: Pearson $chi^2(17)$ =157.95 Pr=0.000, -2 log likelihood = 2331.22
Final Model (F): Overall model fit: Pearson $chi^2(15)$ =156.56 Pr=0.000, -2 log likelihood =2333.37

Model 1(M): Overall model fit: Pearson $chi^2(15)$ =301.59 Pr=0.000, -2 log likelihood = 2436.27
Model 2 (M): Overall model fit: Pearson $chi^2(20)$ =308.61 Pr=0.000, -2 log likelihood = 2428.51
Model 3 (M): Overall model fit: Pearson $chi^2(17)$ =302.04 Pr=0.000, -2 log likelihood = 2435.82
Final Model (M): Overall model fit: Pearson $chi^2(15)$ =301.59 Pr=0.000, -2 log likelihood = 2436.27

In addition to parental financial resources and academic abilities, marriage plans did not show a gendered influence on major selection. ***Contrary to hypothesis 4***, aspirations for parenthood had no association with the major choices for either sex. This finding is in contrast with findings from the Western literature showing that a higher value placed on family and fulfilling family obligations of childbirth pushes females *away* from STEM college majors (e.g., Wang & Kenny, 2014). For instance, in a study examining gender segregation in STEM disciplines, female respondents mentioned discrimination, a lack of role models, and the impact of a career in the discipline on family choices, whereas men's family and science career choices were not generally associated (Ecklund et al., 2012). In addition to China's unique geopolitical arrangement, one plausible explanation is that urban daughters have benefited from the demographic pattern produced by the country's one-child policy (Fong, 2012). For example, Tsui and Rich (2002) found equally high educational aspirations and similar mathematical performance for male and female only children. As girls do not have to compete with brothers for parental investment, it is likely that societal expectations and the process of gender socialisation cause females to defy gender norms and hold egalitarian views compared with those of their male counterparts.

In building a parsimonious model with great explanatory predictive power, although all of the existing variables could be retained, Model 2 (with cultural capital indicators) and Models 3 (with family plans) did not seem to add very much to the explanatory power. Specifically, the removal of the variables from Model 2 and Model 3 had little effect on the values of the coefficients of the remaining variables in the model. Thus, the removed variables added little to the ability of the model to predict the outcome variable and did not influence the behaviour of the remaining variables (MacInnes, 2017). In addition, according to the change in the -2 log likelihood and the associated chi-square statistics (found at the bottom of Table 7.4), although the addition of the removed variables affected the model, they did little to increase its explanatory power and could be safely dropped in the interest of model parsimony (ibid). Hence, Model 1 was chosen as the final model.

V DISCUSSION AND CONCLUSIONS

In sum, the analysis of the BCSPS data showed gender differences in personal attributes relevant to the pursuit of STEM fields, including but not limited to household income, the prestige of the attended university, and *Gaokao* scores. These differences may contribute to the underrepresentation of females in STEM even when other characteristics are held constant. My findings indicate that gender equity in the provision of educational and occupational opportunity may not be sufficient to ensure similar educational career outcomes between male and female students. It has long been assumed that a STEM career will yield more monetary rewards than a non-STEM career, and my results echoed those of Leppel et al. (2001) that children from wealthier families who feel more financially secure are more willing to explore majors that offer less financial return (e.g., a non-STEM major). Surprisingly, there were no statistical associations between different beliefs about marriage and family and educational choices. Women who valued their future parenting and spousal support roles *were not* found to be less likely to enter STEM majors than their male counterparts. Such gender role beliefs partially defy the recognition of the culturally produced gendered expectations that '*men rule outside the home and women rule inside*'. Furthermore, my findings also indicate that one mechanism of major selection is adapted from the stratified university system in China. I observed the greatest gender segregation in STEM disciplines in middle-tiered universities with technical institutions. Following discussions from the previous chapter, while lower-positioned universities are predominantly attended by female students, the results from this chapter confirm that these females mostly pursue non-STEM degrees. In contrast, male respondents attending these lower-tiered institutions tend to enrol in STEM subjects, possibly in the hope that a STEM degree will allow them to receive better pay and long-term career prospects and compensate for their relatively low marks on the *Gaokao*. Together, these findings may to some extent explain why, despite similar achievements in school between male and female students, there are persistent gender inequalities in STEM.

Furthermore, there is an array of research that alludes to the role played by cultural capital (Ma, 2009), gendered motivational beliefs (Cech et al., 2011) and self-concepts (Cech, 2013), which likely contribute to the gender gap in math and science career motivation. Although these factors are important, I did not have the scope to expand upon these factors based on the BCSPS data here. However, it is clear that under-representation of women in STEM fields is caused by a complex interaction of psychological, familial, and sociocultural factors. My findings illustrate the importance of taking household income and life goals and values into account when addressing the gender gap in STEM fields. To address these motivational factors, STEM fields and workplaces more broadly (e.g., technology companies) must adapt and evolve to accommodate the needs and goals of women. Unfortunately, progress can be slow under the prevalence of the overwork '996 culture' in major technology companies in China, which is defined as a unanimously shared work ethic of working from 9 a.m. to 9 p.m., six days a week, often without overtime compensation. This culture is even espoused by Jack Ma, the founder of the e-commerce titan Alibaba, who defended long working hours as 'a huge blessing' and thus created heated discussions in the media (Zhong, 2019). Furthermore, numerous measures could be implemented to shift STEM fields and the current overwork culture in the direction of accommodating women's needs and goals. For example, providing young mothers with job flexibility and support and running campaigns to increase public awareness of the work that STEM professionals do and how it benefits society at large would likely make the field more attractive to women. Importantly, however, these measures must be combined with a consideration of cultural and structural factors to tackle entrenched, detrimental stereotypes and combat the persistence of gender inequality in STEM fields and career pathways.

CHAPTER EIGHT

CONCLUSIONS

In this dissertation, I have presented both qualitative and quantitative evidence for Beijing, China, regarding the magnitude and drivers of long-standing differences in university entry among young people from various familial and demographic backgrounds who are funnelled into universities with different levels of prestige. I regard this study as a starting point for examining the similarities and differences in university access, opportunities and experiences in HE. In this chapter, I highlight the implications of key points made throughout the dissertation. Here, I do not revisit in detail the findings from each chapter but rather focus on data integration and the complementary findings that emerged via different research methods. In particular, I first pull together what my research shows regarding gender and the apparent feminisation of HE in China. Second, I examine the importance of key-point schools and region of origin, as well as other structural factors that help shape HE admissions and studies. Third, I consider the role played by IFA in terms of both success and failure and policy changes going forward. Finally, I consider both the strengths and limitations of my research and suggest some directions for future research.

In Chapter 4, I documented the sequential exploratory design of the study, starting from a pre-test of the BCSPS and examining the descriptive results for patterns. Such patterns fed into the design of the interview protocol, which was ultimately conducted with 60 first-year students from 7 universities in Beijing. The thematic analyses conducted as part of the qualitative interviews were used in the statistical analysis of IFA routes and STEM choice. Although the analysis of the quantitative and qualitative data was conducted separately, this concluding chapter attempted to pull together insights on common themes. In terms of connections and incrementality between the qualitative and quantitative work, three points will be highlighted. 1) The purpose of a qualitative study is to extend beyond statistical relationships, thus adding nuanced, detailed descriptions of participants' experiences navigating the higher education systems. Thus, the sampling strategies used by the qualitative

research resemble those utilised by the quantitative survey with consideration of the jurisdictions and levels of prestige of the sampled universities. Hence, to protect the participants' anonymity, the institutions that participated in the qualitative study were given pseudonyms. Hence, among the 7 universities where the qualitative study took place, 5 were also sampled in the BCSPS survey. 2) The original results from Chapter 6 revealed that coming from Beijing makes one less likely to attend higher-positioned universities in Beijing. Upon further scrutiny, I discovered that 72.4% of students who were Beijing locals attended less-selective universities in Beijing, possibly skewing the sample. The qualitative study provided contextualised explanations for this statistical relationship in which less-selective universities in Beijing are predominantly utilised by low-achieving students as venues to maintain their international transmission of geographical advantage as residents of Beijing. 3) The results of my mixed-methods research are shown to be complementary. For instance, the statistical analyses indicate the strong skewness of IFA recruitment policies in attending better-positioned institutions. The qualitative work then explores some of the strategies and mechanisms students employed to navigate the system, thus yielding a more complete picture of the studied sample. The corroborative, complementary nature of the relationship between the quantitative and the qualitative work can also been seen in other topics that have been documented throughout this dissertation, such as the employment of two education models, namely, "education for quality" vs. "education for exam preparation", in elucidating geographical disparities in accessing education as well as some topics detailed below.

I GENDER ISSUES

This dissertation began by contesting the simple idea of the 'feminisation of HE' and calling for a more detailed, nuanced contextualisation that looks beyond enrolment statistics. Although statistics gathered by the Ministry of Education show that women started to outnumber men in undergraduate enrolment in 2006 and exceeded men in postgraduate enrolment in 2009 (as illustrated in Figure 6.2, page 108), the reality is far less optimistic. For my fieldwork at the non-selective Beijing Institute of Graphic Communications, the responses of low-achieving Beijing females indicated that they sought every possible

opportunity that would enable them to secure a place at *any* university studying virtually *any* major. The finding is considered to be preliminary given that females make up 65% of the year group at BIGC. However, the results of the analysis of the BCSPS data show that lower-tier universities in Beijing are predominantly attended by local female students. It is possible that local females who do not perform well academically may hope to prevent any downward mobility by applying their *hukou* advantage of being a resident in Beijing to enrol in less-selective postsecondary institutions in the city. To some extent, a university's location in Beijing, irrespective of the university's prestige, distinguishes it from other universities in China. Although Yeung (2013) argues that the gender gap in college attendance has disappeared and even reversed, female advantage is more significant at associate degree-granting colleges than at traditional 4-year academic colleges. While HE massification involves the transformation of associate degree-granting institutions into comprehensive universities, the fact that lower-tier universities are still predominantly a female route of entry may indicate an extension of China's existing stratified educational hierarchies.

Gender and STEM

Part of my fieldwork involved exploring some of the reasons behind female students' uptake of a STEM degree. These possible reasons include following family traditions as an intergenerational transmission of career choice, attending a high school that is STEM-driven, and majoring in STEM as assigned. The qualitative data, though based on a small sample of 9, revealed struggles and college unreadiness among those female students already enrolled in a STEM programme, and some of this unreadiness was bounded by different pedagogy models that may be applicable to men as well, warranting further investigation. Furthermore, the analysis of the BCSPS data showed gender differences in the pursuit of STEM fields, including but not limited to gender differences in household income, performance on the *Gaokao*, and the prestige of the attended university. Specifically, the findings suggest that female students who reported early realisations about marriage and family were *not* found to be less likely to enter STEM majors than their male counterparts. Not long ago, in the Outline of the 14th Five-Year Plan for the National Economic and Social Development of People's

Republic of China, the State government stressed the strategic role of '*independent* scientific and technical innovation', focusing on the areas that will help defeat US sanctions (e.g., the semiconductor industry) (Xinhuanet.com, 2020). Hence, it is reasonable to expect that talents in STEM will be continually needed in the forthcoming years. As such, STEM fields and workplaces more broadly need to transition away from the current overwork culture to cultivate sustainable technological development.

II STRUCTURAL FACTORS: KEY-POINT SCHOOLS AND GEOGRAPHY

This dissertation highlights the significance of secondary school status in university enrolment. The fieldwork provides a contextually rich description of the reality of the respondents' experiences with their high school and how their experiences are shaped by structural inequalities within the system. Specifically, two types of key-point schools emerge based on geographical differences. On the one hand, 'education for quality' key-point schools, modelled on a Western student-centred style of pedagogy, aim to spark students' interest in various disciplines and are often found in coastal cities. At the other end of the spectrum, students educated in 'education for exam preparation' key-point schools are subjected to strict discipline and ruthless cycles of lessons and mock tests, and these schools are often found in populous inland areas. The results of the quantitative survey further describe the strong statistical significance of secondary school status on university enrolment. As a key-point school system exists across compulsory and secondary levels of education, students' progression to the next level of education is constrained by their current position on the educational ladder. The dichotomy of two seemingly opposing educational systems then becomes legitimised under the holistic ideals of educational meritocracy and comes to justify the unequal allocation of educational resources based on a stratified schooling system. This partially explains the seemingly paradoxical scenario I posited in Chapter 1, as meritocracy has been interpreted as a double-edged sword. China's rapid industrialisation cultivated the emergence of the middle class, where worried parents are forced to mobilise more of their resources because their offspring need to enter key-point schools long before secondary school. In contrast, education has been held up by society at large as a route to social

mobility, and the *Gaokao* has been regarded as the fairest means for social selection. Overall, the two polarising schools of thought coexist in an allegedly meritocratic environment.

Reflecting on the theoretical grounding from Chapter 3, especially the concept of meritocracy and Bourdieu's social reproduction theory, the suggestion from my subsequent analysis seems to support the latter. The concept of meritocracy has been subject to strict scrutiny in sociology. Young (1958) originally defined the term as "IQ plus effort". Alternatively, merit is also interpreted in terms of educational attainment, as favoured by Bell (1972). In the context of China, though admissions to secondary and post-secondary institutions are claimed to be merit-based (demonstrated by test results), the results from this study demonstrated that present-day education systems in China are still far from being a meritocratic society. Rather, to overcome the geographical barriers of unequal access to higher education opportunities as demonstrated by Chapter 6, children from less advantaged origins need to display substantially more "merit" by achieving a much higher score in *Gaokao* than children from more privileged origins to obtain similarly desirable seats at universities. With respect to Bourdieu's social reproduction theory, the empirical results from the dissertation seem to partially validate the main theoretical stances of Bourdieu. However, in applying Bourdieu's theory to the Chinese setting, China's geopolitical arrangements need to be taken into consideration. The data analysis revealed that it is not just family factors that predict students' variation in educational attainment. Instead, the processes and outcomes between social mobility and education are complex. The interplay of both familial factors and institutional factors helps to shape educational selection in contemporary China. Some institutional factors, such as the key-point school system and regional stratification in access to HE opportunities based on population, reflect China's unique socialist past and its transition to a market economy that are not captured in Bourdieu's original theory, which is based on his observation of the strategies and dynamics of France at that time.

III IFA: NOW THAT IT IS BEING CANCELLED, WHAT'S NEXT?

IFA recruitment began with good intentions by introducing more opportunities to

compensate for the rigidity of the *Gaokao*, but the enactment of the policy has not always followed a linear trajectory; more opportunities do not translate into greater equality. The qualitative research produced more detailed, nuanced descriptions of the reality of individual respondents' experiences with the IFA policy. From there, I revealed how both familial and institutional habitus as well as the close synergy between the two function collectively to reaffirm class advantage in the pursuit of educational mobility. Insights provided from two admissions tutors helped me obtain a glimpse into institutions' view of IFA. From an institutional perspective, IFA became an early quest to secure talent before other institutions, and one of the admissions tutors contended that IFA is designed for those who exhibit stellar performance in one subject in addition to mastering existing lessons. For students, IFA has deviated from its original purpose of cultivating 'unusual' talent and has instead been used as a strategy to gain a competitive advantage in securing a seat during the competition for college admission. In this regard, IFA is recognised by parents and schoolteachers as a way of getting ahead in the education game. Furthermore, the results of the statistical models in Chapter 6 reveal that coming from a college-educated family with members who have been through the college process and attending a key-point school supported by extra educational resources provide an advantage for IFA placement. To that extent, IFA is skewed towards those who are already advantaged because it reaffirms and reproduces their advantages in the competition for opportunities.

IFA was unexpectedly suspended by the Ministry of Education in January 2020, and it has been replaced by the *Jiqiangjihua*, which literally translates to the 'Strong Base Plan'. Similar to IFA, the Plan is available to only 36 selected universities with high prestige. the Plan adopts an elitist stance, aiming to recruit students 'who are committed to serving the country's major strategic needs and have well-rounded qualities and are subject experts with a focus on STEM and technology'. Specifically, the subject areas listed are predominantly those whose potential output is sanctioned by the United States. Students who are selected under the Plan will receive individual mentorship and are exempted from national exams for consideration for master's and doctoral degrees (Ministry of Education, 2020). A considerable portion of the new plan devotes major attention to creating transparency to

ensure procedural fairness; for example, interviewers are blindly assigned to candidates, and the entire process is video-taped. Here, the underlying message of the policy is that the presumed notion of procedural transparency will ensure 'educational equality'. More than three decades after the original market reform of the 1980s, China is still perpetuating an elitist educational system, despite the repeated government rhetoric of 'promoting more equitable and higher-quality education' (China Education Daily, 2019). In fact, I would argue that very little will change if China's educational system insists upon taking the path of elitism. Overall, more time and data will be needed to observe the sociological effects related to the characteristics of the students being selected for the Strong Base Plan.

IV STRENGTHS AND LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

This dissertation was motivated by a broader concern related to continued stratification in higher education in China. This study empirically investigated the following proverb: '*impoverished families can hardly nurture rich sons*'. As cited in the introduction, with a gross enrolment rate of 51.6% in 2019 (Ministry of Education, 2019), the question of HE attendance has shifted from 'who gets to go to universities' to 'who gets to go where'. The research also sheds light on IFA, one of the preferential recruitment policies in HE admissions that target students who exhibit stellar performance in one subject in addition to mastering existing schoolwork; these policies serve as a gateway for such students to enter top-tier universities. Although there is abundant scholarly work on stratification in education, to date, this dissertation is one of the first attempts to investigate IFA that pulls together into common themes evidence that is based on both quantitative and qualitative data. While the present findings from the BCSPS data verify systematic skewness towards key-point schools and middle-class families, the fieldwork study details the nuanced contextualisations of the reality of participants' experiences with the IFA policy. It provides frameworks and methodologies that can potentially be rolled out to a national sample. Furthermore, it serves as a starting point for future research on this topic that investigates the sociological influence of the 'Strong Base Plan' on equity issues in China.

To conclude, there are several limitations to this dissertation. First, the sample was limited to universities in Beijing; thus, it is not representative of all HEIs in China. Future research capturing HE access issues would need to examine nationally representative samples to ensure that these trends are generalisable. Second, for the qualitative research, due to time constraints and access issues in the field, I was unable to secure a balanced sample that 1) reflects the real scenarios occurring in less-selective universities and 2) provides clear comparisons across the STEM vs. non-STEM spectrum. Future research efforts should continue to engage in in-depth field work among different populations across universities with different levels of prestige in order to identify the possible mechanisms underlying the gender disparities in STEM uptake. Third, the BCSPC data are limited with regard to cultural capital measures, especially because they rely on self-report measures of the indicators, such as the number of books at home. The dataset is also limited because it does not contain a sufficient number Olympiad exam participants to yield a compelling statistical analysis. Finally, due to the drastic drop-out rate in later waves of the survey (as identified in Chapter 4, page 53), the 2009 data were employed with the aim of studying the effects of precollege characteristics on university admissions. Future research should analyse potential socio-economic and structural outcome differences beyond university entry. Specifically, future areas of research should follow pupils from an early age as they enter formal schooling right through to university and beyond graduation based on a national dataset to ascertain if and how the mechanisms and strategies that I have identified play out in broader contexts (e.g., to investigate marriage and labour force participation following university to identify broader gender and social mobility trends). Finally, for future studies of stratification in the HE realm in China, scholars should be wary of the rapidly changing nature of HE policies, especially for a country where policies are centrally planned and HE is regarded as a means of strengthening the nation. As such, it is crucial to increase our knowledge of inequality in HE in China to challenge and modify some of the taken-for-granted claims about inequalities in HE, which rest on insights derived from the West. China offers a different context for HE, and credible data and rigorous analysis are vital if comparative research is to fully uncover both the similarities and differences in higher education and inequalities between the East and

West.

APPENDIX I THE INTERVIEW SCHEDULE

I aimed to keep the questions open and to constantly reflect on how these questions were presented in Chinese so that they were not excessively loaded. I utilised prompts to engage the participants with flexibility and a conversational tone. The interview consisted of four parts: 1) family background and geographical upbringing, 2) discussions about the participant's high school, 3) the college application process and the IFA (if applicable), and 4) the college major decision-making process.

Date: _____
Name: _____
Pseudonym: _____
Gaokao score: _____
Name of institution: _____
Academic major(s): _____
Parents' highest level of education: _____

1. How would you describe your family background?
    a) What was the educational background of your family? Have things changed in your family?
    b) Compared with your family, do you have new opportunities for your education?
    c) What do your parents do?
    d) How would you describe your parents? Are they "authoritative", "charismatic" or something else?
    e) In your view, how did your parents help you get into the university where you are now?
    f) Do you have any brothers or sisters? How old are they?

2. Where did you grow up? How would you describe your hometown?
    a) If the participant is a Beijing local: Why do you want to stay in Beijing for university?
    b) If the participant is new to Beijing: How is Beijing different from your hometown? Do you like it here? What drove you to come to Beijing for university?

3. How would you describe your high school? Is it a key-point school or an average school? How were your grades? Did you participate in any gifted and talented programmes? Why or why not? How did your high school help you get into the university you currently attend?

4. What was your score on the *Gaokao* exam? How did you feel about it? How would you describe the whole process? Is there anything you would do differently if you were to repeat the process again?

5. There is another opportunity to enter the university called the IFA. Have you ever considered it? Have you tried it? Why or why not?

6. How did you end up majoring in_____? What inspired you to pursue a major in _____? Was this your primary choice? Have you encountered any difficulties? How did your parents help you with your major selection?

7. What are your future plans after finishing university? Do you want to stay in Beijing? Do you aspire to a graduate degree?

<u>The questions below were developed for students who had entered their universities through the IFA:</u>

8. What were your experiences with the IFA? What were some of the hurdles? What were some of the successes?

9. How did you feel about the interview process? During the interview process, what kind of questions were asked? How did you feel about those questions? Is there anything that you felt you weren't able to address?

10. Why did you apply for the IFA route but not the standardised testing route? What drove you to apply for admission to _____ University? How many university applications did you submit? How many interviews did you attend?

11. Do you think the IFA process was fair? Why or why not? There are discussions in the media about cancelling the IFA. What is your view on this?

12. What did you have to do in the IFA admissions process? Can you describe the admissions process for me? What kind of qualifications did you submit? How did your parents help you with the IFA application process?

Part II: Admissions Tutor Interview Questions

Date: _____
Name: _____
Pseudonym: _____
Name of institution: _____
Position: _____

1. Would you talk about the recruitment pattern for 2017? Is there anything particular you want to highlight? How many undergraduates did you recruit this year? How many IFA students? How many students have gone through the Rural Preference Recruitment

route? How many students were local to Beijing?

2. How long have you been in this position? Has the recruitment pattern changed since you got here?

3. What are some of the government's top-down philosophies in terms of university recruitment? How do you follow them?

4. There is a widespread "myth" that students from Beijing can enter a university in Beijing with substantially lower marks than students from other provinces. How would you comment on this?

5. My current dissertation utilising data from the Beijing College Student Panel Survey has found that even though higher education has been expanding at an unprecedented rate, women are still concentrated in lower-tiered universities. Do you agree or disagree with this finding? Why or why not?

6. Another preliminary finding from my dissertation is that men are more likely to major in STEM subjects and women are concentrated in liberal arts subjects. How would you comment on this?

7. How would you comment on the IFA programme as a whole? There are discussions in the media about cancelling the IFA. What is your view on this?

8. How would you comment on the Rural Preferential Recruitment programme? How many students have you recruited? Based on what criteria? Could you describe the admission processes?

9. There are discussions in the news about the "over-recruitment" of undergraduates and unemployment among college graduates. What your thoughts on this issue?

APPENDIX II SUPPLEMENTARY GRAPHS

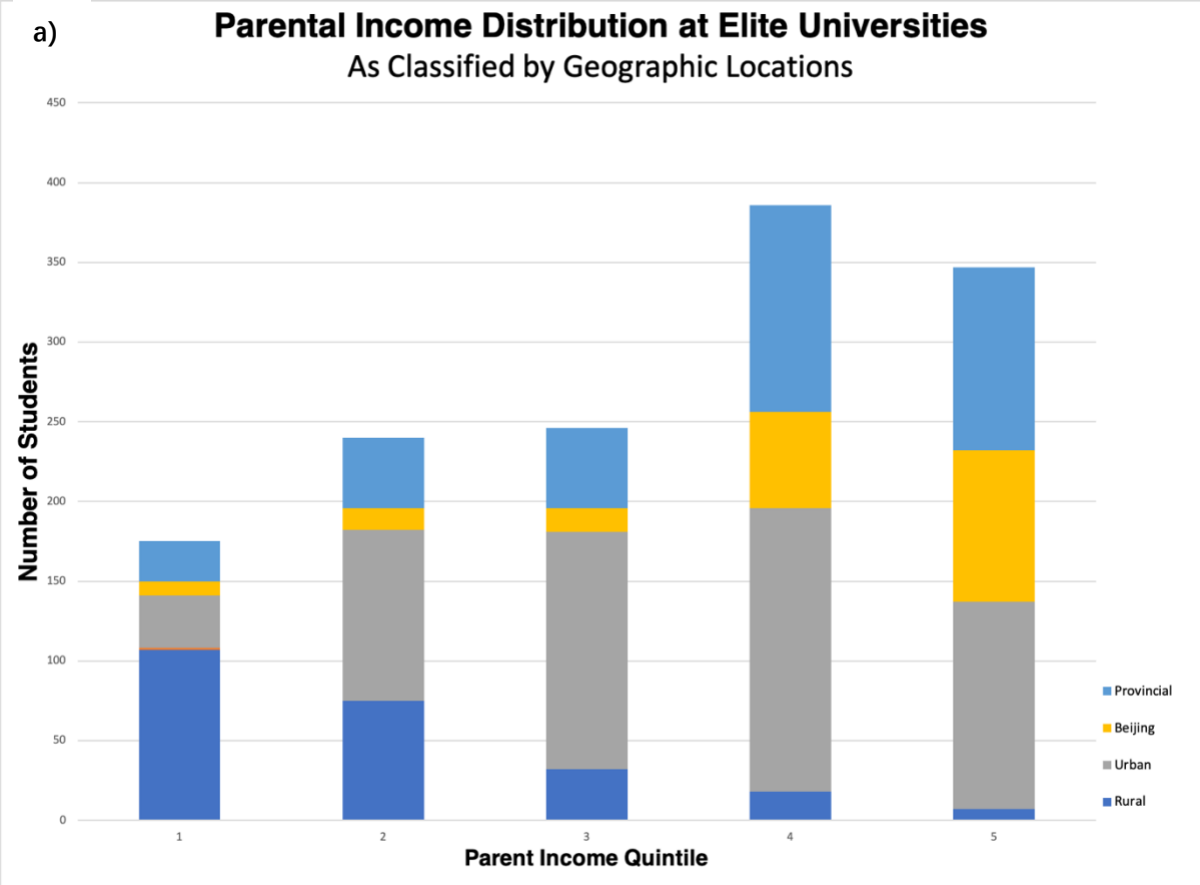
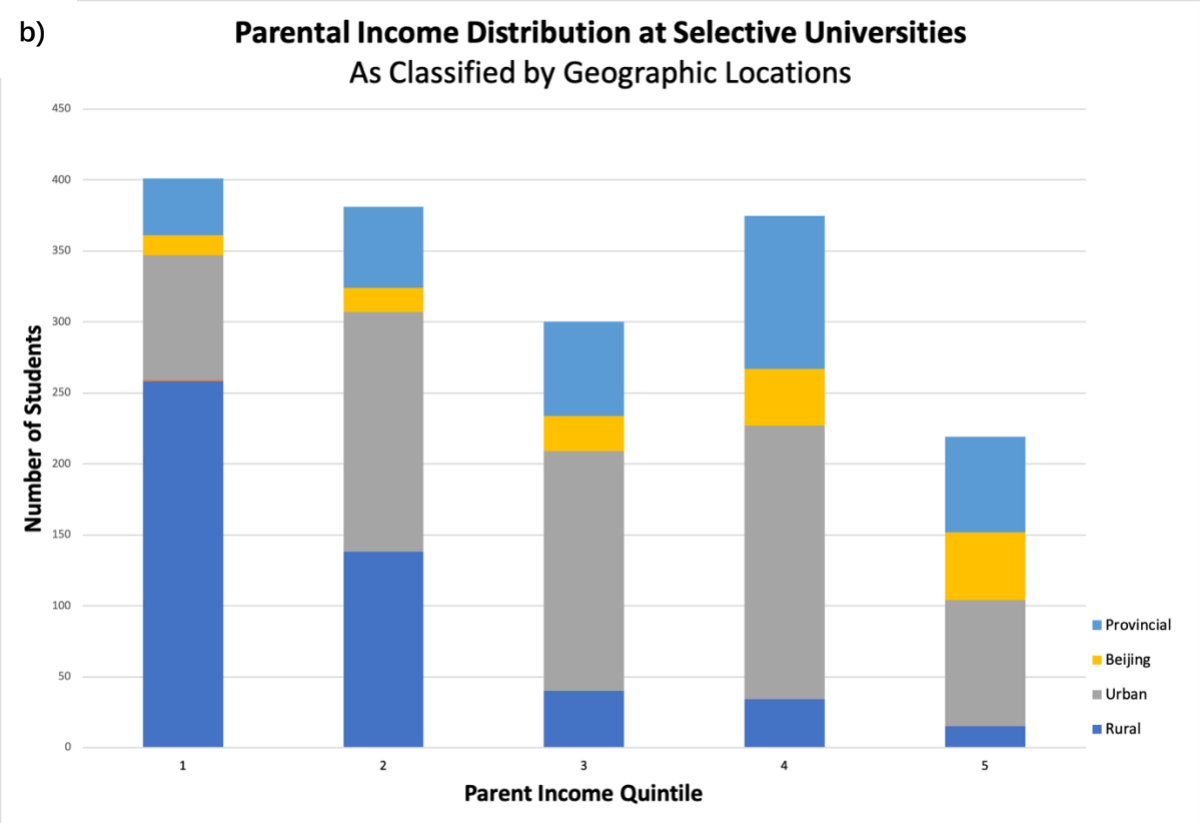


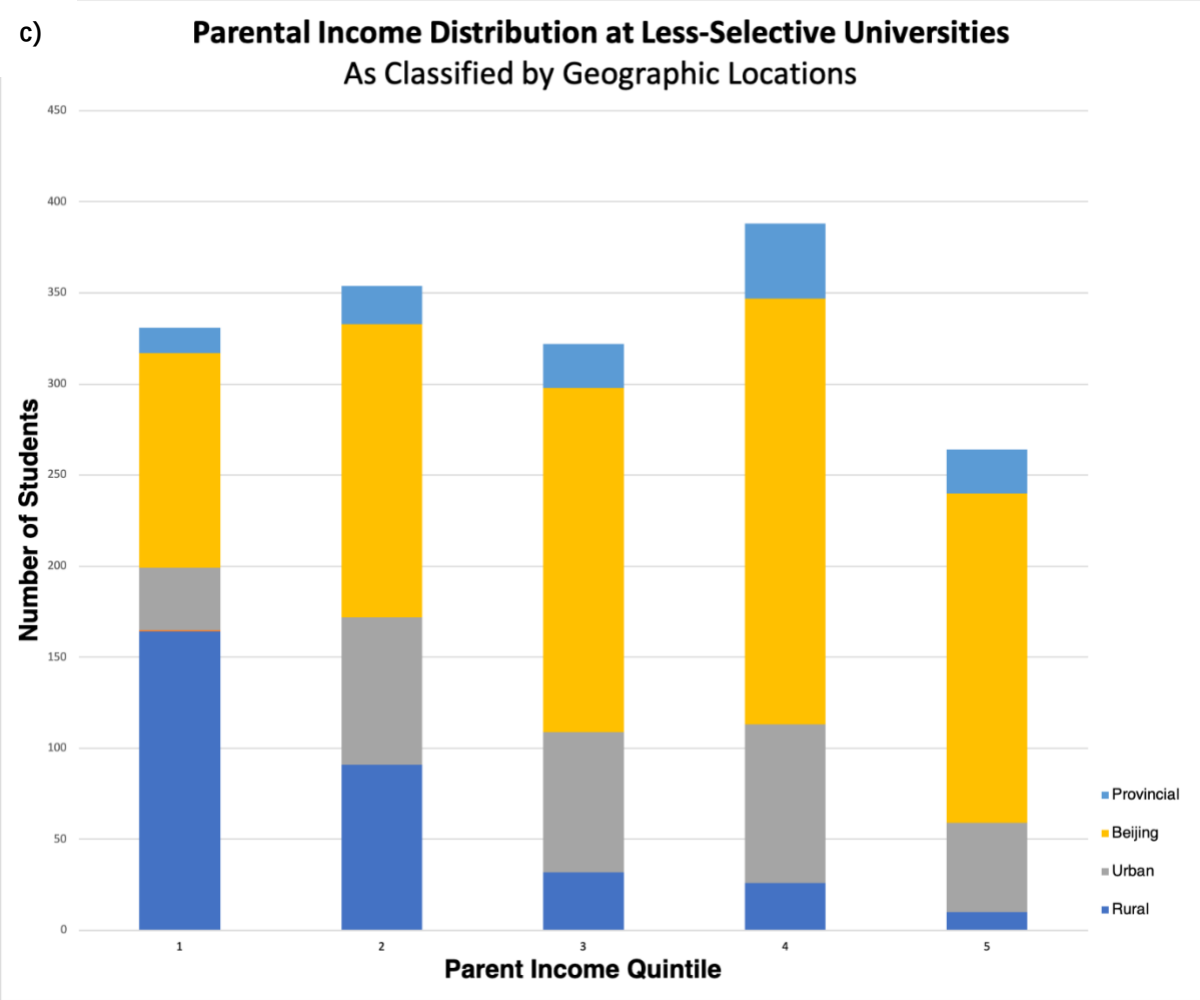
Figure A.1 Parental Income Distribution at Three Tiers of University

Figure A.1 shows clear associations across all 3 tiers of university admission with parental income quintiles and urban/rural origin, with elite universities predominantly admitting students from urban cities and with parents in higher income quartiles. Selective universities take a great number of poorer and rural students, and the strong association between less-selective universities and local (Beijing) students remains clear after controlling for parental income.

b)


Parental Income Distribution at Selective Universities
As Classified by Geographic Locations
Number of Students
450
400
350
300
250
200
150
100
50
0
1
2
3
4
5
Parent Income Quintile
Provincial
Beijing
Urban
Rural

c)


Parental Income Distribution at Less-Selective Universities
As Classified by Geographic Locations
Number of Students
450
400
350
300
250
200
150
100
50
0
1
2
3
4
5
Parent Income Quintile
Provincial
Beijing
Urban
Rural

APPENDIX III PROPORTIONAL ODDS ORDERED LOGIT MODEL PREDICTING STUDENT'S CATEGORY OF COLLEGE ATTENDED

Table A.1 Proportional Odds-Ordered Logit Model Predicting Student's Category of College Attended

	Model 1: Family Background	Model 2: Status of Secondary School	Model 3: Standardised *Gaokao* Score	Model 4: Preferential Recruitment Policy
Parent SES (Ref: Agriculture/Unemployed)				
Working Class	1.022	0.987	1.060	1.077
	(0.107)	(0.109)	(0.112)	(0.113)
Professional	1.166	1.134	1.148	1.230
	(0.123)	(0.125)	(0.129)	(0.131)
Managerial	1.326**	1.237	1.323*	1.337**
	(0.137)	(0.139)	(0.144)	(0.146)
Parent Education (Ref: Less than secondary school)				
Secondary School	0.958	0.943	0.959	0.919
	(0.090)	(0.092)	(0.094)	(0.095)
Associate	1.117	1.052	1.076	0.998
	(0.121)	(0.123)	(0.127)	(0.129)
Bachelor's Degree	1.802***	1.667***	1.684***	1.386**
	(0.122)	(0.125)	(0.128)	(0.131)
Household Income	1.178***	1.127***	1.124***	1.112***
	(0.032)	(0.033)	(0.034)	(0.034)
Party Membership (Ref: Y)	1.074	1.089	1.028	1.024
	(0.068)	(0.069)	(0.071)	(0.073)
Hukou status (Ref: Urban)	0.993	0.957	0.950	0.969
	(0.163)	(0.167)	(0.173)	(0.173)
Urbanicity (Ref: Rural village)				
Urban	0.984	1.008	1.042	1.043
	(0.097)	(0.098)	(0.102)	(0.103)
Beijing	0.121***	0.163***	0.201***	0.196***
	(0.110)	(0.113)	(0.117)	(0.119)
Provincial Cities	1.205*	1.108	1.168	1.120
	(0.111)	(0.113)	(0.116)	(0.118)
Ethnicity (Ref:	0.945	1.048	1.218**	1.297***

Non-Han)				
	(0.086)	(0.088)	(0.090)	(0.091)
Sibling (Ref: Have Siblings)	0.833**	0.883*	0.883*	0.931
	(0.072)	(0.073)	(0.075)	(0.076)
Gender (Ref: Female)	0.756***	0.780***	0.881**	0.885**
	(0.058)	(0.059)	(0.061)	(0.062)
Secondary School Status (Ref: Non-Key-Point School)				
Key-point county		1.751***	1.292**	1.363**
		(0.115)	(0.120)	(0.123)
Key-point national/provincial		3.678***	2.439***	2.357***
		(0.111)	(0.116)	(0.118)
Standardised *Gaokao* Score			1.622***	1.686***
			(0.024)	(0.024)
IFA (Ref: Yes)				7.230***
				(0.114)
Constant cut 1	2.011**	3.253***	3.435***	3.541***
	(0.346)	(0.365)	(0.376)	(0.381)
Constant cut 2	11.93***	20.57***	26.30***	30.33***
	(0.348)	(0.367)	(0.379)	(0.384)
Pseudo R^2	0.113	0.135	0.187	0.221
Observations	4,704	4,704	4,704	4,704

Standard errors in parentheses

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

Estimates are presented as the odds of coefficient: $e^{coef.}$

APPENDIX IV BRANT TEST OF PARALLEL REGRESSION ASSUMPTION FOR SELECTED VARIABLES

Table A.2 Brant Test of Parallel Regression Assumption for Selected Variables

	Chi2	p>Chi2	df
All	402.76	0.000	15
Parent SES (Ref: Agricultural/Unemployed)			
Working Class	0.89	0.345	1
Professional	2.19	0.139	1
Managerial	2.07	0.151	1
Parent Education (Ref: Less than secondary schooling)			
Secondary School	0.73	0.394	
Associate	0.16	0.693	1
Bachelor's Degree	6.82	0.009	1
Household Income	19.04	0.000	1
Party Membership (Ref: Yes)	3.33	0.068	1
Hukou Status (Ref: Urban)	0.11	0.738	1
Urbanicity (Ref: Rural village)			
Urban	0.10	0.755	1
Beijing	67.86	0.000	1
Provincial city	1.24	0.265	1
Gender (Ref: Female)	21.29	0.000	1
Ethnicity	39.13	0.000	1
Sibling (Ref: Have Siblings)	3.46	0.063	1

APPENDIX V CORRELATION MATRIX OF MEASURES FOR STUDENT'S CATEGORY OF COLLEGE ATTENDED

Table A.3 Correlation Matrix of Measures for Student's Category of College Attended

	Parent SES			**Parent Education**						**Urbanicity**			**Secondary School**					
	Working	Professional	Managerial	Secondary	Associate	Bachelor	Household Income	Party Membership	Gender	Urban	Beijing	Provincial	KP county	KP national	*Gaokao*	Ethnicity	Sibling	*Hukou*
Parent Education																		
Secondary School	.28**	.45**	.28**															
Associate's	.50**	.73**	.79**															
Bachelor's	.47**	.86**	.85**															
Parent SES																		
Working	—																	
Professional		—																
Managerial			—															
Household Income	.50**	.64**	.72**	.25**	.49**	.61**	—											
Party Membership	.26**	.54**	.67**	.19**	.55**	.64**	.31**	—										
Gender	.14**	.12**	.16**	.11**	.18**	.14**	.06**	-.04**	—									
Urbanicity																		
Urban	.65**	.78**	.76**	.31**	.66**	.73**	.48**	.39**	.15**	—								
Beijing	.50**	.50**	.67**	.27**	.53**	.69**	.52**	.28**	.21**		—							

Provincial	.54**	.68**	.74**	.24**	.67**	.71**	.54**	.43**	.13**			—						
Secondary School Status																		
KP County	-.09**	.02	-.07	-.03	.02	.00	-.06*	.02	.01	.04	-.21**	-.04	—					
KP national	.05	.20**	.18**	.01	.14**	.18**	.11**	.12**	-.03	.12**	-.26**	.19**		—				
Standardised *Gaokao*	-.04	.07**	.04	-.50*	-.00	.06**	.04*	.08*	-.08**	.01	-.21**	.05*	.26**	.28**	—			
Ethnicity	-.01	-.00	-.02	.03	.02	-.00	-.04**	.01	.03*	.02	-.06**	.26**	.28**	-.05**	-.05**	—		
Sibling	-.47**	-.60**	-.65**	-.24**	-.60**	-.64**	-.35**	-.29**	-.04**	-.45**	-.52**	-.61**	-.05*	-.09**	-.03	.09**	—	
Hukou Status	.13**	.22**	.22**	.05*	.16**	.22**	.14**	0.14**	.05**	.20**	.15**	.13**	.02	-.03	.02	.01	-.13**	—

Source: BCSPS, 2009

*p < 0.05, **p < 0.01.

APPENDIX VI BCSPS'S CLASSIFICATION OF MAJORS

Broad Categories	Specific Major
01 Philosophy	0101 Philosophy
02 Economics	0201 Theoretical Economies 0202 Applied Economies
03 Law	0301 Law 0302 Politics 0303 Sociology 0304 Ethnology
04 Education	0401 Education 0402 Psychology 0403 Physical Education
05 Literature	0501 Chinese Language and Literature 0502 Foreign Languages and Literature 0503 Journalism 0504 Art
06 History	0601 History
07 Physical Sciences	0701 Mathematics
	0702 Physics 0703 Chemistry 0704 Astronomy 0705 Geography 0706 Atmospheric Science 0707 Marine Science 0708 Geophysics 0709 Geology 0710 Biology 0711 Systems Science 0712 History of Science and Technology
08 Engineering	0801 Mechanics 0802 Mechanical Engineering 0803 Optical Engineering 0804 Instrument Science and Technology 0805 Material Science and Engineering 0806 Metallurgical Engineering 0807 Power Engineering 0808 Thermo-physics 0809 Electrical Engineering

	0810 Information and Communication Engineering 0811 Control Science and Engineering 0812 Computer Science and Engineering 0813 Architecture 0814 Civil Engineering 0815 Hydraulic engineering 0816 Surveying Science and Engineering 0817 Chemical Engineering and Technology 0818 Geological Engineering 0819 Mining Engineering 0820 Petroleum & Natural Gas Engineering 0821 Textile Science and Engineering 0822 Light Industry Technology and Engineering 0823 Transport Engineering 0824 Naval Architecture and Marine Engineering 0825 Aeronautics & Astronautics Engineering 0826 Armament Science and Technology 0827 Nuclear Science and Technology 0828 Agricultural Engineering 0829 Forestry Engineering 0830 Environmental Science and Engineering 0831 Biomedical Engineering 0832 Food science and Engineering
09 Agricultural and National Resources Sciences	0901 Crop Science 0902 Landscape Technology 0903 Utilisation Science of Agricultural Resources 0904 Plant Protection Science 0905 Animal Science 0906 Veterinary Medicine 0907 Forestry
	0908 Fishing Industry

10 Medicine	1001 Medicine 1002 Clinical Medicine 1003 Oral Medicine 1004 Public Health and Preventive Medicine 10051 Basic Chinese Medicine 10052 Clinical Chinese Medicine 1006 Interdisciplinary of Chinese Medicine and Western Medicine 1007 Pharmacy 1008 Traditional Chinese Medicine
11 Military	1101 Military Doctrines and History 1102 Defence Studies 1103 Military Geography 1104 Strategic Studies 1105 Leader Development Science 1106 Military History 1107 Military Politics 1108 Military Technology and Equipment
12 Management	1201 Management Science and Engineering 1202 Business Administration 1203 Agricultural and Forestry Economics & Management 1204 Public Management 1205 Library Science and Management

Source: BCSPS (2009)

APPENDIX VII INTERACTION TERMS BETWEEN ALL THE INDEPENDENT VARIABLES AND GENDER

Table A.4 Interaction Terms between All the Independent Variables and Gender

	Non-Interaction Model		Interaction Model with Gender		Non-Interaction Model		Interaction Model with Gender		Non-Interaction Model		Interaction Model with Gender	
Selection of STEM college major												
	Model 1: Background and qualifications				**Model 2: Cultural capital**				**Model 3: Family Plans**			
Predictor	β *(SE)*	$e^{coef.}$	β *(SE)*	$e^{coef.}$	β *(SE)*	$e^{coef.}$	β *(SE)*	$e^{coef.}$	β *(SE)*	$e^{coef.}$	β *(SE)*	$e^{coef.}$
Family Characteristics												
Parent SES (Ref: Agricultural Working Class)												
Working Class	-0.221 (0.118)	0.802	-0.356 (0.190)	0.701	-0.179 (0.121)	0.836	-0.279 (0.195)	0.757	-0.221 (0.118)	0.801	-0.349 (0.191)	0.705
Professionals	0.007 (0.139)	1.007	-0.090 (0.218)	0.914	0.056 (0.142)	1.058	0.003 (0.225)	1.003	0.004 (0.139)	1.004	-0.083 (0.218)	0.921
Managerial Staff	-0.300 (0.155)	0.741	-0.562 (0.240)	0.570	-0.244 (0.159)	0.783	-0.457 (0.249)	0.633	-0.306 (0.155)	0.737	-0.557 (0.241)	0.573
Household income	-0.097** (0.038)	0.908	-0.125*** (0.023)	0.083	-0.081** (0.039)	0.922	-0.114*** (0.024)	0.893	-0.095** (0.038)	0.910	-0.125*** (0.024)	0.882
Aptitude at 12th grade												
High school characteristics (Ref: Non-key-point school)												
Key Point County	-0.233 (0.119)	0.792	-0.225 (0.172)	0.799	-0.233 (0.119)	0.793	-0.241 (0.173)	0.786	-0.239 (0.119)	0.788	-0.248 (0.172)	0.780
Key Point National	-0.164 (0.118)	0.849	-0.220 (0.175)	0.803	-0.151 (0.119)	0.860	-0.209 (1.406)	0.812	-0.170 (0.119)	0.844	-0.245 (0.175)	0.783
Standardised *Gaokao*	0.344*** (0.027)	1.411	0.246*** (0.039)	1.279	0.343*** (0.027)	1.410	0.248*** (0.040)	1.282	0.344*** (0.027)	1.410	-0.245*** (0.039)	1.278
***Univ. Strata* (Ref: Less-selective universities)**												
Selective Univs.	0.563*** (0.089)	1.757	0.668*** (0.132)	1.951	0.563*** (0.089)	1.757	0.650*** (0.133)	1.915	0.563*** (0.089)	1.756	0.673*** (0.132)	1.961
Elite Univs.	-0.779***	0.459	-0.476** (0.162)	0.622	-0.780***	0.458	-0.488** (0.163)	0.614	-0.783***	0.457	-0.478** (0.162)	0.620

(0.105)				(0.106)				(0.105)		
Possession of Cultural Capital										
Newspaper Subscription				-0.217* (0.086)	0.805	-0.129 (0.130)	0.879			
More than 50 books in the home				0.041 (0.089)	1.042	0.066 (0.134)	1.068			
Computer at Home				-0.037 (0.133)	0.964	-2.08 (0.211)	0.812			
Internet Connection at Home				0.031 (0.125)	1.031	0.012 (0.198)	2.013			
Classic Books at Home				-0.069 (0.099)	0.933	-0.154 (0.156)	0.858			
Family Plan										
Marriage Plan										
Will get married by the targeted age								0.020 (0.095)	1.021	-0.103 (0.146)	0.902
Family Plan										
Will have children by the targeted age								-0.101 (0.089)	0.904	0.164 (0.137)	1.178
Additional Covariates										
Parent Education (Ref: Less than secondary school)										
Secondary school	-0.247 (0.103)	0.781	-0.246 (0.162)	0.782	-0.225 (0.104)	0.798	-0.219 (0.156)	0.858	-0.244* (0.103)	0.784	-0.248 (0.162)	0.781
Associate's Degree	-0.407** (0.134)	0.665	-0.397 (0.204)	0.735	-0.352 (0.137)	0.703	-0.245 (0.209)	0.783	-0.410** (0.134)	0.664	-0.309 (0.204)	0.734
Bachelor's Degree	-0.315* (0.133)	0.730	-0.228 0.205	0.796	-0.249 (0.139)	0.780	-0.131 (0.215)	0.877	-0.312* (0.134)	0.732	-0.228 (0.205)	0.796
Geographic locations (Ref: Rural village)										
Urban	-0.176 (0.111)	0.838	0.162 (0.184)	1.176	-0.147 (0.114)	0.864	0.228 (0.188)	1.256	-0.176 (0.111)	0.839	0.163 (0.185)	1.177
Beijing	-0.167 (0.119)	0.846	0.236 (0.190)	1.267	-0.128 (0.125)	0.879	0.337 (0.200)	1.401	-0.172 (0.119)	0.842	0.237 (0.190)	1.268
Provincial City	-0.089 (0.130)	0.915	0.049 (0.211)	1.051	-0.042 (0.134)	0.959	0.139 (0.217)	1.149	-0.095 (0.130)	0.910	0.047 (0.212)	1.048
Constant	1.490*** (0.377)		0.802*** (0.046)		1.376*** (0.390)		0.801*** (0.046)		1.515*** (0.379)		0.802*** (0.046)	

Pseudo R-squared	0.158	0.219	0.160	0.220	0.158	0.219

Notes: β(SE)= standardised coefficient (standard errors); STEM= science, technology, engineering, and mathematics (0=non-STEM college major, 1=STEM college major); ***p<0.001, ** p<0.01, * p<0.05. Significant findings are highlighted in bold.

Non-Interaction Model

Model 1: Overall model fit (non-interaction model): Pearson $chi^2(15)$ =529.64 Pr=0.000, -2 log likelihood = 5297.11
Model 2: Overall model fit (non-interaction model): Pearson $chi^2(20)$ =537.18 Pr=0.000, -2 log likelihood = 5287.89
Model 3: Overall model fit (non-interaction model): Pearson $chi^2(17)$ =531.28 Pr=0.000, -2 log likelihood = 5292.59

Interaction Model with Gender

Model 1: Overall model fit (interaction model): Pearson $chi^2(15)$ =754.20 Pr=0.000, -2 log likelihood = 5072.55
Model 2: Overall model fit (interaction model): Pearson $chi^2(20)$ =758.83 Pr=0.000, -2 log likelihood = 5067.92
Model 3: Overall model fit (interaction model): Pearson $chi^2(17)$ =754.53 Pr=0.000, -2 log likelihood = 5069.34

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