

ABSTRACT

This thesis explores major selection for Chinese international students and the role of cultural capital in this process. Previous research has predominantly examined the impact of cultural capital on academic achievement among domestic students, with limited attention given to its role in shaping college major selection, particularly among Chinese international students. This thesis uses both qualitative and quantitative methods to analyze the process of major selection and the transition of cultural capital across nations. The findings reveal that cultural capital accumulated through strategic approaches employed by families at different life stages significantly influences the major selection process for Chinese international students, particularly women. Specifically, embodied cultural capital acquired through pre-high school cultural activities decreases the likelihood of choosing STEM majors. Furthermore, science-related cultural capital influences the significance of career aspirations in major selection, highlighting the role of parental education in this process. Additionally, parents play an active role in shaping their children's major selection through strategic plans, such as investing in shadow education and working with private counselors. Shadow education develops both embodied and institutionalized cultural capital, indirectly influencing college major choices. Accessing private counseling services facilitates the transition to U.S. colleges, enabling the acquisition of transnational cultural capital, and impacting the selection away from STEM fields.

Major Transitions:
Cultural Capital and Major Selection for Chinese International Students at Historically
Women's Liberal Arts Colleges

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PREFACE

I started this research with a goal of understanding how Chinese international students choose their majors. I was trying to find the most important factor that outweighs everything. But through my pilot interviews, I quickly noticed that this is not a straightforward decision, but a complex process shaped by a multitude of factors that interact in intricate ways, often influenced by past decisions made by oneself or one's family. Many participants hesitated to name one single factor that had the biggest influence on their major selection. Instead, they shared all sorts of stories about how they explored their interests and major preferences in different stages of their life.

Although this decision-making process is very complex, many respondents described their choice of major as a natural and intuitive decision. This makes me wonder: why and how does this process feel so “natural” for them? While no one from my interviews considered the influence of peers as the most important one, they tend to select a similar set of majors as if they have some secret agreements.

Then I started to think about the underlying reasons behind this pattern. Instead of finding the one most significant factor, I shifted my focus on the mechanisms that contribute to their choices and explored how different factors build upon each other, particularly how they interact with cultural capital.

CHAPTER 1: INTRODUCTION

College major selection is one of the most important higher education decisions faced by students and their families. Major selection is influenced by one's identity and prepares them for membership in status groups. According to Weber (1958), in modern society with increasing rationalization and bureaucracy, one's status is conferred in large part via educational credentials. The educational system equips individuals with the specialized knowledge and practices necessary for membership in specific occupations and professions, resulting in the formation of status groups. Educational credentials function as a signal or marker of specialization and identification within a particular subject area, ultimately conferring entitlement, honor, and prestige upon the individual. Major selection, therefore, can lead to claims of privilege and social exclusions as it enables individuals to belong to specific status groups.

The importance of selecting a college major goes beyond the individual level as it serves as an example of how social reproduction operates in contemporary society. According to Bourdieu (1984), families of high socioeconomic status are more likely to possess cultural resources that confer advantages to their children in the educational system. As a result, students from these backgrounds may opt for majors that are perceived as more prestigious and valuable in terms of cultural capital, such as English, History, or Arts, which are culturally intensive and less technical. On the other hand, students from lower socioeconomic backgrounds may favor majors with better career prospects to avoid the risk of downward mobility (e.g., Ma 2009). Also,

these students are less likely to choose majors with high social or cultural rewards. Consequently, college major selection can serve as a mechanism for perpetuating social inequality through reinforcing existing social hierarchies.

This study employs a sociological perspective to understand the process and the strategies for college major selection for international students who come from China. As defined by Bourdieu (1984), cultural capital refers to the cultural knowledge, dispositions, tastes, and skills that individuals acquire through their upbringing and socialization. It might come from formal education as well as informal cultural practices and values transmitted through family, community, and social networks. It emphasizes one's familiarity with the dominant and legitimate culture. For Chinese international students who predominantly come from highly educated and affluent families, cultural capital may play an essential role in their college major selection.

This thesis concentrates on the experiences of high-status Chinese women who came to U.S. colleges to understand the effect of cultural capital in college without confounding factors. The participants in this study are current students or recent graduates from Mount Holyoke College and Smith College, two highly-selective private institutions and historically women's liberal arts colleges in the United States. These female students have the privilege of going abroad for higher education in highly selective liberal arts colleges. They represent an important part of the student body and community within these institutions. Based on enrollment data for the 2022-2023 academic year, at Smith College, 14.3% of students are international, while at Mount Holyoke College, the proportion is even higher, with almost a quarter of the student body being international students. Specifically, Mount Holyoke College has 262 Chinese students, making up 11.9% of the student population. The focus on female international students allows

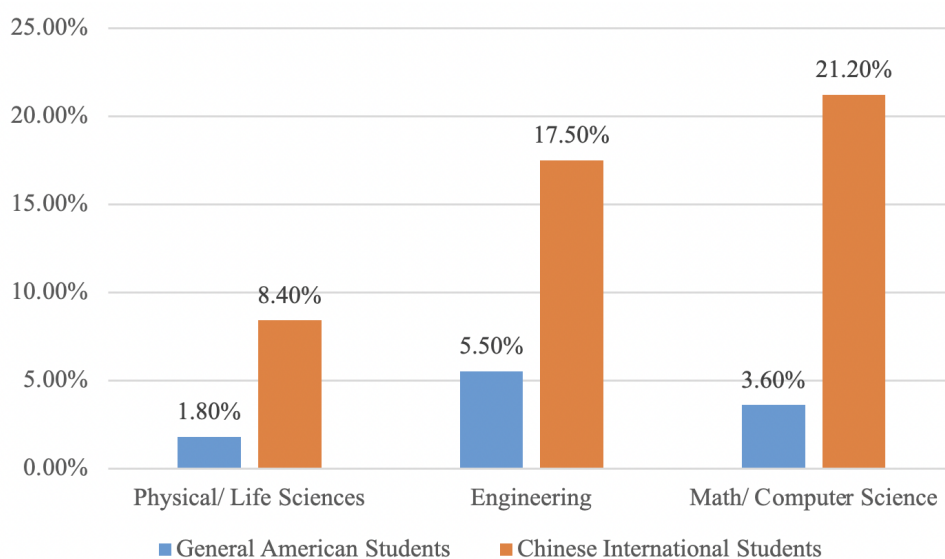
the researcher to closely examine the role of cultural capital amongst other factors for major selection.

It is important to consider how social class interacts with gender in impacting college major selection. Bourdieu (1984) suggests that one's social class is largely determined by cultural capital and access to economic and social resources. Bourdieu also takes into account other features of class, such as gender, race, age, region, or nationality as secondary factors in the constructed social class (Swartz 1998). Many studies have shown gender differences in major selection and suggest that the influence of socioeconomic background is different for men and women (Davies and Guppy 1997; Goyette and Mullen 2006; Mullen 2014; Quadlin 2020). Male students tend to be influenced by a complex set of factors. They are more likely to be influenced by potential high-paying careers associated with their major since they have the pressure of reproducing their family's affluent class status; they also attempt to avoid academic disciplines associated with femininity (Davies and Guppy 1997; Mullen 2014). In contrast, women, especially those from higher-socioeconomic backgrounds, are more likely to have high cultural involvements and form academic identities by cultural capital (DiMaggio 1982). They tend to pursue their intellectual interests and imagine career pathways based on their academic interests (Mullen 2014). This indicates that cultural capital might play a more important role in major selection for women. The focus on students at two historically women's colleges allows the author to examine the effect of cultural capital on major selection without confounding factors.

While college major selection is an important decision for all students, it holds particular significance for Chinese international students studying abroad. In recent decades, an increasing number of Chinese students pursue higher education abroad, particularly in the United States. Based on data provided by Open Doors, there are 948,519 international students enrolled in U.S.

higher education programs in the 2021-2022 academic year, representing an increase of 4% from the previous year. The majority of international students studying in the United States are originally from China and India, with the former constituting the largest group of foreign students at 290,086.

Figure 1.1 Comparison of Percentages of STEM Majors during 2019-2020 School Year



Recent statistics by Open Doors and National Center for Education Statistics show that international students tend to have different major choices compared with the general population. A large proportion of Chinese international students choose technical fields as their college major, especially science, technology, engineering, and mathematics (STEM) fields. Figure 1.1 demonstrates that during the 2019-2020 school year, Chinese international students exhibited a greater interest and preference for technical fields than the general population of college graduates in the U.S. This trend persists, as evidenced by the 2021-2022 data which indicates that 23.1% of Chinese international students chose Math/Computer Science and 17.2% pursued engineering. This raises the question: what are the underlying factors behind major selection for Chinese international students?

Sociologists have conducted extensive research on cultural capital and school successes, while only a small portion of them discuss how cultural capital influences one's college major selection. Previous studies suggest that students with different cultural capital, social capital, and economic capital have significantly different academic interests and choices of majors (DiMaggio 1982; Hassani and Ghasemi 2016; Ceglie and Settlage 2016; Hu and Wu 2019). However, these studies predominantly focus on domestic students within the United States, lacking the perspectives of international students. Different forms of cultural capital may influence the mechanisms within their major selection process, further resulting in different major choices. International students utilize their transnational cultural capital to negotiate the process of major selection in a new national education field.

The study will employ a mixed-methods approach to investigate the major selection process for Chinese international women and the influence of cultural capital. In the qualitative phase, in-depth interviews were conducted with a sample of female Chinese international students to explore their perceptions of cultural capital and its role in their decision-making process regarding major selection. In the quantitative phase, a survey was administered to a larger sample of Chinese women to measure how cultural capital interacts with other variables and affects major selection.

Research Objectives

This study will explore how students choose the area of study in college from a sociological perspective and examine the role of cultural capital in this process. To what extent do students' distinctive cultures and identities influence their major choices? More specifically, what is the role of cultural capital in the process of major selection for Chinese international

female students in American universities? By understanding the steps they took and the strategies they used to explore their major preferences, this study aims to interpret how they are able to make decisions and preserve their advantage in the educational system. Some specific research questions include:

1. How do international students position themselves in a new cultural context? How does their cultural capital transmit between their country of origin and country of study?
 2. What strategies did Chinese international students and their families employ when exploring their academic fields? How does cultural capital affect the logic of major selection?
 3. How do different forms of cultural capital lead to different outcomes in major selection?
- For Chinese international students with relatively high cultural capital, which types of majors or fields of study do they tend to select?

Significance

This thesis will extend the understanding of cultural capital. While most research in cultural capital is conducted in the context of Western countries, this thesis will contribute to a deeper understanding of how cultural capital is transitioned and translated between national fields. Scholars working on understanding the migration of cultural capital and its effect will be interested in seeing this research as it explores cultural capital for international students and shows how it will influence their college major selection.

This thesis might provide insights to understand the learning experience and the decision-making for international students. Thus, it might be useful for any educational institution that welcomes international students. Ryan and Hellmundt (2005) proposed that

educators should first recognize the difficulties for international students to connect their existing schemas to new knowledge as they are unfamiliar with the social context or academic environment, and then create appropriate contexts for them to make them feel more engaged in the classroom. By understanding Chinese international students' cultural capital and major selection, this study can offer some insights for teachers and educators to understand the reasons for the difficulties that international students experience in a new cultural context. This further gives teachers inspiration for a more inclusive curriculum to support the needs of all students. Understanding the major selection process for Chinese international students can also help school administrators facilitate better teaching practices and foster strategic initiatives to promote culturally diverse academic life.

Organization

The remainder of this dissertation extends the objectives listed above. The next chapter will review the existing literature related to the research questions. Significant contributions to scholarly understandings of cultural capital will be examined, including its impact, cross-national and transnational variations, as well as its influence on the selection of majors. The subsequent methodology chapter will explain the design of the mixed-methods study, the data collection processes, and the approaches used to analyze the data.

This study explicates the trend that a majority of Chinese international students opt for STEM majors in pursuit of their career goals. Parents with advanced degrees or work experience in STEM-related fields tend to transmit their “science capital,” which refers to science-related cultural capital, to their children. Influenced by the Chinese educational system's emphasis on scientific subjects, these parents often discuss STEM-related topics with their children and help

them learn STEM subjects outside of school. This prepares students to feel comfortable entering STEM-related fields and fosters students' career prospects in STEM-related professions, thereby prompting them to select STEM fields as their primary majors.

Another major discovery made in this thesis is that Chinese parents play a subtle but active role in guiding their children's academic pursuits, particularly in the area of selecting a major. This is accomplished through the provision of strategic plans aimed at supporting their child's learning before their enrollment in American universities. Middle-class parents in particular utilize two strategies: the first involves investing in private tutoring to acquire embodied and institutionalized cultural capital, while the second entails taking advantage of counseling services to cultivate transnational cultural capital. Different from American middle-class families who cultivate their children through organized activities, Chinese middle-class parents invested in shadow education oriented to prepare for school curriculums and elite school admission, aiming to succeed in Chinese educational systems with standardized tests. These practices develop and solidify academic identities, which can have a significant impact on their subsequent major selection. As students prepare for applying to U.S. colleges, counselors play an important role in helping them transition into the new educational field. They work closely with parents to provide students with abundant information and strategies to preserve their advantages. One of the strategies is to embrace the liberal arts spirit of exploration before making decisions.

These trends and patterns observed from the interviews are examined via quantitative data. A series of logistic regression models are constructed to investigate the determinants of choosing a STEM major. The results show that engaging in cultural activities before high school decreases the likelihood of selecting a STEM major among Chinese international students.

Furthermore, consistent with the qualitative analysis, the significant indirect effect of parental education on college major selection is found to be mediated by career aspirations. The mediating role of cultural activities is also observed in the relationship between shadow education and STEM major selection. Furthermore, the regression models indicate that an increased frequency of communication with college counselors is associated with reduced odds of selecting a STEM major at the significance level of 0.1.

CHAPTER 2: LITERATURE REVIEW

This thesis centers on Chinese international students' cultural capital and their major selection. It builds upon prior research that develop the theory of cultural capital and discuss its effect on academic achievements. This chapter will review important contributions made to the concept of cultural capital, the effect of cultural capital, cross-national and transnational cultural capital, and the role of cultural capital in major selection.

Bourdieu's Theory of Cultural Capital

The term cultural capital was proposed by French sociologists Pierre Bourdieu and Jean-Claude Passeron in 1977 to interpret educational inequality and social reproduction in France and was further developed by many scholars in the sociology of education. According to Bourdieu, cultural capital is defined as "instruments for the appropriation of symbolic wealth socially designated as worthy of being sought and possessed" (Bourdieu 1977:488). Lareau and Weininger understand cultural capital as "micro-interaction processes whereby individuals' strategic use of knowledge, skills, and competence comes into contact with institutionalized standards of evaluation" (2003:569). This concept covers a wide variety of cultural attitudes, styles, tastes, aesthetic preferences, and behaviors (Bourdieu 1977; Lamont and Lareau 1988). Cultural capital could affect all sorts of choices in our life, ranging from our daily eating,

consumption, and physical activities, to our educational attainments and school successes (e.g., Bourdieu 1984; Kamphuis et al. 2015; Ren and Liu 2022).

Bourdieu (1986) argues that cultural capital exists in three forms – embodied, objectified, and institutionalized. Embodied cultural capital refers to “long-lasting dispositions of the mind and body” acquired from participation in cultural activities (Bourdieu 1986:243). Objectified cultural capital is defined as material collections, possessions, and consumptions of capital; its usage and appropriation are determined by one’s embodied cultural capital. Institutionalized cultural capital is exemplified by educational qualifications or academic credentials to recognize the value of embodied cultural capital.

Bourdieu’s work shows the unequal distribution of cultural capital among different classes and class fractions. He suggests that cultural capital has become a source of power that contributes to the reproduction of social structure, which helps the dominant group remain or gain status. In *Distinction*, Bourdieu (1984) analyzes the tastes, lifestyles, and preferences of people with different occupations by using survey data. Certain cultural practices, lifestyles, and principles become legitimate as characterized by the dominant class. One’s knowledge of culture and resulting behaviors are closely related to social position, which explains the unequal distribution of educational performances and outcomes for people from different classes and class fractions.

Bourdieu (1984) also examines the role of habitus and field to elaborate upon his theory of the reproduction of cultural capital. Habitus is defined as a set of dispositions and schemas that determine one’s social position. Field is characterized by structured zones and spaces, internally constructed by goods and properties attached to class. Bourdieu used the formula “[habitus] (capital)] + field = practice” (1984:101) to show how individuals’ set of practices and

social positions will be transformed or reconstructed, and their habitus needs to be recalibrated, as they switch fields.

The Measures and Effect of Culture Capital

The research on cultural capital explains why families from higher classes are more likely to achieve academic success. Children from families with high socioeconomic status have more access to the informal rules of presenting themselves to teachers and adjusting to the school environment; in contrast, children from families with lower socioeconomic status do not share the dominant lifestyles and habitus with those with high cultural capital, which makes it difficult for their children to meet the standards of dominant institutions (Bourdieu 1984; DiMaggio 1982; Lareau 2011). Although Bourdieu's theory of cultural capital has a huge influence in this field, some scholars have criticized its ambiguity and engaged in debates regarding the measure and the effect of cultural capital (Jaeger 2009; Lamont and Lareau 1988; Lareau and Weininger 2003).

Early cultural capital research analyzes people's participation in high culture, measured by the frequency of exposure to fine arts and classical music. DiMaggio (1982) concludes that individuals from the upper class possess more knowledge of high-status culture, which helps them succeed in the educational system. DiMaggio and Mohr (1985) explore cultural capital by examining attitudes, interests, activities, and information about literature, arts, and music. These pieces have been criticized for being too narrow as the majority of their measures are related to individuals' familiarity with high culture, omitting their skills and abilities (Jaeger 2009; Lareau and Weininger 2003).

Furthermore, extant literature underscores parental influence on educational practices and achievements. Many studies have shown that parents' institutionalized and embodied forms of cultural capital shape their children's cultural capital (DiMaggio 1982; Kallunki and Purhonen 2017; Kalmijn and Kraaykamp 1996; Kraaykamp and Eijck 2010). De Graaf, De Graaf, and Kraaykamp (2000) conceptualize cultural capital through cognitive resources provided by parents, especially parental participation in highbrow cultural practices and parental reading habits. Lareau (2011) extends the theory of cultural capital to address class differences in parenting styles by introducing the concept of concerted cultivation, which shows how children in middle-class families can develop their talents by engaging in "organized activities" while children in low-income families experience "natural growth." The work by Armstrong and Hamilton (2013) sheds light on how families from different social classes adopt distinct parenting strategies to support the academic success of their daughters in college. Hamilton (2016) highlights the variation in families' cultural, social, and economic capital across social classes, emphasizing its significant impact on their daughters' academic performance and selection of majors.

Recent studies understand the definition of cultural capital in a more comprehensive way and explore new forms of cultural capital. Different aspects of cultural capital can work together to shape individual choices. For example, Tramonte and Willms (2010) treat cultural capital into two forms: static cultural capital (parents' highbrow cultural practices) and relational cultural capital (the transmission of cultural capital from parents to children). They find that both static and relational cultural capital can significantly impact students' reading literacy, sense of belonging at school, and occupational aspirations. To expand the view of traditional Bourdieuan cultural capital, Yosso utilizes critical race theory to develop the model of "community cultural

wealth” and notices six overlapping forms of capital, including “aspirational, navigational, social, linguistic, familial, and resistant capital”, as sources of power for disadvantaged groups to challenge systematic oppression (2005:77). Although this article describes the accumulated resources and sources of capital specific to minority groups, it shows how different forms of capital interact with each other in a dynamic process to advantage or disadvantage certain groups. Additionally, Archer et al. (2015) argue that "science capital" should be recognized as a modern manifestation of cultural capital, deviating from traditional forms of cultural capital as delineated by Bourdieu. The researchers operationalize science capital through engagement with science-related media and involvement in extracurricular science learning environments.

In sum, many sociologists have discussed different aspects of cultural capital, from participation in high culture to cognitive resources, and then to different parenting practices and other modern measures. Although they use different ways to measure cultural capital, they all share a similar perspective on how cultural capital can have a significant impact on educational outcomes. While these studies mostly focus on Western countries and discuss the experience of children who receive education in the country they grew up in, research that discusses the transition of cultural capital from their country of origin to another country also needs to be reviewed.

Transnational Cultural Capital

Most of Bourdieu's work focuses on the role of cultural capital in European societies, especially in France, paying little attention to the construction process or the effect of cultural capital in other countries. It is important to note that the effects of cultural capital differ across countries. The relationship between cultural capital and educational outcomes is similar across

different countries, while the extent of the influence differs significantly (Hampden-Thompson, Guzman, and Lippman 2008). Specifically, elite students in China, benefiting from their cultural capital, tend to have higher admission rates into Peking University (Liu, Wang, and Yang 2012). However, in South Korea's educational system, children's embodied cultural capital affects their academic performance negatively (Byun, Schofer, and Kim 2012).

Lots of recent studies explore how cultural capital transfers and converts across different countries. The literature on transnational cultural capital reflects varying opinions. Many articles demonstrate how cultural capital and habitus are adaptable and constructable in different fields and countries. Bourdieu (1984) discusses that cultural practices and habitus will switch as individuals move into a different field, but he does not explicitly discuss how this process will happen transnationally. Dai, Lingard, and Musofer (2020) show that twelve Chinese students in China-Australia articulation programs adjust their habitus as they navigate the contrasting educational frameworks and the logics of international education compared to their previous experiences in domestic education. Trueba (2002) shows that immigrants are able to take advantage of their multiple identities and create their cultural capital to succeed in diverse environments. Similar to Trueba's argument, Erel (2010) discusses how cultural capital travels in a global context and argues that migrants engage in "bargaining activities" with institutions and individuals, by drawing from resources and practices from their home country to build new forms of cultural capital within their migrant communities. Furthermore, Gu and Lee (2020) show the migration of cultural capital and habitus among migrant women in Hong Kong, demonstrating that integrated social and linguistic resources transform into capital and help individuals fit into the new environment.

The article by Sin (2013) argues that the current literature over-emphasizes the value of

foreign cultural capital, questioning the assumption that international students will embrace the western dispositions to obtain their competencies and relative advantages in their status groups. Additionally, other scholars find that the cultural capital from students' countries of origin may not be acknowledged as they enter a new country. Pherali (2012) analyzes the experience of transnational academics in the UK and concludes that the lack of understanding of local culture makes the process of transferring cultural capital extremely difficult. Leopold and Shavit examine how cultural capital does not travel easily from FSU to Israel and show that immigrant students, particularly those from non-Western countries, are less likely to benefit from their cultural capital than native students since their cultural capital "can differ from the codes which prevail in the school system of the host country" (2013:459).

The Role of Cultural Capital in Selecting College Majors

Numerous studies have shown the significance of cultural capital in the process of major selection, but they have contradictory results about how cultural capital leads students to succeed in different areas of study. DiMaggio finds that cultural capital is expected to "make a difference" in non-technical subjects like "English, History, and Social Studies" rather than technical subjects like Mathematics (1982:194). Consistent with DiMaggio's findings, Hu and Wu (2019) show that cultural capital "mediates" between family background and college major choice for Chinese students. They argue that people with greater cultural capital will have a natural tendency and greater inclination towards pursuing liberal arts major rather than a science major through improving one's cognitive skills and cultivating one's noncognitive habitus that aligns better with the qualities associated with these disciplines. A cross-national analysis by Hampden-Thompson, Guzman, and Lippman (2008) has similar results: participating in cultural

activities significantly benefits reading literacy for all countries in Europe or North America, but it is not true for mathematics and science literacy.

On the other hand, some recent studies explore the relationship between cultural capital and persistence in science disciplines (Ceglie and Settlege 2016; Hassani and Ghasemi 2016; Tilbrook and Shifrer 2022). Ceglie and Settlege (2016) conduct in-depth interviews with 16 women of color and assert that cultural capital supports students to persist in learning science. Hassani and Ghasemi (2016) conclude that students majoring in different academic disciplines have significantly different social, cultural, and economic capital based on survey data from 438 students from different types of universities in Urmia, Iran. This research shows that students learning medical sciences have significantly higher ranks on cultural capital and economic capital compared with other students. Adding to Hassani and Ghasemi's point, Tilbrook and Shifrer (2022) further suggest that parents' knowledge and cultural capital in STEM lead young adults to persist in science majors.

Only a few studies describe major selections of Chinese international students under the framework of cultural capital. Wang finds that Chinese middle-class parents often expect their children to have more comparative advantages and better career outcomes from their overseas experiences, resulting in students demonstrating "strong pragmatism in choosing majors" (2020:1320). The lack of Western cultural capital is also seen as a key component to understanding why Chinese international students tend to avoid choosing humanities majors and instead choose more technical subjects (Ma 2020).

Statement of Contribution

This thesis will extend previous research that focuses on cultural capital and its influence

on fields of study. While some studies argue that cultural capital can help students succeed in subjects that do not require technical abilities, other scholars argue that cultural capital can lead to persistence in choosing STEM majors. Through interviews and surveys, this thesis will explore the forms of cultural capital that will make students more likely to choose STEM majors.

While most research investigates the role of cultural capital in educational outcomes for domestic students in Western societies in general, only a few studies have specific focuses on cultural capital from the perspectives of students from non-Western countries or students who move across nations, such as Chinese international students. This thesis will explore the experiences of Chinese students and contribute to the current literature on how cultural capital transitions across countries, including the mechanism of accumulating transnational cultural capital and the effect of transnational cultural capital upon major selection.

The forthcoming chapter on methodology will elucidate the mixed-methods study's framework, the procedures undertaken for data gathering, and the methodologies utilized for data analysis.

CHAPTER 3: METHODOLOGY

Research Design

The study employs mixed methods to explore the complex process of major selection and identify important variables within this process. Following Creswell and Clark (2017), this study uses the method of an exploratory sequential design. This design consists of three phases: a qualitative phase followed by a survey development variant and a final quantitative phase. The researcher first collected interview data and then analyzed initial qualitative data by selecting quotes, developing codes, and finding themes. The analysis of qualitative data refined and developed the measures and the questions on a survey instrument. Then the researcher used this instrument to collect quantitative data. The findings are synthesized from both qualitative and quantitative data sources. The integration of multiple sources of data can provide the researcher with detailed, contextual, and precise insights from qualitative data as well as comprehensive, generalized, and broader perspectives from quantitative data.

Qualitative Methodology

To answer the research questions, the researcher conducted semi-structured interviews with Chinese international students from different class years at Mount Holyoke College. Eleven Chinese international students, ranging from first-years to seniors, were recruited. The researcher started the interview after receiving approval from the Institutional Review Board at Mount

Holyoke College. Interviewees were selected using the membership lists from the Chinese Cultural Association, word-of-mouth referrals, and snowball techniques. The interviews were conducted as in-person or remote meetings, lasting from 25 minutes to 55 minutes. All the questions were asked in English, and all participants were informed to answer the questions in English but were given the freedom to switch to Mandarin Chinese anytime.

Interviewees were asked to share how they choose their college majors, key factors in their decision-making processes, who was involved in their decision-making processes, the environment they grew up in, their cultural activities, family educational culture, and family educational expectations. The set of questions is designed based on a review of the literature on the role of different factors in choosing a major and ways of conceptualizing cultural capital (see Appendix A for interview question guidelines). The interviews help the researcher establish preliminary hypotheses, refine the focus of the research, and design specific survey questions.

Transcripts from the interviews were analyzed to see how they are influenced by multiple factors when they chose their major(s). Interviews were transcribed through Otter.ai and Feishu Minutes. The researcher then edited the transcripts for accuracy and manually translated the conversation when interviewees are talking in Chinese. Transcripts were shared with the interviewees to see if there are any parts with which they are not comfortable. The names of all interviewees have been pseudonymized, which allows for the protection of the privacy and confidentiality of the individuals involved.

To analyze interview transcripts, as suggested by Seidman (2006) and Saldaña (2021), the researcher first coded and labeled the transcripts, identified the list of categories and themes in the conversations, and analyzed connections among different people's responses within the category and subcategories. The analysis was finished via a qualitative data analysis software

named NVivo. Coding and labeling the transcripts can reveal the patterns or contradictions among passages, allowing the researcher to find interpretations of the research questions from the experience of interviewees.

Saldaña (2021) gives specific guidelines for coding and categorizing qualitative data, proposing “first cycle coding methods” as initial coding and “second cycle coding methods” to analyze, classify, and synthesize initial coding. The researcher started with a “generic” method and combines different first-cycle coding methods, including “attribute coding,” “structural coding,” “descriptive coding,” and “in vivo coding,” “process coding,” and/or “values coding” while changing the methods during the discovery process. By experimenting with different methods, the researcher can determine which ones are the most useful for their research. In this study, a combination of descriptive coding, in vivo coding, and process coding was employed. Descriptive codes are used to represent subtopics in the interview and manage the relationship between quotes and research questions; in vivo codes are the interesting and useful direct quotes, including phrases that are emphasized and used repeatedly by the participants; process codes show how different steps and strategies are used in major selection.

The codes from the interview transcripts are later developed into six categories of conversations: (1) learning habits and experiences before high school, (2) learning experiences in high school, (3) learning experiences in college, (4) attitudes towards the major, (5) communication with parents, (6) relationships between two majors. All the first-cycle and second-cycle codes are finished in Nvivo, which can link participants’ phrases or sentences to code, sort codes by colors, and create upper-level codes to find categories (see the interview codebook in Appendix B).

After creating the categories, the researcher grouped the interviewees by the disciplines of their major to compare their responses across groups as shown in Table 3.1. Among eleven participants, nine of them have declared or intend to declare double majors. Seven of them identify their primary major as a STEM major, such as Mathematics, Statistics, Psychology, and Data Science, while four of them majored in non-STEM majors, like psychology and education, sociology, history, and philosophy. This grouping allows the investigator to see the patterns within their major selection processes and identify the mechanisms of different outcomes to understand the association between college majors and cultural capital.

Table 3.1. Summary of characteristics of Interviewed students

Pseudonym	Class year	Primary Major	Secondary Major	Primary Major Discipline
Anne	2023	Mathematics	Economics	STEM
Bella	2023	Psychology and Education	N/A	Non-STEM
Charlotte	2023	Mathematics	Economics	STEM
Daisy	2024	Mathematics	Music	STEM
Emma	2026	Psychology	Statistics	STEM
Fiona	2024	Sociology	Statistics	Non-STEM
Grace	2023	Data Science	Mathematics	STEM
Harper	2023	Philosophy	Economics	Non-STEM
Isabella	2026	Psychology	Art Studios	STEM
Jasmine	2024	History	East Asian Studies	Non-STEM
Katherine	2023	Statistics	Economics	STEM

Quantitative Methodology

Surveys were used to analyze the relationship between their major choices and their cultural capital. The list of questions for the survey was developed based on the literature review and findings from the interviews and was used to operationalize cultural capital as well as other

factors involved in major selection. As many answers from the interviewees cannot be directly evaluated and standardized, especially when asking about their socioeconomic status and their frequency of involvement in cultural activities or communications, surveys addressed these questions specifically and played an important role in analyzing if different forms of cultural capital would lead students to choose significantly different fields of study.

The sample of participants for the survey were Chinese international students and alums who graduated within the last 10 years from Mount Holyoke College and Smith College, both of which are historically women's liberal arts colleges. Although this context might limit the generalizability of this study, this provides the researcher with the opportunity to interpret students' choices of major without the influence of the confounding environment.

Survey data is collected online via emails and private messages. The investigator sent emails to the international students' centers at two institutions to invite all current Chinese international students to participate in the survey. Additionally, the invitation to participate in the survey was sent in group chats managed by student organizations and alumnae associations at both institutions. The researcher also invited participants via word-of-mouth referrals and snowball techniques to reach as many students as possible. Table 3.2 shows the sample population who completed the survey.

Table 3.2. Survey Distribution and Completion by Research Site

Research Site	Current Enrolled Students	Completed Survey (By Current Students)	Percentage of Completed Survey (By Current Students)	Completed Survey (By Recent Graduates)
Mount Holyoke College	262	58	22.13%	7
Smith College	160	23	8.12%	1

The survey was set up into 5 sections. The list of survey questions is shown in Appendix C through online supplements. The respondents were asked to answer questions about their college majors and their cultural capital. The first section asked about their basic information, including the college they are attending, their class year, and their status regarding major declaration and completion. The second section of the survey comprises six smaller sections, each tailored to meet the specific needs of three distinct groups of participants who are in various stages of their major declaration and completion. The first subsection is designed for participants who have not yet declared their major(s), while the second and third subsections are tailored for participants who are in the process of completing their declared major(s) or have already completed their major requirements, respectively. The sections have been carefully designed to make the survey as user-friendly as possible for individuals in different stages of their academic journey. To this end, the ways of phrasing questions have been modified slightly in these subsections. The questions aim to understand their reasons for taking this major, their attitudes towards the utility of their major, possibilities of switching majors, and if their major is considered a STEM major. The list of items about the attitudes toward their majors is revised from the study by Tilbrook and Shifrer (2022), which measures science-related identity, self-efficiency, and utility values. If participants intend to have, or have declared, or used to have a second major, they will be directed to answer one more section of the same set of questions about their second major.

The third section asked about their family background, including their parents' educational backgrounds, occupations, family structure, family income level, and the level of their involvement in college major selection. Their parents' previous educational background is measured through their highest level of education and these categories are developed from both

academic and governmental sources (Kamphuis et al. 2015; Ministry of Education of the People's Republic of China n.d.; National Center for Educational Statistics 2015). The occupation categories are revised from the International Socio-Economic Index of Occupational Status (ISEI), International Standard Classification of Occupation 1988 (ISCO88), and Bourdieu's classifications of occupations (Bourdieu 1984; Ganzeboom, De Graaf, and Treiman 1992; Ganzeboom and Treiman 1996). Each option included a general category and some specific examples, which might help the responders have a clear sense of each category. The responders can choose "others" and enter a new category if none of the subcategories apply. Family income level is measured through students' self-perception of their family wealth among their peers in the community of Chinese international students. A family's socioeconomic status is measured through five variables: mother's education level, father's education level, mother's occupation status, father's occupation status, and family's relative income level.

Questions in the fourth section evaluated their possessions of educational resources, including the approximate number of books, a dedicated place for learning (e.g., a study), a daily newspaper, an encyclopedia or dictionary, a personal room, a desk, classic literature (such as a *Dream in Red Mansions*), and books of poetry. These categories are developed based on the shared responses by interviewees and the research by Hu and Wu (2019) as well as Simon and Ainsworth (2012).

The fifth section included a list of questions about their involvement in family activities related to cultural capital at different ages. Questions are listed in chronological order based on the different levels of educational institutions they are involved in, including before elementary school, during elementary school and middle school, during high school, and college.

Questions about their experience with high arts are designed to measure their cultural capital by focusing on their experiences in elementary or middle school because people tend to internalize their cultural capital through cultural practices and habitus in childhood, then develop certain skills, abilities, and interests in high school (Georg 2004). These questions related to cultural activities and cultural communications are revised from the Program for International Student Assessment (PISA) used in the articles by Hampden-Thompson, Guzman, and Lippman (2008) and Xu and Hampden-Thompson (2012). More items, such as their frequency of having one-on-one meetings with teachers and participation in shadow education, are added to estimate cultural capital as many interviewees mentioned these topics during the interview. To understand students' previous educational background and their accredited cultural capital in high school, participants are also asked to select the type of high school they attended, the range of courses in their high school, and their comfort level with intensive English writing and presentation.

The scales of the survey questions were developed based on previous research articles and the responses from my interviewees. Most questions in the survey used a 4-point scale. Many researchers pointed out the importance of having measures in similar scales to increase internal consistency for the survey (Barnette 2000; Fowler 2014). The literature on the scales of survey items shows different opinions on if adding a middle point can increase reliability and validity, but many of them agreed that omitting the middle point can avoid participants to choose options that are more socially acceptable (Armstrong 1987; Chyung et al. 2017; Garland 1991). As many of the questions were related to how one sees themselves in relation to others, a 4-point scale forced the participants to choose a side, which reduced social desirability bias.

Data collected from the survey were used to analyze how different factors are involved and interacted to predict students' major disciplines. A total of 89 students participated in this

study. A series of regression models were constructed to predict the likelihood of having a STEM major. Since our response variable is categorical, the researcher will use the method of logistic regression following Long (1997). A set of explanatory variables was constructed by summing and aggregating the survey data. Each constructed variable has a Cronbach's alpha of more than 0.5, which demonstrates the internal consistency of the data (See Appendix D for a detailed description of all observed variables). Mediation effects were also built to understand the mechanisms of how cultural capital plays a role in major selection following the methods by MacKinnon (2008) and Tingley et al. (2014). The descriptive statistics of all variables can be found in Appendix E. Detailed analysis of the survey data will be presented in Chapter 6.

CHAPTER 4: CAREER ASPIRATIONS AND SCIENCE CAPITAL

One important factor that can influence the choice of a major is the perception of its utility value in future career. For many Chinese international students, constructing specialized knowledge and skills to achieve economic security in the future is seen as the main purpose of a college education. Research has shown that Asian Americans tend to choose "culturally valued majors" which are characterized as high-salary, prestigious, and secure (Shen 2015:59). This inclination towards high-salary majors is also observable among Chinese international students. According to Wang (2020), most Chinese parents exhibit a strong sense of pragmatism when choosing majors for their children to maintain their children's advantages in the global markets. Interestingly, some interview participants with STEM majors shared a common characteristic: they had strong career aspirations and viewed their choice of major as an important step to build their career path. This highlights the importance of perceived career utility in the decision-making process of Chinese international students pursuing STEM majors.

STEM pathways are notoriously hard to complete. A vast body of literature attests to the "leaky pipeline" that students must traverse if they are to graduate with STEM majors. Persisting until completion has been demonstrated to be particularly challenging for women who often face systemic barriers that discourage their participation and success in STEM fields, such as the pressure of conforming the traditional gender roles, science pedagogy that devalues women's contributions, and a lack of female role models (Blickenstaff 2005).

This chapter reviews qualitative data derived from interviews. The first section focuses on the centrality which career ambitions hold in the process of major selection for the women interviewed. The career prospects associated with their chosen major were a significant concern for students, and as such, they strategically selected their academic disciplines in accordance with their desired future employment opportunities. The second section leverages data from the same interviews to surface ways families influenced the orientations of their children toward career and then to major. For Chinese international students, having parents with advanced degrees or work experience in STEM cultivates their science-related cultural capital, which makes them feel comfortable entering these fields.

Career Aspirations

The clarity and strength of career ambitions stood out during qualitative interviews. Emma, though unsure about her major preferences, is very determined in building her career in Public Relations (PR) before she entered college. She plans to have double majors in psychology and statistics to find success in such career path. She said: “[My interest in the PR industry] gave me a general scope... For example, PR may be related to majors such as these and so on. Then I select my majors from this pool.” Emma’s story shows how some students select their majors based on their desired career path.

Similarly, some Chinese international students also interpreted choosing majors as a way to show their qualifications in these competitive fields and make themselves stand out among other job candidates. Middle-class Chinese parents employ international education as a strategy to assist their children in obtaining relative advantages globally and achieving upward social mobility (Wang 2020). Consequently, these students consistently experience the pressure to

pursue prestigious and lucrative careers upon graduation, leading them to select majors aligned with their desired career paths. For example, Daisy had always decided to choose a STEM major as her primary major. She initially expressed interests in Physics, but her preferences later shifted towards Computer Science, and subsequently to Statistics. She ultimately declared a major in Mathematics. Daisy also mentioned that, after entering college, she “started to think about some real-life issues,” including future careers, work visas, paying back to her parents, and the return rates of this expensive tuition. When explaining the strategies she used to select majors-related courses, she mentioned:

I take probability just because I originally want to go [into] quantitative trading, which is more wealthy than software engineers. And Probability is just the core course for this career. They all want to see “Probability” on our transcript. I just got to take it. I hate Statistics actually.

Daisy considered her experiences learning applied mathematics and statistics as proof of her advantages and qualifications for high-paying positions in the global job market, which explained why she decided to choose STEM majors. These examples all demonstrate that Chinese international students consider career aspirations as an important factor when choosing majors.

The rest of this chapter aims to explore the mechanisms through which career aspirations are developed. Data from the interviews demonstrates that parents with advanced qualifications or work experience in STEM-related fields are more likely to transmit their “science capital,” a variant of cultural capital, to their children. In the Chinese educational system with a strong emphasis on scientific subjects, students cultivate science-related capital by actively participating in science-related activities and communicating science-related topics with their parents. This

makes students feel confident and comfortable in pursuing STEM professions, which explains why they pursue STEM majors as their primary choice.

Transmission of Science Capital

While Bourdieu's research focuses on highbrow cultural activities to understand cultural capital and social reproduction in France, it is worth noting that the measures and the effects of cultural capital vary in different countries with distinctive educational systems (De Graaf et al. 2000). In the Chinese educational system, there is a strong emphasis on science and technology subjects. There is a popular saying in China: "Mastering math, physics, and chemistry, one is fearless in the world." The importance of STEM is imprinted in almost every schoolchild. Additionally, Chinese parents often do not prioritize the organized non-academic cultural practices that are frequently associated with valued forms of cultural capital prioritized by American parents (Lareau 2011; Zhang 2020). They tend to engage in students' learning by economically investing in shadow education and supervising their children's homework (Zhang 2020; Zhou and Wang 2019). As a result, Chinese parents often push their children to excel in STEM areas and create a cultural environment that values and rewards STEM knowledge and skills.

The weight of career aspirations in one's major selection process is influenced by their science-related cultural capital, or "science capital." Archer et al. (2015) suggest that "science capital" should be considered a contemporary form of cultural capital, moving away from Bourdieusian arts-based forms of capital. They measure science capital from "scientific literacy," "science dispositions," and "symbolic forms of knowledge about the transferability of science qualifications" (Archer et al. 2015:929). Further research suggests that the concept of science

capital can be extended to a broader concept of “STEM capital” and finds that STEM capital is linked with aspirations and attitudes toward STEM areas (Moote et al. 2020). Parents transmit field-specific cultural capital to their children through engaging in science-related topics as well as creating a household atmosphere that places high importance on scientific knowledge and technical skills (Chen et al. 2022; Tilbrook and Shifrer 2022).

Students may construct their science capital through their home education in science-related subjects. Learning science outside of school is considered one of the essential components of science capital; these informal learning experiences may enhance scientific literacy and develop science-based dispositions (Archer et al. 2015). Parental support helps students persist in learning these subjects, especially for female students who have experienced systematic barriers in entering STEM fields. Charlotte, a student with double majors in Mathematics and Economics, was able to build confidence in these subjects under the influence of her mother. She said:

My mom is really good at math. And she was always ...number one [in her class from] primary school [to] high school. So it gives me the initial impression [that] I should [be] good at this because, you know, I should [have] inherited something from my mother, right? When I was studying math in primary school, my mom always helped me, not always, but sometimes helped me [with] quizzes [and other things].

When Charlotte embarked on her math studies, she was not as intimidated by the perceived difficulty of the STEM fields. This was because she knew that her mother had successfully navigated a similar path and could offer guidance through any potential obstacles.

Parents with advanced degrees in STEM and work experience in STEM fields have institutionalized and embodied science-related cultural capital, which allows them to

communicate the value of STEM majors and create a sense of comfort or easiness in STEM fields for their children. Recent research shows that having a parent with a STEM bachelor's degree is positively correlated with majoring in STEM and persisting in STEM majors (Tilbrook and Shifrer 2022). This means that parents with institutionalized cultural capital in STEM fields are more likely to help their children succeed in STEM majors as they may communicate the value of STEM majors with their children and prepare their children for advanced-level STEM education. Katherine, a student with double majors in statistics and economics, mentioned that her mother was frequently involved in helping her understand math concepts and instilling the value of STEM subjects in her. She said:

Before high school, my mom [was involved] a lot when I was doing Math Olympiads in primary school... I learned [the concepts and example questions] in class, but I still don't know how to solve any of them. And then my mom, I don't know why, she just knows how to solve every question. Maybe because she [was] a STEM major. I think at that time, my mom [took the lead in] teaching me and also [asked] me to do it. You need to do this. You need to learn this.

Katherine's mother's degree in engineering contributes to her family's science capital, fostering her persistence in learning science-related topics. Although her mother stopped being involved in her education in high school, she holds the belief in the importance of science subjects and considers these subjects as her comfort zones.

Additionally, parents who work in STEM-related industries are more likely to transmit field-specific cultural capital to their children by sharing their industry insights and their strategies to succeed in these fields. For instance, Grace, as a data science and mathematics double major, shared that she was able to discuss data science concepts with her parents who are

working as computer science engineers. When asked about how does their daily conversations look like, Grace said:

I'll share some of the classes that I am taking right now, [like] applied regression methods, [and] some Python courses like text analysis that I took last year. And they say: "Oh, this is similar to what I was doing, like, somewhere in their work or ... this is the kind of method that we're using [and developing] in Python."

Grace could understand how her knowledge of data science could have real-life impact through these conversations with her parents. Being surrounded by a professional community who knows how to apply theoretical knowledge from their majors to real-world issues, students can envision their future in STEM fields and strategically plan their majors in accordance with these goals.

In sum, this chapter interprets the pattern that most Chinese international students choose STEM majors to fulfill their career aspirations. Students have shown strong career ambitions and select their majors to maintain their competitiveness in the global job market. Growing up in the Chinese educational system which highly values science subjects, students built STEM cultural capital through engaging in STEM-related activities with their parents who have received higher education in STEM-related areas or work in relevant industries. Having a parent with institutional and embodied STEM capital facilitates their belief in the value of STEM-related occupations, which leads them to declare their majors in STEM fields. Overall, this chapter suggests that the intergenerational transmission of science capital between parents and their children plays an important role in shaping career aspirations and ultimately affects the decision to pursue a STEM major as the primary major.

CHAPTER 5: PARENTING TO A PLANE TICKET

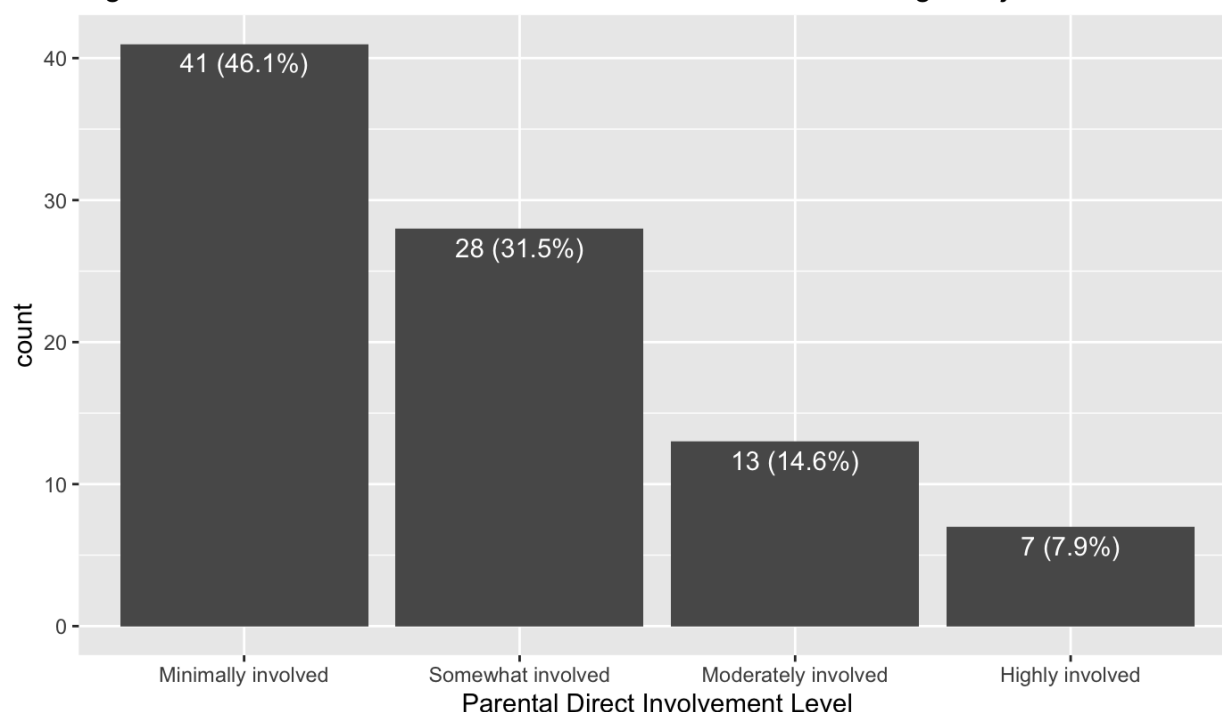
For many students, the process of choosing majors becomes a family project that is significantly influenced by the active participation of parents. Previous literature discussed how different parental practices will lead to significantly different academic performances and college major selection. In *Parenting to a Degree*, Hamilton (2016) shows that families employ different parenting approaches to assist their female children in gaining success in college. She highlights that families with middle or upper social class tend to demonstrate high levels of involvement in their children's college experiences. *Professional helicopter parents* are classified as those who highly engage in their child's college education, provide ample financial support, and prioritize the importance of professional career advancement. Hamilton also mentions that, when it comes to major selection, professional helicopters tend to “[conduct] a realistic inventory of their daughters’ academic capabilities” and steer them towards majors with clear career prospects (2016:53). These parents also encourage their children to take advantage of the academic resources on campus, such as choosing “the most selective, rigorous majors and programs” and “[taking] classes with tenured professors” (Hamilton 2016:143). In addition, Hamilton views parents who highly value the social experiences of their children as *pink helicopter parents*. These parents tend to encourage their children to select “easy majors” that allowed them to obtain superficial academic achievements with minimal learning time so that they could spend more time socializing and networking with others. Through leveraging their economic and

cultural resources, these helicopter parents directed their children in choosing majors to fulfill their shared visions of college.

While some Chinese parents share similar goals and visions of college education with American helicopter parents, their level of direct engagement in their children's college education is relatively low. Despite this limited engagement, such an approach does not necessarily result in negative educational outcomes. Compared with American parents, it is difficult for Chinese parents to be fully involved in their children's college education. Parental participation in their education decreased when their children moved to another country. When asked about the extent of parental involvement in their education, one of the interview participants Daisy said: "When I was little? Yeah, that's very important, especially for my Chinese course, nearly my mom educated me... But when you get to junior high, senior high, their involvement decreases." In addition, as shown in Figure 5.1, nearly half of the participants in the survey reported that their parents' involvement in college major selection is minimal.

Because of the substantial transformation in the cultural and social context, Chinese parents can only transfer a limited portion of their cultural knowledge, resources, and professional networks to the U.S. As Bourdieu (1984) suggests, individuals' position in the field is shaped by the interplay between habitus, cultural capital, social capital, and the rules within the field. Chinese parents may experience difficulties transitioning their cultural capital to a new field as some components of cultural capital might be less relevant in a different national context (Pherali 2012). It is hard for their parents to be directly involved in the decisions made in college, especially compared with the American "helicopters" who possess sufficient local resources and western cultural capital, such as their familiarity with the cultural context as well as norms of specific majors and professional groups.

Figure 5.1. Bar Chart of Parental Direct Involvement in College Major Selection



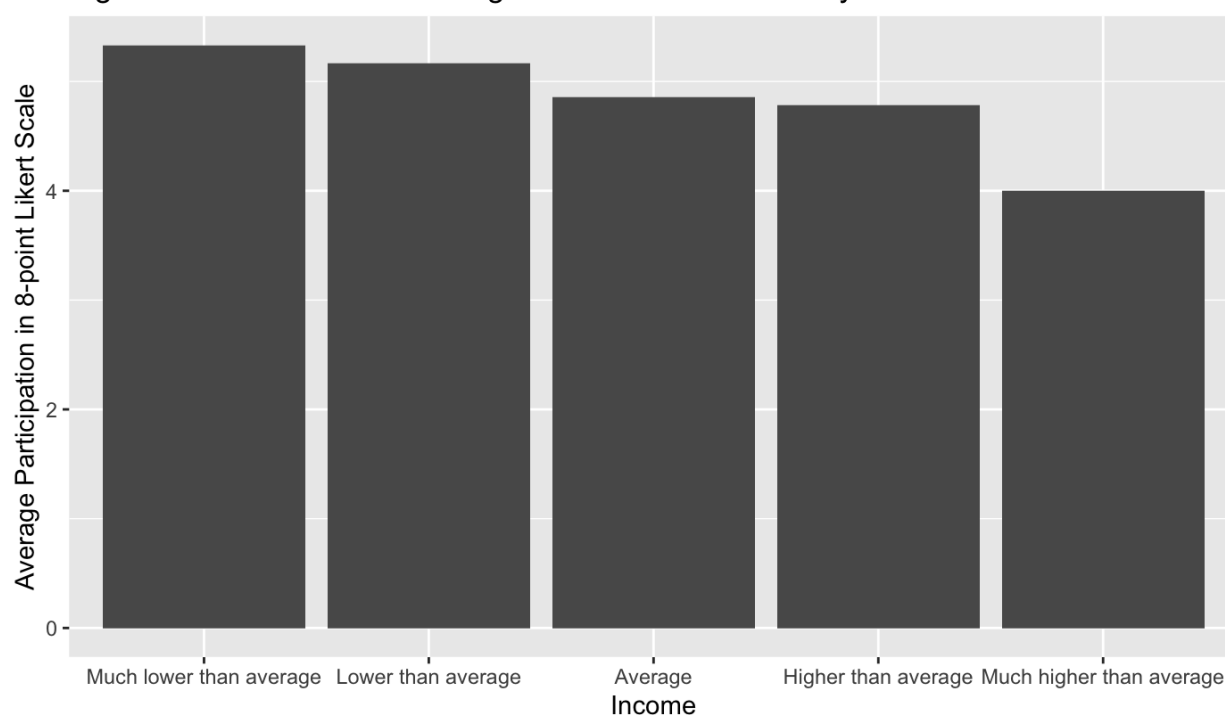
While upper or middle-class domestic students whose choices are influenced by parental investment and direct involvement in their college education, such a paradigm can not be assumed to apply to Chinese international students. Chinese students' parents are involved in their college education and major selection process in an indirect and almost invisible way, including cultivating certain habitus before going to college, investing in private tutoring to gain embodied and institutionalized cultural capital, as well as taking advantage of counseling services to build their transnational cultural capital.

Among middle-class Chinese families, it is a common strategy to strategically support children through indirect engagement via shadow education and private educational counseling. Figure 5.2 shows that students who perceive their family income as being much lower than other Chinese international students tend to have a higher frequency of participation in shadow education before high school and educational counseling during high school. Most Chinese

international students are drawn from middle or upper classes in their home country. Although many students reported "much lower than average," "lower than average," or "average" incomes, these assessments are relative to generally privileged starting position of international students. These middle-class families want to maintain their social status within the middle-class community, so they frequently participate in shadow education and seek help from private counselors to ensure their success in diverse educational systems.

The frequency of participation in these activities was lower for high-income families. This pattern may reflect the fact that families with high-income levels consider these tactics less essential for their children. It may be easier for these families to find alternative channels to achieve school choice regardless of their children's academic performances, so they may not be as anxious and demanding as middle-class parents.

Figure 5.2. Bar Chart of Average Indirect Involvement by Income



The following sections will use data from interviews to reveal some patterns about how cultural capital is obtained or functions to affect college major selection. The first section will start by analyzing the importance of early socialization in shaping habitus and accumulating cultural capital, then present that investments in shadow education is a common strategy used by middle-class parents. Child-rearing practices in the U.S., which are commonly documented in the literature, are very different from norms in China. Many middle-class Chinese parents have invested in shadow education, which refers to educational activities outside of formal education, particularly private supplementary tutoring, aiming to improve their children's academic achievements and ensure their admission to elite schools. The aim of these investments is to enhance their children's academic achievements and secure admission to prestigious schools within the exam-oriented Chinese educational system. During these sessions, students establish academic identities, referring to their perceived ability to learn in the school environment, which subsequently impacts their college major selection. The second section introduces the role of private counselors in exploring the academic journey in a new country. Counselors work with parents to help students translate their advantages across national fields and provide strategies for major selection.

Early Investment in Shadow Education

Although Chinese parents can't be directly involved in their children's college education, early preparations and involvement in education played an important role in their college major choices. The habitus that internalized in one's early socialization process and can be easily applied between the spaces, leading to one's consistent lifestyle. Bourdieu's theory of the hysteresis effect of habitus demonstrates how previous knowledge and schemes can be easily

used in later experiences. Bourdieu mentioned that “total, early, imperceptible learning, performed within the family from the earliest days of life and extended by a scholastic learning which presupposes and completes it [shapes] the relationship to language and culture” (1984:66). This manifests the importance of cultural resources in early stages of life upon their future senses of distinction. The hysteresis effect of habitus is further corroborated by Georg’s study on the transmission of cultural capital over the life course. Once accumulated in childhood and youth, one’s cultural capital tends to remain stable during the life course independent from changes in economic, social, and cultural resources (Georg 2004). While Bourdieu and Georg focus on cultural activities and topics discussed at home, Zhang (2020) highlights the role of shadow education as externalized parenting to accumulate cultural capital. As Buchmann (2002) argues, shadow education, which has traditionally been used to supplement learning in countries with exam-oriented educational systems, can provide students with valuable cultural capital.

Middle-class Chinese parents tend to use shadow education as one of their strategies to leverage their cultural capital to “win at the starting line,” supporting their children to succeed in the educational system. Shadow education activities can be categorized into two forms: one linked to school curriculums, while the other one linked to preparation for admission to elite schools (Zhang 2020). Chinese parents are aware that shadow education will help their children succeed in the Chinese educational system and maintain their elite social status.

Shadow education seems to be a common strategy employed by middle-class families worldwide, but the objectives and forms of shadow education vary considerably across different national contexts with distinct educational systems. In the United States, for instance, families invest in these activities to learn the “rules of the game,” which could provide their children with a competitive edge in a highly selective educational system. The ethnographic study of

elementary school children and their parents by Lareau (2011) introduces the concept of “concerted cultivation” as a parenting approach used by middle-class families in an attempt to foster their talents and skills. This approach involves arranging their daily schedules and developing their reasoning skills, such as participating in sports, music, and playgroups. Through these involvements in organized activities, middle-class children in America exhibit a sense of entitlement when interacting with gatekeepers of educational institutions. In contrast, under an exam-oriented educational system, the child-rearing practices used by Chinese parents help their children to prepare for tests to ensure their academic success. Zhang (2020) mentions that middle-class parents adopt the “tiger parenting” approach via tutoring as they consider tutoring as important means for achieving future success in education and the job market and further maintaining high social status. From their early years, children's lives are extensively organized and filled with activities that aim to boost their literacy, reading, writing, and mathematical skills, in preparation for their enrollment in formal schooling (Zhou and Wang 2019). In such an exam-based educational system, parents invest in shadow education to enhance their mastery of basic subjects, which contributes to their cultural capital by teaching students “dominant ways of learning and understanding cultural and scientific knowledge” (Yamamoto and Brinton 2010:70).

Participation in shadow education can also be seen as a cultural resource used to improve linguistic ability and cognitive skills for children from middle-class families. Linguistic competence is considered to be one of the key components of cultural capital (Bourdieu 1984; Sullivan 2001). One’s history of receiving bilingual education and one’s ability to communicate with others using multiple languages are categorized as linguistic capital in the model of community cultural wealth by Yosso (2005). Specifically, tutoring in spoken English is a strategic approach used by middle-class families to gain cultural capital. Proficiency in spoken

English is a valuable cultural asset that they must utilize to create social connections and networks with other middle-class families and to perform their middle-class identity (Gupta 2022).

During the interview, Grace articulated her positive encounters with spoken English courses taught by a foreign instructor. She shared that the sessions were less structured around grammar and pronunciation and more focused on enjoyable conversational practice in English. She described the experience as “going there to have fun” and learning English. While English lessons at schools emphasize on systematically learning the vocabulary and the usage of grammar professionally, spoken English lessons in shadow education institutions encourage students to enjoy the process of learning English and then feel comfortable speaking this language in any scenarios. Grace’s confidence in English contributes to the accumulation of cultural capital in the form of linguistic competency.

This confidence and comfortableness in using English is also an important cultural asset for Chinese international students. It enables them to communicate effectively with their professors, classmates, and potential employers in the U.S. It also helps them navigate the complexities of a new cultural environment and adapt to the cultural norms and expectations, contributing to their overall cross-cultural competence and ability to function effectively in a globalized world (Trueba 2002). Possessing high levels of confidence in English makes them more inclined to choose fields that require strong English reading and writing skills or fields with an international focus. Therefore, middle-class parents invest in private tutoring to help their children gain embodied cultural capital through building linguistic competence, which, in return, impacts their college major selection with an inclination toward non-technical subjects.

In addition to linguistic-related courses, many parents are willing to invest in private tutoring courses designed to help students enter competitive private secondary schools that require taking special entrance exams and field interviews in addition to the standardized tests required by public schools. Chinese middle-class parents are aware of the advantages bought by academic credentials, so they are anxious about supporting their children to have high scores in school entrance exams (Zhang 2020; Zhou and Wang 2019). They see shadow education as an approach to secure their admissions to elite schools, which are considered symbols of academic excellence and social status. Thus, for middle-class Chinese parents, shadow education becomes a means to accumulate institutional cultural capital for their children, which later impacts their major selection.

Many interview participants shared that they participated in shadow education outside of formal school since primary school. Jasmine, a student with double majors in History and East Asian Studies, received intensive tutoring aiming to prepare for entrance exams for prestigious private middle schools. Being raised in Beijing's Haidian district, a district that is known for its exceptional educational resources, she was exposed to a highly competitive academic environment. When asked about her extracurricular activities outside of school, she responded:

At that time, because of the need for an entrance examination at the beginning of junior high school, I would go to learn a “Chinese” course in a broad sense, which might be translated as Chinese language, literature, and culture in English... Most teachers graduated from Beijing Normal University and Peking University's Department of Literature and Chinese, and they may take some simple concepts from basic college courses and try to teach them in primary school, so it is a crazy teaching experiment.

Jasmine's experience highlights the crucial role of private tutoring in accumulating cultural capital for middle-class Chinese families. Her experience with shadow education allowed her to develop a strong foundation in the Chinese language, literature, and culture, which further reinforced her reading habits, particularly in reading “diaries and memoirs” as primary sources for academic research. This habit likely contributed to her success in gaining admission to a prestigious senior secondary school. When speaking about her high school experiences, she proudly shared:

[My high school] is one of the most liberal high schools in China. At least from what I heard, there are [only two other schools] with the same vibe... [My school] encourages students to take courses according to their interests. And the whole system is pretty much like the college system [in the U.S. where] you only have core requirements, selective requirements for every student.

Graduating from a prestigious high school also provided her with a formal qualification that was recognized and valued by educational institutions, thus contributing to institutionalized cultural capital. It can be also seen as a symbol of academic identity and social status. She was able to confirm her academic interests in a prestigious high school with the spirit of “liberal arts,” which encourages her to explore different areas and allows her to prioritize her intellectual interests in major selection. In fact, this experience sparked Jasmine’s interest in History and East Asian studies, which led her to pursue a double major in these fields in college. Her story shows the role of shadow education in preserving embodied and institutionalized cultural capital, which leads students to choose majors that align with their academic identity.

Seeking Advice from Private Counselors

In addition to investing in shadow education, Chinese parents also paid for services from private counselors as a strategy to indirectly involve themselves in their children's major selection process. As most Chinese parents lack the field experience and knowledge of applying to an American university, they are willing to pay for their services at a high price in exchange for personalized guidance from a counselor. Hiring private counselors and seeking their advice as supplements to high school counselors and teachers are common strategies used by the upper-middle class to optimize their schooling opportunities (McDonough, Korn, and Yamasaki 1997).

The individualized guidance offered by educational consultants often incorporates the expectations and preferences of students' parents. Parents play a significant role in engaging with consultants to determine how the college application package can be optimized to best support their children. For instance, in a recent conversation with her parents, Bella was informed that her interests in psychology and education were part of their plans since high school. During the follow-up interview, Bella shared the details about how this works:

So, we have a group chat for all the students and another one for all the parents with children who are applying in the same year. Sometimes, the counselors recommend resources and activities in this group chat to encourage their students to get involved. One time, my parents saw an activity and they thought it was perfect for me, [but] they didn't tell me directly what to do. Instead, they contacted my counselor and asked them to invite me to participate. They know that I will not say no to my counselor.

This level of involvement is not uncommon, as Bella's parents have been consistently communicating with their daughter's consultants since signing the agreement in the summer

before she entered international high school. The conscious negotiation between parents and counselors activates the cultural capital of students by aligning their educational goals with their cultural values and expectations. This process identifies the unique cultural knowledge of students and facilitates the transfer of cultural capital across generations. By actively engaging with counselors, parents indirectly support their children to navigate the complexities of the educational system and make informed decisions about their majors. Overall, the negotiation between parents and counselors represents an important mechanism for the transfer and activation of cultural capital among students.

Educational consultants tend to provide students with specialized knowledge in preparing for college applications in America, including making plans for their extracurricular activities, writing or revising personal statements, and choosing suitable schools. Counselors are also involved in the process of choosing college majors for their students to present their academic potential. Their involvement usually takes two forms: first, gathering credible information, and second, providing strategic plans to help students navigate different fields of study or tailor their applications to a specific major area.

The negotiation between counselors and students' family provides insider information about college majors and activates their transnational cultural capital. Tu (2020) analyzed the role of go-abroad educational consultants in helping urban Chinese upper-middle-class families in applying for secondary education in the United States. Consultants, who typically have prior study abroad experiences, will provide personalized and tailored services to "bridge the discrepancies" between the education market in China and the United States (Tu 2020:14). As private counselors aim to help students transition smoothly into U.S. colleges and universities, many of their services introduce how the values and norms of their home culture may differ from

those in the U.S. as well as explain the cultural norms and expectations of the new educational setting for their students. Emma shared that she considered her educational consulting firm as one of the sources of information, especially connecting resources and building activities related to her academic interests. She was introduced by her counselor to participate in a psychology research project during high school, which confirmed her interest in psychology. Similarly, Bella mentioned that she was not familiar with any social science subjects since these courses are not offered in her high school, but she was able to figure out the differences between psychology, sociology, and anthropology after speaking with a foreign advisor from her consulting firm. The information and resources provided by counselors foster the accumulation of cultural capital across nations, especially upon the understanding of social science and humanities majors.

Besides furnishing information regarding the new educational context, counselors also aid students in formulating tactics to adapt to the new environment and maintain their relative advantages. Anne's story will illustrate how counselors help her develop strategies for long-term success. Anne was very interested in business and finance when she was in high school, but eventually gave up her interest in business schools following her counselor's advice. With her affluent background, her parents will support any choices she made as long as she enjoyed the college experience. When asked about her school choices and her interests in business, she recounted:

I initially wanted to go to a business school and major in business, but my counselor suggested that a major in business might not provide enough practical skills and hands-on experience... Alternatively, a major in a more specific field, such as accounting or finance, might be more beneficial in terms of preparing you for a specific career path. This is also the reason why I chose Mount Holyoke – I want to explore different

possibilities instead of settling down in a university or a college with only business-related courses.

Anne was encouraged by her counselors to try different majors and find her real interest before declaring her major. While the belief of discovering interests and finding oneself, often referring to expressive individualism, is a dominant strategy used by middle-class students in the U.S., this belief is rare in Chinese culture due to its highly standardized educational system (Ma 2020). Counselors play an important role in helping students understand American culture and values, thereby bridging the gap between different ideologies. As suggested by Tu (2020), counselors often need to manage their client's expectations and help them find the best-fitted choice. Anne's counselor shows her the benefits of enjoying the academic journey in a liberal arts college and encourages her to step out of her comfort zone. This shows how counselors were able to equip students with strategies for acclimating to this new milieu and preserving their advantages in American universities.

To conclude, Chinese international students' parents play an understated yet active role in guiding their children's educational journey, particularly in matters concerning academic major selection. They do so by providing strategic plans to support their child's learning before they enter U.S. colleges. Parental investments in private tutoring experiences before high school helps students accumulate cultural capital in the embodied form and institutionalized form. Specifically, shadow education in English learning brings them cultural capital in the form of linguistic competency, leading them to choose non-technical subjects. Shadow education aiming to prepare for admission to elite schools might set students up for accumulating embodied and institutionalized cultural capital, which impacts their logic of major selection. Middle-class parents also hire educational counselors who gain credible information and generate strategies to

preserve their advantage in a new context. This contributes to their children's accumulation of transnational cultural capital. It further allows students to explore a diverse range of majors instead of only focusing on what they are familiar with before college.

CHAPTER 6: LOGISTIC REGRESSION AND MEDIATION ANALYSIS

This chapter will show how college major selection is influenced by multiple interacting variables based on the survey of 89 Chinese international students or recent alums from Mount Holyoke College and Smith College. While the previous chapters present how different mechanisms and strategies of utilizing and accumulating cultural capital influence college major selections, this chapter will examine the patterns observed from qualitative data by using a series of logistic regression models to predict the log odds of choosing a STEM major by multiple determinants. Mediation analysis is also utilized to understand the mechanisms of the complex relationship among cultural capital, major selection, and other interacting factors.

Following Long (1997), for multivariate analysis, a series of logistic regression models were used to model the dichotomous outcome of choosing a STEM major and a non-STEM major as the primary major. The author examines each set of independent variables in a separate logistic regression model and eventually builds a full model to test the combined effects of all variables as shown in Table 6.1. Model 6, the full model with all predictors used in the analysis, is the most useful model as the p-values for all likelihood ratio tests are smaller than 0.05.

Table 6.1. Logistic Regression Models Predicting College Major Selection

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	2.175 (2.070)	-0.680 (1.010)	1.131 (1.968)	-2.630 (0.641)***	1.438 (0.929)	2.801 (4.659)
Objectified cultural capital						
Home resources	-0.106 (0.198)					0.056 (0.286)
Number of books at home	-0.011 (0.160)					-0.042 (0.230)
Embodied cultural capital						
Cultural activity	-0.184 (0.077)*					-0.378 (0.151)*
Cultural communication	0.141 (0.120)					0.181 (0.183)
Family's socioeconomic status						
Mother's education (ref = no college)		-0.038 (0.542)				2.264 (1.033)*
Father's education (ref = no college)		-0.322 (0.466)				-0.801 (0.751)
Mother's occupation (ref = admin or sales)		-0.288 (0.678)				-0.676 (1.085)
Father's occupation (ref = admin or sales)		0.767 (0.679)				2.395 (1.086)*
Income level		0.178 (0.249)				-0.215 (0.388)
Controls						
Type of high school (ref = in US)			0.734 (1.318)			-0.559 (1.720)
Range of courses in high school			-0.112 (0.273)			-0.004 (0.393)
Confidence in English			-0.427 (0.243)			-0.426 (0.424)
Parental direct involvement			-0.084 (0.137)			0.049 (0.227)
Major identity and Self-efficacy			-0.025 (0.072)			-0.338 (0.148)*
Major utility for career				1.321 (0.302)***		2.454 (0.607)***
Parental indirect involvement						
Shadow education					0.008 (0.350)	0.344 (0.535)
College counselors					-0.478 (0.245)	-0.680 (0.386)
AIC	126.792	132.809	130.169	99.686	125.139	104.985
BIC	139.236	147.741	145.101	104.663	132.605	149.781
Log Likelihood	-58.396	-60.404	-59.084	-47.843	-59.569	-34.493
Deviance	116.792	120.809	118.169	95.686	119.139	68.985

*** p < 0.001; ** p < 0.01; * p < 0.05; p < 0.1

Across all models, it is worth noting that cultural activity, as one of the measures for embodied cultural capital, is always a significant predictor using a 5% significance level. In the full model, for every unit of increase in cultural activity, the odds of choosing a STEM major decrease by 32%. The marginal effect or the effect of an infinitely small change in engagement in cultural activities is -0.048 when all independent variables are at their mean values. This result echoes previous literature which suggests that individuals with higher cultural capital tend to pursue non-technical majors (Bourdieu 1984; DiMaggio 1982; Hampden-Thompson et al. 2008; Hu and Wu 2019).

Chapter 4 demonstrates the association between STEM major and career aspirations for Chinese international students. It proposes that both parental education and parental occupation play an important role in shaping the transmission of intergenerational science-related cultural capital, leading them to strong career aspirations and then to STEM majors.

As expected, there is a significantly positive relationship between career aspirations and declaring STEM majors across two models in Table 6.1. Model 4 shows the relationship between utility for career and STEM major. In this model, the odds of choosing a STEM major are 3.747 times higher for students who are interested in a STEM-related career compared to those who are not ($b=1.321$, $p<0.001$). In the full model, one unit increase in the belief of the utility of their major for a future career is associated with an increase of 31.02 percentage points in the probability of choosing a STEM major when holding all other variables at their means ($b=2.454$, $p<0.001$).

Consistent with findings from the interview data, parents with higher occupational status and higher education levels would indirectly contribute to students' choice of STEM major. Model 2 examines the relationship between the family's socioeconomic status and major

selection. As shown in this model, parental education and occupations seem to be nonsignificant factors explaining college majors independently. After controlling for career utility value and many other factors, the effect of the mother's education level and father's occupation status on the outcome variable becomes more apparent. The full model shows that mother's education and father's occupation has significantly positive effects on STEM major choice. Mother's advanced education level is positively associated with having a STEM primary major ($b=2.264$, $p=0.029$). The odds of having a STEM primary major increase by approximately 9.62 for students whose parents had undergraduate and graduate schools. Father's high occupational status is significantly associated with choosing STEM majors ($b=2.395$, $p=0.027$). The logistic coefficient of 2.395 indicates that the odds of choosing a STEM major are about 10 times higher for those with fathers who are professionals or business owners than for those with fathers working in administrative or sales roles. Thus, parents with higher education levels or occupational prestige might transmit their science-specific culture capital and foster their children's major selection around STEM areas. However, father's education level and mother's occupation status have opposite effects but lack significance, which suggests that more data is needed to fully understand this relationship.

Table 6.2. Causal Mediation Analysis Results

Independent Variable	ACME Estimate	95% CI Lower	95% CI Upper	p-value
Mother's Education	-0.186	-0.317	-0.05	0.008
Father's Education	-0.138	-0.290	0.00	0.07
Mother's Occupation	-0.032	-0.137	0.08	0.61
Father's Occupation	0.006	-0.180	0.14	0.92

Note: ACME Estimate refers to the estimation of the average causal mediation effect.

The relationship among education level, occupation status, career aspirations, and STEM major is further examined through the mediation analysis. As shown in Table 6.2, there is significant evidence showing that parental education level has an indirect effect on choosing a STEM major, mediating through career aspirations, while no significant evidence is found for the indirect effect of parental occupation status.

Following MacKinnon (2008), to establish the mediation effect, it is necessary to 1) see if any changes in the mother's education level will affect choosing a stem major as the primary major, 2) calculate the effect of mother's education level on career aspirations of the primary major, and 3) simultaneously examine the effect of mother's education and career aspirations on major choice. As shown in Figure 6.1, this study built three corresponding models to understand the mediation effect.

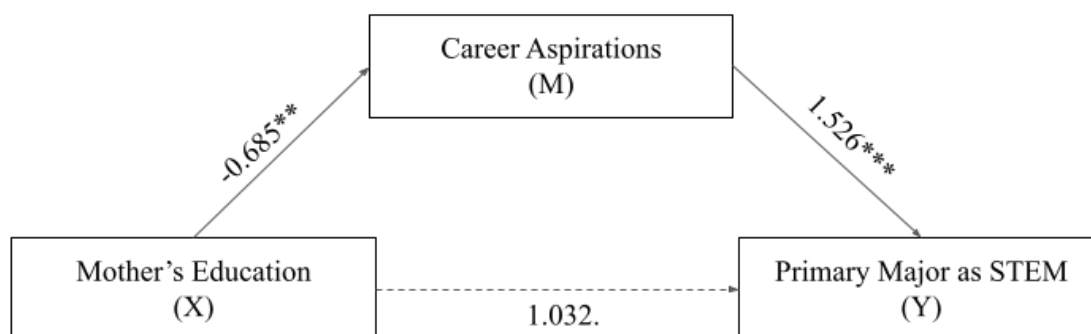


Figure 6.1. The indirect effect of Mother's Education on Major Choice

*Note: '.' indicates significance at the 0.1 level; '**' indicates significance at the 0.01 level; '***' indicates significance level at the 0.001 level.*

Overall, Figure 6.1 suggests that there is a significant mediation effect of career aspirations between mother's education and STEM major. Lower education levels are associated with stronger career aspirations, and further associated with STEM majors. Mother's education is

significantly negatively associated with career aspirations ($b=-0.685$, $t=-3.119$, $p=0.002$), and career aspirations have a significantly positive relationship with STEM major after controlling for mother's education ($b=1.526$, $z=4.449$, $p<0.001$). The significance of these variables proves that the mediation effect exists. To confirm this result, the unstandardized indirect effects were calculated for 1000 bootstrap samples. The average causal mediation effect (ACME) point estimate for the control group is -18.6% with a 95% confidence interval of -31.7% to -5% and a p-value of 0.008, which suggests the indirect effect of the mediator is statistically significant at the 0.01 level. Father's education level has a similar effect: it has a ACME estimate of 13.8% with a p-value of 0.07. This result shows that first-generation students are more likely to perceive the weight of utility in careers, which results in choosing a STEM major. To understand if science capital contributes to career aspirations and major selection, more data on the discipline of academic majors for parental education and the specific industry of parental occupation should be collected to evaluate parents' qualifications in STEM areas and to construct the variable of science capital.

Additionally, as discussed in Chapter 5, parents use a set of strategies to prepare their children for major selection before they enter U.S. colleges. The analysis from the interview transcripts and secondary sources demonstrates how shadow education is a parenting strategy contributing to the accumulation of students' cultural capital and thus indirectly influences their college major choice, while survey results further confirm this hypothesis and present how shadow education will result in significantly different outcomes in major selection.

Model 5 predicts major choice from measures of two strategies used by middle-class parents to get involved in their college major selection in an indirect approach, and the full model shows the effect of these strategies after controlling for other variables. Shadow education

is positively related to STEM majors, but the result is not significant in both Model 5 and the full model. The magnitude of the measures for embodied cultural capital increases in the full model compared with Model 1, which shows that parental indirect involvement might interact with embodied cultural capital. Mediation analysis is conducted to understand how shadow education has an indirect effect on major selection.

To show the mediation effect, the researcher first shows the relationship between participation in shadow education (the independent variable) and choosing a stem major as the primary major (dependent variable), then examines the relationship between cultural activities (the mediator) and the independent variable, eventually tested how cultural activities mediates major choice when the frequency of shadow education is controlled. Based on the survey data, cultural capital accumulated from cultural activities before high school mediates the relationship between the frequency of participating in shadow education and choosing a STEM major.

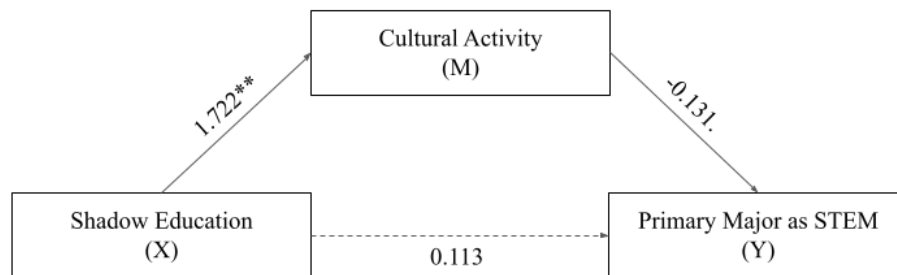


Figure 6.2. The Indirect Effect of Shadow Education on Major Choice

*Note: ‘.’ indicates significance at the 0.1 level; ‘**’ indicates significance at the 0.01 level.*

It was found that there was a statistically significant relationship between cultural activities and shadow education ($b=1.722$, $t=3.133$, $p=0.002$). When controlling for the independent variable, the relationship between participation in cultural activities and choosing a

stem major as the primary major is found to be significant at the significance level of 10% ($b=-0.131$, $z=-1.908$, $p=0.056$). The analysis based on bootstrapped samples confirms that there is a significant average causal mediation effect of -5.31%, indicating that the mediating variable has a significantly negative effect on the relationship between the independent and dependent variables for both groups.

However, the relationship between shadow education and major choice is not significant, and the total effect is very small. This represents an inconsistent mediation effect, which typically occurs when the mediated effect and the direct effect are in opposite directions (MacKinnon 2008). This also suggests the lack of power for this analysis. It might be a suppression model, which will be resolved by a larger sample size (MacKinnon 2008). Statistically, the model is as valid as a mediational model, but more evidence is needed to support the actual link between shadow education and college major choice.

Analysis from Chapter 5 also illustrates the role of college counselors in college major selection: college counselors tend to provide information and strategies to help students gain transnational cultural capital, which makes their transition to college in America easier. Many of the strategies involved showing the value of a liberal arts college, encouraging students to explore a diverse range of majors without constraining themselves to what they are familiar with in high school. The frequency of visiting college counselors the year before applying to college is considered a significant variable to predict the log odds of choosing a STEM major. It is independently negatively associated with major selection and demonstrates a stronger effect after controlling for other predictors in the full model.

Engagement with college counselors is found to be a significant predictor under the significance level of 10% after accounting for other predictors ($b = -0.680$, $p = 0.078$). This

result suggests that a unit increase in the frequency of visits to college counselors is associated with a decrease in the log odds of choosing a STEM major by 0.680 units, after accounting for all other variables. For each unit increase in the frequency of visits to college counselors, the odds of choosing a STEM major are about 50% lower, holding other variables constant.

However, since this variable is found to be significant at a low threshold, a larger sample size is needed to confirm this finding.

In sum, this chapter uses survey data to confirm the previous findings from qualitative analysis. Participation in cultural activities will decrease the odds of choosing a STEM major for Chinese international students. Consistent with the analysis in Chapter 4, parental education is found to have a significant indirect effect on college major selection and this relationship is mediated by career aspirations. Shadow education is found to be indirectly related to STEM majors through the mediating role of cultural activities, which aligns with the pattern found in Chapter 5. These regression models also show that a higher frequency of talking with college counselors is associated with a lower probability of choosing STEM majors.

CHAPTER 7: CONCLUSION

This thesis investigates cultural capital and college major selection for Chinese international students at historically women's colleges. Its research objectives are to understand the experiences of Chinese international students and their transmission of cultural capital across nations, their strategies for navigating college majors, and the impacts of different aspects of cultural capital in college major selection. This thesis answered these questions using a combination of evidence from interviews and surveys and offered three main findings.

Major selection process for Chinese international women is influenced by their accumulated cultural capital, which is shaped by strategic approaches implemented by their families throughout different stages of life. This cultural capital encompasses various interacting components, including science capital transmitted from parents who have advanced degrees or work experience in STEM fields, embodied and institutionalized cultural capital acquired through participation in shadow education during early education, and transnational cultural capital developed through interactions with private counselors during the college application process. While science capital guides students towards choosing majors aligned with their career aspirations, embodied and institutionalized cultural capital acquired through shadow education highlights their academic identity during major selection. Furthermore, transnational cultural capital diverts them away from STEM majors.

Chinese international students who obtain science-related cultural capital from their families place a greater emphasis on their career aspirations in their major selection. Data from the interview reveal that parents who possess advanced qualifications or work experience in STEM-related fields are likely to transfer their "science capital," a variation of cultural capital, to their children. In the context of the Chinese educational system, which places a strong emphasis on scientific subjects, students actively engage in science-related activities and communicate about scientific topics with their parents in order to develop science-related capital. This contributes to a sense of confidence and comfort among students in pursuing STEM careers, which is reflected in their choice of STEM majors as their primary field of study. Quantitative results align with qualitative findings and show that parental education has a significant indirect effect on college major selection, mediated by career aspirations.

Chinese parents play an active but often invisible role in shaping their children's major selection. Parents provide strategic plans to support their child's learning before they enter U.S. colleges, which includes investing in shadow education before high school and hiring private counselors during high school. As observed from interviews, shadow education in English learning facilitates the development of linguistic competency, thereby leading students to pursue non-technical subjects. Shadow education programs designed to prepare students for admission to elite schools help students accumulate embodied and institutionalized cultural capital, which affects their academic identities and subsequently influences their rationale for major selection. According to survey findings, there exists an indirect association between shadow education and STEM majors, which is mediated by cultural activities. Higher levels of embodied cultural capital gained through cultural activities in primary or middle schools are significantly associated with a lower likelihood of choosing STEM majors.

Another strategy used by Chinese parents is working with private counselors to support their children explore their journey in a new country. Counselors collaborate with parents to facilitate the translation of students' strengths into diverse national contexts, and to furnish guidance on the selection of majors. Interview data shows that counseling services can provide trustworthy information and cultivate strategies to transition into U.S. colleges, which allows students to gain transnational cultural capital. Counselors also encourage students to explore a broader range of majors, beyond those with which they may be familiar prior to entering college. Consistently, the results of regression models indicate that an increased frequency of communication with college counselors correlates with a diminished likelihood of choosing STEM majors.

Limitations and Future Directions

Although this study sheds light on the significant role of cultural capital in Chinese international women's major selection, it is important to acknowledge the limitations of the research and identify potential directions for future research. The researcher's identity as a Chinese international student helps establish a sense of rapport and comfort with the interviewees. While this insider perspective provides first-hand understanding of the cultural context, it may influence the selection and interpretation of data, potentially reinforcing preconceived notions or biases.

Additionally, this study relies on students' retrospective recall of their major selection and early life activities. While this approach may be subject to recall bias as participants may selectively recall certain events or experiences, it allows for a rich and nuanced understanding of

students' experiences and decision-making processes. Future studies could consider combining retrospective data with other objective measures or collecting longitudinal data.

This research concluded that engagement in cultural activities is negatively associated with the likelihood of choosing a STEM major as the primary major. However, participation in cultural activities is just one of the aspects of embodied cultural capital. Current literature does not have a common agreement on the measures of cultural capital. Recent research by Archer (2015) extends Bourdieu's concept of cultural capital and highlights the importance of science-related cultural capital in contemporary society, which provides new directions and perspectives to understand and estimate cultural capital. This study tried to estimate science-related cultural capital as one component of cultural communication through the question about participation in STEM-related documentaries but fails to find significant relationships from the logistics regression models. More data is needed to examine the relationship between science capital and major selection. Collecting data upon whether students' parents have advanced degrees or work experiences in STEM fields would be helpful in understanding students' science capital more precisely. Future research should continue to explore different aspects of cultural capital and its effect on college major selection.

In terms of the investigation into the transmission of cultural capital, the study provides an insightful perspective on the experiences of students, but the perspectives from parents might be missing from this study. Children's perceptions of their parents' support may not always align with their parents' intentions or actions. As a result, future research might want to incorporate the perspectives of both students and their parents in order to gain a more comprehensive understanding of how cultural capital is passed down from generation to generation. In particular, it would be interesting to explore gender differences in how mothers and fathers

strategically support their children in pursuing academic and professional goals. Such research can provide insights into the ways in which gender dynamics and societal norms influence the transmission of cultural capital.

This thesis also acknowledges that there are various approaches to understanding the areas of college majors. Most parts of this study categorized majors into STEM subjects and non-STEM subjects. It is important to note that this categorization is not a perfect or definitive one. There are many interdisciplinary fields and overlaps between subjects. Further research can investigate the differences in outcomes and opportunities between majors within the same STEM or non-STEM category.

Overall, the relationship between college major selection and cultural capital is complex and context-dependent. Many mechanisms used by Chinese international students are embedded in the Chinese educational system. Findings from this study might be applied to other Asian countries with similar educational systems, these findings may not fully capture the experiences of international students from diverse cultural and social contexts. More research is needed to comprehensively understand how cultural capital shapes major selection decisions. A cross-national analysis would be particularly useful for unraveling the complexities of cultural capital and its impact on major selection.

Implications

The results of this study highlight the importance of educators and policymakers taking into account the influence of cultural and economic capital on the academic interests of international students. It appears that parents' ability to draw on a range of resources and strategies in support of their children's college major selection implicates one's cultural capital.

This study showed the role of parents and their investments in private educational resources to accumulate cultural capital. These private resources shape students' sources of information regarding majors and necessary steps taken to choose the most suitable major, which is typically utilized by students from the middle or upper class to ensure their continued advantage. This implies that college educators and institutions need to acknowledge and counteract the strategies employed by the middle or upper class to preserve their advantages. Potential action plans could involve additional guidance and mentorship programs for international students, especially for low-income students and first-generation students.

APPENDIX A

Semi-Structured Interview Outline

1. Background
 - a. Before we start, I would like to ask you to introduce yourself briefly, including your name, pronouns, and class years.
2. Major preferences
 - a. Have you chosen a major?
 - i. If so, what is your major?
 - ii. If not, what is your intended major?
 - iii. Do you (intend to) have a minor, another major, or a Nexus?
 - b. At what point did you realize you would have to pick a major in college and start to explore your interests?
 - c. Could you tell me some of your stories as you are exploring your interests?
 - d. Did your preferences change over time? What factors lead to the changes?
 - e. When did your interest in your current or intended major start?
 - f. Are there any particular moments or events that trigger your interest?
 - g. How did you confirm your interests?
 - h. Did you ever want to give up on your major at some point?
 - i. If yes, could you share your feelings and experiences? What makes you think about giving up this major?
 - ii. If no, how did you keep your passion and interests?
 - i. What are the key factors in your decision-making process?
 - i. Potential examples: career outcomes, income level, intellectual engagement, etc.
 - ii. Could you rank these factors or determinants?
 - iii. Why is this factor the most important one?
 - iv. When did you begin to realize the importance of this factor? How?
 - v. Do you believe that your major is very important to the world? Why?
3. Social or cultural context
 - a. Where do you come from?
 - b. Do you like your hometown? Why or why not?
 - c. Imagine if you are raised in a different city or even a different country, how would that influence your major preferences?
 - d. Compared with your peers, what are some of your biggest advantages?
 - e. To what extent are your major preferences influenced by your peers and your friends?

- f. What's the role of your teachers and professors in your decision-making process of choosing your major?
 - g. Some people say that "If you master STEM, you would succeed in any career." Do you agree or disagree? And why?
 - h. Do you believe that outside comments, judgments, or reviews will easily influence you?
4. Family influences
- a. Family background
 - i. What's the highest degree your father/mother attained?
 - ii. If their highest degree is undergraduate or higher, what were their majors?
 - iii. If they did not go to college, based on your understanding, what is likely to be their major preferences?
 - iv. How would you describe your family's socioeconomic status?
 - v. What are their current occupations?
 - b. Educational expectations of the family
 - i. Did your parents discuss the importance of education?
 - 1. To what extent do your parents see the importance of education?
 - 2. How much are they willing to invest in giving you more educational resources?
 - ii. What did they expect you to major in? And why did they suggest that way?
 - iii. To what extent were your parents or other family members involved in your education?
 - 1. Did they influence your learning habits?
 - 2. Did they provide you with home education resources?
 - 3. Did they set up academic expectations for you?
 - iv. What's your reaction to their expectations?
 - c. Educational culture within the family
 - i. What are some activities you really enjoy doing in your free time?[6]
 - 1. How often do you watch a movie in the cinema?
 - 2. How often do you visit a museum or exhibition?
 - 3. How often do you watch opera, see music concerts, or enjoy dance performances in the theater?
 - ii. Did you have classes outside school, such as piano lessons, lessons for a second language, or sports training?
 - iii. In your home, do you have artwork, books of poetry, or classical literature?

- iv. Did you like to read books for pleasure?
 - 1. How often did you read?
 - 2. Which type of books do you enjoy the most? Why?
- v. Did you have a preference for learning spaces?
 - 1. Do you have a fixed place for learning, such as a personal study room?
 - 2. How often do you go to the library?
- vi. Did you observe your parents reading books when you were young?
 - 1. How often do they read?
 - 2. Will they read books for you?
 - 3. Did their reading habits influence yours?
- vii. How often do you and your parents discuss books, movies, or tv shows?
- viii. How often do you and your parents discuss social or political issues?
- d. In comparison to your peers, what is the most special or unique aspect of your family? Could you share one short story with me?
- e. Imagine you were raised in a different family, how would that influence your major preferences?

APPENDIX B

Table A1. Descriptions for categories and codes used for qualitative analysis

Categories	Subcategories	Code Descriptions and Data Samples
Learning habits and experiences before high school	Reading habits	This code refers to the frequency of reading books, favorite type of books, and frequency of visiting bookstores: "So I basically spend most of my childhood in front of bookshops."
	Performing Arts	This code refers to the practices of playing instruments and dancing: "I started to learn Chinese folk dance for nine years because we have to go to the level 10. And then piano also maybe 10 years or 12 years. So I will spend like the whole weekend in the 'shao nian gong' (Children's Palace)."
	Shadow education	This code refers to the participation in educational activities outside of formal schooling, such as private tutoring in subjects like Mathematics, physics, chemistry, oral English: "So taking math thing, 'shu ao' (Mathematical Olympiad), in elementary school and I've taken like the extra English course. But I really liked that but for those that I enrolled because it's with a foreign teacher."
Learning experiences in high school	High school curriculum	This code refers to the advanced courses taken in high school, the range of courses offered, and the course registration system: "We only have social science classes like econ, psych, and geography. And then all other classes are STEM like biology, physics, math, chemistry, and CS. So that's kind of a big reason for me to choose things later."
	College counselors	This code refers to the support from college counselors during college application processes: "My counselor just gave me the opportunity because I think maybe her friends or something else has this camp, opened this camp and she asked me to participate in, and I'm willing to do that."
	Extracurricular activities	This code refers to the engagement in various extracurricular activities, such as volunteering, internships, academic research projects, competitions, etc: "I officially Interned at a TV station during high school. But my mom doesn't want me to go into this industry. My mom is just like: okay, you can write this on your activity list, but don't go for a major."

	Peer pressure	This code refers to one's interaction with peers in high school, particularly how peers shape one's academic interests: "We were friends and they are pretty nice to me and, okay, we just like have a promise we are going to Physics together."
Learning experiences in college	College professor or advisor	This code refers to one's relationship with college professors and the role of professors in major selection: "your advisor is like the most important resource that you have on campus about different courses."
	Course enrollment	This code refers to the experiences of learning courses that align with academic interests: "taking calc 3 definitely helps me to explore more about calculus... And I realize that, like, doing math, having the moment to solve the question makes me feel so worth the time I spend rather than doing humanities."
Attitudes towards the major	Identity and self-efficacy	This code refers to one's confidence in one's ability to succeed in this major and identifies oneself as this major student: "I didn't have a clear sense of what kind of major I would like to choose. But I know I always know that I'm not really a math person."
	Doing well	This code refers to one's ability to have great academic achievements in this area: "I'm good at math rather than other a lot of subjects. When I was in high school, math was kind of an intended major for me when I would start college. So that's kind of like, I don't know, just like naturally I got into this and then doing these things."
	Career aspirations	This code refers to one's belief that this major is very useful for future careers: "I'm considering being a therapist. That's what I'm thinking about entering psychology means to me."
	Practical value for daily life	This code refers to one's belief that this major is very useful for everyday life: "I feel like philosophy is more than a major for me. It's more like a lifestyle. Or it's like a part of my life."
	Taking challenges	This code refers to one's willingness to challenge oneself, such as learning something completely new: "This is powerful and mind-blowing when you don't know something and see how like, it can work that well, you know, and we have a data science major here, so I was like, why not try it?"

Communication with parents	Expectations of academic performances and future careers	This code refers to parental expectations on their child's performances in schools, their major selection, and their future plans: "My father thinks if you get a 90 out of 100, that's enough. My mother is that kind of person, like if you get 99 out of 100 and she will be mad at you."
	Discussion of applications for theoretical knowledge	This code refers to discussions around how to apply things learned from a school context to a professional context: "But my stepfather is working at a tech company, so that's sort of like an AI related company. He's a humanities major, but he works there and he told me that if you major in philosophy, it's really easy for you to learn coding."
	Discussion of media consumption	This code refers to discussions around interesting insights on books, theater performances, and television shows: "After watching operas, I will discuss with my mother, but not my dad. And we share feelings about how I feel, and how I love the content, also how the artistic design of that."
Relationships between two majors	Negotiation of personal interests and economic security	This code refers to the reason for declaring a double major -- one for academic interests and another one for career: "I'm a bit more interested in art, but art doesn't get me money, so I do psychology."
	Interdisciplinary knowledge	This code refers to one's interpretation of having two majors and enjoying learning their overlapping parts: "I decide to have a statistics major first, so I'm just thinking about if I wanna do a double major, what is connected with that? Like something that uses part of this knowledge or like they have the overlap part. That's kind of another reason for me to choose econ."

APPENDIX C

Online Supplement:

A list of survey questions can be accessed [here](#).

A copy of the Google Form can be accessed [here](#).

APPENDIX D

Table A2. Descriptions for all variables used in the analysis

Variable Name	Description	Metric
Primary major as a STEM major	Would you consider this major as a STEM major?	1 = Yes 0 = No
Home educational resources	Select the option if you have it at your home: (1) A daily newspaper (2) An encyclopedia or dictionary (3) A desk (4) A personal room (5) A dedicated place for learning (e.g., a study) besides your bedroom (6) Classic literature (such as a Dream in Red Mansions) (7) Books of poetry	0 = One has zero of these items at home 7 = One has all seven of these items at home
Number of books at home	At your home, what is the approximate number of books (excluding textbooks and tutorial books)?	1 = 101 to 200 books, 2 = 11 to 25 books, 3 = 201 to 500 books, 4 = 26 to 100 books, 5 = More than 500 books
Cultural activity	Before high school, how often did you participate in the following activities? (1) Read books aloud to you (2) Listen to classical music at home (3) Go to the bookstore (4) Go to the movies (5) Visit a museum or gallery (6) Attend an opera, ballet, or classical concert	(Item 1-2) 1 = Once a year/Rarely/NA 2 = Once a month 3 = Once a week 4 = About every day (Item 3-6) 1 = Never or hardly ever 2 = Once or twice a year 3 = About three or four times a year 4 = More than 5 times a year
Cultural communication	During high school, how often have you discussed the following topics with your parents? (1) Political or social issues (2) Books, television or films	1 = Once a year/Rarely/NA 2 = Once a month 3 = Once a week 4 = About every day

	(3) STEM documentaries or articles	
Mother's education	Please indicate the highest level of education that has been achieved by your mother:	0 = Below Undergraduate 1 = Undergraduate or Postgraduate
Father's education	Please indicate the highest level of education that has been achieved by your father:	
Mother's occupation	What's your mother's occupation?	0 = High-level executives or business owners or professionals 1 = Others (administrative or sales worker)
Father's occupation	What's your father's occupation?	0 = High-level executives or business owners or professionals 1 = Others (administrative or sales worker)
Income level	How would you describe your family's income level compared to other Chinese international students at your school? Please choose the option that best reflects your family's income level.	1 = Much lower than average, 2 = Lower than average, 3 = Average, 4 = Higher than average, 5 = Much higher than average
Parental direct involvement	To what extent do your parents involve in your college major selection?	1 = Minimally involved 4 = Highly involved
Type of high school	Which type of senior secondary school did you attend?	1 = High school in China 0 = High school outside of China
Range of courses	How would you describe the range of courses or areas of study offered in your senior secondary school?	1 = Limited 4 = Broad
Confidence in English	During high school, to what extent that you are comfortable with the following tasks? (1) Write a 10-page paper in English (2) Do a 30-minute presentation in English	1 = Very uncomfortable 2 = Somewhat uncomfortable 3 = Somewhat comfortable 4 = Very comfortable

Major identity and self-efficacy	To what extent do you agree/disagree with the following options? (1) I took this major because I enjoy it (2) I took this major because I like challenges (3) I took this major because I do well in it (4) I took this major to succeed in college (5) I saw myself as "this major" person (6) Others saw me as "this major" person	1 = Strongly Disagree 2 = Disagree 3 = Agree 4 = Strongly Agree
Major utility value	To what extent do you agree/disagree with the following options? (1) I thought this major would be useful for career (2) I thought this major would be useful for everyday life	
Shadow education	How often did you participate in educational activities outside of formal schooling, such as private tutoring, during elementary school or middle school?	1 = Once a year/Rarely/NA 2 = Once a month 3 = Once a week 4 = About every day
College counselors	During the year before applying to college, how often have you participated in one-on-one meetings with your college counselors?	1 = Once a year/Rarely/NA 2 = Once a month 3 = Once a week 4 = About every day

APPENDIX E

Table A3. Descriptive statistics for all variables

Variable	Range	Percentage/Mean (SE)
Objectified cultural capital		
Home educational resources	1-7	5.62 (1.28)
Number of books at home	1-5	3.22 (1.40)
Embodied cultural capital		
Cultural activity	1-24	15.14 (3.55)
Cultural communication	1-12	8.23 (1.96)
Family's socioeconomic status		
Mother's education		66.29%
Father's education		82.02%
Mother's occupation		66.29%
Father's occupation		87.64%
Income level	1-5	3.09 (0.90)
Controls		
Type of high school		92.13%
Range of courses in high school	1-4	2.53 (0.94)
Confidence in English	1-4	5.28 (1.97)
Parental direct involvement	1-4	1.84 (0.95)
Major identity and self-efficacy	1-24	10.87 (3.24)
Major utility for career	1-4	2.11 (1.03)
Shadow education	1-4	2.00 (0.64)
College counselors	1-4	3.09 (0.89)

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