# ABSTRACT

Title of Document: FAMILY INVOLVEMENT IN CHILDREN'S MATHEMATICS EDUCATION EXPERIENCES: VOICES OF IMMIGRANT CHINESE AMERICAN STUDENTS AND THEIR PARENTS

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This study examines ways in which Chinese immigrant families are involved in their children's mathematics education, particularly focusing on how different types of families utilize different forms of capital to support their children's mathematics education. The theoretical framework defines four types of Chinese immigrant families – working families, small business families, transitional professional families, and settled professional families – and addresses three forms of capital – cultural, social and economic capital. In the analysis, the first two groups are often clustered as less educated families and the other two groups as highly educated families. Nine families with different backgrounds participated in the study. Data include observations, interviews, essays and Twitter messages from students, and a video discussion activity. Data analysis utilized cross-case analysis (Yin, 2002).

First, this study shows significant differences in how Chinese immigrant parents conceptualize U.S. mathematics education. Highly educated parents believed U.S. mathematics education failed to meet their children's mathematical needs while less educated parents were less critical of U.S. mathematics education.

Second, this study examines how different types of families use cultural, social and economic capital to influence their children's mathematics education. Parent tutoring and aspirations are indicators of cultural capital. Less educated parents tended to tutor their children when they were in lower grades. Students with highly educated parents received more direct tutoring from their parents, even when they went on to more advanced grades. All parents had high aspirations for their children's education, but to varying degrees depending on the type of family. One common approach was to send their children to supplementary education programs which suggest an indicator of social capital. Family location and hiring tutors are indicators of economic capital. All families but one managed to live in what they believed were good school districts. Higher income families also spent money to hire tutors to teach their children academic subjects (including mathematics) and sports.

This study contributes to the exploration of the role of families in the mathematics education of Chinese American students. It also extends current literature in general Chinese American studies that primarily focus on highly educated, high income, professional families and less educated, low income, working families while omitting populations that fall between them, particularly small business families and transitional professional families.

# FAMILY INVOLVEMENT IN CHILDREN'S MATHEMATICS EDUCATION EXPERIENCES: VOICES OF IMMIGRANT CHINESE AMERICAN STUDENTS AND THEIR PARENTS

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# Chapter 1: Introduction

To many, mathematics education in the United States is in a state of crisis. In the State of Union address on January 25, 2011, President Obama (2011) warned that "the quality of our math and science education lags behind many other nations" and stressed the urgent need to enhance math and science education in the United States. U.S. educators and policy makers decry and seek ways of addressing mathematics achievement gaps: both the gap between U.S. students' achievement and students from other countries, especially East Asian countries or districts, such as People's Republic of China, South Korea, and Japan, Hong Kong, and Taiwan (National Center for Education Statistics, 2009) and the gap between Black, Hispanic, and that of White and Asian students within the United States (National Center for Education Statistics, 2011).

**MATH**

| | *OECD Average:* | *496* |
|---|---|---|
| 1 | **Shanghai-China** | **600** |
| 2 | Singapore | 562 |
| 3 | Hong Kong-China | 555 |
| 4 | South Korea | 546 |
| 5 | Taiwan | 543 |
| 6 | Finland | 541 |
| 7 | Liechtenstein | 536 |
| 8 | Switzerland | 534 |
| 9 | Japan | 529 |
| 10 | Canada | 527 |
| **31** | **United States** | **487** |

Figure 1: PISA (Programme for International Student Assessment) 2009 Math

The first gap is widely seen in large-scale quantitative studies such as *Trends in International Mathematics and Science Study* (TIMSS) and *The Program for International Student Assessment* (PISA). For example, the results of the PISA (2009) indicate that the United States ranks 34 in mathematics and is far behind countries (or other political entities) such as Shanghai-China, Singapore, Hong Kong-China, South Korea and Taiwan (See Figure 1). Students from East Asian countries or political entities, such as Hong Kong and Shanghai, are reported to achieve at higher levels than U.S. students in mathematics on these assessments (National Center for Education Statistics, 2009, 2013a, 2013b). This gap suggests that in terms of mathematics education, there is a systematic gap between the United States and these East Asian countries (or political entities).

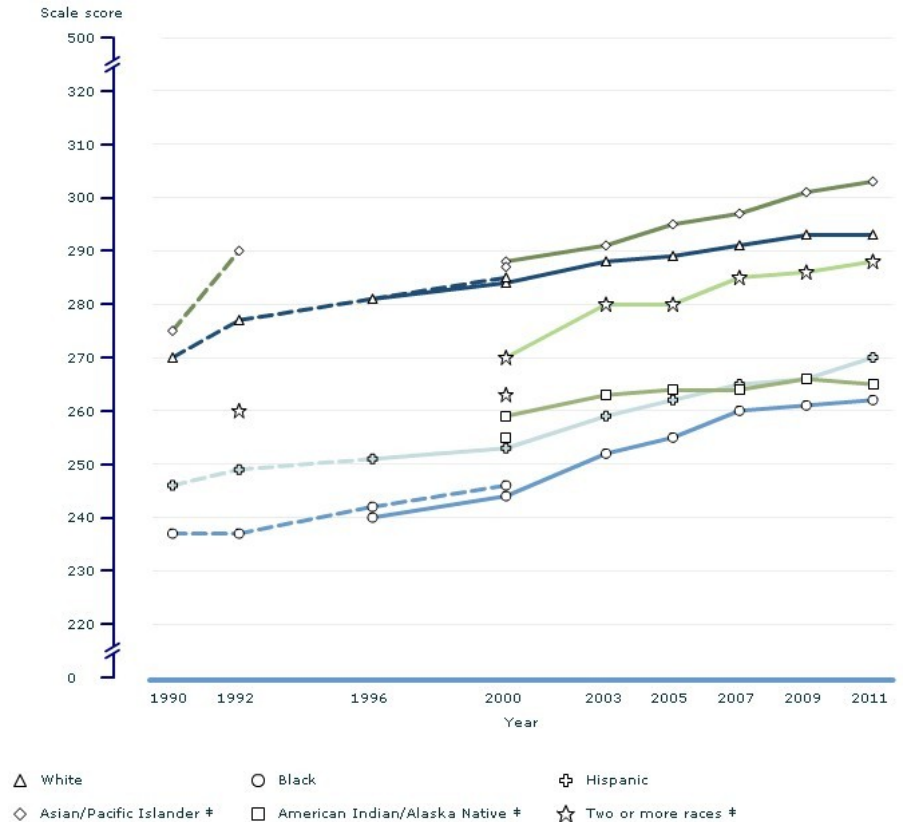


Figure 2: NAEP (National Assessment of Educational Progress) 2011 Math

However, Asian American students, who mainly receive mathematics education in the United States, are also on average high achievers in mathematics (Aldous, 2006; National Center for Education Statistics, 2011; Sheldon & Epstein, 2005a; Whang & Hancock, 1994) and in general education (Smith & Billiter, 1985). For example, NEAP (National Center for Education Statistics, 2011) results show that Asian American 8$^{th}$ graders, on average, perform higher in mathematics than other racial/ethnicity group (See Figure 2). This means that systematic educational difference between East Asian countries (or political entities) and the United States cannot explain these Asian American students' mathematics achievement. Thus, something rather than school education may influence their education, which suggests a need to examine their educational experiences at home. The field of mathematics education may gain insight into addressing these gaps by better understanding Asian American students' mathematics education experience. It is important to note that while many studies and the mainstream media report that Asian American students are, on average, high achievers in mathematics, the diversity within the population labeled Asian American students (including Chinese American students) and the public's complex image of students with Asian backgrounds must be addressed. For example, many researchers (often with Asian heritage) have questioned or criticized the "model minority" stereotype of Asian Americans (Lee, 1996; Lew, 2006b; G. Li, 2005; Suzuki, 1977), particularly by illuminating the diversity of Asian Americans. For example, in terms of Chinese American students, Weinberg (1997) analyzed that only students from middle class families were high achievers. What is needed are studies that include Chinese immigration families from different

educational, economic, and social backgrounds in order to address the impacts of the diversity of economic capital, cultural, and social capital on Chinese immigrant families' educational experiences.

Several research studies, primarily employing quantitative methodologies, have found that parental involvement is one of the most important factors contributing to Asian students' mathematics achievement (G. Li, 2006; Muller, 1995; Pan, Gauvain, Liu, & Cheng, 2006; Yan & Lin, 2005). However, qualitative analysis that deeply examines family involvement and Asian students' mathematics learning experiences is sorely needed. This dissertation is a qualitative study that examines Chinese American students' mathematics education, with a focus on the practices of and rationales for family involvement. Different types of Chinese immigrant families are included in this study. I have chosen to focus on Chinese immigrant families because, of all Asian groups, Chinese Americans have had the longest history in the United States and constitute this country's largest Asian ethnic group (Siu, 1992b). Personally, by better understanding Chinese immigrant families, I will be better prepared to educate my own child by leveraging the strengths of both U.S. and Chinese mathematics education and to deal with the potential conflicts between the U.S. mathematics educational system and the mathematics education I obtained in China.

In the following sections, I first describe my research questions. I will review and synthesize literature pertaining to "model minority" stereotype of Asians in the United States and the role and impact of family involvement on students' education. In Chapter 2, I present the theoretical framework. In Chapter 3, I describe my research methods, including data collection

and data analysis. Then, in Chapters 4 to 7, I illustrate my analysis of the four research questions respectively. Finally, in the last two chapters, I summarize the research results, and discuss the significance, implications, limitations and future research directions.

**Research Questions**

This study asks: What is the nature of Chinese immigrant family involvement in their children's mathematics education? This question is divided into five subquestions:

1: What are Chinese immigrant parents' conceptions of their children's mathematics education?

2: How do Chinese immigrant families used cultural capital to influence children's mathematics education?

3: How do Chinese immigrant families used social capital to influence children's mathematics education?

4: How do Chinese immigrant families used economic capital to influence children's mathematics education?

**The "Model Minority" Stereotype**

The public image of Chinese American and other Asian American students' academic achievement is complex. On the one hand, they are generally seen as a successful minority and are called the "model minority" (Brand, 1987; Kristof, 2006; Peterson, 1966a, 1966b). For example, in a *New York Times* article published an article at May 14, 2006, titled "*The Model Students*" (Kristof, 2006), Kristof stated, "Increasingly in America, stellar academic achievement has an Asian face", and "Among whites, 2 percent score 750 or better in either the math or verbal

SAT. Among Asian-Americans, 3 percent beat 750 in verbal, and 8 percent in math" (p.13). Asian American students are consistently reported to be overrepresented in academic achievement in general and mathematics achievement in particular (Aldous, 2006; Sheldon & Epstein, 2005b).

On the other hand, the reality of the model minority stereotype has been widely questioned for several reasons (S. Lee, 1994; Lee, 1996; Lew, 2006b; G. Li, 2005; Louie, 2004a; Suzuki, 1977). For example, this group has a large diversity within its population (S. J. Lee, 1994; Lee, 1996; Wan, 1996); different criteria for success makes the pictures of Asian Americans' success different (Ying et al., 2001).

**Explanations for Asian American students' "success"**. Researchers who at least partially accept the assumption that Asian American students as a whole are "successful" have provided different explanations for Asian American students' "success". I have identified five categories of explanations, which center on either culture or social structure, or both1. In the following paragraphs, I will briefly describe the explanations of Asian American students' education by cultural or social structural perspectives and also their limitations.

The first typical explanation can be named the "culture and Confucianism" perspective. Siu (1992a) analyzes how Chinese cultural values and Confucianism emphasize education and claims that Chinese Americans tend to define their cultural identity in terms of academic achievement. The culture and Confucianism perspective can also be found circulating in the popular and media discourse about Asian Americans. In his article in the *New York Times,* Kristof

[1] I will give the definition of social structure in the theoretical framework.

(2006) concluded, “[the reason behind the Asian-Americans’ success] is the filial piety nurtured by Confucianism for 2,500 years”, “Confucianism encourages a reverence for education”, and “…the success of Asian-Americans is mostly about culture” (p. 13).

However, many scholars rejected the cultural perspective of Asian Americans’ success (Louie, 2004a; Ogbu, 1983; Sue & Okazaki, 1990; Weinberg, 1997). Ogbu (1983) argued that the cultural explanation is problematic because “it makes no distinction between the behavior and values of peasants and those of the higher classes. In the history of China, only a very small portion of Chinese were educated and most Chinese were illiterate”(Ogbu, 1983, p. 184). This perspective has also been challenged by Weinberg (1997) and Kwong (1987) . Kwong (1987) claims,

> There is no truth to the belief that the Chinese have a greater respect for knowledge than other groups. If that were the case, the Chinese selection of college majors would spread across many academic disciplines. As it is, few Chinese go into humanities and social sciences; most concentrate on technical fields and engineering science….The claim linking Chinese achievement in education to Confucianism is a myth. Confucius’s greatest legacy was the structuring of a political and social order in ancient China. Scholars were the highest class, ranking above farmers, menial laborers, and merchants. (p. 72-73)

The second category involves what I call the “social class” perspective, which is a structural explanation. These researchers claimed that the general Asian American population has a bimodal distribution with respect to educational attainment and socioeconomic status (Hu, 1989; Rong & Preissle, 1998). They argued that there are large proportions of both educated and skilled Asian immigrants and less-educated and unskilled Asian immigrants. The Chinese American population presents a similar bimodal distribution (G. Li, 2005; Louie, 2004a; Siu,

1992a; Weinberg, 1997; Yin, 2007). There are two distinct groups of Chinese immigrants: a) those who are educated, skilled and professional immigrants, that is, the middle class; b) those who are less-educated, unskilled and manual-working immigrants, that is, the working class[2]. Some scholars called them "uptown" and "downtown" Chinese respectively (Louie, 2004; Yin, 2007). Siu (1992a) argues that "uptown" children tend to show high educational attainment and "downtown" children do less well in school. Some researchers argued that it is the sizable middle class Chinese immigrant population that has fostered the reputation of Chinese Americans and Asian Americans more generally as "high achievers" or "model minority" (Holdaway, 2007; Weinberg, 1997; Yin, 2007). The reason why there is a sizable population of professional Chinese immigrants is because U.S. immigration policy favors educated and skilled immigrants (Siu, 1992a) and, in this way, contributes to Asians' success (Zhou, 2007). This perspective implies that social class is related to the "success" of Asian American students in general and Chinese American students in particular. Weinberg (1997) claims,

> [The Chinese]…developed a sizable, educated, middle class. The early generations of Native Americans, African-Americans, and Mexican Americans lacked such a sizable [middle] class. That was one of the reasons that Chinese were mistakenly regarded as especially gifted in the field of education. Ethnic factors were confused with class factors, indigenous development with that stemming from immigration. (p. 36)

The "social class" perspective has been challenged. Some researchers have argued that socioeconomic status alone cannot explain Asian American students' academic success (Fuligni,

[2] Weinberg (1997) added that there is a third group of Chinese immigrants which he defines as the "down" class: "These where persons who came from a highly educated background and who had held professional managerial jobs in China. Now, however, they could be found working at the most menial occupations in the United States" (p. 36).

1997). In her dissertation work, Louie (2004) found that students from both the middle class and working class do well in school. Similarly, a study about Asian Americans' adaptive strategies in California indicated that Asian parents are highly engaged in home-based teaching such as reading, writing and doing mathematics with their children (Cheng, Trueba, & Ima, 1992). The authors claimed that this type of home teaching is very common among Asians and is not class linked. Conversely, research has also shown that being from the middle class does not necessarily mean that a Chinese immigrant student will be a high achiever in school. For example, in one case study, Li (2005) explored how a child from a well-educated middle class Chinese (Hong Kong) immigration family failed in school and lived under the shadow of other children's success. Li argued that the "model minority" images contribute to Asian students' underachievement and the promote invisibility and disguise the social realities of many Asian students who are not successful.

Another structural explanation can be termed the "inequality of society" perspective. This perspective argues that Asian Americans are facing inequality in U.S. society. As an immigrant group and a minority group, each of which implies negative social capital in the U.S. context, Asian Americans use education as their last resort to combat the inequality of society. This perspective is reflected in Sue and Okazaki's (1990) analysis of relative functionalism:

> It is proposed, under the concept of relative functionalism, that Asian Americans perceive, and have experienced, restrictions in upward mobility in careers or jobs that are unrelated to education. Consequently, education assumes importance, above and beyond what can be predicated from cultural values. (p. 913)

This perspective is also congruent with Louie's (2004) finding regarding parental emphasis on

education:

> …the story my respondents tell is quite the opposite of the model minority: it is precisely because Chinese immigrant parents see inequalities along the lines of race that they advise their children to do well in school (p. xxxi). …The fruits and lingering inequalities of post-civil rights America are what prove to be central to the children's cultural framework for understanding why their parents stressed education. (p. xxxii)

Chinese Americans and other Asian Americans have been facing inequality, discrimination, and marginalization since very early in the history of their immigration to the United States. However, the "inequality of society" perspective can't explain why Asian American students achieve, on average, at higher levels than Blacks and Hispanics, who also face inequality and discrimination.

This analysis suggests that neither "cultural" perspectives nor "structural" perspectives can alone explain Asian American students' educational achievement. As such, some researchers seek to consider culture together with structure. In this vein, the fourth perspective derives from cultural-ecological theory, which was largely contributed by sociologist John U. Ogbu (Ogbu, 1978, 1983; Ogbu & Simons, 1998). This perspective addresses the academic differences between different ethical and racial minorities. According to Ogbu's theory, minorities' educational achievement is dependent upon their history of becoming minorities in the host society. Ogbu (1978; 1983) compared two groups of minorities: voluntary minorities and involuntary minorities. Voluntary minorities are people who have moved more or less voluntarily to the United States--or any other society--because they desire greater economic wellbeing, better overall opportunities, and/or greater political freedom, in contrast to involuntary minorities who were originally brought into the United States or any other society against their will, for

example, through slavery, conquest, colonization, or forced labor.

Ogbu and his associates (1998) defined community forces as the way the minorities perceive and respond to schooling as a consequence of treatment imposed by the mainstream society. In order to explain minority students' achievement, Ogbu (1983) emphasized the importance of community forces and a minority's history in the United States, and he explains how these elements interact with cultural elements. Ogbu (1983) explained that Chinese immigrant parents in the United States see more opportunities for themselves and their children than back home; they trust what educational institutions have to offer; and they believe that barriers (such as English language and discrimination) are temporary. Thus, according to Ogbu's theory, Chinese immigrants are voluntary minorities in the United States, and thus have high levels of academic achievement.

However, Ogbu's theory has been criticized for neglecting the variation among minorities, including both Asian American and Black students (S. Lee, 1994; Lee, 1996; Lew, 2006b). Ogbu's (1983) article addressing the academic achievement of students from Chinese immigrant families was published about 30 years ago. In it he identified most Chinese immigrants as sojourners (i.e. temporary residents) and the remainder as laborers and peasant immigrants. However, the pattern of Chinese immigration has changed dramatically since then, which means that we have to reconsider Ogbu's analysis of Chinese immigrants (Siu, 1992b; Siu & Feldman, 1996). For example, there is now a large proportion of students and professionals from China, which Ogbu's analysis does not address.

Zhou and his co-author (2007; Zhou & Kim, 2006) suggest that the interaction between

structure and culture contributes to the educational achievement of students with Chinese, Korean, or Vietnamese heritage in the United States. Zhou and Kim (2006) defined *ethnic social structure* as the social institutions and interpersonal networks within a community that have been established, operated, and maintained by group members. According to this theory, in order to transfer culture into real educational attainment, Chinese Americans take advantage of the ethnic support structure—e.g., Chinese language schools and other afterschool programs—because these schools directly support students' education (not only in Chinese language but also in other subjects) and serve as useful networks for Chinese American social activities. Zhou (2007) explained how culture and structure interact:

> I argue that cultural and structural factors constantly interact. The value of education must be supported not only by the family but also but the larger social environment. For immigrant children, this social environment is often formed by ethnic-specific social structures manifested in various economic, civic, sociocultural, and religious organizations in an ethnic community as well as in social networks arising from co-ethnic members' participation in these organizations. Therefore, an examination of specific ethnic social structures, namely ethnic language schools and afterschool establishments that target children and youth, can provide insight into how the community is sustained and how recourses are generated to support education. (p.118)

Zhou (2007) also suggested that the differences between Asian and Latino students' achievement may be because the former have ethnic structural supports while the latter do not: "While most immigrants, Asian, Latino or other alike, share the educational value of the American middle-class, not all have the same access to structural and cultural resources conducive to education" (p. 126).

**Challenging the "model minority stereotype".** Instead of accepting the assumption of the "success" of Asian American students, some researchers have analyzed the "model minority"

stereotype from other perspectives and have identified much evidence to disprove the "model minority" stereotype (Lee, 1994, 1996; Suzuki, 1977, 1989, 2002; Weinberg, 1997). These scholars have applied a historical perspective to uncover the background of the "model minority" label for Asian Americans. The first basic question is: How did Asian Americans, as a disadvantaged group in the history of the United States, suddenly obtain the status of the "model minority" in the 1960s?

It is interesting to note that the label "model minority" initially emerged in 1960s during the same period as the U.S. civil rights movement. Suzuki (1977) cites one article titled "Success Story, Japanese-American Style" from the *New York Times* in 1966 published by sociologist William Petersen (1966b), who claimed "By any criterion of good citizenship that we choose the Japanese-Americans are better than any other group in our society, including, native-born Whites" (p. 24). Shortly after the publication of this article, Petersen published another similar article that praised Chinese American's success in *U.S. News & World Report*, titled "Success Story of One Minority Group in U.S." Suzuki (1977) cites Peterson (1966a),

> At a time when it is being proposed that hundreds of billions be spent to uplift Negroes and other minorities, the nation's 300,000 Chinese-Americans are moving ahead on their own-with no help from anyone else…In crime-ridden cities, Chinese districts turn up as islands of peace and stability. (p. 24)

Some scholars believe that the "model minority" label was used as a tool by Whites to oppose other minorities', especially blacks', fight for civil rights (S. Lee, 1994; Lee, 1996; Suzuki, 1977; Weinberg, 1997). Weinberg (1997) argues that "conservatives insisted that if African-Americans could not match this record, it was their fault, not American society's [fault]." Similarly, Suzuki

cites Uyematsu (1971),

> The activists charged that the actual status of Asian Americans was being deliberately distorted to fit the "model minority" image in an attempt to discredit the protests and demands for social justice of other minority groups by admonishing them to follow the "shining example" set by Asian Americans. (p.24)

In addition to addressing the underlying historical reasons for the emergence of the "model minority" label, researchers have problematized the myth of the "model minority" on several grounds. First, researchers have noted that overwork, depression, stress, anxiety, and other psychological disorders are emerging in Asian American students (Abe & Zane, 1990; Siu, 1992a; Suzuki, 1989). For example, Abe and Zane (1990) found that even after controlling for differences on these variables, greater levels of intrapersonal and interpersonal distress were found for foreign-born Asian-American students than U.S.-born Asian- and White-American college students.

Second, more broadly, Asian Americans are still treated as permanent foreigners and suffer distrust, racism, discrimination, and marginalization. It is not rare to see Asian Americans become victims of anti-Asian violence, harassment, and intimidation (Suzuki, 1989; 2002). According to Suzuki (1989), even American-born Asians complain that they are occupationally restricted, underpaid and under-promoted, and believe their advancement is blocked by discrimination. The famous Wen Ho Lee case and Vincent Chin case are examples of Chinese Americans becoming victims of ethnic prejudice in U.S. society. In order to avoid discrimination, Asian Americans feel forced to choose majors concentrating on STEM (science, technology, engineering, and mathematics) fields (Suzuki, 1989; 2002) possibly because these fields require

less communication than other fields such as social science. This standpoint reflects the above "inequality of society" perspective, which argues that Asian American students are forced by an unequal society to succeed.

Third, Asian Americans are underrepresented in management positions, school administrative positions, and in K-12 teaching (Hu, 1989; Suzuki, 1989; Xue & Preissle, 1998). Asian youth may need additional help from their teachers because of linguistic and cultural problems. It is crucial to recruit Asian American teachers to improve the quality of education Asian American students receive. However, according to Rong and Preissle (1998), "only 1% of the nation's elementary and secondary schoolteachers were Asian in 1990, but Asian students accounted for more than 3% of the U.S. elementary and secondary students' population" (p. 127).

The "model minority" stereotype of Asian Americans is controversial. A tension exists between studies that tend to strengthen this stereotype by exploring reasons associated with Asian American students' "high achievement", typically through quantitative studies (Aldous, 2006, Yao, 1985), and those that seek to disprove this stereotype, largely employing qualitative methods (Lew, 2006; Li, 2005). However, I contend that the issue is not whether to either agree or disagree with the "model minority" myth, but to have a better understanding of Asian American students' and their families' adaptive experiences, especially educational experiences, because, due to the model minority myth, Asian American students are too often overlooked by their teachers and by policymakers (Li, 2005; Louie, 2004; Xue & Preissle, 1998). Studies suggest that family involvement play a crucial in education (Finn, 1998) and it is important to

explore the family's role in order to understand Asian American students' educational experiences (Zhang, Carrasquillo, 1995). The following section addresses the role of family involvement in education with a focus on Asian and Chinese family involvement.

## Family Involvement in Education

**Definitional issues.** There is little disagreement about the importance of parental involvement (Finn, 1998; US Department of Education, 2004). Most current definitions of family involvement or parental involvement are closely associated with the partnership between parents and school (Epstein, 1995; Muller, 1995; US Department of Education, 2004). For example, Epstein defined six types of involvement: parenting, communicating, volunteering, learning at home, decision making, and collaborating with the community. Yan & Lin (2005) examined the relationships of three dimensions of parent involvement (family obligations, family norms, and parent information networks). Among these dimensions, family obligation includes participation in Parent-Teacher Organization (PTO) activities and attendance at high school programs and discussions of school topics. Family norms include family rules, educational expectations, and parent-teenager relationships. Parent information network includes contact with school regarding teenagers' performance and knowledge of teenagers' parents and teenagers' schoolwork.

However, this framework of family or parent involvement definition may be problematic when it is applied to Asian American families. Studies show that Asian parents tend not to be highly involved in school-related activities (Chang & Shimizu, 1995; Siu & Feldman, 1996); however, this does not mean they are not involved in their children's education. They tend to be

closely involved in their children's education at home and in their ethnic communities (Cheng et al., 1992; Siu & Feldman, 1996). Due to this mismatch between the mainstream definitions of parental involvement and Asian parents' actual practices, the results of some studies seem paradoxical. For example, one study indicates a negative relationship between parental involvement and academic achievement for Asian American students (Mau, 1997). Another study claims that parent involvement could predict educational achievement of White students but could not explain the variance of Asian American students (Desimone, 1999). However, in fact, Asian parents usually only visit schools when their children have done something wrong (Chang & Shimizu, 1995), which explains why parental involvement in these studies is negatively linked to Asian American students' achievement. Further, this suggests that there is a need to redefine the parental involvement, especially when it refers to immigrant or minority groups (Auerbach, 2007).

Therefore, this study will not employ the mainstream definition of family involvement, but rather focus on Chinese immigrant parents' and other families member's actual practices toward their children's education. In addition, this study uses the term family involvement, as opposed to parental involvement, because in some families, extended families members such as uncles, aunts and grandparents are also substantially involved in students' education. In this study, *Family involvement* refers to the participation of family members (including parents, siblings, and members of extended families) in their children's general and mathematics education employing three forms of capital: cultural capital, social capital, and economic capital, especially within their families and Chinese ethnic communities.

**Family involvement and Asian American students' mathematics achievement.** Many studies have found that Asian American students outperform other ethnic groups in mathematics achievement in the United States (Aldous, 2006; National Center for Education Statistics, 2011; Sheldon & Epstein, 2005a; Whang & Hancock, 1994). Researchers have found that parental involvement (G. Li, 2006; Muller, 1995; Pan et al., 2006; Yan & Lin, 2005) together with other factors (many closely related to parental involvement) contribute to Asian American students' success in mathematics: effort and hard work (Chen & Stevenson, 1995; Hess, Chang, & McDevitt, 1987); high standards and expectations from parents, students, and peers (Aldous, 2006; Chen & Stevenson, 1995; Yao, 1985); the structure of mathematically related terms in Asian languages[3] (Bower, 1987); parents' and students' attitudes and actions (Fejgin, 1995); and a culture that supports and respects education (Diamond, Wang, & Gomez, 2004; Kao, 1995). For example, through a survey of 26 middle-class Chinese immigrant parents, Li (2006) explored Chinese immigrant parents' perspectives on their children's reading, writing, mathematics learning, and homework, and on their involvement in and communication with mainstream American schools. Li (2006) found that Chinese parents believe that mathematics was best learned through drill and practice and by building strong foundations in basic skills and concepts. Li (2006) also found that a majority of her participant parents bought workbooks and assigned additional homework to strengthen their children's learning.

[3] For example, Bower (1987) found how several number words in Asian languages (Chinese, Korean, and Japanese) can support math skills: " the number 11 is read as ten-one, 12 as ten-two and 22 as two-tens-two. The numbers 13 and 30, which when spoken sound similar in English, are entirely different in the Asian tongues; 13 is spoken as ten-three and 30 as three-tens" (p. 183).

Besides mathematics achievement, parent involvement is also beneficial for students' achievement in other aspects. Parental involvement can contribute to children's talent development (Wu, 2008), improve students' reading ability, and stimulate students' motivation to study (West, 2000). For example, West (2000) found that increased parent involvement through parent-teacher communication acts as a motivating factor for students in a 7$^{th}$ grade reading classroom and is positively related to student's success in reading. Wu (2008) explored five immigrant Chinese parents' beliefs and practices on their children's talent development. She found that her participant parents have several common characteristics: a sense of responsibility for parenting, a high level of confidence over their children' future, and a mixed strategy of parenting that combines traditional Chinese parental expectations with an adopted Western notion of respect for a child's own decision making.

More generally, studies show that high levels of parental involvement can often benefit not only students, but also teachers and parents (Finn, 1998; Sohn & Wang, 2006; US Department of Education, 2004). Through parent-school partnerships, teachers become better informed about what happens in students' families, such as if they have enough time for sleep, if they spend time on homework, and if they have to work to support their families. Parents benefit from parental involvement by becoming better informed about what is going on with their children's education and gaining familiarity with the school system and curriculum.

While most studies about parental involvement suggest it is a positive factor for students' academic achievement, some studies paint more complicated stories (Crosnoe, 2001; Mau, 1997). The effectiveness of parental involvement can be mediated by other factors, such as race,

class, and children's age. First and foremost, race has important implications for parental involvement. Desimone (1999) conceptualized parent involvement as a set of group-defining actions, beliefs, and attitudes that serve as an operational factor in defining categorical differences among children from different racial-ethnic and economic background. According to Desimone (1999), parental involvement explained considerably less of achievement for Asian students than White, Hispanic, Black, and low-or middle-income students. For Mau (1997), parental involvement includes support, encouragement, and direct instruction in the home, as well as maintaining good communications with the school. In a quantitative study of 10$^{th}$ graders' academic achievement using National Educational Longitudinal Study data from 1988, Mau (1997) found that the more parents participated in school events, meetings, or volunteered in school, the less likely that Asian American students were to perform well, but the more likely White American students were to perform well.

Furthermore, studies also show that the influence and degree of parental involvement may be different for younger children and adolescents (Mau, 1997). According to Mau (1997), although young children may respond well and gain much from parental educational input, high school students are typically at a developmental stage in which they are striving for independence. In Crosnoe's (2001) definition, *parental involvement* generally refers to parent's management of their adolescents' careers (e.g., helping to select courses), active assistance (e.g., helping with homework), encouragement of educational goals, and attendance at school events. Crosnoe (2001) found that parents become less involved in education as their adolescents move through high school.

Researchers should carefully interpret the mediating factors of parental involvement. The few studies that suggest that parental involvement is negatively associated with Asian American students' achievement, especially for high school students, are overwhelmingly based on quantitative analysis. However, this statistical association does not equate to a cause and effect relationship between parental involvement and student achievement. Most Asian American parents, such as Chinese parents and Korean parents, only contact schools when their children do something wrong or have academic trouble (Crosnoe, 2001; Mau, 1997; Sohn & Wang, 2006).

**Chinese families' culture and value of education.** A recent high profile event stirred debate about parenting styles, particularly between "Chinese" parenting and "American" or "Western" parenting. On January 8, 2011, the *Wall Street Journal* published the article "Why Chinese Mothers Are Superior" (Chua, 2011b), an excerpt from Yale professor Amy Chua's recent book *Battle Hymn of the Tiger Mother* (Chua, 2011a). This article immediately catalyzed a debate about the issue of parental involvement, especially with respect to education. For example, within two weeks of that *Wall Street Journal* article, *Time* magazine published a cover story article "Tiger Moms: Is Tough Parenting Really the Answer?" (Paul, 2011). This debate about the strengths and weaknesses of Chinese and American/Western parenting styles suggests a rethinking of the roles and styles of parental involvement, especially in education. However, there is no single Chinese parenting style that applies to every Chinese family. In this section, I will discuss Chinese families and their involvement in their children's education because Chinese immigrant families may be largely influenced by traditions to which have been accustomed before immigration (Wu, 2008).

The Chinese have a long history of placing high value on education. Confucius, whose doctrines have fundamentally influenced Chinese history, Chinese people's beliefs, morals, and daily activities, was a professional educator. Stressing the importance of education is one of the prominent principles of Confucianism. At the policy level, governments also recognize the importance of enrolling the most highly educated into the administrative system. One predominant approach is through exams. For example, the Imperial examination, the examination system in Imperial China designed to select the best administrative officials for the state's bureaucracy, lasted for more than a thousand years in China (605-1905 A.D.). Even though the Imperial examination was abolished in 1905, the high value of selection via examination continues. The current National Higher Education Entrance Examination is considered to be the most important exam because it is a crucial equalizer for the unequal Chinese society. For many families, especially families from rural or underdeveloped areas, having a child succeed in this exam it is the only way for them to achieve upward mobility.

Furthermore, many Chinese, especially low class peasants, believe that education is the only means for upper mobility. In the popular Chinese culture, there are many sayings about the importance of education, such as "If you are not diligent in study when your hair is black, it will be too late to sigh about study when your hair is white" (Hess et al., 1987).

Chinese parents usually use students' academic achievement to define their overall success. They believe that students should study hard to achieve academic success. If they fail to achieve, Chinese parents usually attribute that failure to lack of hard work rather than factors such as students' innate ability, schools, or teachers' education (Chen & Stevenson, 1995; Siu,

1992a; Wu, 2008).

In Chinese families, parents and children have a reciprocal obligation, which means that parents will sacrifice to raise the children, and, in return, the grown children will take care of their parents, especially when they are old (Leung, Lau, & Wai-Lim, 1998; Wu, 2008). Furthermore, children should show reverence to elders. For example, children cannot use their parents' names directly. This reciprocal obligation guarantees the parents' authority to decide the best way to parent their children. This emphasis on parental authority is also a source of conflict between parents and adolescents, who are at the age where they are seeking independence (Foner & Kasinitz, 2007; Fuligni, Yip, & Tseng, 2002).

Chinese immigrant parents, on the one hand, bring their previous beliefs and approaches to parenting, informed by their own experiences growing up. On the other hand, these families are in a society new to them, one that more strongly emphasizes developing individual's development and freedom than families' honor and interests. In the following section, I will discuss Chinese immigrant parents' perceptions, obstacles and strategies towards education.

**Chinese parental involvement in children's education.** Many studies have found that Chinese parents have low participation in school-based activities (Chang & Shimizu, 1995; Siu & Feldman, 1996) and have developed several explanations for why Chinese immigrant parents do not participate actively in school-based activities. First and foremost, although Chinese immigrant parents often have great respect for schools and teachers (Siu & Feldman, 1996), they do not see themselves as partners of the school system (Chang & Shimizu, 1995; Li, 2002). They believe that when their children are in school, it is better to leave it to teachers to take care of

them because teachers know best about how to educate their child, particularly in academic learning (Chang & Shimizu, 1995). In China, parents usually do not work as volunteers in schools. Only when there is a real trouble with his or her child will Chinese parents contact the teacher (Chang & Shimizu, 1995). However, my pilot studies suggest that this phenomenon may relate to students' family background. In one pilot study, a father from a professional family reported that his wife communicated with his sons' teachers regularly. In my other pilot study a student from a working class family firmly stated that her family and her school were two different worlds with no interaction.

English language competency is another obstacle to school-based parental involvement. Many Chinese immigrant parents do not speak English or do not speak fluent English, which limits their communication with the schools and teachers (Lo, 2009; Mau, 1997; Siu, 1996). Most documents from school are only available in English, which also hinders parents' attention to and participation in school-based activities.

Third, many Chinese immigrant parents received their education before their immigration and they have very limited knowledge of the U.S. school system (Lo, 2009; Mau, 1997; Siu, 1996). Their unfamiliarity with the school system and U.S. teaching approaches may result in their choosing not to participate in the school-based activities.

Finally, for various reasons, Chinese parents do not have sufficient opportunities to communicate with teachers. Many parents work long hours each day, which make it impossible to attend parent meetings. Teachers and schools thus have little access to the voices of Chinese immigrant parents and may pay little attention to students' families.

Even though many Chinese students are high achievers in school, studies show that Chinese immigrant parents are not satisfied with the current U.S. education system (Siu, 1993, 1996). The reasons for their dissatisfaction include lax discipline, lack of moral education, lack of enough homework, and poor mathematics training (Cheng et al., 1992; G. Li, 2006; Siu, 1996). For example, a Chinese parent told me that the mathematics curriculum in the United States is at least three years behind the Chinese curriculum. As a result, many Chinese immigrant parents seek to obtain Chinese mathematics textbooks and tutor their children by themselves in mathematics.

Despite Chinese parents' low-level participation in school-based activities and dissatisfaction with U.S. education, studies show that many parents are highly involved in home-based activities and community-based activities (Chang & Shimizu, 1995; Cheng et al., 1992; Siu, 1992a; Siu & Feldman, 1996). These two aspects of parental involvement are not class related for Chinese families, which means that both working class and professional class families are trying to provide the best support for their children (Cheng, et al., 1992). Parents from the professional class usually tutor their children by themselves; if they cannot teach their children by themselves, both working class and professional class parents hire tutors for their children (Cheng, et al., 1992). Many Chinese parents also purchase Chinese mathematics textbooks and additional books (such as SAT preparation packages) for their children. Studies show that many Chinese immigrant parents teach mathematics to their children using Chinese textbooks and their own mathematics knowledge and pedagogy (Cheng et al., 1992; G. Li, 2006). As one parent told me, "I cannot teach my daughter English because I cannot speak fluent English. However, I can

teach her mathematics. Mathematics [content] is the same as they teach in China." Chinese parents also use communities as resources for their children's education. For example, some researchers (Zhou, 2007; Zhou & Kim, 2006) suggested that attending Chinese schools can explain Chinese students' success.

In this section I first reviewed different perspectives on the "model minority" stereotype of Asian American students. These perspectives are largely based on either cultural or social structural explanations for Asian American students' education. Then I reviewed research on family involvement and its influence on general and mathematics education, and specifically Chinese and other parents' involvement in their children's education (such as their low participation of school-based activities). In the following chapter, I propose a theoretical framework that considers the diversity within Chinese immigrant families (i.e. social stratification) together with three forms of capital: cultural capital, social capital, and economic capital.

# Chapter 2: Theoretical Framework: Families and Their Capital

Current studies about Chinese American students' education tend to focus on the bimodal pattern that includes highly educated professional middle class and less educated laboring working class families (Louie, 2004b; Siu, 1993; Yin, 2007). These studies fail to address the families who fit in between these two groups: those who are highly educated but have relative low income and those who are less educated but have relatively high income. Thus, there is a need to address the variation within the Chinese American community more broadly. Moreover, in terms of education, the degree to which families can influence their children depends on factors such as the resources they have, their use of these resources, and their attitude towards education. Therefore, in order to understand Chinese American families' influence on their children's general and mathematics education it is necessary to address both family types and forms of capital.

The theoretical framework seeks to address three primary goals. The first goal is to define the four types of Chinese immigrant families. The second goal is to describe the three forms of capitals and define them within the scope of Chinese immigrant families. The last goal is to describe the indicators of the three forms of capital in terms of the four types of families.

## Types of Chinese Immigrant Families

The participating families were categorized into four types: working families, small business families, transitional professional families, and settled professional families. With these categories, I do not intend to generalize these four types of Chinese immigrant families to the broader Chinese immigrant population in the United States, which would deserve a much larger

scale study. It is possible that many Chinese immigrant families do not fit into any one of these four types of families. Thus, the ultimate goal was not to stratify the general Chinese immigrant families but to explore how different family types might use the different forms of capital to influence their children's mathematics education and general education. Much of the relevant literature has suggested that the Chinese American population is characterized by a bimodal pattern consisting of a highly educated middle class and a less educated working class (G. Li, 2005; Louie, 2004b; Siu, 1992a; Yin, 2007). Little attention has been paid to the families that fit between these two categories. In this study, besides the two widely known types of families, two additional types of families were included: small business families and transitional professional families.

*Working families* refers to families employed in non-intellectual sectors of the economy, such as in garment factories, and as cooks and waitresses in Chinese restaurants (Louie, 2004b; Siu, 1992a). They often work long hours, have relatively lower income and may not be able to afford to own a home, and have relatively lower educational attainment. Parents in this group have usually received education equivalent to high school completion or less. Weinberg (1997) has argued that children from these families are not high achievers.

*Small business families* include as those who run small businesses, usually restaurants, especially Asian or Chinese restaurants. This group of families is often treated as similar to working families. However, these groups are different since small business families usually have higher incomes and can afford to own their homes. There is more of this type of family than generally believed. Like working families, they have lower level of educational attainment,

usually no more than middle school. These families tend to be well connected with other Chinese immigrants with similar backgrounds. Little research has been done to differentiate between small business families and working families. These two types of families are often combined and compose one of the "bimodal model" types in Chinese American society (Yin, 2007). Consequently, how their different economic capital influences their children's education is largely unexplored.

The third type of family is called *transitional professional families,* adapted from Weinberg's "down" class (1997) and Louie's (2001) downward mobility families. These Chinese immigrants work as professionals in the United States. However, they are usually not permanent residents or U.S. citizens, or have received their green cards within a short period time. Some of them may have had prestigious positions before immigration, but because of various difficulties such as restrictions of U.S. immigration law or language barriers, it is difficult for both parents to be able to work in their previous careers. Typically, only one parent works (holding a H1B visa and in a different career before immigration) while the other spouse is unemployed; as a result, their family income is relatively low, and they cannot afford to purchase a home that meets their standards and expectations. They are usually highly educated and some of them may be recently graduated from American institutions.

The fourth type is called *settled professional families*. These professionals, who are usually U.S. citizens or permanent residents who have held that status for relatively long periods, came to the United States earlier than those in transitional professional families. They have an education level similar to the transitional professional families; however, compared to them,

settled professional families have much higher income and can afford large homes in higher academic achieving school districts. Some researchers believe it is from the children of settled professional families that Chinese Americans have obtained the reputation of “model minority” (Weinberg, 1997).

To simplify, in this dissertation, working families and small business families are sometimes referred to as *less educated families*, while transitional professional families and settled professional families together are called *highly educated families*. Similarly, working families and transitional professional families will sometimes be called *lower income families* while small business families and settled professional families together will be called *higher income families*. To remind readers which participant belongs to which type of family, I will use the following abbreviation: WK for working families, SM for small business families, TR for transitional professional families, and ST for settled professional families. The first time a participant appears in a subsection, the abbreviation follows the participant’s name, such as Alice (SM).

**Forms of Capital: Cultural Capital, Social Capital and Economic Capital**

Among the three forms of capital, economic capital is the least controversial. The other two forms of capital were derived from this conception. According to Bourdieu (1986), *economic capital* is immediately and directly convertible into money and may be institutionalized in the forms of property rights. Similarly, Andersen and his colleague (Andersen, Brisson, Portner, & Verner, 2010) modifed the definition as seen in Deparment for International Development

(EFID)[4] and define *economic capital* as command over economic resources (such as cash, assets, credit, real estate). Despite the title *The Forms of Capital*, in this article Bourdieu (1986) did not specifically write about economical capital. Instead, he frequently applied the ideas of economic capital to address cultural capital and social capital. According to these definitions, family income should be a primary measure of economic capital. In terms of the relation between economic capital and education, Davis-Kean (2005) found that the influence of family income on children's education decreases as they grow up and economic difficulty does not necessarily constrain academic achievement. Economic capital's (mainly family income) influence on educational achievement is often diagnosed together with the parents' education, which is addressed in the following paragraphs.

The definition of *cultural capital* is more complex than that of economic capital. Bourdieu (1986) did not provide a complete definition of cultural capital. Instead, he described its three forms:

> Cultural capital can exist in the three forms: in the *embodied* state, i.e., in the form of long-lasting dispositions of the mind and body; in the *objectified* state, in the form of cultural goods (pictures, books, dictionaries, instruments, machines, etc.), which are the trace or realization of theories or critiques of these theories, problematics, etc.; and in the *institutionalized* state, a form of objectification which must be set apart because, as will be seen in the case of educational qualifications, it confers entirely original properties on the cultural capital which it is presumed to guarantee. (p. 47)

Some researchers or organizations have defined *cultural capital* in their own terms in order to serve a particular purpose. For instance, Andersen et al. (2010) augment the definition from DFID and define *cultural captial* as the knowledge, experience, and connections people

[4] A government department in the United Kingdom.

have had throughout their lives that enable them to greater success than someone from a less-experienced background.

Bourdieu (1986) found that cultural capital is embedded in higher-class families, and thus enables students from such families easier access to higher educational credentials. Some studies have found that cultural capital has a significant positive influence on students' academic achievement (Graaf, Graaf, & Kraaykamp, 2000; Sullivan, 2001). In fact, by comparing the influence of family income and parental education, studies have found that parental education and other cultural relevant resources (such as aspiration) have a much higher level of influence on students' education than financial resources (Duncan & Magnuson, 2005; Graaf et al., 2000).

According to these definitions, senior family members' (parents, grandparents, uncles, aunts, and elder siblings) strictness, supervision, and expectations for younger children are examples of the *embodied* form of cultural capital. The family's possession of culturally relevant items such as books and computers are examples of *objectified* forms of cultural capital. Family members' educational attainments (mainly parents' education but not limited to parents because it may also include extended family members', such as uncles, aunts, cousins and siblings) are one form of cultural capital—the *institutionalized* form. Hence, family members' familiarity with learning materials and facilities is also related to cultural capital.

Compared to economic and cultural capital, the conception of *social capital* is difficult to clarify. In fact, there are numerous versions of definitions according to various disciplines and there is no universally accepted definition for this conception. However, the idea of social capital was not a novel creation. As early as 1916, L. J. Hanifan's wrote:

> In the use of the phrase *social capital* I make no reference to the usual acceptation of the term capital, except in a figurative sense. I do not refer to real estate, or to personal property or to cold cash, but rather to that in life which tends to make these tangible substances count for most in the daily lives of people, namely, goodwill, fellowship, mutual sympathy and social intercourse among a group of individuals and families who make up a social unit…(p. 130)

However, several definitions are widely applied in many areas and have become very influential. Bourdieu (1986) describes *social capital* as "the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition" (p. 51). Bourdieu's approach for this conception emphasizes the positive aspect of its application—the use of the social network as helpful resources. Robert Putnam's (2001) definition of *social capital* refers to the collective value of all "social networks," and the inclinations that arise from these networks to do things for each other.

James Coleman (1988) refers to *social capital* as "a variety of entities with two elements in common: they all consist of some aspect of social structure, and they facilitate certain actions of actors...within the structure" (p. S98). Similarly, as Bourdieu did for cultural capital, Coleman describes social capital in three forms: obligations, expectations, and trustworthiness of structures; information channels; and norms and effective sanctions. According to him, it is through individual's or group's mutual obligations, expectations, and trustworthiness that they can share useful information within their networks. If someone or a group does not follow a proper norm that is adopted within the network, they would be excluded from this network. In Coleman's theory, social capital is neutral—people can use it for both positive and negative

purposes.

Coleman defines *intergenerational closure* as relations between parent and child and relations outside the family, especially relations between different parents who have children (Coleman, 1988; Kao & Rutherford, 2007). According to Coleman (1988), there is social capital between parent and children as long there are parent-child interactions. However, social capital within a family can easily entangle cultural capital (Kao & Rutherford, 2007; Portes, 2003). Thus, in this study the scope of social capital is limited to Chinese ethnic immigrant families instead of within Chinese immigrant families. In fact, some researchers have pointed out that an issue in need of examination related to social capital is how different groups (such as Chinese immigrant families in this study) make use of certain types of social capital (Furstenberg & Kaplan, 2007; Kao & Rutherford, 2007). Kao and Rutherford (2007) suggested,

> Although there appears to be no consensus in the near future on how to define social capital, it can still be of use to researchers as long as they define it clearly and in a way that is consistent with its original theoretical roots. (p. 29)

In the field of sociology of education, the role of social capital has been deeply examined by many researchers (Bourdieu, 1986; Furstenberg & Kaplan, 2007; Zhou & Kim, 2006). According to Bourdieu (1986), the degree to which a family possesses social capital is critical for their application of cultural capital, which therefore largely influences their children's education and overall success. Putnam (2001) found that students' positive outcomes are the result of parents' social capital in their community and that higher social capital leads to higher educational performance. Zhou and her co-authors (Zhou, 2007; Zhou & Kim, 2006; Zhou & Li, 2003) examined how different groups of Asian American's ethnic social capitals contribute to the

children' academic performance.

It must be pointed out that a family's possession of these three forms of capital is not static but dynamic, largely for two reasons. First, at different stages, a family's possessions of capital are different. For example, a two-parent working family should have higher levels of economic capital than they had when only one parent works. An immigrant family's possession of social capital tends to accumulate after a period time when they gradually connect to more people. A family's cultural capital will increase when a family member goes to college or obtains a college degree. Second, under certain circumstances, one form of capital can be transformed to another form of capital (Bourdieu, 1986). For example, consider the case if one has a valuable painting and sells it for cash. In this case, cultural capital is transformed into economic capital. In another case, say a parent spends money to purchase a SAT preparation book for her 10$^{th}$ grade daughter. Then the economic capital is transformed into cultural capital. Social capital can also be purchased, particularly with the Internet. For example, there are multiple websites through which one can access other people's information, such as dating and social networking sites. In some cases, access requires economic capital. For example, Facebook recently began to charge $100 for a person to send a message to a non-friend famous person. If the buyer successfully builds a stable connection with the new friends and benefits from this connection, he or she transforms economic capital into social capital. Social capital has economic capital value as well—that is exactly why Facebook is worth billions of dollars. Cultural capital and social capital can be transformed as well. For example, say your child is going to apply for college, but your knowledge of the college application process is very limited. Some people you know well

in your neighborhood happen to have a child who recently went to a prestigious college. Then you begin to chat with the parents about how to help kids apply for college, thus, increasing your knowledge of the college application process. In this case, social capital is transformed into cultural capital. Conversely, cultural capital can be transformed into social capital. For example, you are real fan of stamp collecting; your knowledge of stamps indicates that you have a certain amount of cultural capital in this aspect. Then you join several stamp collecting clubs and make new friends and some of them gradually become close friends. After a period of time, the conversations among you are not limited to stamp collection but to many other aspects of life. In this case, cultural capital is transformed into social capital.

It is sometimes difficult to disentangle the three forms of capital. A simple event may have all three forms of capital involved. Let's return to the SAT preparation example. You want to purchase a SAT preparation book for your child; however, you have no idea of which book may be the best one. So you ask your friend whose child just took this test for a suggestion; on their advice, you purchase the book for your child. In this example, all three forms of capitals are involved. You used social capital when you asked your friend for help. Your decision to buy the book indicates your cultural capital. You spent money to buy the books so your economic capital is transformed into cultural capital.

The definitions of the three forms of capital employed in this study are as follows. *Economic capital* refers to Chinese immigrant families' possession and use of economic resources, such as cash, credit, assets, real estate, and businesses. *Cultural capital* refers to the possession and use of education, knowledge, skills, experiences, expectation, aspiration, attitude,

values and culturally relevant materials Chinese immigrant family members have had that enable their children to achieve higher levels of academic success. *Social capital* refers to access to and use of networks in which Chinese immigrant families (mainly parents) interact with other Chinese immigrant families (mainly others parents but may also include Chinese immigrants without children), especially with the purpose of supporting their children's education.

**Family Types and Indicators of the Three Forms of Capital**

In terms of the three forms of capital, one issue is to identify and estimate to what degree different types of families possess these three forms of capital. Another issue (which also pertains to three of the research questions) is to diagnose how different families use (or do not use) these forms of capital for their children's mathematics education and general education. However, technically, unlike economic capital, which is relatively easier to measure, it is harder to quantify the cultural capital and even more difficult to quantitatively measure social capital (Furstenberg & Kaplan, 2007; Harpham, Grant, & Thomas, 2002; Portes, 2003). Thus, for researchers who want to apply the theories of cultural capital and social capital, measuring them is a real challenge. Different researchers, depending on their disciplines and the questions they are pursuing, may choose very different indicators of cultural or social capital. For example, some indictors of cultural capital may include children's reading literature, drawing pictures, while some include parents' and pupil's cultural activities such as reading, music, and television (DiMaggio, 1982; Sullivan, 2001). Indicators of social capital are also not universal. Some researchers (Bankston III & Min, 2002) use indicators such as "parent knows most neighbors," "parent born in neighborhood," and "parental organizational membership," and some use

indicators such as “parents know parents”, “friends in school”, and “parents work together supporting school policy” (Morgan & Sørensen, 1999). These studies, which are nearly all quantitative analyses, fail to illustrate how each indicator influences children’s education. For example, an indicator such as “parents know parents” did not tell us how parents use social capital to support children’s education. A parent may know many other parents but may not necessarily exchange ideas of how to promote children’s education. Just as Portes (2003) pointed out, researchers must differentiate between the resources themselves and the ability to obtain them. A parent who knows many parents may not necessarily obtain much useful information from them if their network is weak. Meanwhile, a parent who has few close friends may obtain substantial information from his or her friends. As a result, when researchers use different indicators they may even come to opposite conclusions for the same research question (Coleman, 1988; Morgan & Sørensen, 1999).

Qualitative research, on the other hand, can provide detailed information about how family members use various approaches to influence their children’s education. In this way, parents’ behaviors or attitudes become concrete indicators of capital (Graaf et al., 2000). However, despite this, Bourdieu (1986) and Coleman (1988) neither explicitly explain the differences among the three forms of capital themselves nor show how people “see” them.

For example, in terms of economic capital, family income must be a major component. However, researchers can hardly document the cash or income the participant family actually has. In certain cases, participants may report their income in surveys or interviews, but generally it is impossible for researchers to directly measure the amount of economic capital. It is through

people's possessions of property, and their ability or inability to buy products or services that illustrate a family's economic capital. If a family can afford tens of thousands for their child to attend skating class, it is reasonable to estimate this family has a relative higher level of economic capital. On the contrary, if a family wishes to but is unable to purchase a $50 SAT preparation book for their son even though they think it is important, it is reasonable to estimate this family has a relatively lower level of economic capital.

Measuring cultural capital and social capital are even harder. You may know a person's educational attainment but how they perceive children's education and how their knowledge influences their children's education are not easy to gauge, especially in surveys. The problem of measuring social capital has been explained above—that is, the number of other parents known by a parent cannot tell us to what degree this parent obtains social capital. What matters is how a parent uses the network to influence his or her child's education. A simple metaphor of cultural capital and social capital is *wind*: we cannot directly see the wind, what we really see are the results of wind—swirling leaves, moving dusts, and so on. Conversely, if a parent wishes that he could tutor his children in higher level mathematics (but is actually not able to), the parent's wish illustrates his lack of cultural capital in this context.

Based on this analysis, it is necessary to differentiate between capital and its indicator (just as with the difference between a linear function and its representations which can be a mathematical expression, a graph, a table, or description in words). Just as mentioned before, this study limits the scope of the three forms of capital to Chinese immigrant families. The indicators of these three forms of capital will be used to see how different types of families use the forms of

capital to influence their children’s mathematics education.

# Chapter 3: Methodology

Despite the evidence that Asian American students, on average, are higher achievers in mathematics, they are in fact least known to researchers and the public, and perceptions of their educational experiences are largely rooted in myth (Rong & Preissle, 1998; Tuan, 1999). On the one hand, the scarce qualitative studies intentionally only focus on the low achieving students' educational experience in order to provide counterexamples to the model minority stereotype (Lew, 2006a, 2006b; G. Li, 2005). Thus, these studies fail to explore the majority Asian American students' educational experience. On the other hand, mainstream studies about Asian American students' educational experience are predominantly quantitative analyses, which fail to capture the real picture of these students' educational experience. Quantitative studies tell us little about the underlying reason behind this "model minority" myth. For example, quantitative studies can show the positive correlation between parents' expectations or aspirations of their children's education and their children's subsequent achievement (Aldous, 2006; Fuligni, 1997). Studies can also show that Asian families have higher aspirations for their children than other racial and ethnic groups (Kao, 1995; Mau, 1997). But they provide little information about why Asian families have high expectations of education for their children and how different groups of Asian families may have different expectations. Moreover, current quantitative studies often highlight the racial aspect of Asian American's success and do not pay enough attention to other issues such as how parents used their education, network, financial resources to influence their children's education.

As a result, in order to better understand Asian American students' (including Chinese

American students) educational experience, more qualitative studies, especially those that include a diversity of family backgrounds, are highly needed. This chapter describes the context of the study. Then I will give a brief biography for each of the nine participating families. I will then address how I collected data and analyzed data.

**Context**

This study was conducted in a Mid-Atlantic metropolitan area in the United States. Asian Americans have become a significant part of this area within the last twenty years and Chinese Americans are one of the largest Asian American groups in this area. In fact, this area ranks in the top 10 for regions with significant Chinese American populations (Wikipedia, 2013).

This area has many government organizations, non-profit organizations, IT business companies, research institutions, colleges and universities. Many Chinese Americans work as professionals for these institutions. All are also significant numbers of Chinese or Asian restaurants run by Chinese immigrants. There are dozens of Asian or Chinese supermarkets located in the area and more than 10 Chinese language schools. These schools are not regular public schools but non-profit organization run by Chinese immigrants. They usually open during the weekend or after regular school hours. Some of them actually share a location with certain public schools. For some schools the enrollment could be thousands of students, the majority of which are of Chinese heritage. It is very typical for Chinese immigrant families to send their children to these schools because they not only teach the Chinese language, which is essential for the purpose of communication between parents and children and maintaining Chinese culture, but also academic subjects such as SAT preparation classes, and other classes (e.g., dancing,

music, etc.)

**Subjects**

**Recruitment**. Future Chinese School[5] was originally founded in the early 1990s by the Chinese Students and Scholars Association of an American institution. This nonprofit organization owns several campuses in the eastern metropolitan areas. Besides teaching Chinese language, other courses include arts (dancing, chorus, and orchestra), sports (basketball, volleyball, badminton, tennis, martial arts, and swimming), and academic subjects such as SAT test preparations (readings, writing, and mathematics). Future Chinese Schools are all weekend schools and are not part of public education system. All teachers and staff are volunteers. Future Chinese School is one of the most popular Chinese language schools for Chinese immigrant families in this area. Families with children attending one campus of the Future Chinese School were the main sources of participants. At the time when I was recruiting participants, Future Chinese School had over 4000 students enrolled in all campuses. However, in order to enroll enough participants with diverse backgrounds I also attempted to enroll families through other channels, such as snowball sampling, ties to the broader Chinese ethnic community, and Chinese Christian churches.

In practice, my first attempted enrollment was not successful and I could not enroll any new participants (except the several ones I had known well before) in the school. I found it was hard to persuade parents and children to participate in the study, despite multiple attempts to

[5] This is a pseudonym. This weekend school provides various courses to mainly Chinese American students.

persuade them. The most common concern from the parents was that they believed that they would not have enough time, especially if observations were needed. For parents who were working for Chinese restaurants, they worried that their limited educational background would be a problem for them to do well in the study. It was difficult for me to persuade them that education was not a problem and they could just tell me whatever they wanted to say.

Among the four less educated families, two of them came from my experience in the Future Chinese School (and it took me a long time to persuade one of them to participate). One of the two families recommended another working family for this study—the father of the family was working as the Sushi chef at their Chinese restaurant. I also went to multiple local Chinese or Asian restaurants to enroll participants and I found one family using this method.

As for the highly educated families, I enrolled two families from the Future Chinese School. One of them introduced another family for this study. I enrolled one family from a Chinese church. I also enrolled a family that I knew for a relatively long time. A friend of mine introduced a recent immigrant family to this study. I finally dropped this family because this family had not decided whether to immigrate to the United States (the father of family was still working in China and had no clear intention to emigrate) and thus I thought they did not fit my definitions of four types of families.

**Description of Subjects.** A total of nine families participated in the study. For two of the families, both parents participated. Therefore, in the end, there were 11 parents and 9 students that participated in the study. Table 1 provides a snapshot of the subject information of each family. In this following paragraphs, I briefly describe each family.

Table 1

*Subject Demographic Information*

| Parent information | | | | Student information | | |
|---|---|---|---|---|---|---|
| Name | Occupation | Education | Years in U.S. | Name | Grade | Immigration status |
| Cindy Cao | Restaurant manager | Middle school | 17 | Alice | 11th | U.S. born |
| Xian Zhou | Restaurant owner | Middle school | 21 | Alex | 10th | U.S. born |
| Abby Lin | Photo store worker, Restaurant waitress (part time) | Middle school | 20 | Kitty | 9th | U.S. born |
| Hai Liu | Restaurant cook | Middle school | 5 | Xueliang | 11th | Arrived U.S. at age 12 |
| Maggie Shao | Accountant | Master's | 8 | Zanmin | 8th | Arrived U.S. at age 5 |
| Xuehua Hou | Housewife | MBA | 10 | Devin | 2nd | U.S. born |
| Fan Gao; Li Pan | Househusband Counselor | Bachelor's Master's | 5 5 | Tony | 2nd | Arrived U.S. at age 4 |
| Yan Sun | Computer data analyst | Master's | 18 | Kyle | 11th | U.S. born |
| Wei Han; Ganquan Yao | Scientist Self-employed | PhD Master's | 22 22 | Molly | 6th | U.S. born |

Xueliang[6] was an 11th grader and was born in China. He came to the United States at the age of 12 with his parents and had been in the U.S. for five years. During the time of this study, Xueliang was learning calculus. His father Mr. Hai Liu was a Sushi chef for Alice's family's restaurant. His mother was a waitress for a different Chinese restaurant. Mr. Liu did not finish middle school. When Xueliang was about 2 years old his father went to Japan and lived there for 10 years, which was why his father knew how to make Sushi. Xueliang's family did not own a home but lived with one of Mr. Liu's family friends, who came from the same village in Fujian

[6] All participants' names are pseudonyms.

province in China. Mr. Liu's friend provided a room for Xueliang's parents and divided the living room into two parts: one part remained the living room and the other part was Xueliang's bedroom. However, due to the father and mother's (who did not know how to drive) long working hours in distant locations the family only saw each other once a week altogether. In fact, there was only one hour that the three family members could be together every week. According to my definition of the types of families, Xueliang's family was a working family (WK).

Kitty was a 9th grader and was born in the United States. Kitty was taking Geometry. She was the only child of her family. Her father worked as a chef for a Chinese restaurant and her mother Abby Lin was a part-time waitress at the same restaurant. During the day, her mother worked for a photo store. Abby did not finish middle school in China and by marrying Kitty's father she immigrated to the United States. Kitty's family was living together with her grandparents and one member of her father's brothers' family. According to my definition of the family types, Kitty's family was a working family (WK).

Alice was an 11th grader and was born in the United States. During the time of participation in the study, she was taking AP Calculus in a high school's magnet program. She was also preparing for the SAT. She was the oldest child in her family and she had two younger sisters and one younger brother who was the youngest child in her family. Alice's parents ran a successful Chinese restaurant and partially owned another Chinese restaurant and an Italian pizza restaurant. Usually, Alice and her sisters had to work at least three evenings a week (Thursday, Friday, and Saturday) from 4 to 10 pm in her family's restaurant. Alice's mother, Cindy Cao, worked as the manager of the restaurant. She did not finish middle school before she began to

work in her hometown in China. She then married Alice's father and immigrated to United States 17 years ago. According to my definition of the family types, Alice's family was a small business family (SM).

Alex was a 10th grader and was born in the United States. Alex was enrolled in an honors pre-calculus class. He has a younger sister. This family used to own three Chinese or Asian restaurants, but they sold two of them. Alex's father Mr. Xian Zhou and his mother ran an Asian carry-out restaurant. Mr. Xian Zhou only finished five years of education in China and he had been in the United States for 21 years. Mr. Zhou owned at least three houses and he rented two of them to others and lived in the one that he believed to be in a good school district. Alex and her sister sometimes worked in the restaurant on Sunday afternoons, after their classes at the Future Chinese School. According to my definition of the family types, Alex's family was a small business family (SM).

Zanmin was an 8th grader and was born in China. He came to the United States at the age of 5 with his parents. He was taking Algebra 1 when he was participating in the study. He has a very young brother. His father obtained a Ph.D. and his mother obtained Masters' degree from two separate American institutions. His father was postdoctoral researcher at a University and his mother Ms. Maggie Shao was an accountant. Zanmin's family managed to purchase a house in a good school district but had to rent out the master bedroom to relieve the economic burden. Before immigration, Zanmin's parents had good positions in Shanghai but they decided to immigrate to the United States because they believed it would be beneficial for Zanmin's future. Zanmin's father was working hard in order to get more publications and thus apply for

permanent residency for the whole family (except his younger brother who is a U.S. citizen). According to my definition of the family types, Zanmin's family was a transitional professional family (TR).

Devin was a 2nd grader and was born in the United States. Despite the fact that he was excellent in mathematics, he was in the 2nd grade mathematics because the school he was attending did not have a Gifted and Talented (GT) program. Devin's father obtained a Ph.D. and was a postdoctoral researcher in another state a great distance from his family and his mother obtained a MBA degree and was unemployed. Devin's family owned a house in what they believed to be a bad school district. According to my definition of the family types, Devin's family was a transitional professional family (TR).

Tony was a 2nd grader and was born in China. He came to the United States at the age of 4 with his father Mr. Fan Gao to join his mother Ms. Li Pan who was pursuing her Master's degree. Tony, despite living in the same school district where Devin was living, was granted the opportunity to be enrolled into the district's magnet program. So even while he was in 2nd grade, he was taking 3rd grade mathematics. Tony's mother had a Master's degree and her father had Bachelor's degree from one of the best universities in China. Ms. Li Pan was working for a non-profit organization and her husband Mr. Fan Gao could not work due to immigration law restriction. Tony's family lived in a studio apartment. According to my definition of the family types, Tony's family was a transitional professional family (TR).

Kyle was an 11th grader and was born in the United States. He was taking two mathematics courses: calculus and statistics. Meanwhile he was preparing for the SAT. Kyle had

an elder sister who was an undergraduate student. His father obtained a Ph.D. from an American institution and was a chief scientist for a U.S. federal government organization. His mother Ms. Yan Sun had a Master's degree and was a data analyst for a healthcare company. Kyle's family owned two houses: one in the perceived "good" school district where Zanmin's family lived. One was in another location and was rented. According to my definition of the family types, Kyle's family was a settled professional family (ST).

Molly was a 6th grader and was born in the United States. She has an elder brother who was a high school student. Molly's father Mr. Wei Han obtained a Ph.D. and was scientist for a company. Her mother Ms. Ganquan Yao had a Master's degree and was self-employed. Molly's family owned a big house in the school district where Kyle's, and Zanmin's families were living. According to my definition of the family types, Molly's family was a settled professional family (ST).

**Data Collection**

Table 2

*Proposed summary of data collection*

| Data sources | Subjects | Methods |
|---|---|---|
| Survey | Up to 50 students and 50 parents | Paper |
| Interview | 12 parents and 12 students | Audio recording |
| Narrative Writing | 12 students | Paper |
| Journal Writing | 12 students | Paper |
| Observation | 4 families | Field notes and audio recording |
| Video-based activities | 4 families | Field notes and audio recording |

In my proposal, I planned to use multiple methods to collect data, including surveys (student survey and parent survey), interviews, essays written by participating students, observations of families, and a video watching activity with parents and children (See Appendix

A-E for detail). Table 2 shows a summary of data collection.

I planned to conduct anonymous surveys (up to 50 participant students and 50 parents) to collect basic demographic information and information about family involvement in education. At the end of the surveys I planned to ask them if they would like to participate in other activities such as an interview, observations and write essays. If they agreed, they would need to provide me contact information at the end of the surveys. These survey results would characterize the broad trends of the participants' social-economics status, immigration status, and other information about family involvement in children's education and help me to put the participating families into the four categories (or new categories based on the responses). Second, I would conduct interviews of about 12 parents and their children selected based on the surveys. I would choose families from the four different categories. I would transcribe the audio recordings after each interview. Third, I would request 12 participating students to write essays about their mathematics learning experiences (J. Li, 2009). Fourth, based on the survey responses and interviews I would choose to observe some families at home. The ideal situation was that I can observe one family from each of the four categories for three to seven times. I will explain to them the intent of my observations. I would also tell them that during my observation, they should go about their daily activities as usual. I thought the number of observations would reduce the possibility that the families would 'perform' at my visits. I would observe the general environment of the family and the academic environment as well, such as the availability and types of books for the children. I would also observe how parents interact with children, especially regarding general education issues and mathematics in particular. I would take field

notes during observations and write memos after each observation. Finally, I would show two short excerpts of videos to some parents and children together. One excerpt of the video would show a typical Chinese mathematics classroom and the other excerpt would be a typical U.S. mathematics classroom. That activity aimed to solicit parents and children to have conversations about mathematics teaching and learning at school. I would audio record their conversations and write memos after this activity.

Table 3

*Summary of data collection*

| Data sources | Subjects | Methods |
|---|---|---|
| Survey | 10 parents and 9 students | Paper |
| Interview | 10 parents and 9 students | Audio recording |
| Narrative writing | 7 students | Paper |
| Twitter log | 7 students | Paper |
| Observation | 8 families | Field notes and audio recording |
| Video-based activities | 9 families | Field notes and audio recording |

In practice, I largely executed the data collection plan. I used multiple methods to collect data which include surveys (student survey and parent survey), interviews, narrative writing and a Twitter log from seven participating students (two 2$^{nd}$ grade participating students did not do the writing activities), observations of families, and the video watching activity with parents and children (See Appendices A-E for details). For example, the narrative writing is expected to show how the student's family (such as parents, grandparents, siblings, and extended family members), community (such as Chinese language schools, Chinese churches, and other ethnic organizations) influence the student's general education and mathematics education. The Twitter log is for the student to report what family members just did for them. Students can send a message via Twitter like, "My father helped me SAT preparation this afternoon." The data

collection process lasted about six months. Table 3 shows a summary of data collection.

However, there were several modifications to data collection mainly due to difficulties enrolling participants. First, I enrolled far fewer participants than I expected. Second, due to the limited number of participants, I had to modify the order of the data collection methods and some other aspects of the data collection. For example, for the 2nd graders, it was difficult to ask them to do the narrative writing. I planned to conduct the survey first and then choose typical families for other activities. However, due to the limited participants, I had to change this plan. For example, I did not conduct the surveys at the beginning because many parents refused to do so. Instead, I decided to conduct observations first if the parents agreed. Except for Kitty's family I was able to observe the families at least one time and I observed some families more than three times. During the first observation I explained to them the intent of my observations and also told them that they should go about their daily activities as usual. The foci of my observations included the general environment of the family and the academic environment, such as the availability and types of books for the children. I also observed how the parents interacted with children, especially regarding general education issues and mathematics in particular. I took field notes during the observations and wrote memos after each observation.

I conducted interviews with about 10 families (including 12 parents and 10 students because in two families both participant father and mother participated in the interview). I audio recorded the interviews and later transcribed them. However, the interviews for two 2nd grade students were not successful because these younger students needed interview questions very different than other, older, students. However, for these 2nd grade families, I had at least four

observations for each family.

Each participating parent and student was requested to finish a survey (available both in Chinese and English). The surveys were designed to collect basic demographic information and information about family involvement in education. The survey results helped to estimate participants' social-economics status, immigration status, length in the United States, and other information about family involvement in children's education.

During one visit to each participating family, I showed two short video excerpts to the parent(s) and the child together. Each video clip that was initially shown was about 5 minutes long, but if parents or child wanted to watch more I showed them more than 5 minutes. One video excerpt was of a Chinese mathematics class and the other excerpt was of a U.S. mathematics classroom. The Chinese video was obtained from a well-known Chinese video website (kuyou.com) and the U.S. video was from TIMSS 1995 video study website (UCLA & Carnegie Foundation, 1995).


*Figure 3*: A US 8th grade math class

The TIMSS website provided an overview of the U.S. lesson: “This eighth grade mathematics lesson focuses on graphing linear equations. It is a review lesson that followed a unit of work on this topic. The lesson is 44 minutes in duration. There are 36 students enrolled in the class.” At the beginning of the lesson, the teacher assigned the students a set of problems. The lesson involved small group instruction with the teacher circulated from group to group, assisting students if they had questions about how to do the problems.


*Figure 4*: A Chinese 8th grade math


*Figure 5*: A Chinese 8th grade math class

The Chinese mathematics lesson was also 8th grade mathematics and the topic was the introduction of linear equations. The lesson was 38 minutes in duration and there were more than 60 students in the class. The students sat in rows and columns in the class while the teacher lectured the lesson in front of the classroom. Throughout, the teacher asked questions and students answered questions. The teacher wrote many equations on the blackboard and he used a projector for the lesson. There was no group work and students did not discuss questions with each other. Overall, it could be considered as a teacher-centered lesson.

This activity aimed to solicit parents and children to have conversations about

mathematics teaching and learning at school. I also asked them some questions about their responses to the two videos and general comments about U.S. and Chinese mathematics education. All relevant conversations were audio recorded and I wrote memos after this activity. The audio recordings were transcribed. All parents agreed that the Chinese mathematics class looked like exactly the way they used to have when they were in schools in China. As for the U.S. mathematics class, students said it was typical in the United States and some parents also believed it was similar to what they had visited. This video-based activity provided the primary data for Chapter 4: Parents' conceptions of U.S. mathematics education.

Each of the participating students (except the two 2nd grade students) were requested to write a narrative about their mathematics learning experiences (J. Li, 2009) with particular consideration given to their parents' involvement. They also were asked to send messages documenting when their parents took actions they believed indicated their involvement in their education through updating Twitter logs to my Twitter account. In terms of family involvement, the narrative writing could reveal the student's perceptions of parental involvement prior to the study and the Twitter log writing could shed light on what was currently happening or what happened recently. Students who were supposed to do the Twitter log sent some messages to me (except one student) about their families' activities regarding their education. However, only three students sent me messages regularly; other students sent messages to me only when I reminded them.

Among the six data collection approaches, interviews and the video-based activities provided the main sources of data. Other data collection approaches provided supporting

evidence for my data analysis. For instance, students' narrative writing provided supporting materials for what they claimed during the student interviews.

The video-based activity and parent interviews were conducted in Chinese. Most of the other data sources were collected in English, except Xueliang's essay, which was written in Chinese. The Chinese interview data were transcribed directly in Chinese and the relevant parts were translated into English if they were important for addressing the research questions of this study.

**Data Analysis**

I utilized the methods of cross-case study (Eisenhardt, 1989; Yin, 2002) to guide my data analysis. My original plan was to analyze the data in three categories: home-based activities, community-based activities, and school-based activities. Each category was expected to include multiple themes.

Practically, I used a software application called *Nvivo* to analyze the data. *Nvivo* allows me to code any part of transcripts and then analyze them either within or across different sources of raw data. I uploaded the different sources of data into *Nvivo*, which included student interviews, parent interviews, student essays (both narratives and Twitter logs), video discussions, observations and memos separately. Then within each data source (e.g., student interview), I coded excerpts of transcripts that were relevant to my research questions or other excerpts that I thought to be important. For example, the following excerpt from an interview of Alex was coded as *T-tutor* (which means students' responses about parent tutoring).

On, well for the multiplications table, he [Dad] taught me how to do it in Chinese because

> he told me it was a lot easier if I learn it in Chinese. First because it's like somewhat of an arithmetic tone to it so it's kind of easier to remember. So he like taught it to me. And it took me a while to get it. And he even put a whole poster on the wall at our old house so I can come home and just stare at it every day, like 'Oh, my gosh I have to remember this.' – Student interview, Alex

In this way, I coded each document and obtained multiple subthemes, such as *T-tutor*, *P_tutor* (which mean parents' responses about parent tutoring). Then I aggregated subthemes into themes. For example, all parent tutoring relevant subthemes (e.g. *T-tutor* and *P_tutor*) were put into a big theme called *parent tutoring* in a tree diagram format. In this way, I first found a "small theme" from a different data source then I copied these "small themes" and pasted them under a "larger theme", say, *parental tutoring*. In this way, I obtained several themes under each level (i.e., home-based activities, community-based activities, and school-based activities). I mainly focused on the themes most relevant to my research questions and left the other interesting but indirect themes to be analyzed in future separate studies.

Each family was assigned a specific number so I could bring together information from different data sources (i.e. interviews, narrative writings) about each family. Similarly, once a theme was developed, I brought together supporting data from different sources and put them under the designated theme. In this way, I was able to cluster productive data to support a theme or a subtheme. Because this process involved data from different families (i.e. cases) it is essentially a cross-case analysis.

In the end, I had seven themes for family-based activities (e.g., parent tutoring, books availability, parents' strictness, parents' monitor, tutor hiring, assistance from sibling, and assistance from extended family), nine themes for community-based activities (e.g., attending

supplementary educational program, use of libraries, sharing program information, sharing college application information, sharing materials, sharing information about hiring tutors, send children to lodge in highly educated families, participant in educational foundation, and college tour), and four themes for school-based activities (e.g., parent-teacher conference, back to school activity, other communication, and other visits). Although I employed data from different sources and put them in a single theme, *Nvivo* allowed me to easily track back the original document where the excerpt was from which helped me to analyze any theme's difference across different families. Then I wrote memos about the chosen themes, such as parent tutoring, family location, and use of libraries.

As stated above, my original plan was to organize these analytical memos according to three categories: home-based activities (such as parent tutoring), community-based activities, and school-based activities. Then I could analyze each type of family across the three categories and compare different types of families, say highly educated families vs. less educated families, high income families vs. low income families. However, it turned out such an analysis was challenging for several reasons. It was difficult to categorize the 20 themes into the three categories of family involvement and simultaneously analyze the differences and similarities across the four types of families. In this way, I had to analyze each type of family across all 20 themes. Considering that I had nine families and a total of 20 participants, it would have been be a tedious and unproductive process. Another option was to analyze each type of family and then go across each theme. This method also had problems because some parents had little or no data (for example, two families did not hire a tutor) for some themes while some families had a great

deal of data for the same theme (for example, parents' monitor). Furthermore, categorizing the themes into three ways (home-based activities, community-based activities, and school-based activities) increased the complexity of data analysis because I need to compare the differences and similarities across difference types of families for these three categories of activities.

However, following the principles of grounded theory (Glaser & Strauss, 1967), the actual development of themes was an iterative process because as my data accumulated, I needed to visit and revisit data from different cases, and think and rethink my theoretical framework and research questions. As the ultimate goal was to better understand Chinese American students' mathematics educational experiences related to family involvement, I modified my theoretical framework and some research questions to address this goal more effectively and fundamentally. On the one hand, with the new theoretical framework I had no difficulty categorizing the 20 themes. On the other hand, the previous theoretical framework (e.g., home-based activities, community-based activities, and school-based activities) categorized the families' activities but failed to address why families were able (or unable) to conduct these activities, which was largely determined by their capital they possessed. Thus, the new theoretical framework is theoretically more fundamental. As a result, I re-developed my theoretical framework and applied the three forms of capital theory to guide my organization of data analysis. Accordingly I kept the main research questions and one sub–question but revised three sub-questions for my research. The proposed research sub-questions are:

1: What are Chinese immigrant parents' conceptions of their children's mathematics education?

2: What is the nature of Chinese immigrant families' involvement in relations between school and home regarding their children's education in general and mathematics education in particular?

3: What is the nature of Chinese immigrant families' use of community-based resources as they pertain to general and mathematics education?

4: What do Chinese immigrant parents do to support their children's mathematics study at home?

5: What are the relations between families' various forms of resources and families' involvement in their children's mathematics education?

After the revision, the updated sub-questions are:

1: What are Chinese immigrant parents' conceptions of their children's mathematics education?

2: How do Chinese immigrant families use cultural capital to influence children's mathematics education?

3: How do Chinese immigrant families use social capital to influence children's mathematics education?

4: How do Chinese immigrant families use economic capital to influence children's mathematics education?

Employing the new theoretical framework I was able to cluster the 20 themes into themes relating to the three forms of capital (seven themes for cultural capital, two themes for social capital, and three themes for economic capital), which became the bases for Chapters 5, 6, and 7.

Thus, these three chapters were largely based on cross-case analysis. However, the analysis of the video discussion did not cut across other data sources and became the basis of Chapter 4. Furthermore, I largely dropped the data of school-based activities for this study because the most families had very little interaction with the schools.

## Researcher Positionality

**Researcher background.** I am a Chinese man in my early-thirties, born and raised in Hunan province, which is located in central China. In China, I speak Mandarin Chinese to my friends outside my hometown and I speak a local dialect to my hometown people. Currently, I am an international doctoral student holding an F-1 visa in the United States. In spring 2009, I volunteered to teach SAT mathematics to a group of Chinese American students in Future Chinese School.

My experience before coming to the United States was deeply influenced by Chinese culture. In terms of my mathematics educational experience, I obtained nearly all my mathematics knowledge in China. I am used to the lecture, teacher-centered style of mathematics classes in China. However, while in the United States, I also experienced or observed many other styles of mathematics teaching, such as group work, and problem-based lessons. But my experiences in the mathematics courses from the University math department were similar to what I had in China. I believe both American (e.g., group work) and Chinese (e.g., lecture) styles have advantages and disadvantages but I believe that typically students in Chinese classes learn more content than their American peers. I think the U.S. education system (not just mathematics education) is more helpful for students (especially gifted and talented students) to develop

independent thinking and innovative creativity.

My educational experience in China not only profoundly influenced my perceptions of U.S. mathematics education but also specifically influenced my perception of how Chinese immigrant families participated in their children's mathematics education. Parents from these families, like me, obtained the majority of their mathematics knowledge from China and they are unfamiliar with the U.S. school system. I believe mathematics must the subject in which parents could say and do the most for their children. Parents thus need to find a balance between their pre-immigration knowledge of education and the new U.S. school system. Do they like U.S. mathematics? If not, what do they do? If they like it, why? How immigrant Chinese parents negotiate the new system (and U.S. mathematics education) given their previous knowledge is a very interesting issue for me. It is possible that someday I will face the same issue.

In reflecting on my positionality with respect to this study, it is important to discuss my own student experiences in China and the participant parents' background in China, and, in particular, how the difference between my background and theirs contributed to the reluctance/resistance to participate of less educated parents (and similarly, the relative willingness of some highly educated parents). In general, among the four types of categories of families, my personal situation fits into the transitional professional family type because I came to the United States to study and I am in my transitional period from an international student to a professional with a work visa, instead of permanent residence or citizenship.

I was born and raised in a rural area in China and my parents were farmers. Both my parents never had a chance to attend higher education. My father graduated from high school and

my mother did not even finish elementary school. However, they believed that education was the only channel that my brother and I can avoid repeating the tough life they have. Even though they had great economic difficulty, they managed to send me not only to high school but also to college. I knew many parents in my hometown could not support their children to go to high school and college even though their children were academically qualified. I am one of the few lucky ones who had the opportunity to go to college. Nearly all highly educated parents in this study had similar experience like mine: they experienced poverty and they and their families believed that education was probably the only channel for success. As a result, when I introduced them to this study, they were relatively cooperative. Even when they could not participate due to schedule conflicts, many parents were willing to share their parenting experiences with me.

However, the less educated parents have a completely different background in China. These people came from two provinces in China: Fujian and Guangdong, two coastal provinces that have a very long history of emigration. The earliest Chinese, who came to the United States more than 100 years ago, mostly came from these two provinces. Many people in these two provinces rely heavily on working on the sea (say, fishing) and seeking opportunity overseas. For them, education was not the only channel of success. Many people emigrated (legally or illegally) to other countries, not only to the United States, but also areas and countries like Southeast Asia, Argentina, and Italy. They mainly work in manual related industries (which require little education) such as Chinese restaurants, garments factories, and supermarkets. As a result, the less educated parents have different channels for success. When I talked to them about inviting them to participate in the study, I felt great resistance. Some parents said, “We are

different. Our way of educating our children is very simple." These parents have a strong sense of identity and intentionally distance themselves from people like me. Luckily, I had built personal connections with several families before this study and some of them became participants and introduced new participants.

**Research influence, biases and strategies.** In this section, I address how my background might have influenced the data collection process and how I conducted data analysis. Then I explore what strategies I used to minimize these issues.

*Data collection.* I have a similar cultural, educational and language background with many of the participating Chinese immigrant parents, particularly parents who obtained their highest degree in the United States and managed to remain in the United States after completion of their degree. Because I also volunteered in the Future Chinese School I obtained permission from the principal to conduct this study and I also knew many Chinese immigrant parents. To some degree, this volunteer experience and my Chinese cultural, language and educational background helped me to recruit participant families and collect data. However, I also realize that my familiarity and friendship with those immigrant Chinese families did not guarantee that participants would always be open and honest with me. For example, during the interview, some parents might have intentionally filtered some information but exaggerated other information. In Chinese culture, people often try to hide what they believe others might find troubling. For example, Chinese children often refuse to talk about or they feel embarrassed to talk about their parents if their parents are divorced. Outsiders might think poorly of them based on this information. Sometimes, they may divulge sensitive information only after the inquirer is fully

trusted. Also, during the observations, some family members behaved in ways different from the daily practices due to my presence. For example, one parent asked her child to do math problems because I was there.

*Data analysis*. My analysis of data was influenced by the interaction of two intertwining aspects: who I am as a person and who I am as a researcher. As a researcher in mathematics education I seek objectivity in my research. However, who I am as a person is always associated with biases and preconditions. I cannot separate who I am as a person and who I am as a researcher. For example, my mathematics background affects how I perceive mathematics education. The Future Chinese School principal believes the only effective way to learn mathematics is to practice as much as you can. However, I think understanding and curiosity are no less important than mechanical practice. To me, an understanding of the quadratic formula is no less important than knowing how to use this formula. As a result, during data analysis my background might have influenced me to unintentionally emphasize some themes but omit others. It is quite possible that other researchers may interpret the same data in a very different way than me, especially when one has different theoretical framework.

*Strategies*. I was aware of the fact that it's impossible to collect data which completely reflected truth and that I could never eliminate biases; what I did was to try to collect data that reflected the perspectives and actions of my subjects as closely as possible, to minimize my biases. I employed several strategies to counterbalance data collection biases and data analysis biases. First, I clearly explained the purpose and procedure of the study to the participants. I repeatedly emphasized to participants the importance of telling me how they really feel and

avoiding “performing” for me. Second, I used multiple data sources to triangulate the analysis, which I believed was a good way to check my biases. The data were from both students and parents and included multiple forms of data (e.g., surveys interviews, field notes, observations, and narrative writings). I also observed families one to six times to minimize the potential effect of my presence on their behavior. Third, I made sure to listen carefully to the voices and the perspectives of my participants to provide compelling, fair evidence, and record or make notes with thick description. Fourth, as an honest researcher I truthfully wrote down what I had seen and heard rather than focus on what I expected to see and hear. During both data collection and data analysis, I iteratively communicated with participants to confirm that the data accurately recorded what they said and their behavior and the data analysis reflected their perspectives.

# Chapter 4: Parents' Conceptions of U.S. Mathematics Education

Despite evidence that on average Asian American (including Chinese American) students are higher performers in mathematics their parents are not satisfied with the mathematics education in mainstream schools (Huntsinger, Jose, & Larson, 1998; Huntsinger, Jose, Larson, Balsink Krieg, & Shaligram, 2000; G. Li, 2006). By studying a group of middle-class Chinese immigrant parents, Li (2006) found that compared to China's mathematics education, Chinese immigrant parents believe that United States (U.S.) was "easier" and "insufficient" even though U.S. schools were better to develop students' interests, motivation and creativity. However, these studies fail to differentiate the possible variations within Chinese immigrant parents—that is, different types (in this study, the four types of families) of parents may possess different conceptions of U.S. mathematics education.

This chapter explores how Chinese immigrant parents (with different educational and social economic backgrounds) conceptualize U.S. mathematics education. First is an examination of parents' beliefs about general mathematics education and U.S. mathematics education in particular focusing on six aspects: parents' beliefs of mathematics performance of Chinese (and Chinese American) students and American students; parents' beliefs of students' capacity; parents' beliefs of mathematics teaching; parents' beliefs of U.S. textbooks; parents' beliefs of U.S. mathematics education's failure to meet high achieving students' needs; and parents' beliefs of U.S. mathematics education's policy flexibility. Then I will analyze parents' responses to contrasting U.S. and Chinese mathematics classes focusing on five aspects: class efficiency; issues of group work (including classroom organization, class management,

applicability of group work for mathematics classes, effectiveness of group work); equity; communication; and parents' preferences of classes. Last is an illustration of parents' educational experiences, which is followed by a discussion. The primary data source for this chapter came from the video discussion activities supplemented by the parent interviews.

## Parents' Beliefs of Mathematics Education and U.S. Mathematics Education

This subsection explores Chinese immigrant parents' beliefs of general mathematics education and U.S. mathematics in six aspects: parents' beliefs of mathematics performance of Chinese (and Chinese American) students and American students; parents' beliefs of students' capacity, parents' beliefs of mathematics teaching; parents' beliefs of U.S. textbooks; parents' beliefs of U.S. mathematics education's failure to meet high achieving students' needs; and parents' beliefs of U.S. mathematics education's policy flexibility.

**Beliefs of mathematics performance of Chinese (and Chinese American) students and American students.** The parents in the study believe that Chinese students are good at mathematics and "American" students lag behind. This perspective is held by parents from both highly educated backgrounds and less educated backgrounds. First, most parents expressed that Chinese or Asian students are usually good at mathematics (Li, 2006). For example, parents with less education expressed their perspectives. Mr. Xian Zhou asserted, "I think in terms of mathematics, Chinese students are good at it no matter where they are." These less educated parents also pointed out that immigrant Chinese students often found that what they are learning in the United States is what they have learned in China. For example, Ms. Abby Lin and Mr. Hai Liu shared their experiences of how Chinese immigrant students found themselves going ahead

of their U.S. peers.

> Based on my experience as a parent: An 8th grader came from China to U.S. to go to school and found that his or her math is better than the general U.S. 8th grader? –Parent video discussion, Mr. Hai Liu

> I had many schoolmates whose children came to U.S. for colleges. They all experienced that what they were learning in colleges they had already learned in high school when they were in China. –Parent video discussion, Ms. Abby Lin

> American students have lower capacity in mathematics. – Parent video discussion, Ms. Xuehua Hou

Meanwhile, these Chinese parents also expressed their critiques of the American schools' low requirements and American students' low performance in mathematics. For example, Mr. Hai Liu claimed that U.S. 5th graders were not able to recite the times table. Similarly, Ms. Maggie Shao pointed out that Chinese kindergarten kids have mastered their times tables and addition pretty well while U.S. 2nd graders still need to count by fingers.

> The mathematics problems for America's 5th graders are equivalent to the 3rd graders' in China. What 1st graders and 2nd graders are doing in the United States is equivalent to the kindergarten's level in China. America's mathematics problems are too easy. They do not have difficult problems. – Parent interview, Mr. Hai Liu

> For American kids, I dare to say that if I ask a 5th grader to recite the times table, he will not even know what it is; he does not know. – Parent video discussion, Mr. Hai Liu

> American 2nd graders need to count by fingers; what a terrible teaching ... They count on fingers for things such as times table and addition. They are confused in for these skills. Chinese kids mastered these skills very well even during kindergarten. That is true. – Parent video discussion, Maggie Shao

In fact, some parents believe that it is not only that U.S. students lag behind Chinese peers in mathematics but also that highly educated American people are struggling in mathematics. Ms. Li Pan constantly commented on how her educated American colleagues could

not and disliked to deal with mathematical problems. She said, “American people did not even want to see the numbers and they generally believe mathematics is difficult.” In another example, Mr. Xian Zhou, who only received five years of education in China, described his experience of how university professors frequently make simple mathematical mistakes when they pay for carryout.

> Based on my experience, I delivered carryout more than a thousand times. I also delivered to the university. Even though they are professors, I think their mathematics sucks because they cannot even make correct change … They made mistakes for simple addition. For example, the cost is about $20 then plus $4 tip, they made mistakes for this simple addition. – Parent video discussion, Mr. Xian Zhou.

**Beliefs of students’ capacity.** Cindy Cao, who received her highest education in middle school, believes that students’ capacity is related to genes, gender and training. For example, she talked about the role of genes in students’ education. She believes that genes are important in students’ education so students from educated families are not likely to fail in school. She even implied that the reasons why some African American students are not good at mathematics have genetic factors. Her statement may reveal problematic prejudices regarding African American students. This deficit belief about some minorities is problematic but is found broadly, so the parent's biases are not unusual. (Valencia, 2010). The genetic perspective of black people's math (and general intelligence) capacity used to be common but now it shifts more to social aspects (say, unequal society) (Jencks & Phillips, 1998; Jensen, 1969). However, this racialized comment only reflect the parent’s standpoint and does not represent my perspective. Cindy’s commented:

> I think genes play an important role in education. If the parents received higher education it is not likely the child will fail in school, unless the parents do not cultivate the child. The child will became a successful person if these parents just spend a small amount of

> energy to cultivate the child. That is what I think about genes. Parents like us, we did not like to study that much. When I was young, I did not like to go to school, nor did Alice's father. In terms of Alice, we spent a small amount of energy on her and her achievement is just so-so. It is same for foreigners. Why some are good at math and some are not, (such as some African Americans)? There must be some genetic factors. – Parent video discussion, Ms. Cindy Cao

What she did not explain is that even though she and her husband did not like to go to school, their children were doing well in school. In Cindy's eyes, the reason why students fail in education is largely associated with the students' capacity to absorb the knowledge which is predetermined and the students can do little for it.

> For some students, they can only absorb 60% of the content. They are just unable to absorb all knowledge. Even if they know the content today, they will forget tomorrow. They may remember the content today and they will forget within two days. When they meet the same questions, they still don't know how to do them. It depends on the student's capacity to absorb the content. – Parent video discussion, Ms. Cindy Cao

Interestingly, Mr. Wei Han has very similar perspectives as Cindy's as he also believes that for a small number of students, no matter how you teach them, they will not be able to succeed in school, that only a few students are excellent students, and that the majority are average students who need to be pushed by teachers to learn.

> According to my understanding, only few students are excellent in understanding, right? Sixty percent students are just average people who need teachers to push them to study. How many kids are motivated voluntarily to study? There are 10% to 20% students who are not able to master the content no matter how you teach them. – Parent video discussion, Mr. Wei Han

Cindy also believes there was gender difference between male and female students. She said, "I heard that boys did not like to go to school. However, when they grow up and enter high school or college they will excel girls if they learn by heart."

**Beliefs of mathematics teaching.** Some parents expressed their perceptions of the teaching of mathematics. Two highly educated parents who are not satisfied with mathematics education in the United States explained how they felt mathematics teachers should teach mathematics. Ms. Maggie Shao specifically pointed out that the quality of a mathematics class largely depends on the mathematics teacher's capacity. She pointed out that teaching determines to what degree students learn: superficial teaching results in superficial learning. During the video discussion, she later provided an example of how she found the teacher's instruction of the absolute value concept to be superficial. The teacher did not explain there are three situations within an absolute value symbol[7].

> It really depends on how the teacher teaches. If the teacher teaches superficially the kids will learn superficially. When the teacher teaches, whether or not he or she can strengthen some content that is not covered by the textbook, it really depends on the teacher. In another word, if the teacher cannot [strengthen the content that is not covered by the textbook] it means that teacher is just a so-so teacher. – Parent video discussion, Ms. Maggie Shao

Similarly, according to Ms. Li Pan, a math teacher should explain the math content to students thoroughly. In her opinion, lecturing the content to students would be better than asking them questions and letting them to figure it out by themselves. Ms. Li Pan said, "I think the foundation of mathematics should be taught like that [the Chinese class]. Teachers must teach [the content] thoroughly because you cannot expect every student is a genius."

Besides these educated parents who expressed their wish for "better" mathematics

[7] Ms. Maggie Shao later provided an example and said that students must know there are three situations of an absolute value: $a = \begin{cases} -a, & a < 0; \\ 0, & a = 0; \\ a, & a > 0. \end{cases}$ However, she said her son told her that the teacher did not teach them this knowledge.

teaching, less educated parents also commented on how the subject of mathematics could be taught. Mr. Xian Zhou strongly emphasized the importance of times tables. He believes that knowing times tables is one of the reasons why Chinese students are doing better than their American peers in mathematics. He suggested that American students should be taught the times tables because of its importance.

> The 9×9 times table is really important. A Chinese student who mastered this table would go much ahead in mathematics than foreign students. It will be really good for foreign students if they can master it. Chinese students go much ahead of American students because they know this times table…The times table should be taught to American students. This issue, they should learn from Chinese. The times table could be taught and it's very useful. – Parent video discussion, Mr. Xian Zhou

One working family parent believed that during class a U.S. teacher not only works as a subject matter teacher but also has other roles, while a Chinese teacher's function is simpler, having only to deal with subject teacher and not with other issues.

> In America, during a mathematics class, the teacher not only teaches mathematics content but also needs to deal with other issues such as emergencies … which means a mathematics teacher is not a specialized teacher and he/she has other roles. In China, a mathematics teacher's (or Chinese language teachers') only role is to teach the class perfectly. – Parent video discussion, Mr. Hai Liu

To some degree, this is largely true because in China it is always that same group of students who sit in the same classroom. Different teachers of different subjects come to the classroom to teach the students – generally speaking, these teachers' only role is to enhance students' performance in the subjects he or she is teaching. For each class, there is a director teacher (who may or may not be a subject teacher) whose responsibility is to take care of general issues of the students. In the United States, there is no such role, and it is the subject teachers

who take the similar roles.

**Beliefs of U.S. textbooks.** Two parents commented that U.S. math teachers do not follow textbooks while Chinese teachers do. Because of the lack of consistency in teachers' use of textbooks, some parents and students may face trouble when they are trying to refer to the textbooks for homework. For example, Ms. Abby Lin recalled her frustrating experience of her daughter's mathematics learning at home. When her daughter needed to find something in the textbook, she was unable to find the right content because the teacher did not teach chapter by chapter.

> When they learn, not like in China, where the teacher goes through topic by topic, they [American teachers] just jump from one topic to another topic. Sometimes, she [my daughter] cannot find what she needs for her homework in the textbook, no matter how hard she attempted to find. – Parent video discussion, Ms. Abby Lin

Ms. Maggie Shao also pointed out that U.S. teachers do not follow textbooks and what they teach may not match the textbooks. She also suspected the degree to which teachers use U.S. textbooks.

> Chinese teachers follow textbooks. American teachers do not follow textbooks… American textbooks are not like Chinese ones. Sometimes, what they are learning does not match the textbooks at all. I do not know to what degree they use textbooks but I feel they are used much less than in China. – Parent video discussion, Ms. Maggie Shao

Two highly educated parents commented that compared to Chinese textbooks, U.S. math textbooks are relatively easier and more readable. For example, Mr. Wei Han commented that, "You can see that the American textbooks are relatively easier." Similarly, Ms. Li Pan said, "In China, textbooks are taught by teachers; in U.S., books are more readable to kids."

Meanwhile, two less educated parents expressed their difficulties of reading textbooks.

For instance, Cindy Cao admitted that she cannot read and understand the textbooks. She said, "How can I read their textbooks? I cannot understand their textbooks." Another parent, Abby Lin explained that her English capacity was an obstacle to reading textbooks when she was trying to help her daughter.

> My English reading capacity is not so good. I told my daughter: "If you do not understand the content, you can read the examples from the textbook then you will know how to do the problems." Sometimes it works by reading the examples but sometimes it does not work ... Sometimes I spent lots of time to help her to find the part that she did not understand. It is possible that my English is not good so it is difficult for me to find the right part. – Parent video discussion, Ms. Abby Lin

Interestingly, even though Abby Lin expressed her and her daughter's difficulties using textbooks when her daughter needs help, she implied the importance of students owning textbooks. She criticized the U.S. policy that students need to return the books to school.

> Here [U.S.] they do not provide the textbooks to students permanently. This is one of the worst things to go to school in the United States … In mainland [China], each student has a book of his or her own so they can review. But here you can only rely on your notes. When you come back you only read these notes … she has textbooks in school but she needs to return them. –Parent video discussion, Ms. Abby Lin

To Abby Lin, owning textbooks is critical for her daughter. By contrast, Mr. Wei Han, who holds a Ph.D., expressed a completely opposite opinion on this issue. In his opinion, returning textbooks to school after use is a good policy.

> Of course this is a good thing. Otherwise, if we do not use our books any more it will be a waste, right? Furthermore, in this way, she does not need to carry the books to go to school and back. These recyclable books are useless if they are placed in a home. – Parent video discussion, Mr. Wei Han

In Mr. Wei Han's opinion, it is never a problem when his daughter returns the books to school. I asked him what they are going to do if his daughter needed books after returning the

books, Mr. Wei Han replied easily, “There are many resources that have the same content. We can borrow books from the library for her.” These contrasting opinions about owning mathematics textbooks suggest the different levels of access to educational resources between these two families: working families have less access to books than do highly educated families.

**Beliefs of U.S. mathematics education’s failure to meet high achieving students’ needs.** Studies have found that in the United States most Chinese parents are dissatisfied with the mathematics education in mainstream schools (Huntsinger et al., 1998; Huntsinger et al., 2000; G. Li, 2006). This perspective is shared by the highly educated parents in this study. Some parents believed that the goal of U.S. schools was to focus on the average student (or the majority of students). For example, Ms. Yan Sun said that, “The American schools’ goal is to take care of the majority students.” Another parent, Ms. Xuehua Hou, whose 2nd grader son was excellent in mathematics, explained how U.S. schools treated all students in the same way [in terms of mathematics education], “[American] schools treat all students in the same way so students are in the same level which the schools feel OK with that situation.”

According to these parents, because the goal of American schools mainly focuses on the majority of students they fail to address their children’s needs (all of whom could be considered as gifted or accelerated students). For example, Mr. Wei Han, in his analysis of the U.S. education video, claimed that good students can easily master the content but slower students may struggle longer.

> America’s education is a spiral style. They do not teach much content every year and they will come back to the same topic next year. So fast students can master the content after one cycle but slower students cannot understand even after three cycles. –Parent

interview, Mr. Wei Han

Because the school failed to address her son's needs in mathematics, Ms. Xuehua Hou stopped expecting anything from school.

> It is not only an issue of too simple. The school absolutely did not fit my son's needs. It looks like that they did not care about the high achieving children and they only pay attention to the average students … I am not interested in their mathematics class … besides reading, I don't care about other aspects my son learned from school because I do not expect he can learn anything in mathematics from school. – Parent interview, Ms. Xuehua Hou

Ms. Xuehua Hou's dissatisfaction with U.S. school mathematics was echoed by her close friend, Ms. Li Pan, whose son was attending a magnet program. Ms. Li Pan said, "His [my son] capacity is not fully developed … If what he can accept is 100 percent then the amount he received from school is about 10 to 20 percent at the most. So I am very dissatisfied."

Besides their general dissatisfaction, highly educated parents' major complaints about U.S. mathematics education include failing to teach enough content and not enough assigned work, which, according to the parents, is crucial in learning mathematics. As a result, the parents decided to take action by themselves and asked their children to do additional exercises in order to compensate for the weaknesses of the schools' mathematics education. Ms. Li Pan complained, "He [my son] did not really understand the content but briefly touched the topic. The school did not strengthen his understanding by assigning him lots of exercises. I think it's not enough. So when there is a test or exam we would ask him to do some extra practice." Another parent, Mr. Wei Han, also complained about U.S. mathematics education, saying "American teachers did explain many basic [mathematics] concepts and they did not repeat them

enough times so we attempted to make up at home." A third parent, Ms. Yan Sun, further believed that extra practice at home actually helped students to excel in mathematics. She said, "…but we do not think they teach enough content so we assign extra learning tasks for our children. If I did not push my children, they would be average students."

**Beliefs of U.S. mathematics education's policy of accelaration.** However, despite studies suggesting that Chinese parents are dissatisfied with mainstream U.S. mathematics education (Huntsinger et al., 1998), these parents also have some positive perceptions of U.S. mathematics education. Most participant parents believe that the policy in the United States that allows high-achieving students to skip grades if they are doing well in mathematics is beneficial. Ms. Abby Lin expressed her opinion that the policy that allows kids to skip grades is not available in China where the same class has students at all achievement and ability levels. She believes that separating students into different groups is efficient for learning because students will learn faster if their academic backgrounds are similar.

> Unlike in mainland China, where they put smart kids and "non-smart" kids together, in the United States, students are categorized into different groups. Students from different groups learn different content even though they are in the same grade … I think this education approach is relatively good because it will not waste time. I mean by putting students with similar academic backgrounds together, they will learn faster. – Parent video discussion, Abby Lin

Mr. Hai Liu explained how this policy of acceleration explores students' strengths and provides opportunities for students to attend higher level classes.

> Based on my son's experience in school, I estimate that American school often has a sifting function. If they think the student can survive in a certain level they push you to a higher level of class. This sifting way is more efficient to discover each student's strength. Some students may be interested in some areas and some students may be

> excellent in some areas; this sifting way provides opportunities for these students to attend higher level classes. – Parent video discussion, Mr. Hai Liu

Mr. Xian Zhou also prefers this policy even though he admitted that class efficiency in the United States is lower. Like Ms. Abby Lin, he also pointed out that there is no such a policy in China.

> The U.S. class' efficiency is lower. However, students can skip grades, which is good; and, in China it looks like there is no such a policy. I think this policy in U.S. is very good. If you are doing well in your study you can skip grades. – Parent video discussion, Xian Zhou

However, based on Mr. Xian Zhou's and Ms. Xuehua Hou's experience the availability of this flexible policy is obviously not universal in the United States and is closely linked to the families' locations. Both Mr. Xian Zhou's and Mr. Fan Gao's families used to live in Springfield County[8]. Mr. Xian Zhou moved to Fox Hill County several years ago and Mr. Fan Gao's family moved to Fox Hill County during data collection. However, Ms. Xuehua Hou's family, who are well known to Mr. Fan Gao's family, stayed in the Springfield County. These families expressed the limited availability of this policy of acceleration in Springfield County. For example, Mr. Xian Zhou said that when they lived in this Springfield County his son wasted his time in his mathematics classes.

> When he was in Springfield County he told me he had nothing to do [in math class] because he understood everything the teacher taught. That was a waste of time to sit in the class. That's why I sent him to the Chinese School to learn more math. – Parent video discussion, Xian Zhou

Ms. Xuehua Hou expressed her disappointment that her son's [Devin] school did not

[8] All counties in this study are pseudonyms.

make specific arrangements for her son even though he was identified as a GT (gifted or talented) student. As in the case of Mr. Xian Zhou's son, she believed that Devin did not learn in his mathematics class.

> I am not sure of the situation in other schools. However, in my son's [Devin] school I do not think they have any specific arrangements for kids who are doing well in mathematics. In terms of mathematics, I think my son's stay in school is a waste of time. – Parent video discussion, Ms. Xuehua Hou

Ms. Xuehua Hou's son's [Devin] situation is well known to the couple Mr. Gao Fan and Ms. Li Pan. They used to live Springfield County as well. However, they were lucky enough to win a spot for their son Tony to a magnet program through a lottery in the county, even though the school was very far away from home. They said that it is unfortunate for kids who did not win the lottery, like Devin.

> In Springfield County, it is bad luck for kids who did not win the lottery. When we moved to Fox Hill County we found that we do not have to use lottery any more in order to go to magnet class. – Parent video discussion, Ms. Li Pan

> In Springfield County, if you did not win the lottery you cannot go to magnet program. Like Devin [who is a 2nd grader], he cannot attend the 3rd grade math class [because he did not win the lottery]. So he needs to waste of time in his 2nd grade math class. – Parent video discussion, Mr. Gao Fan

Ms. Yan Sun expressed her mixed perspectives towards the policy of acceleration. On the one hand, like most other parents, she believes this is an advantage because students feel comfortable studying with similar classmates and it provides opportunities for high-achieving students.

> In the United States, if you are doing well in school you can go to GT program, which starts at 3rd grade in Littlewoods County. The education system has four levels: lower, regular, higher, and GT. If you are slow you go to the lower level. In this way, the kids

> feel comfortable. If the students are slower the teachers teach them slowly and if the students are fast and the teachers teach more content to them. This approach provides an opportunity for those fast students … I think this is an advantage of the U.S. school system. – Parent video discussion, Ms. Yan Sun

On the other hand, she is also concerned about several equity issues: the lower-achieving students are not stimulated to study hard because everyone in the class is behind; teachers cover less content, which is unfair to these students; lower-achieving students may have potential capacities which will not be discovered under this tracking policy; and lower level students lag further behind because they learn less content than other students.

> However, there is a drawback of this approach. For those lower level students, they do not feel they are being pushed. They do not have a sense of urgency to study: no matter study hard or not, they are who they are, like everyone else in the class. These American students feel comfortable because they are in the same level. It is also easy for teachers to teach. Students from different levels learn different content: teacher teach more content to higher level kids and less content to lower level kids. I think it is not fair to [the lower level] kids because they may have potential capacity yet to be discovered. If you put them in the lower level then they are who they are. – Parent video discussion, Ms. Yan Sun

> I do not think it is good. They believe this separation policy is fair to kids and takes care of them. In fact, for students who have strong self-esteem they will lag behind severely just because of their failure in one exam. Because they learn different content than other students, they will be further behind. That is why this policy has its drawbacks. – Parent video discussion, Ms. Yan Sun

This section illustrated how parents conceptualize general mathematics education (such as mathematics teachers and students' capacity) and U.S. mathematics education. The following section analyzes parents' responses specifically to the two contrasting examples of mathematics classes.

**Parents' Observations about Examples of U.S. and Chinese Mathematics Classes**

Studies indicate that most Chinese parents are dissatisfied with the U.S. mathematics

education in mainstream schools (Huntsinger et al., 1998; Huntsinger, Jose, Larson, Krieg, & Shaligram, 2000; Li, 2002, 2005). However, besides critiques of American schools' mathematics as being "easier" and "insufficient", little is known about Chinese parents' responses to typical U.S. mathematics classrooms. This subsection reports on how the parents responded to a U.S. mathematics class and a Chinese mathematics class. The data in the section were based on the video discussion activity that was described in Chapter 3.

**Class efficiency.** In the video discussion activity nearly all parents believed that U.S. classes are less efficient than Chinese classes. Many parents believe that within same amount of time, the Chinese teacher teaches more problems than the U.S. teacher, even though their estimations of the numbers of problems covered by the teacher varied largely between the parents. Mr. Xian Zhou and Ms. Cindy Cao, both less educated parents, said that the U.S. class is less efficient but also pointed out that in a Chinese class, whether students understand or not, the teacher will keep going on his teaching schedule. This equity issue will be analyzed later.

> There is not enough time. It must be slow to teach like this way. In the Chinese way, the teacher can teach more. Within the same amount of time, the Chinese teacher can cover 10 problems but the U.S. teacher may only be able to cover 7 or 8 problems. The U.S. class is definitely slower because when the Chinese teacher teaches on the blackboard every student can listen to his instruction. For U.S. class, on the other hand, the teacher has to check students' work on each table which requires much more time than the Chinese teacher. The U.S. teacher needs much more time. In our Chinese way, every student is aware of what the teacher is talking about. However, whether or not the student can understand the content and if the student can catch up is his or her own business, right? When the U.S. teacher teaches one table, only 4 or 5 students know what he is talking about. -- Parent video discussion, Mr. Xian Zhou

> In the Chinese class the teacher teaches in front and can cover more content. In the U.S. class, the teacher talks all the time. For the same problem he needs to go through each table so it takes more time. That is the difference. In the Chinese class, no matter how

> much knowledge the students absorb, the teacher goes through until he finishes all problems. With the same amount of time, Chinese teacher can teach two examples but the U.S. teacher can only teach one. – Parent video discussion, Ms. Cindy Cao

By contrast, the highly educated parents, when talking about the inefficiency of the U.S. class, do not heavily emphasize the Chinese teacher's inattention to individual student's needs. These highly educated parents, just as in the above analysis, believe that U.S. mathematics education failed to address high achieving students' needs as in the case of their own children. Therefore, unlike the less educated parents, who worried about the teachers going too fast and not paying attention to individual's needs (which was the case when they were in school in China), highly educated parents wished the teachers could cover more content and at a faster pace. Ms. Xuehua Hou even mentioned that when the Chinese teacher teaches, all students can hear what the teacher is talking about, which is not true in the U.S. class. Mr. Fan Gao harshly criticized that the U.S. class group work is a waste of time.

> In the U.S. class, the teacher needs to teach each table separately so I think the efficiency is not high. I think the Chinese class has a relatively higher efficiency because within 45 minutes the teacher teaches all students at the same time. The students can hear each sentence of the teacher. When the U.S. teacher talks with one group of students, only this small group of students can hear what he said. Or, sometimes even only one student hears what he said. In conclusion, I think the U.S. class is less efficient than the Chinese class. – Parent video discussion, Ms. Xuehua Hou

> You can see the Chinese class has covered so many problems but the U.S. class is still working on these two problems. – Parent video discussion, Ms. Li Pan.
> They are still graphing. I think the group work is a waste of time. – Parent video discussion, Mr. Fan Gao.

**Issues of group work.** Parents reported four issues about the use of small groups in mathematics instruction: classroom organization, classroom management, applicability of group

work to mathematics class, and effectiveness of group work.

***Classroom organization***. Several parents expressed their concerns that if students sit in groups to work on problems some students will inevitably be unable to see the teacher comfortably when the teacher is talking to the whole class. Parents observed that students either need to turn around to see the teacher or merely ignore the teacher. For example, Ms. Xuehua Hou and Mr. Xian Zhou questioned whether some students could see the content.

> These kids sit face to face. Some are back to the teacher. How can they see the content when the teacher is lecturing? – Parent video discussion, Ms. Xuehua Hou

> The students sit in a table like this. It is impossible for some students to see [the teacher]. – Parent video discussion, Mr. Xian Zhou

Similarly, Mr. Fan Gao noticed that some students do not pay attention to the teacher. The U.S. teacher needs to shout loudly to the whole class in order to get attention of the students, which is not successful. Meanwhile, Mr. Fan Gao expressed his preference for the Chinese class organization which enables the teacher to easily monitor the whole class.

> Many students cannot see the teacher and they need to turn around. You can see that a student needs to turn around. This student does not turn around at all. Most students do not listen to the teacher. At the beginning of the class, he needs to shout "listen closely" every time to bring students' attention back. Even he shouted several times, not everyone is listening to him. In contrast, the Chinese teacher can easily spot the students who do not pay attention. – Parent video discussion, Mr. Fan Gao

***Classroom management***. Another issue raised about group work is classroom management. They pointed out that if students work in groups they are more likely to chat with each other. Also, some students may easily disrupt the whole group. Ms. Xuehua Hou recalled her own experience in school where kids chatted during class and argued that the American kids

would chat as well, especially in this form of group work. Mr. Xian Zhou went further by saying that a troublemaker can disrupt the whole group.

> Doesn't this organization make it easier for kids to chat during class? I remember when I went to school, kids often chatted in classes, right? I believe it's the same for these kids. – Parent video discussion, Ms. Xuehua Hou

> Within the group of four or five students, if one student makes trouble, the whole table will be disrupted. – Parent video discussion, Mr. Xian Zhou

***Applicability of group work to mathematics class***. Some parents questioned the reasoning for using group work in mathematics class. Interestingly, it is the highly educated parents who hold this perspective. These parents believe group projects are not suitable for mathematics, especially for problems like graphing linear equations. In their perspective, mathematics is a subject that requires more individual thinking than group work between students. For example, Ms. Xuehua Hou believes that mathematics trains students' calculation and reasoning capacity rather than creative thinking and hence should not be conducted in groups.

> I don't understand why the teacher asks the students to do group projects for mathematics. I think mathematics is a subject that tests an individual's thinking capacity rather than creates new ideas. For example, calculation and reasoning are tests for individual's capacity. Why do they need group projects? ... I feel mathematics is not a subject suitable for group projects. – Parent video discussion, Ms. Xuehua Hou

> However, I think mathematics class should be different than many other subject classes because mathematics requires individual thinking. I think to work in groups may result in great confusion sometimes. – Parent video discussion, Mr. Fan Gao.

> [Analytical] geometry like this, is not doing a project; is there any meaning to do group work? I think just by plugging in numbers into the equations it is meaningless, right? – Parent video discussion, Yan Sun

***Effectiveness of group work***. Beside the aforementioned critiques of the U.S. class, four highly educated parents also expressed their skepticism regarding the level of students' participation of the class. They believe that the even though students sit together and work in groups this does not mean all students participate in the class. For example, Mr. Fan Gao commented that, "The American students, even though they work in a group it does not mean every student is participating."

In the same way, Ms. Xuehua Hou observed that although the U.S. students sit in groups the teacher still works with individual students instead of the whole together which meant that group work is a meaningless pedagogical approach. Furthermore, Ms. Xuehua Hou implied that students' participation in discussion is largely determined by whether students have ideas about how to solve the problems.

> In fact, although the [U.S.] teacher goes to each table or each group, ultimately he still needs to focus on the individual student. That is, he actually just tutors each individual student. In this way, I do not think it is meaningful for students to work in groups. You see, each individual student does not understand the problem. Because none of them has an idea, even if they sit together they cannot even start to discuss. That is what I think. – Parent video discussion, Ms. Xuehua Hou

Mr. Wei Han believes that only a limited amount of students participate in the problem solving. According to him, only smart or successful students do the problems in the group, other students can only listen and contribute nothing. He also claimed that students only get attention from the teacher when they ask questions. Mr. Wei Han said when the teacher is helping one desk the other desks are just waiting and bored, which indicates that these students do not participate.

> I think although the teacher is working hard he just is repeating the same content to each table. Among the four students in the same table, if there is one smart student he or she will do the problem. The others do not understand and can only listen. Furthermore, the teacher asks heuristic questions which only work for smart students but the other students still get nothing. I think for problems like these, it would be better for the teacher to explain four different examples on the blackboard rather than explain the same problem four times [to different groups]. Every student needs to repeat and only in this way can they have opportunity to do the problems. In a group, although it's supposed to be teamwork, in practice, only the most talented kid makes [and] did all work. Half of the kids contributed nothing. – Parent video discussion, Mr. Wei Han

> Most students do not participate. Only a few good students who are doing well on the problems talk in the class. Those who cannot do the problems do not talk. For the same question, the teacher teaches four times to four different desks. When students in one desk are finishing, the students from the other three desks are just waiting and are bored. Successful students feel bored. For unsuccessful students, I suspect if the teacher paid attention to each of them. I think that only when a student keeps asking question the teacher pay attention to him or her. If a student do not ask question, the teacher does not pays attention to him or her. – Parent video discussion, Mr. Wei Han

The limited positive aspects U.S. mathematics education includes focusing on students' interests, motivation and creativity (Li, 2005) and an appreciation of the U.S. mathematics education's policy of acceleration. Parents, especially less educated parents also pointed two other positive aspects of the U.S. mathematics class they viewed: issues of equity (i.e., teacher pays attention to individual students) and the communication issue (i.e., U.S. classroom is suitable for teacher-student communication so students could ask questions easily.)

**Equity issue.** Three less educated parents and two highly educated parents concluded that the U.S. teacher pays more attention to individual students while the Chinese teacher pays little attention to individual students and just teaches the whole class. Mr. Xian Zhou (SM) believes in this instance that the U.S. pedagogical approach is better than the Chinese one because it is easier for students to ask questions in the U.S. class; different students can ask

different questions. In the Chinese class students who sit in front have much more opportunities to ask questions than those who sit in back.

> It is really good for the U.S. teacher to walk around. If you raise your hand, the teacher will talk to you. Each student is different: what you can do may not be the ones the other students can do. This is really important. – Parent video discussion, Mr. Xian Zhou
> I think this pedagogical approach is really good, especially when compared to the Chinese approach. You see, in the Chinese class, among ten times that students ask questions, eight questions will be asked by the students who sit in the front and less than half of the students who sit in the back cannot have chance to ask questions. – Parent video discussion, Mr. Xian Zhou

Ms. Cindy Cao (ST) claims that even though the Chinese class is more efficient than the U.S. class the Chinese teacher did not pay attention to each student's needs and goes on to teach while the U.S. teacher goes to each table to answer students' questions.

> In the U.S. class, the teacher talks all the time. For the same problem he needs to go through each table so it takes more time. That is the difference. In the Chinese class, no matter how much knowledge the students absorb, the teacher goes through until he finishes all problems. – Parent video discussion, Ms. Cindy Cao

Like what Ms. Cindy Cao has said, Ms. Abby Lin (WK) admitted the U.S. class is slower compared to the Chinese class. However, she claimed that the U.S. class can make sure that the each student can learn the content and ask questions. She also recalled her previous educational experience in China when she did not understand the class and could not ask questions.

> The U.S. teaching way takes much more time so its progress is slow. However, it can guarantee that each student learns the majority of the content. In the Chinese class, the teacher just goes ahead no matter if the students understand or not… When I was in school, I was not smart and I dared not to ask questions. I could not understand the content during class and was more confused after class and the problems began to accumulate. Although the U.S. class is slower, it can guarantee each student to ask questions if he or she does not understand. – Parent video discussion, Abby Lin

The perspective that the U.S. teacher pays attention to each student is also shared by two

highly educated parents, Ms. Yan Sun and Ms. Xuehua Hou. Ms. Yan Sun also claimed that the Chinese teacher mainly pays attention to the middle students, instead of each student. Similarly, Ms. Xuehua Hou claimed that the U.S. class covers more students because the U.S. teacher communicates with every kid. She further commented in the Chinese class there must be some students, who do not pay attention.

> In the Chinese class, like Kyle has said, the drawback is the teacher teaches the some content to the whole class in a same pace. For example, for students who are fast in understanding, they may feel it's too easy while for slower students they may not understand at all, that is the problem … Chinese education generally pays attention to the middle students rather than the faster and slower students. In the U.S. class, the students work in groups and the teacher pays attention to each student. It is different than the Chinese class. – Parent video discussion, Ms. Yan Sun

> The U.S. teacher covers more students because he communicates with each student [more than the Chinese teacher]. I feel the U.S. class probably covers more students, that is, takes care of each student. – Parent video discussion, Ms. Xuehua Hou

> The U.S. teacher walks to each student. Although the efficiency is not high he walks to each student. He can basically guarantee. No, I do not mean guarantee. The teacher can ultimately communicate with each student. It is impossible for the Chinese teacher to teach this way because he teaches much more content. It is only supposed that each student follows the teacher. In fact, this assumption is not true. There must be some students who do not pay attention to the teacher and do not follow the class. – Parent video discussion, Xuehua Hou

However, for Mr. Wei Han, the degree to which the U.S. teacher pays attention to each student is highly suspect. According to him, whether or not the teacher pays attention to a student is conditional—it depends on if the student ask a question. For those who do not ask questions, they do not receive attention from the teacher. This claim contradicts most of the other parents' assertions that the teacher pays attention to each student. He also analyzed that the Chinese teacher teaches the whole class instead of paying attention to each student.

> For unsuccessful students, I question if the teacher pays attention of each of them. I think that only when a student keeps asking questions the teacher pay attention to him or her. If a student does not ask question, the teacher does not pay attention to him or her. – Parent video discussion, Mr. Wei Han

> The Chinese teacher teaches what he knows. He teaches different techniques to students. Whatever you can accept it or not, that is your thing because it's 50 people in the class. – Parent video discussion, Mr. Wei Han

**Classroom communication.** Less educated parents believe that in the U.S. class, the communication between the teacher and students is helpful for the students to feel comfortable asking questions. According to Ms. Abby Lin, and Ms. Xuehua Hou, the U.S. teacher and students have a close relationship with each other. This friendly teaching method helps students to feel comfortable asking questions when they do not understand. Moreover, Ms. Xuehua Hou believes that the organization of group work reduces students' stress about asking questions because nobody in the group knows how to do the problem. In contrast, these three parents expressed their perspective that in the general Chinese class students dare not to ask questions even though they have question because the teacher only lectures in front and has complete authority.

> The way they communicate is good. I think the teacher and students are close to each other. The teacher treats the students like friends. The students are not afraid of the teacher. They ask questions they have when the teacher talks to each desk. It is considerate that the students can ask questions when they do not understand. By contrast, in mainland China, the class is large and students do not have opportunities to ask questions if they are not brave enough. – Parent video discussion, Ms. Abby Lin

> In Chinese class, because students sit alone, they are afraid to ask questions, right? The students are likely to hide what they do not understand. They dare not ask question even if they do not understand. In the U.S. class, because students sit in groups, if there is something no one in the group understands they will feel comfortable to ask the teacher. That is what I think. Because in the group if no one understands how to do the task – it is

> not an individual who does not understand, they feel much better to ask the teacher questions. – Parent video discussion, Ms. Xuehua Hou

Mr. Xian Zhou also agreed that the U.S. teaching method is better than the Chinese by pointing out that different students have different questions. Hence it is better for the teacher to walk around and answer students' questions.

> If a teacher can teach like him it would be real great. It would absolutely better than the Chinese teaching way… It is good for the teacher to walk around because students' capacities vary and they have different questions. When they do the tasks different students have different questions. – Parent video discussion, Mr. Xian Zhou

Mr. Hai Liu estimates that the U.S. teaching approach would be helpful for students to understand the questions. He commented: "I am surprised that the [U.S.] teacher communicates to the students face to face. I think it's probably helpful for students to understand the mathematics with common sense."

Similarly, Ms. Cindy Cao expressed her appreciation interactions in the U.S. class compared to her previous educational experience in China where teachers only lectured and did not walk around.

> The interactions between the U.S. teacher and the students are good. It is different than China. When I was a student the desks were arranged in rows and columns. The teacher merely lectured in front and rarely went down to talk to students. – Parent video discussion, Ms. Cindy Cao

**Parents' preferences of classes.** The highly educated parents and less educated parents had contrasting preferences for the two classes that were showed to them in the video discussion activity. Four highly educated parents preferred the Chinese class for several reasons: Chinese students put more into class, gained deeper understanding, and had higher level of concentration.

> Personally, I prefer the Chinese class' management. Furthermore, I think Chinese students input much more in the class than American students. I also think Chinese students have a deeper understanding of knowledge [than American students]. – Parent video discussion, Ms. Xuehua Hou

> For me I prefer this one [Chinese class]. I think this class must have higher efficiency than the U.S. class. Furthermore, the kids are serious and pay attention in the class. They can concentrate and use their brains. If kids are given too much freedom, and even look like play in the class, how can their brains be stimulated to think? – Parent video discussion, Ms. Sun Yan

> I think fundamental courses [like math] should be taught in the Chinese approach. – Parent video discussion, Ms. Li Pan

> For me I prefer the Chinese class. – Parent video discussion, Ms. Maggie Shao

However, two of the less educated parents prefer the U.S. class because they like the class environment and the teacher' attention to each student. However, one less educated parent, Ms. Cindy Cao believes the Chinese approach is acceptable because she had this approach during her school years.

> I think this teaching approach is really good. It is much better than the Chinese approach. – Parent video discussion, Mr. Xian Zhou

> If I had a chance it would be better for me to have the American style class. I am an extrovert and I like an active environment. – Parent video discussion, Mr. Hai Liu

**Parents' Educational Experience**

When parents talk about their previous educational experiences in China there is a fundamental difference between the less educated parents and the highly educated parents. Generally, parents with less education tend to perceive their educational experience in China negatively, while parents with more education tend to perceive their experience much more positively.

For example, three less educated parents recalled that students did not ask questions during class and the teachers just lectured and went on. The students could only ask questions after class or some other time. One parent pointed out that it was through grading the homework that the Chinese teachers found students' problems. Therefore, it may take much longer for students to get the feedback from the teacher, which is not a problem in the U.S. class. Some less educated parents expressed explicitly if they had a better teacher their scores would have been higher.

> When I was in school we rarely did this [group work]. The teacher just lectured in front, no matter if you understood the content or not. A few minutes before the end of class, the teacher assigned the homework. If you have any questions you might ask the teacher early the next day or during the self-study class. – Parent video discussion, Ms. Cindy Cao

> Based on my previous education experience [in China], Chinese teacher taught an example on the blackboard for the students to understand. Then he assigned homework. After students submitted their homework the teacher would grade. In this way the teacher would estimate the students' understanding. However, this only happened after class, maybe three days later, or even one week later … If I had a teacher like him when I was in mainland [China], my score would be higher. – Parent video discussion, Mr. Hai Liu

Another parent explained that when she was in school, "non-smart" students like her dared not to ask questions even if they did not understand, and this became a problem because they had more and more questions.

> We were not smart students when we were in school in China. Hence, when the teacher was teaching we dared not ask questions even if we did not understand. Then in the next class we were even more confused because our questions accumulated gradually. – Parent video discussion, Ms. Abby Lin

In the case of one of the less educated parents, even though he did not explicitly describe his negative classroom experiences, he recalled the poor education he received when he was in

China. He also pointed out that he did not go to school beyond middle school, let alone high school or college, which was a typical phenomenon in his hometown area.

> When I went to [elementary] school, there was no 6th grade, there was only 5th grade. Then it was middle school year one and year two, and then high school year one and year two, that's it. I have never gone to a high school. In fact, I did not even finish middle school year two. I only attended for one semester. It indicates that people from Fuzhou don't think it's useful to go to school. No one took the college entrance examination, especially in 70s, we only went to school for few years. I was born in 1967. – Parent video discussion, Mr. Xian Zhou

While these less educated parents shared negative experiences of their pre-immigration educational experience, the highly educated parents described a completely opposite picture of their education in China. For example, one parent, who had immigrated to the United States twenty years earlier, recalled how her Chinese teachers were responsive to students' questions and provided time after work to help students.

> I know our Chinese teachers often work overtime and give extra time for students. I remember when I was in school [I do not know the current situation] the teachers did not go home even after school. Teachers asked us like this, "If you have any questions please come and ask me." For slower students, teachers always hoped they would ask questions and solve the questions as soon as possible. The teachers may also have arranged for high performing students to help low performing students. Anyway, the teachers were trying to help no one was left behind. – Parent video discussion, Ms. Yan Sun

The other two highly educated parents both claimed their previous schools and teachers were excellent. When they talked about these experiences, one could feel their tone of pride and self-confidence, qualities missing from the less educated parents' conversations. However, these two parents are also aware that others may not have shared their positive mathematics educational experiences in China. One of them, Ms. Li Pan, admitted her lack of knowledge of those left behind.

> However, you need to think, we were all good at mathematics when we were at school in China. How about those who were left behind? We do not know … Our [middle school] mathematics teacher taught us for all three years until we finished our middle school exit exam. Our class had the highest average mathematics score. He taught pretty well. Chinese teachers grade homework very seriously. – Parent video discussion, Ms. Li Pan

Another parent, Ms. Maggie Shao, implied that her negative perceptions of her son's mathematics educational experience in school may be related to her positive educational experience in China where she had all senior teachers in her high school. She supported supposition by referring to one of her middle schoolmates who later went to a bad school. Based on her interactions with her friend, she understood how a bad teacher can influence students' learning.

> I was really surprised. Problems like this we do not even need to think and we can definitely solve it. However, I am not sure if it's because the high school I attended was an excellent high school. My teachers were senior teachers in Shanghai. This may be the difference … I was in Songjiang, Shanghai. The high school I attended was a key high school in Shanghai and all teachers were excellent. So it is related to the difference between teachers. I had a close friend who went to the same middle school with me. However, after middle school she went to a bad high school because of her bad score. Sometimes we were studying together to prepare for the high school exit exam and I found how bad their teachers were. Their teachers only taught them like, "Remember this because it will be tested." The teachers just guessed the content of the test rather than taught students how to solve problems, such as how to solve a specific type of questions. They did not teach students the methods to solve problems. Their teaching was totally different from my teachers' and was very inflexible. – Parent video discussion, Ms. Maggie Shao

However, a fourth highly educated parent provided a seemingly contradicting perspective. On the one hand, she believes that "in terms of the subject of mathematics the American approach is not as good as the Chinese approach". Surprisingly, she first recalled her experience that students did not have a chance to ask questions during class and later pointed out

that this is a drawback of the Chinese class.

> I remember in my school if you did not understand something you could ask the teacher after class. The teacher told us to ask him or her after the class. I think in the American class it is rare for students to ask questions after class because the teacher worked on all questions during the class. I remember when I was in Chinese classes the teacher only lectured and did not answer students' questions … There is a drawback of Chinese class, that is, the lack of discussion. If a student meets a problem, he can get help from the teacher after class. But this is not as good as the American way because they have time during class for discussion and answering questions. – Parent video discussion, Ms. Xuehua Hou

**Discussion**

In terms of parents' beliefs of mathematics education, parents, both highly educated and less educated, believe that Chinese (and Chinese American) students outperform mainstream American students. They also appreciated the policy of acceleration in U.S. mathematics education that allows students to skip grades if they were high achievers. However, despite the existence of a this pathway for high achieving students, highly educated parents still believe that U.S. mathematics education failed to address high achieving students' needs (Huntsinger et al., 1998; Huntsinger et al., 2000). Some parents also commented on how the subject of mathematics should be taught: high quality mathematics teachers, a focus on mathematics content, and strengthen multiplication tables. Two parents believe that some students' capacity is fixed and it is useless to expect them to excel in education.

In terms of parents' conceptions of U.S. mathematics education, the differences and similarities between highly educated parents and less educated parents have not been addressed by current literature. In terms of parents' responses to the two contrasting classes (i.e., U.S. and Chinese mathematics classes), highly educated parents and less educated parents have nearly

opposite preferences. Highly educated parents tend to prefer the Chinese class while the less educated parents prefer the U.S. mathematics class. Even though both types of parents have critiques of the U.S. mathematics class—U.S. class was not efficient and there were multiple negative consequences associated with group work (classroom was organized in a way which was not suitable for students' learning); classroom management was problematic because some students may chat instead of studying; group work was not suitable for mathematics and many students did not participate -- some parents, mainly less educated parents, argued that the U.S. mathematics class was more equitable than the Chinese mathematics class: the teachers paid attention to each individual student' needs. Furthermore, these parents believed that in the U.S. mathematics class the communication between the teacher and the students was more conducive for students to ask questions, which was unavailable in the Chinese class.

Furthermore, less educated parents and highly educated parents have contradicting perceptions of their educational experiences in China. The less educated parents commented that their educational experiences in China were undesirable and their teachers did not pay attention to them, and their mathematics achievement was deficient. The highly educated parents, however, recalled their pre-immigration experiences very positively. They believe their teachers were excellent teachers and were responsive to students' needs.

In terms of how to perceive the U.S. educational system, there were both similarities and differences between less educated parents and highly educated parents. First, parents, both less educated and highly educated, believe that American students lag behind their Chinese peers (both Chinese students and Chinese American students) in mathematics. This perception

coincides with the most current findings in terms of Asian American students' mathematics achievement (Chen & Stevenson, 1995; Whang & Hancock, 1994; Yan & Lin, 2005). One reason why some parents have this perspective is because either their own children are immigrants (such as Mr. Hai Liu) or they know some Chinese immigrant students within their social circle (such as Ms. Abby Lin). According to them, these immigrant students' high achievement in mathematics is an evidence of general Chinese students' strength in mathematics. Some parents, like Mr. Wei Han, observed that in the GT mathematics program, Asian students were the majority. Second, generally speaking, highly educated parents are much more critical than less educated parents when they expressed their perspectives of how the subject of mathematics should be taught. Ms. Maggie Shao, for example, expressed her extreme dissatisfaction with her son's teacher and emphasized the importance of the teacher's quality for good mathematics education. Some highly educated parents also believe group work is not suitable for mathematics because mathematics requires more individual thinking than cooperative thinking.

All parents hold positive perspectives toward the policy of acceleration in the U.S. —that is, allowing students to skip grades if they are doing well in mathematics. However, two highly educated parents Ms. Xuehua Hou and Ms. Yan Sun, were critical of their children's school because they prohibited their children's access to such a policy.

The first parent, Ms. Xuehua Hou, lives in a county with limited educational resources. Even though her son, Devin, is a GT student, he could not attend any GT program because he did not win the lottery—a way to select students who can go to GT programs. These two parents did not say this is not a good policy and I think the two parents all believe this is a good policy

because the reasons they are not satisfied is that their children have difficulties participating in the higher class. Another family, Ms. Li Pan and Mr. Fan Gao, who were once neighbors of Ms. Xuehua Hou's family, did win the lottery and sent their son to a magnet program even though it takes 40 minutes to reach the school by school bus. When Ms. Li Pan's family moved to another county they found that they could send their son to a magnet program without a lottery. Ms. Xuehua Hou's and Ms. Li Pan's contrasting cases also suggest one important practice of Chinese immigrant families' involvement in their children's education – choosing to live in the community with the best public schools.

The second parent, Ms. Yan Sun, in the parental video discussion said that her son was not admitted to a higher grade level math class because he had missed few points. Ms. Yan Sun and her husband spent lot of time and energy during a summer to tutor their son in order to get him enrolled into a higher level mathematics class.

When comparing the two mathematics class videos, parents from both less educated and highly educated group, expressed their concerns about the efficiency of the American mathematics class and about group work (such as classroom organization, class management). Some parents believe the U.S. class organization (i.e. students in groups) is not suitable for learning because some students will not able to see the teacher, and class management is problematic because students may chat and cause troubles. Nearly all parents commented that the U.S. class is less efficient than the Chinese class.

The issue of efficiency is closely related to the issue of equity. Although parents believe that the U.S. class in the video was less efficient than the Chinese class, some parents (except Mr.

Wei Han), especially less educated parents, believe the U.S. class addresses the equity issue better than the Chinese class because the U.S. teacher pays more attention to individual students while the Chinese teacher pays little attention to each student and just follows his lesson plan. In fact, some parents analyzed the inefficiency and the equity issue together by pointing out that the U.S. teacher's addressing of equity is exactly the reason why his class is less efficient. These parents (mainly less educated parents) also appreciated the communication between the U.S. teacher and his students—who can comfortably ask questions during class. However, two highly educated parents also commented that the U.S. class does not necessarily guarantee students' participation. For instance, according to Mr. Wei Han, only few "smart students" participate in the discussion. On the other hand, the less educated parents are much more confident in the function of group work because students can easily communicate with the teacher.

How the two types of parents conceptualize the U.S. and Chinese mathematics classes in the videos and how they perceive general U.S. mathematics education was essentially associated with their pre-immigration educational experiences in China, which were fundamentally different between the two types of parents. When highly educated parents talk about their previous educational experiences in China, they all have a positive and confident tone while less educated parents usually present a tone of hesitance. For example, Maggie Shao, who holds a Master's degree, recalled that her previous high school had all senior teachers. In contrast, Abby Lin recalled that in her school time in China "non-smart" students like her dared not ask questions even if they did not understand.

Those highly educated parents received a good education in China (or they believe they

received a good education in China). As a result, when they consider U.S. mathematics education, they use their previous mathematics education in China as a reference. As a result, they tend to refer to their previous schools and teachers (which are excellent according to them) and are not satisfied with the U.S. mathematics education. For the same reason, these parents have their own perspectives of how teachers should teach mathematics. These parents tend to see fewer positive aspects than the less educated parents. Possibly because of their distrust and dissatisfaction with U.S. mathematics education (not all subjects, as Ms. Xuehua Hou emphasized), these parents tend to directly participate in their children's mathematics education especially through personal tutoring. This is further discussed in succeeding chapters.

On the other hand, the less educated parents received only middle school or less than middle school education in China. These parents have more negative impressions of their educational experience than those of highly educated parents. For instance, their teachers did not answer their questions even when students did not understand or students dared not to ask questions. By contrast, U.S. mathematics education is seen as much better because students can confidently and comfortably ask questions and the teacher pays attention to each student. This explains why these parents expressed greater appreciation of U.S. education than the highly educated parents. Because these parents have more trust in the U.S. school system and because of their limited capacity to participate in the mathematics content (especially at higher levels), they tend to rely more on the U.S. school system than the highly educated parents. For example, Mr. Xian Zhou paid an additional fee to some Chinese teachers to tutor his son after school. Mr. Hai Liu asked his son to stay in his math teacher's class after school in order to ask questions.

These practices are related to the research questions regarding the relationship between family and school and will be addressed in succeeding chapters as well.

# Chapter 5: Cultural Capital and Family Involvement

As stated in the theoretical framework, *cultural capital* refers to the possession and use of education, knowledge, skills, experiences, expectations, aspirations, attitudes, values and culturally relevant materials Chinese immigrant family members have had throughout their lives that enable their children to achieve high levels of academic success. Although the definition of cultural capital was adapted from Bourdieu's (1986) definition, in this study his framework of the three forms of cultural capital is used to organize different components of cultural capital. According to Bourdieu (1986), cultural capital has three forms: *embodied, objectified,* and *institutionalized*. However, it is indicators of cultural capital that allow us to perceive how cultural capital functions. Family members' education, as an important part of *institutionalized* form of cultural capital, can deeply influence students' education through direct tutoring. As a result, in this study, how family members apply their educational knowledge to help children's mathematics education will be treated as one cluster of indictors of cultural capital that include: parent tutoring, use of libraries, availability of books, academic assistance from siblings, and academic assistance from extended families members. Parents' (and extended family elder members') attitudes towards children's education reflect the embodied status of cultural capital. In this study, three indicators of embodied status are explored: parents' strictness, parents' and extended family elders' monitoring of students' education, and families' and students' aspiration of higher education, career and general education.

**Parent Tutoring**

According to the definition of cultural capital, parents' educational attainment is an

important component of cultural capital. Parents' education itself is held by the parents themselves and cannot be consumed the way they spend money. It is how parents use their previous education (in this case, particularly the education they received in China before immigration) to influence their children's academic experiences that matters. As a result, parents' tutoring becomes an indicator of cultural capital. Different parents may have strikingly different educational attainment: some of them have doctoral degrees and some of them have not even finished middle school. However, a parent, no matter how little educational attainment he or she has, must have a certain amount of cultural capital in terms of education. Some studies find that Chinese immigrant parents provided tutoring to their children's mathematics education (Cheng et al., 1992; G. Li, 2002; Pan et al., 2006; Siu, 1993). This section illustrates how the Chinese immigrant parents in this study, who have different educational attainment, attempted to directly tutor their children and how their children perceived their parents' efforts and other patterns of parent tutoring.

**Mathematics was the only subject with which parents can help.** For nearly all participating families, mathematics was the only subject with which parents could help their children. This phenomenon was recognized by both students and parents. For example, Zanmin commented in student a group interview, "Well math is the only area they can help in. They didn't study American history so they wouldn't know if I ask them, and Spanish is out of the question." Another student said, "My parents, it's mainly only math because they actually know math. They don't know much English, so they can't really help me out there." Molly claimed that "…it [math] is the only subject that they can help me with English, they don't understand

English greatly, grammar and social studies. We learn about American history and they think American history is worthless." Parents were also aware that mathematics was the only subject with which they could help. As one parent admitted, "We can only help them in mathematics because we cannot help them in other subjects. Subjects such as European history, world history, they had to learn on their own."

**How do parents tutor their children?** Nearly all participant parents tutored or directly helped their children's mathematics to some degree. Some studies have found that home teaching was very common among Asians and is not class linked (Pan et al., 2006). However, different parents engaged in different levels of tutoring for their children's mathematics. In general, highly educated parents tutored their children much more than less educated parents. Some less educated parents tended to tutor their children when they were in the lower grades, when the mathematics content is simpler. For example, one student from a less educated family, Alex (SM), recalled that his father, Mr. Xian Zhou (SM), taught him his multiplication tables and helped him understand the concept of fractions.

> Even when I was young, my parents would teach me math. Although it wasn't much, it certainly helped me through my first eight years of school days … One of the things that I had to study was the multiplication table. My parents, especially my father, were very strict on how it was going to help me multiple times, over and over again. – Student essay, Alex.

> On, well for the multiplications table, he taught me how to do it in Chinese because he told me it was a lot easier if I learn it in Chinese first because it's like somewhat of a arithmetic tone to it, so it's kind of easier to remember. So he like taught it to me and it took me a while to get it and he even put a whole poster on the wall at our old house so I can come home and just stare at it every da. Like 'Oh, my gosh I have to remember this.' – Student interview, Alex

> I remember back then like probably he did help me a lot, like trying to help me out with my homework like I had trouble with fractions, sixth grade. So they taught me easier ways and I was like instead of looking at them like fractions, like all scary and stuff, just look at them as if they were just small parts, not like really big chunks of mass. Look at them like little pieces together - Student interview, Alex

Similarly, another student, Kitty (WK), also from a less educated family confirmed that her mother taught her basic mathematics content such as addition, subtraction, multiplication and division. Interestingly, like Alex's father, who posted the multiplication table on the wall and asked him to memorize it, Kitty's mother used the same strategy to teach her the multiplication tables. Kitty summarized in her essay how her mother taught her these basic mathematics skills.

> I remember my mom teaching me the alphabet when I was a child. She taught me numbers, letters, and all the basics when I was a child. It was easier for my parents to teach me when I was a child, because I just needed to learn all the basic material, and my parents of course, knew most of it. Basic mathematics was actually one of the easiest things for my parents to teach me. It was easy for them to teach me simple mathematics like addition, subtraction, multiplication, and division. I remember having to study the multiplication table that was taped onto the wall. I also remember my parents using flashcards to help me practice every week, and they would make-up problems to help me practice. –Student essay, Kitty

It is not only parents who initiate this parent tutoring activity; students, when they were in need, would voluntarily seek help from parents about their homework. When Kitty was young, she would ask her mother for help if she did not understand the meaning of some mathematics concepts. She said, "I think when I was in first grade, I didn't understand estimation so I asked her [mother] about it and she explained it to me and I understood it."

However, not all students from less educated families received substantial tutoring from their parents. Two students, both from less educated families, asserted that their parents did not tutor them much when they were young. In Alice's (SM) memory, there was no direct help from

her parents, even though her father might occasionally help her with some basic math.

> Anyway, there was really no direct help that I remember from them. Maybe they helped me learn my times tables, I don't know. I do remember asking my dad for help on some algebra 1 problems in the 7th grade though. – Student essay, Alice.

Even though Alice said that her parents did not help her much in mathematics, she admitted that her parents actually attempted to provide mathematics tutoring for her younger siblings.

> When I was a kid, I don't remember my parents teaching me but when my sister was a child, when she had to learn the multiplication tables, they just had a notebook for a composition table, composition notebook, and they write in all the problems like one times one equals, two times two equals, my parents would write out all of them and then my sister had to write them down and like answer them all. –Student group interview, Alice.

Another student, Xueliang (WK), whose father worked as a Sushi chef in an Asian restaurant and her mother worked as a waitress in another Chinese restaurant, believed that his parents did not help him a lot in mathematics. As a result, if he had questions, he would go to his teacher for help. In a later conversation, Xueliang said that after school he would usually stay in his calculus teacher's classroom for one or two hours so he could ask his teacher questions.

> For real, my parents didn't help me a lot because you know that my parents are busy at work. I'm alone at home for most of the time. I don't receive any help from my parents but I receive a lot of help from my teachers because for some questions I don't understand, I'll will ask my teachers. – Student interview, Xueliang

Multiplication facts are a mathematics topic that several parents taught their children when they were young, also found in other studies (Cheng et al., 1992). Ms. Li Pan, who was an English teacher before immigration, described how she taught her son multiplication tables.

> I taught him multiplication table in this way, "Today we are going to learn the multiples of 9. We will try to recite all possible results within 9 seconds." Then Tony and I compete

> to finish the recital as quickly as possible. After about one week, he was able to recite the whole multiplication table from one to nine. – Parent interview, Ms. Li Pan

The reason why parents tutored their children on their multiplication tables is because they believe this was an extremely important skill that students must master. Just as Mr. Xian Zhou analyzed during the video discussion section, "The 9×9 times table is really important. A Chinese student who mastered this table would go farther ahead in mathematics than foreigner students." Furthermore, the multiplication table that parents helped their children learn was the Chinese version, which is a 9×9 table. Some parents pointed out that the American version of the multiplication table was not convenient because it was a 12×12 table, which did not make sense to them. Ms. Li Pan said, "I think the English version of multiplication time is not good. I checked that one YouTube website and the table was crazy and very inconvenient."

Students from highly educated families tend to receive much more tutoring than students from less educated families. One student, Zanmin (TR), whose father has a doctoral degree from an American institution and whose mother has two Masters degrees (one from China and one from America), recalled that if he had questions, he would go to his parents (often his mother) for help. For example, in one Twitter message, Zanmin posted, "Today I asked my mom what a linear function was." His mother, Maggie (TR), not only answered his questions but also provided additional exercises to reinforce Zanmin's understanding of the concept. Maggie also reiterated the mathematics content to Zanmin in order to strengthen his learning.

> Usually for example, if I have a, I have trouble on absolute value so they would create problems for me to do, maybe like five or ten a week and do a couple a day to help me reinforce the skills so that I would have it. – Student interview, Zanmin

> When I was young, my parents often reiterated what I learned in school, often explaining the topic a bit more and making me practice that certain area in math. – Student essay, Zanmin

Unlike Xueliang, who went to his teacher for assistance when he did not know how to solve a math problem, Zanmin would never ask his mathematics teachers for help and only relied on his parents' help. He said, "Well the math course I'm taking is really easy so I don't really have any problems but if I do, I'll ask my parents, I rarely never ask my teachers."

Another student, Kyle (ST), whose father is a scientist and mother is a data analyst, received substantial help from his parents, especially when he had difficulties in mathematics and when he was preparing for the SAT. When Kyle was in 8$^{th}$ grade, he experienced a difficult time in mathematics and he believed that his mathematics teachers hated him. It was his father who spent significant time in the summer checking Kyle's mathematics homework and helping him. Due to these efforts, he caught up in mathematics. When Kyle was participating in this study he was preparing to take the SAT, and again his father spent a great deal of time tutoring him mathematics.

> She [my mathematics teacher] really hated me. I don't know why she just gave me a hard time when I had the math class. And my parents they assume[d] that they try to help me a lot during that time, but they didn't really try to help me but towards the end, my dad started helping me a lot like he was checking my homework every night so I could do a lot better. – Student interview, Kyle.

> When I was in the eighth grade, I began to struggle with math. Around halfway through the year, my dad began to help me with my math and checked my homework nightly. My grades began to improve, and in the end I did well … recently, since I am taking the SAT very soon, my father is once again helping me in math. He looks over my SAT math work and helps me figure out problems and times me. – Student essay, Kyle.

Kyle's mother Ms. Yan Sun (ST) recalled how Kyle's father tutored him during that

summer due to Kyle's struggles in mathematics when he was in 8th grade and the effects paid off well.

> When my son was in middle school his father tutored him a lot such as algebra 1 and 2. In the summer, he did additional [mathematics] exercises. His father spent lots of time and energy to help him. He took a geometry course in the summer. I was surprised that he did well and went to the GT (gifted and talented) program. His exam score was great and he was not left behind since then. – Parent interview, Ms. Yan Sun

Another parent, Ms. Xuehua Hou (TR), claimed that her son, Devin's (TR) mathematics knowledge was mainly from her tutoring rather than school.

> When Devin was young it was me who taught him the entrance level mathematics because his father was busy. At that time I gradually discovered that he was interested in mathematics … When Devin met problems or new conceptions I taught him immediately. That was how I did it. As a result, he has a somehow higher level of mathematics … So his mathematics knowledge basically comes from our teaching. – Parent interview, Ms. Xuehua Hou

**Students' feelings about parents' tutoring.** Just as analyzed above, some less educated parents tended to tutor their children when they were young because they were able to teach basic mathematics content. From the perspectives of their children, this early tutoring is beneficial to their mathematics learning (Cheng et al., 1992), even though the children may have resisted their parents' assistance when they were young. For example, Kitty (WK), whose mother taught her mathematics when she was young, said "It was torture when I was a little kid but now I'm happy they taught me." Another student, Alex (SM), admitted his father's tutoring was very useful even though he was not happy about it when he was young, "I wasn't really happy at the time but now it really comes into use." He wrote in his essay, "I was the 1% that actually received help from my parents." This early parent tutoring, especially his father's help with

multiplication tables had significant consequences for Alex's mathematics classroom experiences in school. Because Alex had mastered the relevant mathematics content, he was able to finish problems much faster than his classmates.

> There was a major difference because mainly every week and I remember like fourth and fifth grade, we'd have like a multiplication, division, addition, subtraction table and like the teacher would give us fifty problems and go like 'All right, you have about three minutes to finish them all so then everyone else, I looked at the clock, and then I was able to finish up really quick, I looked across the classroom and half the class was like still struggling. – Student interview, Alex.

Another student, Zanmin (TR), had received tutoring from his mother starting when he was young. Zanmin actually compared his mother's teaching to his math teachers' and he concluded his mother taught him better because she explained more deeply than his teachers. Zanmin also implied that teachers in public school can only convey the basic content to students.

> She [Mom] explains the concept like how the general, like for example, she doesn't just tell me the answer. She explains these kinds of problems so that in the future I can do them by myself … As in the teacher at my school just sort of explains it. My mom sort of goes deeper than that. And I think the reason is that the teacher at the school it's not a private school and it's just a general class and so she can't spend too much time on one thing. She just gives us a quick synopsis of whatever the problem is. – Student interview, Zanmin

These examples mean that in the parental education aspect of cultural capital, parents with either lower or higher educational attainment could successfully tutor their children at different stages, and the positive effects of parents' tutoring have been recognized by these students. However, not every student values their parents' tutoring. Molly (ST), whose parents have either a Ph.D. or Masters' degree, had negative feelings about her parents' tutoring. Her parents obviously have attempted to tutor her a great deal, at least in mathematics and Chinese

language. For example, she explained that her father's teaching was confusing and incorrect, "My dad helps me study for a math test but sometime his helpful hints confuse me … so there is like this math homework, my dad told me to do it this way but he was totally wrong." This confusion aspect of parent tutoring is analyzed later in this section. Moreover, Molly asserted that she did not need that much help from her parents because she was able to do them by herself.

> My mom thinks that if she doesn't help me with this stuff I will fail math but [it's] not true because I get pretty good grade without their help … When my family tries to help it get a little annoying because I can do it by myself, I just [need] a little help. – Student essay, Molly

**Parents' mathematics vs. teachers' mathematics.** Chinese parents, like Chinese teachers, received their mathematics education in China. Therefore, the differences between the mathematical knowledge of Chinese parents and U.S. teachers may echo the results of Ma's (1999) study, in which she compared Chinese and U.S. mathematics teachers' understanding of fundamental mathematics. Several students (Kyle, Alex, and Molly) expressed the differences they found between their parents' mathematics understanding and their teachers' mathematics understanding. To them, these differences sometimes may cause confusion in learning mathematics.

> Well I guess my dad would explain a problem completely different from how I learned it in school so I would just get really confused after a while. –Student group interview, Kyle
> There are different ways probably because when my dad learned it, there were still some things that weren't discovered yet. And there's some like when he says it, he says it in Chinese and I don't really get the Chinese way of saying it so it's kind of confusing. But then like my teacher, he says it and he probably has more experience with it because he went to college to do it, and also math keeps evolving. I guess so it changes a lot but my dad sometimes probably hasn't seen it. –Student interview, Alex

> Because when they help you sometimes and it's right and when you get it. And then when sometimes your teacher teaches it to you, it gets confusing. – Student group interview, Molly

Molly's father, Mr. Wei Han (ST), admitted there is a difference between his mathematics [what he learned in China] and her daughter's mathematics in school. He provided many examples how his daughter was not able to understand many simple mathematical facts.

> We use what we learned in China [to help her]. This caused lots of differences. It seems that what we learned in China is not correct anymore here. She [Molly] said I do not understand what you are about. For example, it's equivalent to view 3×0.25 and 3÷4. It is a simpler view in the latter way. For her, it's a very complicated approach. Things such as multiplication and division of fractions, reciprocals, minimum common multipliers, simplifying fractions before calculation, conversion fractions into multiplication or division of integers, are difficult for her to understand. – Parent interview, Mr. Wei Han

Mr. Wei Han's comment about how her daughter perceived the relationship between multiplication and division is not unusual if we compare Chinese teachers' and U.S. teachers' performance on calculation (Ma, 1999). Ma (1999) stated, "Of the 23 U.S. teachers, 21 tried to calculate $1\frac{3}{4} \div \frac{1}{2}$. Only nine (43%) completed their computations and reached the correct answer … All of the 72 Chinese teachers computed correct and complete answers to the problem." (p. 56-58).

Kyle also mentioned that his parents tend to emphasize the role of memorization more than his school teacher.

> Their styles are different like my parents help me with math. They're like--you have to memorize all these rules. Memorize, that's their main thing. But at school the teachers are more or less you have to memorize. They're kind of like--you need more practice to understand the material. This is not much on memorizing. – Student interview, Kyle

The differences between Chinese mathematics and American mathematics sometimes

become an obstacle to parents when they attempted to tutor their students. According to Ms. Maggie Shao (TR), it was sometimes impossible to tutor her son using a Chinese mathematics approach.

> Some parents, obviously aware of the fact that there are differences between their ways of doing mathematics and the approaches their kids learn from school. For example, Zanmin's mother, Ms. Maggie Shao commented, "His [mathematics] textbooks are different than the ones I learned when I was in school. Sometimes there was no way to teach him in the way that we have learned in China." – Observation Note, Liang

**Decreased parents' tutoring.** As students grow up and encounter more sophisticated mathematics content, their parents gradually tutor them less. This happens for two reasons. First, parents do not have enough mathematics knowledge to tutor the students when they are learning at a higher level. For children of less educated parents, when they go to higher grades and learn more advanced mathematics, their parents could not help them as they did when students were in lower grades.

For example, Kitty (WK) said that her mother helped her basic mathematics knowledge but when the mathematics content goes to higher level she could not help any longer. She said, "Well [she can help] addition and subtraction, like most of the basics but like when I went to the exponents in algebraic expressions, she [mom] couldn't help me anymore." Kitty further added, "… she [mom] tries to help me with what she knew but now she doesn't really know as much anymore." Kitty actually wished her parents knew more in her subjects so she could ask them for help: "I just wish that they knew a little more so if there's something I really don't know, I go ask them but I'm happy with their involvement."

Another student, Alex (SM) is in a similar situation as Kitty, where his father ceased to

tutor him after 6th grade. He said, “Like these helps were in fifth or sixth grade and in middle school there wasn’t much help.” When students go on to higher level mathematics like calculus, even students from highly educated families may not receive parents tutoring because parents may have forgotten the content. As a result, Kyle (ST), even though his father was still helping him in SAT, he rarely helped him in calculus.

> She [mom] doesn’t really remember a lot because I’m in calculus right now, like advanced. And most people don’t really use it so most parents, like my mom, she doesn’t really remember anything in calculus. So I don’t really get help from my parents, I usually go to my teachers or I teach myself if I have any questions. – Student group interview, Kyle

Second, when students’ knowledge of mathematics accumulates, they tend to rely less on their parents’ assistance and even attempt to build their own self-confidence in mathematics. Kyle, who was in 11th grade, said, “…but nowadays they don’t really help a lot, I mean I’m old enough to do things for myself, I have a year until I go to college but they still do help.” A highly educated mother, Ms. Xuehua Hou (TR) said that she did not teach her son Devin as she used to because he had learned the relevant mathematics knowledge from her and he can teach himself now.

> To be honest, Devin has already mastered most basic mathematical concepts. He practices mathematics problems online such as *First in Math*[9]. The websites teach him relevant mathematics concepts. He has developed the ability to teach himself mathematics. I did not teach that much as I used to, even though it was me who taught and inspired him the earliest mathematics knowledge. – Parent interview, Ms. Xuehua Hou

[9] First in Math (www.firstinmath.com) is a website where students can log in and do mathematics problems that are often represented in multimedia technology, such as music, pictures, and other forms of games. Each student is assigned an ID and can earn scores by doing problems. The student can see his or her ranking within his or her school and within the whole school district. The use of this website is financially sponsored by the school district.

> I think he has a strong self-esteem [in mathematics] ⋯ For example, sometimes he asked me how to solve a mathematics problem. Actually, now he rarely voluntarily asks me questions. It's me who usually check his test sheets. I said, "You did not finish these problems. What are you going to do?" He answered, "I do not know how to do them." Then I said, "Let me see." When I was reading the problem he was very nervous and he began to read the problem together with me. Immediately after I gave him a hint, he shouted, "Stop, stop. Let me see." – Parent interview, Ms. Xuehua Hou

Summary. Most participating parents, no matter what educational attainment they have, attempted to tutor their children. Highly educated parents tend to tutor their children even when they go on to higher grades. But they may still not be able to tutor advanced mathematics courses such as calculus. Less educated parents used their limited knowledge to tutor their children when they were young. Tutoring paid off because students and parents usually perceived the positive influence on children's mathematics learning. However, because parents' knowledge of mathematics was dominantly obtained from the Chinese school system before they immigrated to the United States their instruction may be different from what students were learning in school. For this reason, parents' tutoring may cause confusion for students and may even be underappreciated by the student (as in Molly's case). When students go on to higher level of mathematics courses, they receive less parent tutoring because parents may not be able to handle the advanced mathematics content and students have established their foundations of mathematics learning and do not need help from parents as much as they did when they were young.

**Use of Libraries**

As we all know, libraries, due to their wide range collections of books, periodicals,

newspapers, videos, and many other forms of physical and digital materials, are important institutions for spreading knowledge and culture to people. How families utilize the libraries as educational resources can be considered an indicator of cultural capital because it reflects family members' (especially parents) knowledge and attitude of education. All families, except one – Xueming's (WK) family – reported that they went to local libraries to use the resources. However, to what degree the families use libraries varies significantly between different families.

Less educated families tend to go to libraries less frequently than highly educated families. Cindy (SM) said she bring the children to the library every three weeks or once a month. Highly educated families bring their children to local libraries much more frequently than less educated parents. For example, Ms. Xuehua Hou (TR) brings her son to the library at least once a week. Although students from less educated families do not go to libraries frequently, especially when they are older, some of them did recognize their parents' attempt to tutor them by using books from libraries. For example, both Alice (SM) and Kitty (WK) believed that their mothers used library resources to teach (at least tried to teach) them when they were young. Alice, who claimed that she did not remember any direct help from her parents, recalled "She [mother] tried to teach me when I was a kid, I think I worked OK." Kitty said her mother attempted to help her learn new stuff, "Well back then, my mom would go to the library and look for books to help me or to help me learn new stuff that I hadn't learned yet."

Students from less educated families are aware of the purpose of going to libraries but went there less frequently when they were in high school. In fact, Xueliang (WK), pointed out that one strength of American schools (but not for most Chinese schools) is the possession of a

library. Xueliang is the only student in this study who had never borrowed a book from either a public library or a school library although he was aware that the library could be a useful resource for him. He said, “If I want books I can go to the library and borrow it, but I never borrowed a book.” Xueliang’s immigration background let him view the difference between the availability of school libraries in China and in the United States.

> One thing that I think American school is good because of libraries. The library has computers that you can log in your ID and search anything that you want at the computer in the library. In China I never got [the computers in schools]. –Student interview, Xueliang

Alice and Kitty, who were in high school when they were participating in the study, said that they go to library much less frequently than they used to because they did not even have time to read their own textbooks and finish homework assignments. Alice’s mother, Cindy, told me, “She [Alice] said they could not even finish her own books.” Kitty said, “Because of homework, I don’t really have a lot of free time to read.” To them, going to the library is a completely separate, irrelevant activity from their regular school education. This may be explained by their inability to properly find and use the resources in the libraries.

Going to library is one thing; finding what he or she intended to find is another thing. Less educated parents, due to their limited knowledge of the education system, were not able to provide suggestions about how to use the library productively, such as choosing the proper books or borrowing related DVDs. As a result, their children need to figure out what they need and how to get what they need on their own. Although Alice and Alex (SM) go to the library, they said that they could not find the resources in the way they intended for academic purposes. Alice said

that she ended up not using the math books she borrowed from libraries because she did not know how to get research books from the library.

> I think I tried to get a math book three times but I ended up not using it, like I tell myself, oh I'm going to go through this but then I end up not because I just forget about it or not have time, just not what I wanted. But generally I get mystery books, reading books basically. I actually don't know how to get research books from the library very well, I don't know how. – Student interview, Alice

Alex's father, Mr. Xian Zhou (SM), told me that he sometimes suggested that Alex borrow some books in local libraries in order to make up subjects in which he did not do well. However, Alex claimed that these kinds of academic books are not available in the libraries, so he only brought entertaining books back.

> Sometimes I told him, 'Your exam score in this subject is poor. Go the library to borrow some books for this subject.' He said that the library does not have such books. I do not know if they actually have those books. Then when he came home from the library all books he borrowed are entertaining books such as cartoon books. – Parent interview, Mr. Xian Zhou

In contrast, highly educated families usually went to libraries more frequently than less educated families, and they used resources from libraries in multiple dimensions. In addition to borrowing academic books and exercise books for their children, they also borrowed videos, and some students even chose to finish course projects in libraries.

Ms. Maggie Shao (TR) believed that it would be beneficial for Zanmin (TR) to learn the mathematics content prior to his regular school, so she borrowed mathematics and reading books from local libraries for Zanmin and asked him to read them in advance of their being taught in school (such as during summer).

> He would learn the content in advance. Sometimes I borrowed some books for him from

> the library so he can learn before his teachers teach him. For example, I checked out an algebra II book for him during the summer. – Parent interview, Ms. Maggie Shao

This strategy of learning the content in advance is rewarding to some degree in that the student feels it is easier to learn the content when it is taught in school. Zanmin wrote in his essay that he already knew factoring before his teacher taught it in regular school.

> This helps me to understand some topics before I learn them in school, for example, we will learn factoring later this year, however I already know how to factor due to the fact that my parents checked out a[n] algebra book for me during the summer break. – Student essay, Zanmin

> They generally provide me with extra practice. They get books from the library like discrete mathematics. – Student group interview, Zanmin

Ms. Xuehua Hou's (TR) family even went further in terms of their use the local library resources. She commented that "Public libraries are excellent resources for people. They have many books from different areas." In terms of Devin's (TR) mathematics education, Ms. Xuehua Hou commented that they had already exhausted the library mathematics resources by having watched all relevant pedagogical mathematics DVDs.

> When Devin was young and was learning the basic content of mathematics I borrowed lots of DVDs in mathematics for him from the library. These DVDs were for mathematics pedagogy purpose. Now these DVDs are too simple for him which means that we have watched everything that is suitable for him in mathematics. There is nothing in the library that can still attract his interests in mathematics. So I think library is a great resource where Devin learned his mathematics. – Parent interview, Ms. Xuehua Hou

According to Ms. Yan Sun (ST), her children went to the library and borrowed many books (including mathematics books). Furthermore, the library can be a good place for students to finish group project. Ms. Yan Sun's son, Kyle, confirmed the library is a good place for doing academic work.

> Usually either I'm getting a book for school or, usually I go to the library and meet up for a group project. We have a lot of those in school so we would go to the library and meet up. There's [are] computers, books--everything you need. – Student interview, Kyle

In addition to mathematics books, some families also borrowed reading materials from libraries. Mr. Wei Han (ST) said his daughter Molly (ST) only borrowed novels. Ms. Li Pan (TR) said they mainly want to cultivate Tony's reading habit by using the books borrowed from the local libraries. In fact, during multiple visits to Tony's home, I noticed that they always have many books in the living room – either on the floor of the living room or on the side table.

> He is still a child so we are trying to cultivate his reading habit. We borrow whatever books he likes. We may occasionally borrow the books that we think are good for him. But that situation is rare. – Parent interview, Ms. Li Pan

Summary. Students from less educated families either did not go to or went to libraries less frequently. Their parents may have used some library books to tutor them when they were in lower grades in school. However, their parents could not provide them guidance for which books or other forms of materials to check out, and hence they could not use the resources in libraries properly. Students from highly educated families, on the other hand, utilized the resources in libraries sophisticatedly, often with the assistance of their parents. Some parents checked out mathematics textbooks and (other reading materials) in advance and asked the students to use them, and often provided tutoring when the students needed help. In addition to regular books, some parents also checked out digital materials for pedagogical purposes in the area of mathematics. These approaches were very helpful for students' mathematics and language learning.

**Availability of Books**

Books[10] are important resources for students' academic success. Some studies have found that Chinese immigrant parents purchase books or workbooks for their children (G. Li, 2002, 2006). Parents' providing supplementary books to their children deserves a close examination. How parents manage to obtain books to enhance students' academic success is closely linked to parents' cultural capital, economic capital and social capital. First, parents need to know which books are suitable for their children's learning; books, at first glance, are an objectified form of cultural capital (Bourdieu, 1988). Second, buying books necessarily involves economical capital. Third, if parents do not know which books to buy, they may consult with other parents or friends. Even for parents who know what books they need, they may ask their friends to buy and bring the books for them, especially when they need books from China; hence, they need to use their social capital. Although students' access to books involves all three form of capital, this theme is included in the chapter on social capital.

First, all participant students, but one – Xueliang (WK) – have access to additional academic books in addition to school textbooks. However, in terms of the accessibility of books, there are striking differences between less educated families and highly educated families. First, highly educated families possess a much larger volume of books than less educated families. These families have more bookshelves than less educated families. For example, there are at

[10] In this study, books does not refer to those from students' regular school: algebra and trigonometry textbooks. Instead, it refers books they obtained from non-school channels, often with assistance from their parents.

least four bookshelves in Kyle's (ST) home while none of the three[11] less educated families possess more than one book shelf. In fact, Xueliang has no bookshelf at all, as I observed.

> The study room has two big book shelves and a big table in the center where Kyle was studying all the time during the visit … There is another room in the basement which has a book shelf (with lots of books), a set of drums, and other musical instruments.
> – Observation note, Liang

The second difference is that less educated parents either did not directly purchase books or rarely bought books for their children while highly educated parents bought or borrowed books for their children, often without their involvement. Less educated parents who came from small business families did not have the knowledge to choose the appropriate books for their children. However, they can afford to buy books. As a result, they asked the children to pick books and they paid for them. For example, in Alice's (SM) family, Alice can choose which books to buy and her mother would buy them for her.

> I did not buy many books for her. Sometimes I asked if she needs some books and we will purchase for her. However, it was her who chose which books to buy. – Parent interview, Cindy Cao

> Yeah. She said like 'Aren't there books out there to help you?' and like yeah there is and then we went to the bookstore and I got it and she paid for it. – Student interview, Alice

Alex's (SM) father, Mr. Xian Zhou (SM), also did not directly purchase books for him. Sometimes Alex chose books by himself on websites and asked his parents to pay for them. Sometimes, a close friend of Mr. Xian Zhou would purchase books for Alex, and then Mr. Xian Zhou would reimburse the costs of books to her. Because Mr. Xian Zhou did not possess the relevant cultural capital to choose the proper books for his children he resorted to his friend—

[11] Only three of these families were visited; access to Kitty's (WK) home was not available.

who was well educated and had the cultural capital to successfully choose books. As a result, his use of social capital and economic capital made up for his lack of cultural capital. In fact, Mr. Xian Zhou's use of social capital and economic capital played a critical role in his children's education (which is further analyzed in the next chapters).

> For me, sometimes I go on Amazon or something to find it but other times I ask my aunt, like someone in Chinese school. She's almost like my aunt but she's not related to me but I call her my aunt. She would buy the book and my dad would be like 'I'll pay you the money if you buy it for me. – Student group interview, Alice

The other two less educated families, Kitty's (WK) family and Xueliang's (WK) family rarely purchased books for them – only when the children really like the books. Kitty's family would only get books from the library and Xueliang would rely on his textbooks. This means that their limited economic capital significantly constrains their ability to provide learning materials for their children. Ms. Abby Lin (WK) said:

> If she really likes the book I would buy it for her. If she needs some books for homework I usually borrow books from library. She would borrow some books from her school as well. – Parent interview, Ms. Abby Lin

Xueliang's only purchased books were a series of cartoon collections because he really loved that collection and he did not have any academic books except his books from school. In a later conversation, Xueliang said he never asked his parents to purchase anything for him because he understood the hardships his parents face. He said that he could rely on the resources provided by school so he did not expect his parents to buy any books for him. While he knew that libraries would be good places to borrow books, but never had he actually borrowed a book from either his school library or local libraries. His father, Mr. Hai Liu, claimed that he had taken

Xueliang to libraries and bookstores before, but Xueliang did not choose any books except for a few cartoon books.

> I did not buy books for him. I brought him to libraries and bookstores before. He went there and found no book that could attract him, except few cartoons. I asked him if he was worried buying books would cost parents lots of money and he answered no. He said it was enough just to focus on what was taught in school and school had everything he needed. – Parent interview, Hai Liu (WK)

> Books? If I get any, if I want books I go to the library and borrow it but I never borrowed a book. But those collection [a cartoon collection] I have, I just like those all the time. – Student interview, Xueliang

Second, unlike these less educated family parents, highly educated parents actively managed to purchase or borrow many books for their children, often without consulting their children if they needed or like them. These well-educated parents know exactly which books might be helpful for their children and they also know where to get them—from libraries, bookstores, and friends' knowhow. Choosing books for their children sufficiently illustrates how parents use their cultural capital efficiently. For example, Zanmin's (TR) mother, Maggie, borrowed an algebra book and asked him to read it in the summer in advance so when the new semester began he would be able to know the related mathematics concepts such as factoring.

Kyle's (ST) mother, Ms. Yan Sun (ST) bought him at least three SAT practice books and she obviously bought him many other books. For instance, as Kyle posted a Twitter message, "My mom ordered an AP statistics review book." Besides buying new books for Kyle, the old books Kyle's older sister had used were also available to him.

> Yeah, I have an older sister and my parents give me a lot of her old books, her old SAT books, AP review books and also I have the same tutor that my sister had before so I say that they provide me a lot of learning opportunities, books and other teachers. – Student

group interview, Kyle

Even for young children, these highly educated parents prepared many books for them, either purchasing or borrowing books. Even though both Devin (TR) and Tony (TR) were young, in 2nd grade, the volumes of books in their home were large. A visit to their homes shows books nearly everywhere. For example, Devin's mother, Xuehua Hou (TR), described how she chose the proper books for her son, that is, it should be challengeable and doable. In terms of this issue, the children hardly have any say at all and it was the parent who made this decision.

> Because he had the interests in mathematic when he was young, I bought him mathematics books for him to practice in advance … As for the textbooks, I went to Staples store and some other local stores. Then I checked these books online to get information such as other people's reviews, how many stars they get. The books I bought him are usually challengeable but doable for him. – Parent interview, Ms. Xuehua Hou

Third, besides borrowing or buying books in America for their children, parents also purchased books from China, although these books were written in Chinese. Some Chinese immigrant parents in Canada teach their children using Chinese textbooks they bring from China (Li, 2002) because these parents prefer Chinese textbooks over U.S. textbooks. Just as Ms. Li Pan pointedly observed, Chinese mathematics textbooks, despite the limited pages for each book, have more problems on a single page than American textbooks. She said that if there were any American mathematics practice books that were similar to Chinese books (but in English) she would like to purchase them. Obtaining books (including mathematics textbooks and other supplementary mathematics exercise books) from China is not an easy task. Parents need to know people who they can trust and ask them to bring books back when they travel to China. Some parents may directly use their previous Chinese network and ask friends in China to ship

books to them. In either case, it requires the coordinated use of their social capital (they need help from others); economic capital (it costs money to buy and mail books); and cultural capital (if they know which books they want to buy). For example, Mr. Xian Zhou, Ms. Li Pan (TR), and Ms. Maggie Shao all asked their friends to bring or ship books from China. Ms. Maggie Shao said, "I asked my friend to buy these Chinese mathematics books for us." And Mr. Xian Zhou said, "I asked my friend, who was from Beijing, to purchase books for my kids. When they came back from China I paid him accordingly."

Fourth, there are two side effects of using the additional books or materials that parents obtained for their children. The first issue is related to using Chinese mathematics textbooks. Due to the fact that these books (including mathematics books) are written in Chinese, the children cannot always work on the problems, especially the word problems. Ms. Xuehua Hou commented that Devin can solve the non-word problems but she needs to translate the word problems from Chinese into English for him so he can understand and solve them. The Chinese language barrier also affects how Tony uses these Chinese mathematics books.

> Ms. Li Pan commented that because the math Olympic book is in Chinese, Tony does not like it. She suggested that if the book is in English he would like it better. She asked someone to find some Olympic books for them. – Observation note, Liang

The other issue is the degree of usage of the general mathematics relevant books (not necessarily written in Chinese). Even though parents used various approaches to obtain these books for their children, not all books were used as thoroughly as they were intended. For example, Alice (SM) said her mom borrowed or bought her SAT books, but she actually only used part of the books or did not use them at all.

> Mom made me get a whole lot of SAT prep books, things that can help me for the SAT's. So once I had a whole stack of books this high, because each book was thick and it was all SAT prep but then I didn't use all of them, I only used one or two, the one about writing helped me and in the writing section, I used those, I just looked through it, I didn't actually do much of it. – Student interview, Alice

> I just go to Barnes and Nobles and like the latest SAT book or something or the AP book for some course. I don't know why I buy all this AP prep books because I actually don't use them at all. I'm kind of confused. – Student group interview, Alice

The similar situation occurs in Kyle's (ST), Molly's (ST) and Devin's family. For example, Ms. Yan Sun (ST) had bought multiple SAT books and many other books for Kyle; she admitted Kyle and his sister actually did not use most of them.

> Ms. Yan Sun told me that she also bring lots of textbooks and other study materials from China to her kids. However, she said, the kids never used many of the materials because they were not suitable. She commented the most available books are SAT books because Kyle will take it at spring 2012. – Observation note, Liang

Molly's father talked about how she refused to do the problems in the books, either from her school books or the ones they bought for her. He said, "We bought her books but she rarely did the problems on the books. She did not even want to do the problems from her textbooks … She never did the problems."

When parents buy additional books for children, their children may not actually like it because they already know things, and do not see the value of doing these extra practice problems. Molly's comment echoed that of her father and vividly illustrates the battle between her and her mother.

> My mom is like that's preschool but it's like four years ago, my mom spent money on mathematic books and stuff, except that I never used them and [the] stuff. Then she said that I'm wasting papers and I'm like 'Then don't buy them anymore,' and then she said 'You need to learn it' and I'm like 'I already know it' and she says 'Why don't you do it?'

> and I'm like 'I don't want to do it,' and now she stops buying them because I never do them. – Student interview, Molly

I observed Devin's family many times and I saw how Ms. Xuehua Hou and her husband tutored the children using mathematics Olympic exercise books from China. I noticed that in one exercise book Devin had worked on most problems but left a few problems with question marks. However, Ms. Xuehua Hou stated that these books were not used much.

> I rarely assigned him extra homework. Most time, these books were not used. Sometimes, when I saw him just playing and I would get these books and let him to see if there were any interesting problems he would like to do. Then I would explain to him if he needed help, but I did not systematically teach him [math]. – Parent interview, Ms. Xuehua Hou

Summary. Nearly all families (except one) provide students a certain number of supplemental mathematics books (either textbooks or exercise books). However, less educated families have much less than highly educated families. With the exception of the working class families, nearly all other families purchased mathematics books for their children. Small business parents were not able to choose the proper books for their children while highly educated parents have ideas for selecting the proper books and often actively bought books for their children without consulting them. Parents often asked their friends to purchase Chinese mathematics books for their children and reimbursed their friends. However, Chinese mathematics books may not be adequately used due to the Chinese language barrier for the children and because some books may not be used by the children as they were supposed to.

**Academic Assistance from Siblings**

Studies show that Chinese (or Asian) American students can get support from family members (not limited to parents) in education (Fuligni, 1997; Siu, 1993). This subsection and the

next subsection illustrate how students receive academic assistance from siblings and their extended family members.

For a family, in addition to parents' educational attainment, which largely influences parents' ability to tutor their children, to guide the children in use of libraries, and to obtain books for them, the children' own education is part of cultural capital. As pointed out, a family's cultural capital is not static but dynamic. When a child goes to school and obtains knowledge his or her educational attainment is increasing, which becomes a part of the family's cultural capital. If a family happens to have multiple children, the siblings [often the elder ones] can use their knowledge to help the younger ones. In this sense, students' elder siblings have educational resources that the younger ones can use for their academic study. For example, Alex (SM) said he attempted to tutor his younger sister, "Over time, I have tried to teach her the way our parents taught me." Another student, Kyle (ST) also commented that his elder sister used to help him with SAT, "I know my sister helped me in SAT math and other subjects in the past but now she doesn't live here anymore so not as much." Molly (ST) has an elder brother who helps her with math homework and science projects. Alice (SM), who is the oldest child among four children in her family, provided lots of tutoring to her two sisters (her youngest brother was too young to go to school) in mathematics. Because Alice has learned the relevant mathematics content she was able to tutor her sibling even though she admitted her sisters were actually smarter than her. Her sister, Betty, according to Alice, who was of one the best students in her grade, came to Alice if she met problems in mathematics. Alice commented, "Betty, she asks me questions too because she's in algebra 2, trig[onometry] … It's always with factoring for some reasons. She just doesn't

see how to factor sometimes but I've done factoring" [Student group interview].

Alice's other younger sister, Carla, as Alice pointed out, as "the best in her math class", also came to Alice for help not only for problems she did not understand but also for learning new mathematics content.

> It's a higher learning thing, for example I taught her [Carla] how to do polynomials and what not and she isn't learning that yet; maybe she's learning it now but I don't know. I taught her how to do polynomials and factor polynomials with different variables. – Student interview, Alice

Alice also had three cousins who lived in her family. When her cousins had problems in mathematics, they all came and asked her for help.

> My cousins in Argentina, Ava and Tom and Monica, if they have math problems that deal with words, like word math problems, for example it says Jack rode a bike for five miles, rode a bike for five miles to the store but later on came back on a different route and rode three miles and then went three miles, like how many total miles that Jack ride? That's all words so she won't understand that, came and asked me 'What is this asking me to do?' – Student interview, Alice

Alice was happy that she could help her siblings. In fact, she offered to tutor Betty in calculus. However, Betty refused to because she preferred to learn it later. Alice said, "I want to teach her calculus and she says I'll learn it later, and I'm like why don't you just learn it now?" Alice not only perceived herself as a resource to help her sibling and cousins but also felt it was an enjoyable experience. When asked how she felt when she helped her sibling and cousins, she answered:

> No, it's [to help siblings and cousins] never a trouble for me I mean you have not very many but I think it's a good resource. It's awesome, I love having so many cousins I wish I had more but yeah I wish I had more because it's not the fact that it's a resource, but I enjoy having them over. – Student group interview, Alice

Besides Alice, some students either provide or get academic assistance from their siblings. However, Alice's willingness to offer help to her siblings and cousins contrasts sharply with some other participant students' experiences. Some elder siblings believed that younger siblings should not always rely on elder siblings for help, and they have to do their homework by themselves without help from others. As a result, siblings' tutoring was not always a happy experience for the providers or receivers, and there were tensions between the two. For example, Kyle recalled her sisters yelled at him a lot when he asked her for help. Kyle said, "…but I guess it was kind of helpful but she was really harsh, she would yell at me a lot." Alex analyzed why he refused to help her younger sister.

> Well, that's mainly how it always is like my sister always looks up to me. And I tell her like 'You can't always look up to me. You have to like solve it yourself.' … Well I tell her like who did I look up to when I was a kid? And she's like well you're smarter than me. And I was like I had to work much more that was before. So then I tell her you have to keep working at it. You can't get lazy and be like oh, I'm just going to wait for you to help me. —Student group interview, Alex

Molly, who has an older brother, confirmed Alex's perspective. When she asked her brother for help in mathematics her brother refused because he insisted that she needed to do the problems by herself. Molly said, "I ask my brother and he gets really mad at me because he thinks that I should do it myself." Molly's father, Mr. Wei Han, also observed his son's unwillingness to help his sister. Mr. Wei Han said,

> She has some science projects and mathematics problems. She usually came up to me for help. However, her brother is also good at these subjects. So sometimes she asks her brother but he thinks she is dull and refused to explain these problems to her. – Parent interview, Mr. Wei Han

Parents may also persuade elder siblings to help the younger ones. For example, Alex's

parents asked him to help his younger sister. Alex mocked his parents, “Oh when you finish your homework, you have to help your sister out too, you want her to do good too.” This makes Alex unhappy because he had not anybody to ask when he was young. In addition he complained, “They [my parents] don’t give me any real free time. They try to take all my freedom away literally.”

Summary. Siblings, often the elder ones, can provide academic assistance to the younger ones because they had already learned the content, which enables them to teach. However, not all older siblings have the willingness to provide sufficient tutoring to their younger siblings, so there were tensions associated with siblings’ tutoring in some families.

**Academic Assistance from Extended Family Members**

Cultural capital, in this study, is not limited to the nuclear family, but expands to the extended family. Hence the dynamic aspect of educational attainment is not limited to the nuclear family but to the extended family as well. Two participating families, despite parents’ low educational attainment in the first generation, were accumulating educational resources after several members of the extended families had obtained college degrees or were attending colleges. The people who obtained college degrees or who were attending colleges at the time of this study became very beneficial tutors for the participating students especially when they were learning advanced mathematics courses such as calculus or difficult courses such as geometry. For example, Alice (SM), as previously analyzed, said that she could not rely on her parents for help and she did not remember that her parents tutored her much when she was young. However, Alice received substantial help from two of her extended family members – her uncle

and her cousin although her parents' involvement is "minimum".

> The only family members that can help me with my studies are my uncle and my cousin Ericson, who's only recently started coming over because he went to college, or what not. He is closer now, he's like thirty minutes away every day, he's only like ten minutes away Tuesdays and Thursdays so there's minimal parent involvement. – Student group interview, Alice

Because Alice's father could not help her when she went to higher level mathematics she went to her uncle because he was the only one in her family that had a college degree.

> Once I got into the higher math, Dad couldn't help me anymore but Uncle could because he's gone through college. And he knew all this and sometimes he forgot some of it, but he could roughly do it. So when I was taking algebra 2, trig[onometry], if I really didn't understand something and he was coming over that day, I could ask him and same thing with pre calc. – Student interview, Alice

However, when Alice was taking AP calculus, even her uncle could not help her much, as Alice pointed out, "Even my uncle with his college degree, I don't think he would understand this [calculus] anymore." Alice's cousin is the only one she can ask in her family. Alice's cousin, Ericson, who was a freshman and also was taking calculus in college, lives about 10 minute drive away in Alice's grandparents' home. The two usually met every Tuesday and Thursday evening in Alice's home to discuss calculus related issues. If they did not meet, they discussed problems via phone. Alice said,

> Well right now, I'll go to my cousin Ericson because he's in calc[ulus] too, not in calc[ulus] 2 but like in calc[ulus] also. So he's always like a chapter or two ahead of me so he knows what I'm doing and if I have questions, I'll ask him and if he doesn't get, he says You Tube it and then you help me too so… – Student group interview, Alice

Alice posted several messages via Twitter about how she and her cousin worked together on calculus.

> “The past week has been littered w/ calc exams & my cousin has been helping me study through the phone.”
> “Yesterday, I asked my cousin questions to clarify what I learned in calc on Wednesday.”
> “My cousin explained to me the concepts in my Calc homework today. He's helping me with it right now too. Things make more sense now.” – Student Twitter messages, Alice

This mutual learning activity was rather effective. During one family visit, Alice was glad to tell me that she got the highest score in her last math test—about derivatives. She explained that was because she and her cousin spent lots of time practicing derivatives. Alice occasionally helped her cousin, but usually it was her cousin who helped her more. She told me that occasionally they played together about 10 minutes on the computer and then came back and worked on derivatives.

Sometimes this mutual help from extended family members may be more influential than parent tutoring in highly educated families because, as Kyle (ST) said before despite his parent having either doctoral degree or master’s degree, they can hardly help him in calculus because they have already forgotten the content after so many years. In Alice’s case, her cousin was also studying calculus (only about few chapters before her class pace) so her cousin’s knowledge of calculus knowledge was still fresh and thus the two of them could have a real calculus discussion with each other. In contrast, her uncle, who had graduated from college many years before, could only briefly do calculus, which was not so helpful to her—this could be the case in Kyle’s families as well.

Extended family member may provide help for a student when he was struggling in some hard aspect of mathematics. Another student, Alex (SM), said when he had trouble to deal with proofs in geometry class he asked his cousin Janet for help because she was in a higher level than

Alex in mathematics.

> Like I really hated proofs, like for triangles, like for AAA or ASA or like AS or other stuff, I really hated those and I still got confused on them so I asked her to clarify them for me and she said she'll kind of help me out a bit.—Student interview, Alex

Even after Janet went to college, Alex felt free to text her, call her, or send her a message via internet for help if he needed help.

> Well Janet is in college right now so she doesn't have all the time to help me but I'll like text her and like message her through facebook and ask her if she can like help me if I ask her something. And also like she helps me a lot because when I don't understand something in like geometry like when I didn't understand it, she would like help me out with it because she already took the classes. – Student group interview, Alex

Summary. Besides parents and siblings, extended family members, if they attended colleges or were attending college, could also provide very effective academic assistance for students' mathematics learning, especially when they were learning advanced content of difficult topics.

**Families' and Students' Aspirations for Higher Education, Career and General Education**

According to the definition of cultural capital, parents' and students' aspirations for students' higher education and future careers are important indicators of cultural capital. Students' and parents' aspirations are positively related to students' academic achievement (Aldous, 2006; Yan & Lin, 2005). Studies find that compared to other ethnic groups, Asian American students have higher educational aspiration (Kao, 1995; Mau, 1997). However, for Chinese immigrant families, little is known about the different educational aspirations for families with different educational and economic background. There is also a need to know more about students' responses to their parents' aspirations. This section addresses these two issues

while analyzes the participant families' aspirations for higher education, careers and general education.

First, compared to other families, the two working families tended to have relatively low aspiration for higher education. One student, Xueliang (WK), from a working family commented that he intended to go to community college first then transfer to another college, as long as he could learn the content to become a nurse. For his family, the cost of attending college became the primary consideration because the family's income was limited.

> Because our income is pretty low we're not expecting the higher college, I just plan on going to a normal college, like much cheaper college ... It's a transition college that you take two years in that college ... They [my parents] are all working in restaurants; I'm considering going in medical field to become a nurse. – Student interview, Xueliang

Xueliang's expectation of college was similar to his father, Mr. Hai Liu (WK), who also believed there was no need to attend prestigious institutions, which was largely decided by the family's limited income. Mr. Hai Liu also did not believe that graduates from famous institutions were likely to succeed in society.

> He was thinking for parents now. He would not apply for prestigious colleges or universities. He would attend the one that has the major he wants. I will not send him to prestigious colleges or universities but to the one that could teach him what he needs. Not so many people who were graduated from Harvard University became successful finally. I encouraged him to try to apply for scholarships. If he cannot get full financial support, even twenty percent is desirable because it would relieve my financial burden. I am trying to find information about scholarships as well. – Parent interview, Mr. Hai Liu

Xueliang's father not only had relatively low expectation of Xueliang's college but his expectation for Xueliang's income and status in the society was relatively low as well. Mr. Hai Liu said that he would be satisfied if Xueliang could make $50,000 a year after college

graduation. He added that he did not expected Xueliang to be outstanding but merely survive in American society. The reason why this working family has relatively low expectation for the child was not only influenced by the family's low level of income, but also by how the parent perceives American society. Mr. Hai Liu believed that American society was unequal, and Asian American students were pressed so there was no way to have high expectations because:

> Asian American children grow up in a society full of discrimination. They had been pressed by the society … Many [Asian] predecessors attempted to become doctors but failed and ended in becoming nurses, pharmacists, and medical assistants … In American society, for Chinese Americans you cannot be outstanding. If you are outstanding they would put you down. – Parent interview, Mr. Hai Liu

Another student from a working family, Kitty (WK), had relatively high aspiration for college compared to Xueliang because she said she would be satisfied if she could attend the flagship state college. Her mother had exactly the same aspiration of higher education for her. Kitty said that she wanted to become a physician's assistant. Kitty's mother suggested she should consider accountant or pharmacist. However, her father believed that these two fields were also very competitive because there were too many graduates in these fields. So Kitty's father said another option could be X-ray specialist because he had friend in that occupation.

Second, compared to the two working families, parents from the two small business families were much more ambitious in the children's higher education and careers. Alice's (SM) mother, Ms. Cindy Cao (SM), commented that she would be satisfied if Alice went to the flagship state college. However, she definitely expected Alice to go to a prestigious college or university. This family, together with two other families, conducted a college tour that visited seven Ivy League institutions. As Cindy pointed out, she wanted the children to know that there

were many institutions better than the flagship state college and encouraged them to apply to them. This activity is further analyzed in the Chapter 7. In addition to having higher expectations for Alice's higher education, Cindy had higher expectation of Alice's careers, including being a doctor or lawyer. Alice reported, "They [my parents] want me to be a lawyer or doctor." Cindy obviously knew that it took more years for students to get degrees in these fields, which suggested more investment in higher education. However, the tuition cost was not a problem for this family. Cindy said, "If she [Alice] needs to stay in the college for many years, we could afford the costs."

Despite Cindy's high aspirations for Alice, being as professional such as doctor or lawyer was not the only option this family had for Alice. If Alice could not find a desirable position after college graduation, this would not be a challenge for them. As Cindy explained, "Nowadays it's difficult to find a government position. So if Alice cannot find a position [after graduation] we will consider supporting her to run a small business."

Another parent from a small business family, Mr. Xian Zhou, also had high expectations of his son's higher education. The flagship state college, according to Mr. Xian Zhou would be the minimum requirement. "At least he needs to the flagship state college", He added, "He should at least get a Masters' degree." However, unlike Ms. Cindy Cao, who expected her daughter to be either a lawyer or doctor, Mr. Xian Zhou did not have an exact goal of his son's future career but insisted that "He [Alex] must have higher income than us." Similar to Cindy, Mr. Xian Zhou did not completely believe that the effect of higher education. He said, "These days it's useless to have a Master's degree."

Third, highly educated families tended to have high expectations of their children. One parent, Ms. Maggie Shao (TR), from a transitional professional family, commented, “In my perspective, only incapable students go to the flagship state college. We told him [my son], it would be shameful for our family if you end in going to the flagship state college.” Maggie’s son, Zanmin (TR), aimed at Harvard University or John Hopkins University for medical school because he wanted to become a doctor. Some highly educated parents did not specify which institutions they expected their children to go to college, but they did expect good colleges and they expected their children to become either doctors or lawyers.

Highly educated parents did not expect their children to run small businesses such as Chinese restaurants. For example, Ms. Maggie Shao said, “Like my family, I have never thought that way—that is to let my kids work as manual workers in Chinese restaurants.” A student, Kyle (ST), from a settled professional family, commented, “My parents, if I told them I was starting a restaurant, they wouldn’t be happy.” Another student confirmed her mother’s negative attitude of running small businesses because it was not stable.

> But listen my mom always thinks ahead of time, so like restaurant economies are bad well not like, say if you own a clothing store and the economy is to get bad and your store goes down, so it’s not a stable job. – Molly, student group interview.

Fourth, in two families, the children’s career aspirations were different than the parents’, which caused a certain amount of tension between them. For example, Alice who did not know what major she was going study in college, was aware of her mother’s aspiration for her—to be a doctor or a lawyer because “our parents want us to be lawyers that makes millions upon millions of dollars”.

> That's what every Asian wants their child to be, be a lawyer, be a doctor, make lots of money but I guess it's true but it's hard, it's not possible, I can't be a doctor because I don't like blood; no and then being a lawyer, it takes too long and I don't want to do it. – Alice, student interview

Parents were aware of their children's objections about their preferences of careers. Alice's mother admitted that the preference of doctor and lawyer as career was only true for parents, but not for children. Another parent, Ms. Yan Sun, also wished her children to go into medical science or pharmacy fields, but neither of her two children appreciated these fields.

> Personally I admire doctors so when I was young I applied for medical institutions. Parents often hope their children can achieve their dreams if they did not carry them out. I suggested my daughter study pharmacy if she did not like to study medical science. She disliked it and she grumbled when I asked her to volunteer in pharmacy school. Kyle [my son] said he is not a science person and I suggested him to study a medical related field. But he is not interested in. He is interested in statistics now and said it's possible that he would focus on it. I think it's not bad. – Parent interview, Ms. Yan Sun

Fifth, besides parents' high aspirations for children's higher education and career, students also commented that their parents have high aspirations for their general education. The parents only wanted their children to have the best scores for every exam or test and it was their job to do this so there was nothing to celebrate if they achieved it, but if they failed to meet the high expectations they needed to "do better." Molly said in the group interview, "It's like my parents want me to get straight A's, yeah like for everything." Another student, Alice, had similar comments about how her parents expected her to get straight A's.

> Because if I bring home not straight A's, my parents aren't going to be proud like 'Do better, it's not good enough' ... it's the norm getting straight A's and the community so it's nothing to celebrate over. – Student group interview

Lastly, the participating children were aware of their parents' high aspirations for higher

education, career and general education, and they may or may not like their parents' aspiration for their careers, but they knew the reason why their parents had high aspirations for them. Students from less educated families agreed that their parents wanted them to have a better life than themselves. For example, Xueliang said, "Because they don't want me to do the same job as they are right now; they want me to have a better job, better life and more money, money, money." What Kitty said was very similar to Xueliang, "And they don't want us to work as hard as them, they want us to have a better future." It was critical to go to college to achieve this goal. Alice said, "… so it's just that they want us to have what they couldn't have … they see it as the only option for us and to get into college and do better than them or fail school or follow in their footsteps."

Students from highly educated families agreed that their parents wanted them to have a middle class life and not have to worry about money. For example, Molly said, "To be able to care for yourself, like not live on the streets and be a homeless person, have a good job, at least be like middle class or higher."

Summary. Parents' and students' aspirations for higher education and career are indicators of a family's cultural capital, and can deeply influence students' attitudes toward education. Overall, the two working families tended to have relatively lower aspirations of higher education and career than other families. One working family considered going to community college to save money. Another working family commented they would be satisfied if the student got accepted by the flagship state college. For other families in this study, going to the flagship state college would be the minimum requirement and some believed it was shameful.

The two small business families had higher aspirations of higher education but had reservations about the function of higher education—that is, attending colleges did not necessarily lead to higher income. One family considered supporting the child to run a small business if she could not find a government position. In contrast, highly educated families also expected their children to attend the most prestigious institutions. In addition they preferred that their children enter professional areas; running small business such as Chinese restaurants would not be options for the children.

Besides high aspirations for higher education and careers, students reported that parents have high aspiration for their general education as well. Parents wanted them to have the best scores for every exam. Students were aware of the fact that their parents were expecting them to have a better life than theirs, have middle class life, and do not have to worry about money.

**Parents' Strictness**

According to its definition, parents' attitudes toward their students' education is part of cultural capital, which is also related to parents' culture and beliefs. Hence, whether or not parents are strict with their children is one indicator of cultural capital.

In order to make sure their children were spending time on learning and not wasting time on irrelevant activities, many participant parents are strict with their children, especially in the following two aspects: first, restricting children's accessibility to computer games and other machine games; second, setting rules that children need to finish homework before they can play; in times of need, they may use other strategies to persuade children to study instead of playing.

The most common example of parents' strictness towards children can be seen in how they control their children's use of computers, and specifically children's use of computers to play games. Some parents believe playing computer games is harmful to children's eyes and children can be easily addicted. For example, Mr. Xian Zhou (SM) commented on how he and his wife prohibited their children's accessibility to computer games and successfully forced them to give up the idea to buy games.

> Usually they are not allowed to play on whatever game machines. We do not buy them games. They may, at most, occasionally watch some games on computers. Their game machines have been thrown away. My wife does not wish them to play games as well. They know they will be scolded if they play. He [Alex] gave up the idea to purchase games because he knows he will not be allowed to play. Playing games is detrimental to eyes. It is difficult even for adults to stay away from games, not matter kids. When I was in China I played games and I knew that it was easy to get addicted. – Parent interview, Mr. Xian Zhou

Mr. Xian Zhou's son, Alex (SM), obviously played computer games before; he revealed that he played *War of the Warcraft*. When Alex found that his computer was infected by a virus his parents took his computer to New York and everything was deleted. Alex's attachment to computer game can be illustrated by his desperate description of this experience.

> I was mad when I found a fire sound on my computer because I was play[ing] War of the Warcraft. You know I was a beast at it until like in the end. It totally failed because a virus came and like I'm taking your laptop. So they took it to New York, fixed it, deleted it…deleted everything, like everything I had on it, like all my files, all my previous homework, like Microsoft types, and everything that was there. They just like deleted every single one of it, like my games, my favorites like everything. And I can't remember else what I added to it, the list on the internet. – Alex, Student group interview

Some parents have strict control of how and when the children can use computers. Ms. Li Pan (TR) counted the time that her son Tony could play computer games – a game that was

actually supposed to help children's learning.

Another parent, Alice's (SM) mother also attempted to restrict children's time having fun on computers, such as playing computer games and watching music videos. Alice complained that her mother, Cindy (SM), restricted her too much. She even locked her in her room in order to make sure that she spent time on study rather than playing video games. During the student group interview, after Alex complained how his parents restricted his computer use, Alice sympathized with Alex by saying, "I know. It's really sad." She then shared how her mother, Cindy, prevented her from playing computer games.

> Mom took it. She doesn't let us play video games. She took the Wii and put it in the food pantry closet and I don't have it. I can't find the charger to my DS so I can't play that. I bought a new game too, but it was over winter break. – Student group interview, Alice

Alice also described how her mother wished she spent time studying instead of playing on computer games, or having other fun activities on computers.

> I don't think my parents agree after they saw me on the computer playing games. She'd probably be angry like why aren't you doing your homework? Because she knows that I have a lot of homework and what not so. She is like 'Why aren't you doing your homework? Why are you playing games? Why are you watching k pop, like whatever, She doesn't understand k pop. And I'm, like whatever, like "why are you constantly watching this?" Because it's fun. – Alice, Student interview

Even though these students described their parents as seemingly having absolute power to take control of their computers (or other game machines), such as deleting files, disclosing computer passwords, and hiding chargers, some parents found it is very difficult to control children's use of computers because sometimes children do need computers to finish assignments and it is impossible for parents to always monitor how the children use computers. For example,

Alice's mother, Cindy, mentioned her dilemma about controlling her children's use of computers. She said she became very angry when she saw the children were using computers and were addicted to computers. Then she would command them to do homework or go outside the room and drink some water. She also commented that even her youngest child – her only son (four and half year old) – was very sophisticated in playing computers. So she hid the computer from him in order to prevent him from overusing it. She said it is difficult to control children's use of computers because sometimes they needed them to finish their homework.

> "When I commanded them to stop playing computers they said they need to finish homework on computers. But when I left, they began playing games. It is impossible to delete those games because they can always download them." – Observation conversation, Cindy

Another parent, Ms. Xuehua Hou (TR), who was a highly educated housewife, arranged her son, Devin's, activities after he came home. She did not allow Devin to play games on weekdays and Devin needed to finish homework from regular school and another program (such as mathematics homework from Chinese language school and piano homework (assigned by a private teacher) during weekdays once he came home. As she admitted, "Sometimes I am pushy. I hate to see him idle around." In the parent interview, Ms. Xuehua Hou described how he set Dos and Don'ts for Devin.

> On weekdays, once he comes home, he is occupied every minute because he needs to practice piano and do homework. I watched him closely to conduct these activities. He is allowed to watch TV for a while. I do not allow him to idle and do nothing. He is not allowed to play games on weekdays. He can play on weekends. So he is always looking for Fridays because he can play games on Fridays. He can play games on daytimes during weekends as well. He knows this. A child is a child. Every child loves playing.
> – Ms. Xuehua Hou, parent interview

Besides controlling children's time on using computers and playing games, another phenomenal strategy several parents applied to keep children on the correct track is to require them to finish homework before having fun. These parents require their children to finish homework once came home. For example, Mr. Xian Zhou (SM) asked his children to finish homework once they came home. Mr. Gao Fan (TR) said everyday Tony (TR) needed to finish homework first and then they did some physical exercise. Ms. Maggie Shao (TR) said she did not want her son to do homework after dinner and she required him to finish homework by Friday before he can relax on weekends.

> He is required to finish his homework before 6pm or 7pm. If he really has much homework to do he can spend more time. Another issue is the holidays or weekends. I wish him to finish his homework before playing. He can play on weekends but he needs to finish his homework before Friday. I do not like him to finish homework on Sunday evenings which is common to many American kids. In fact, he has multiple activities on Sundays, including sports and piano. Moreover, he needs a relaxation for a while on Sunday. If I did not set the rule that he needs to finish homework before Friday, after which he can relax, he will forget on Sunday that he has homework. – Ms. Maggie Shao, Parent interview

Sometimes, parents may use pretended threats as a means to persuade children to study. Molly (ST), a 6th grader, from a highly educated and wealthy family described an interesting parent strategy her mother used to push her back to study. She said,

> My mom threatened me and said if I didn't learn it, she's going to take all my stuffed animals and throw them in the trash. And then my brother told me when he was little, my mom told him if he didn't learn it, my mom was going to call the police on him [and send him to] orphanage. – Molly, Student interview

Summary. These immigrant Chinese parents tend to be strict about their children's education in at least two aspects: first, they restricted (or attempted to restrict) their children's

access to computer games; second, some parents required the children to finish schoolwork before having fun; third, parents may use threatening strategies.

**Parents' and Extended Family Elders' Monitoring of Students' Education**

Because family members' (mainly parents) attitudes towards children's education are part of cultural capital, their attitudes decide how they monitor children's behaviors and learning activities. Hence, how parents and other elders (such as grandparents and uncles) monitor children's education should be considered an indicator of cultural capital. Studies show that Chinese American parents tend to monitor closely their children's education, such as checking children's homework (Chang & Shimizu, 1995; Lo, 2009).

Parents, regardless of whether they were less educated or highly educated, tend to monitor their children's schoolwork intensely, especially when the children are young. Less educated parents, as previously analyzed, cannot provide much tutoring in mathematics, especially when they take higher level classes. Even parents who did not tutor their children very much actually monitored their children's academic study closely, especially their homework completion status. For example, Cindy (SM) did not tutor her daughter Alice (SM) very much when she was young. However, Cindy constantly reminded her children to finish their homework for both regular schools and Chinese language school. Another student, Xueliang (WK), who claimed there was no parent tutor in his family, described how his parents monitored his schoolwork despite their knowing nothing about what he was learning [and had learned] in school. He wrote:

I stayed a long time with my mother [in China]. She often monitored my learning. Just

> like most other Chinese mothers, she hoped me to be successful when I grow up. My mother did not have much knowledge but she still sat with me when I was doing my homework ⋯ Then I went to America, a year after my father. At that time, my parents knew nothing about what I had learned before. Therefore, the only thing they could do was to monitor my schoolwork and restrict my time on television. – Student essay, Xueliang

Another student, Alex (SM), said that when his parents were not home "they would call home and ask us if we were home now, or like what are we doing and to make sure that we're doing our homework and that stuff." When his parents were home it would be even easier for them to know if he spent time on studying. Alex described in his essay how his parents monitored his study activity.

> My parents were usually busy at work so they told me to make a schedule for myself to study at this time of day. Most of the time I decided to play around because they weren't there to enforce their time restrictions on me, but when they were home, they know when I have studied or not. They say, "We have our ways of tell whether or not you have been studying." And they always know for a fact whether or not I did or did not. – Student essay, Alex

Some parents, especially highly educated parents, explicitly stated the necessity to monitor children's schoolwork. For example, Ms. Maggie Shao (TR), who checked her son's homework about once a week, commented that "it is important to monitor children's learning; otherwise, you will be shocked by their retreat after a short period of time." Another parent, Ms. Li Pan (TR), whose son Tony (TR) was in 2nd grade, believed that if parents do not treat children's schoolwork seriously they are not likely to take it seriously. She thought this is very important especially when children are young. She said,

> Family needs to follow [kid's] schoolwork. That means to check kid's schoolwork. Parents need to make sure kid can catch up in school. Especially when kid was young, you should follow his schoolwork and know what he is learning from school. If parents

> take schoolwork seriously the kid will take it seriously as well. If parents do not take schoolwork seriously the kid will not treat it seriously as well. – Parent interview, Ms. Li Pan

Ms. Li Pan's friend, Ms. Xuehua Hou (TR), explained what she did in order to monitor her son, Devin's (TR) learning status in school. She checked Devin's schoolbag every day because he would not voluntarily report to her how he was doing in school. Xuehua said,

> If I did not ask him he just let his schoolwork stay inside his schoolbag. The first thing I do every day when he comes home is to check what he has in his schoolbag. He did problems wrong sometimes but his math was good. – Parent interview, Ms. Xuehua Hou

While parents believed it was important to monitor children's schoolwork, their level of monitoring tended to decrease when they went on to higher grade levels. This pattern of decreased monitoring echoes their decreased parent tutoring. For example, Kitty (WK) said when she was young her parents checked her homework every day. But now while she is in high school, they hardly checked. There are multiple reasons why parents check children's schoolwork less when they go to higher level grades: parents' busy schedule, parents' lack of higher level content knowledge, parents' increased trust of children, and children's increased independence.

> When Kyle was young we monitored a lot. We monitored less when he went to middle school and even less for high school. After all, we are busy and they are old enough and independent. We could not catch up with what they learn in school any more. I know some parents monitor their kids closely. When Kyle was in elementary school we asked what he learned from school nearly every day … and to make sure he finished all assignments. – Parent interview, Ms. Yan Sun

> But generally they don't specifically look at my homework, they trust me that I do it and yeah I do it, I do all my homework. – Student interview, Zanmin

> Well they never really checked as much but like they checked it when I was in

> elementary school because they knew that I still needed help with math when I was young. But when I started to go to middle school, they started checking less and less because I already knew the whole work I was supposed to do so they started checking less and less. – Student interview, Alex

Parents were not the only ones who monitor students' activities. Grandparents, despite not being able to help the students directly on academic problems, paid close attention to the grades they got from school, and monitored them in order to make sure they were on the correct track. For example, Kitty's grandparents would ask her how many A's she got. Alice's grandfather, who could not help Alice on her homework, monitored her activities and made sure she was on the right path. Alice's grandfather often went to Alice's home and her family's restaurant. Her grandfather, who was the original owner of the restaurant, sometimes went there to help the business. Alice needed to work many hours in her family's restaurant. Alice's grandfather disliked children playing and would expect them to study. For example, Alice posted a message on Twitter to me, "Grandapa told me to stop playing around and to concentrate on my homework." In student interview, she described how her grandfather monitored her when she was in home and in the restaurant.

> He knows that I have a really big procrastination problem. Every time he walks in the study or anything, depending on where I am like if I'm in the study room or the library room doing homework, he'll walk past and be like 'What are you doing? What is this? Is that a game? Go do your homework, Amy.' and I'm like (groans) fine but that was like before, I sort have gotten better not like… He's over at the restaurant so when at the restaurant when I'm doing homework, if I'm not doing homework like this isn't homework, oh you're right, I'll go and type up and my AP Bio and what not but he's the one that tries to make sure that we're on track. –Student group interview, Alice

Summary. Parents tend to monitor students' learning closely especially when they were young and in lower grades. However, when students went to higher graders, some parents

decreased the intensity of monitoring due to different reasons. Besides parents, some elder family members also paid close attention to students' education.

**Discussion**

This chapter analyzed how Chinese immigrant families' cultural capital influences students' mathematics education. Among the participating families, there were both similarities and differences in terms of families' use of cultural capital.

Generally speaking, most parents were strict with their children by limiting their access to computer games and setting rules for finishing homework. Parents and other elders in families also monitored children's activities in order to keep them in the right track.

However, largely due to their educational and work experiences, and although all the families valued education highly, aspirations of children's higher education and career were different across working families, small business families, and other highly educated families. For example, one working family considered sending their child to community college to save money, which was not an option for other families.

Moreover, parents' educational experiences were related to how they acted on other aspects of cultural capital in terms of their children's general and mathematics education. Most participating parents, regardless of their educational attainment, attempted to tutor their children mathematics. Less educated parents tended to tutor children when they were young. Highly educated parents tutored their children across all grades, but they still could not teach them all mathematics courses such as calculus. Highly educated families tended to tutor their children much more than less educated families, especially when the mathematics content was at a higher

level. These families also made better use of libraries than less educated families. Students from less educated families went to libraries less frequently than those from highly educated families. Highly educated parents also managed to obtain more books (including mathematics text books and exercises books) for their children than less educated families. In families with more than one child, siblings could be useful helpers for mathematics learning. However, there were tensions between siblings. For families who have close extended family members, these members could be a useful resource for help in mathematics learning.

# Chapter 6: Social Capital and Family Involvement

As defined in the theoretical framework, in this study *Social capital* refers to access to and use of networks in which Chinese immigrant families (mainly parents) interact with other Chinese immigrant families (mainly other parents but may also include Chinese immigrants without children). Putnam (2001) claims that parents' social capital in a community is positively linked to children's education. Some researchers (Cheng et al., 1992) find that Chinese ethnic communities are helpful for Chinese American's adaptive life in California. Chinese ethnic supplementary education programs are an example of how Chinese immigrant families work together to create a community where they can support each other to inherit their culture, language, and to support their children (Zhou, 2007; Zhou & Li, 2003). Nearly all enrolled children have Chinese heritage. Most teachers (often paid volunteers) are Chinese immigrants (except a few English language teachers who might be native English speakers) and all community members are Chinese immigrants. As a result, the use of these programs is essentially an application of (ethnic) social capital and can be treated as an indicator of social capital. According to Coleman (1988), one form of social capital includes information channels, i.e., Chinese immigrant parents' exchange of educational information. Examples are discussions at supplementary education programs, and exchanges of information about learning materials and books. These activities can be categorized as indicators of social capital. These indicators have little correlation with the economic capital involved; such indicators are addressed in this chapter. However, sometimes families' usage of social capital requires substantial economic capital involvement; these cases will be addressed in the next chapter.

**Supplementary Education Programs**

In this study, *supplementary education programs* refer to non-regular school programs which are designed to support Chinese American students' success in academics (e.g., mathematics, English reading and writing, and Chinese language) and extracurricular activities (e.g., martial arts, dancing, chess). The typical supplementary education programs include (but not are limited to) weekend Chinese language schools, summer classes, and SAT preparation classes. These programs were originally founded to teach descendants of Chinese immigrants their home language (mainly Mandarin and Cantonese). But gradually, they began to provide other academic subjects (such as English and Mathematics) and extracurricular activities (such as drawing and dancing). When parents send their children to these schools or classes they often communicate with each other about various topics including children's education. As a result, besides children's education, they also become important locations where immigrant Chinese parents can exchange information. If we imagine there is a social network, these programs can be treated a knots in this social network. As a result, the use of these supplementary programs can be treated as an indicator of social capital.

Most participant students attended (or are attending) at least one form of supplementary education program. When students attend these programs, they usually study Chinese language, English (reading and writing), and mathematics. The only participant student who did not go to any of these programs was Xueliang (WK).

There are different reasons why parents send children to these supplementary programs. For less educated parents, the programs can give their children education that they cannot

provide. For example, Cindy (SM), commented that she could not teach her kids the content so she sends her children to Chinese language school.

> My children go to Dr. Chen's program every year – repeatedly … The class is just once a week. If they do not take the class they will forget. Dr. Chen renewed the [SAT preparation class] problems every year. We are not able to teach them but we are enthusiastic at sending them to this program. – Parent interview, Ms. Cindy Cao

Even educated parents prefer to send their children to these programs because it is difficult for them to teach the kids themselves. It is not because they do not know the content, but because kids resist studying seriously at home and programs such as Chinese language school can provide an appropriate environment in which kids can learn. They are assigned homework and know they are not the only ones who have to go to these programs. Ms. Xuehua Hou (TR), whose son Devin (TR) was taking Chinese language and mathematics classes, expressed her motivation for sending her son to Chinese language school.

> It's more difficult for me to teach him. He will get more systematic instruction from the Chinese language school. The environment in the Chinese language school is more suitable for learning because he knows that he is not the only one who has to study. If we teach him at home he thinks that's extra work. They have classes in the Chinese language school so he knows that every student needs to finish the homework. – Parent interview, Ms. Xuehua Hou

Some students believe it is helpful to be enrolled in these supplementary programs because they can learn English and mathematics content, which enables them to excel in regular school. For example, Alex (SM) said that he developed strong math skills from Chinese school.

> When I went to the Chinese school and the SAT schools, they would teach us mainly English and math and that's where I got my really good math skills from, like the multiplication tables and going to the math classes. – Student group interview, Alex

Parents from less educated families cannot help their children with advanced knowledge

such as SAT mathematics, reading and writing, so the SAT preparation in Chinese language school can be helpful. For this reason, Kitty (WK) was grateful for what her parents did for her.

> To further help me with my education, my mom enrolled me into the SAT preparation classes to help me prepare for the SAT. I felt grateful that my mom enrolled me in such a class to help me get ready for the SAT. I think my parents wanted me to take such a class so I could get help if I needed the help, since I couldn't be dependent on them for help anymore. –Student essay, Kitty

Parents often registered for these supplementary classes without permission from their children, no matter how much the children disliked these classes. The parents' enthusiasm for sending their children to these supplementary programs was not always appreciated by their children and some students were very critical of the supplemental programs, especially the mathematics part in the SAT preparation classes.

For example, two students, Alice and Zanmin (TR), who were taking two different level SAT preparation classes (including both English and mathematics classes) in Chinese language school, expressed their strong dissatisfaction of the mathematics part although they thought the English parts (reading and writing) were helpful. Alice strongly believed that the SAT mathematics packages were too difficult and had too many insane problems and could hardly help her with the real SAT.

> She [Mom] helped with my SAT by putting me in SAT classes, I hated those so much so hate like Chinese School those SAT classes, hated them so much, so much hate. I hated the packets that they gave us … I just didn't like the math one. I thought that these packets were insanely stupid and what not, I hated doing them, I didn't hate doing them but it annoyed me that I did it. The reading one was OK, I think because the reading, writing, the critical reading portions was really simple to me, it was easy. My highest SAT score was critical reading, the writing one. I thought it helped because I suck at writing so writing helped. Math was just, I didn't like it. – Student interview, Alice

Zanmin, who was only in 8th grade, was registered for a SAT preparation class by his mother Ms. Maggie Shao. According to Zanmin, the mathematics content in the SAT preparation class was two grades above him. As a result, he was really struggling with the class and complained that he did not learn anything because he did not understand what the teacher was talking about. Similar to Alice, he believed the English part was helpful.

> I mean the English portion was fine, that was OK I liked that part. But it was just the math because I didn't understand most of what they were talking about. – Student interview, Zanmin

> The only program that they ever sent me to is the SAT program in Chinese School and that was really hard, especially the math part so that was two grades higher than I was taking but I didn't understand most of it so that was really helpful but I didn't get most of it. – Student group interview, Zanmin

An interesting observation here is that Zanmin's mother, Maggie Shao (TR), seemed to be unaware of Zanmin's struggles in the SAT preparation math class. When asked if Zanmin liked the SAT preparation class, she answered, "He is OK with the class. He thinks he is interested to learn new content." Maggie Shao did not pay attention to how Zanmin felt about her sending him to the SAT program. Zanmin wrote in his essay, "My parents have also sent me to Chinese school's SAT program. I did not like how I was forced to go to this math program. However I did learn many things from it."

Some students just did not see the necessity of attending any of these supplementary education programs. Xueliang's father, Mr. Hai Liu (WK) who obviously knew that many Chinese American students went to supplementary programs, suggested that Xueliang attend in order to better prepare for the SAT. However, Xueliang rejected his suggestion.

> I suggested Xueliang to attend a supplementary class. I said they have the programs that fit your grade. But he [Xueliang] did not want to attend. He said it's not necessary and it's not because he wanted to save money for us. –Parent interview, Mr. Hai Liu

Another student, Molly (ST) thought it was unnecessary for her parents to send her to a summer program where they taught reading and English. To Molly, it was just a waste of money.

> Other school programs, I'll tell you about other school programs, every single year my mom signs me up, ever since second grade, every summer she takes me to this additional class and sometimes they teach me that we also do in reading and English, even though those are my best subjects, those are also my worst subjects so every single summer she makes me go to a extensional reading\English class … everything they taught me, I already knew anyway so I thought it was a waste of money … I feel bad for my mom because she wasted a lot of money. – Student interview, Molly

According to Zhou and her co-authors (Zhou, 2007; Zhou & Kim, 2006; Zhou & Li, 2003), the contribution of these supplementary education programs and their ethnic culture can largely explain why some groups of Asian American (Chinese American, Korean American, and Vietnamese American) students are high academic achievers. However, Zhou and her co-authors failed to analyze the negative aspects of these supplementary programs. These findings also indicate that the role of these supplementary programs should not be overestimated and they cannot explain Asian American students' educational experience. Asian American students' use of these supplementary programs is only aspect of their application of social capital.

Summary. Chinese immigrant parents often send their children to supplementary education program to study Chinese language, mathematics, English, and other skills because less educated parents cannot teach their children the content the way they would receive it from these programs. Highly educated parents recognize that the learning environment in these programs is difficult to create at their homes. Some students appreciate what they learned from

the Chinese language school. However, some students are critical of these supplementary programs because they either did not need them or the mathematics content was not suitable for them.

**Obtainment of Educational Information**

In this study, *obtainment of educational information* includes Chinese immigrant parents' information exchange about supplementary education programs (teachers and courses); seeking private tutors; exchanging books, materials, and website information; children's college applications; and, discussions with Chinese immigrant mathematics teachers**.** An important form of social capital is information channels (Coleman, 1988). For this reason, how the participating parents use the Chinese ethnic community as a resource to find helpful information for their children's education can be considered indicators of social capital.

**Choose supplementary programs, teachers, and classes.** The ethnic community is a resource for parents to share information about the quality of supplementary schools, teachers, and classes. It is obvious that information from other parents will greatly influence a parent's decision to send a child to Chinese language schools, summer programs, or other supplementary classes or programs. Molly (ST) said "Most of those summer programs that I had to go to were my mom's friend's ideas." Another student, Kitty (WK), confirmed that the idea for going to a Chinese language school was from her mother's friend, "Well my mom had a friend that had a daughter that already went to this one so she recommended my mom to bring me to this one." Parents also confirmed that they exchanged ideas about choosing supplementary classes and schools. Ms. Yan Sun (ST) said, "We discussed what courses they have, for instance, the courses

in Chinese language school. “

When parents believed their children did not make the progress they expected from a program, they might share this comment with other parents and possibly discourage their participation in the program. A parent, Cindy (SM) said that,

> After they finished the program (a SAT preparation program) they did not encourage us anymore because their children told them the program did not help much. As a result, we decided not to send Alice to that program.” – Cindy, Parent interview

**Seek private tutors.** When Chinese immigrant parents want to find tutors to help their children, they ask their ethnic Chinese friends to help them find tutors—who are themselves usually Chinese immigrants. For example, Ms. Yan Sun (ST) found a tutor for her children with whom she was very satisfied. She said that she found this tutor through her [Chinese] friend’s recommendation. Because hiring a private tutor requires economic capital, this topic will be further examined in the next chapter.

**Buying or borrowing books (or materials) and accessing websites.** Chinese immigrant parents also share study materials and information with each other for their children. For example, Cindy copied SAT practice exercises from her friend and asked her daughter Alice (SM) to do these problems. This ethnic community’s scope actually extends to their networks in China because parents asked their friends in China (or immigrant Chinese friends who sometimes traveled to China) to bring learning materials to the United States for their children because there is no lack of mathematics practice books in the Chinese market. Zanmin (TR) said her mother’s friend mailed materials from China and he practiced these problems.

> The books are blank and they were from China and because my mom has a friend in

> China who brings stuff over from China and like mails it to us like she mailed us a whole bunch of Chinese books that what the kids in China do like what their kind of problems are and she just copies them down into the book and we solve them. – Zanmin, Student interview

In addition to concrete learning materials such as books, parents also exchange information about using websites for academic purposes. In fact, it was Ms. Li Pan (TR) who informed Ms. Xuehua Hou (TR) about the use of the website *firstinmath.com* which provides many interesting mathematics exercises for children. Ms. Li Pan said, "If I know some good websites I would tell Xuehua."

**College applications.** Obtaining college application information is very important for parents, who often link college entrance with students' SAT scores. For example, Mr. Xian Zhou (SM) explicitly commented that one of his relatives' children will not be able to attend MIT due to a low SAT score.

> I have relatives who run a restaurant near me. They have two children; one is in 10$^{th}$ grade and another in 12$^{th}$ grade. [The elder] one is applying of colleges and universities. He applied flagship state college, University of Virginia, and University of California. He is going to have an interview for MIT in Boston. So I have much communication with them. His SAT is merely a little more than 2,000, so I do not think he is going to be accepted by MIT and he can only go to the flagship state college. A SAT score of 2,100 is not enough for MIT which costs about $40,000 a year. This is why I said it is difficult for him to be accepted. I have a friend whose child has 2,100 and went to the flagship state college. He got a scholarship and the tuition was waived, and he only needs to pay a housing fee which costs about $8,000. –Parent interview, Mr. Xian Zhou

Even parents whose children are still in elementary school have begun to pay attention to college application information. As Ms. Xuehua Hou pointed out,

> Some people talk about what may be useful for kids' college applications. Anyway, I get such information as much as possible. Despite my child being still young, time flies fast

> and he will go to high school within several years. So it's never too earlier to collect useful information. That is why I like to talk to parents who have children. –Parent interview, Ms. Xuehua Hou

**Discussions with Chinese immigrant mathematics teacher.** Sometimes, parents also directly focus on their children's mathematics education such as an exchange of mathematics competition information and students' difficulty in learning mathematics. For example, Ms. Xuehua Hou learned from a mathematics teacher in Chinese language school (she is Chinese and also teaches regular mathematics course in a local elementary school) that word problems are an obstacle for nearly all elementary school students.

> I think it is very important to communicate with other parents [at Chinese language school]. I think it is an important resource. Sometimes I know the situation of other kids, such as how to learn the Chinese language. In terms of Devin's mathematics, I talked to his mathematics teacher and other parents about mathematics competitions information … In fact, I asked an elementary [math] teacher. She said word problems are difficult for students because they require students to understand the story through words, and then they need to analyze the story which is also difficult. That is true for nearly all elementary students. – Parent interview, Ms. Xuehua Hou

Summary. The Chinese ethnic community is a helpful resource where Chinese immigrant parents can obtain useful information from each other, including choosing proper supplementary education programs, teachers or courses; seeking private tutors; obtaining information about books, learning materials, and websites; learning about college application procedures; and discussing related issues of mathematics education.

## Discussion

In this chapter, I analyzed two indicators of Chinese immigrant families' use of social capital. The first one was their use of (ethnic) supplementary education programs, such as

Chinese language schools. For some students, participation in these programs was helpful for their mathematics learning and English learning. But some students were critical about attending these programs for different reasons because they either did not need these programs or the mathematics content was not appropriate for them. However, some researchers (Zhou, 2007; Zhou & Kim, 2006; Zhou & Li, 2003) only emphasize the positive aspect of these supplementary programs and completely fail to mention their negative aspects. The second indicator was how Chinese immigrant parents use their social network to obtain information that might be useful for their children's general and mathematics education.

# Chapter 7: Economic Capital and Family Involvement

In this study, *economic capital* refers to Chinese immigrant families' possession and use of economic resources, such as cash, credit, assets, real estate, and businesses. Studies have found that family income, which is a crucial component of economic capital, matters for children's education though its influence is limited compared to that of parents' education (Davis-Kean, 2005; Duncan & Magnuson, 2005). However, few researchers have examined the specifics of how family's economic capital influences their children's education, that is, for which aspects economic capital matters. One study (Kao, 1995) finds that Asian American parents invest more in educational resources than their white counterparts despite comparable family income.

This study illustrates how participating families applied their economic capital (often together with social capital) to positively influence their children's general and mathematics education in three dimensions: first, how participating families, with the consideration of sending their children to good public schools, made their decisions about where to live. This activity (e.g., purchasing or renting homes) often requires a large amount of monetary investment and thus can be treated as an indicator of economic capital. The second dimension is related to hiring a tutor. Hiring tutors is a monetary cost activity and thus becomes an indicator of economic capital. The final dimension is related to how a small business family participated in an ethnic educational foundation and conducted a college tour with their ethnic fellows who came from the same village in China. These two activities require monetary investment and thus can be categorized as indicators of economic capital. When families use their economic capital to be

involved in their children's education in the above three components they often also need an input of social capital. This phenomenon is discussed at the end of this chapter.

**Family Location**

In this study, *family location* refers to parents' decisions about where to live, often in consideration of their children's education. A family's economic status often decisively influences where the family will live, so family location can be treated as an indicator of economic capital. The quality of public school education between school districts can be sharply different, but usually students may only attend local schools in their district. Thus, sending children to a good school district requires a family to live in that school district, which is usually very costly. All participant parents believe that living in a good school district is crucial for their children's education. Most participating families managed to live in what they believed were good school districts. However, due to different reasons, especially economic status, not all families could afford to buy a house in a good school district. As a result, families use different strategies to send their children to good school districts.

The two small business families, due to their sufficient financial status, each owns at least two houses in the area. For example, Alice's (SM) family has two houses. According to her mother, Cindy (SM), the old house is located in a good school district while the new one is in a weaker school district. Cindy's husband, Sam, is well-informed about the different school districts. Thus, even though most of their family members moved to their new house, Cindy sent her children to school in the old district because it had better elementary and middle schools.

We like the old house very much because it's in a good school district, including both

> elementary school and middle school. The school district in our new house is not as good as the one where my old house is located … Sam knows which school districts are better and he told me. The reason why we bought a new house here is because the old house is too small to accommodate so many people. Our restaurant has many employees and we have to provide them lodging, otherwise they will resign. It is a difficult issue. However, our kids are still young and need to go to schools in the previous school district. Carla needs to go to school at 8:30. Now even after we moved here, the kids will go their previous schools because we own two houses. – Parent interview, Cindy

The other parent, Mr. Xian Zhou (SM), who also ran an Asian restaurant, said he had three houses and rents out two of them. The one he was living in was located in the best school district in the state, even though it was much more expensive.

> The schools are better and the houses are much more expensive. However, the most important thing for us is to live in a good school district … I got the school district information by visiting the schools, read newspapers, or hear from my friends. It's widely accepted that this school district is good. It's the best school district in [the state] which has three excellent [high] schools. It has the best public schools. These three schools are the top three even though their rankings change slightly sometimes. – Parent interview, Mr. Xian Zhou

Upper middle class families, similar to lower middle class families with sufficient financial resources, tend to purchase homes in what they believe are good school districts. When they talked about the reasons why they chose to buy houses in their current locations, unlike the lower middle class parents, who mainly rely on the rankings of the general reputations of schools, these parents provided more detailed information by comparison with the previous schools their children had attended. It was because they were not satisfied with the previous schools that they moved to their current ones. For example, according to Ms. Yan Sun, teachers from better school districts teach more than those from other schools.

> At that time I was employed so our incomes were higher. So we wanted to buy a bigger house. I also wanted to buy a house in a school district with good high schools. School

> was our priority when we were looking for a house. Teachers from good schools teach differently than others and they teach more to kids … When we were in Springfield County, the elementary school did not teach kids much knowledge. – Parent interview, Ms. Yan Sun

Parents in a settled professional family, Mr. Wei Han (ST) and his wife Ms. Ganquan Yao (ST), described why and how they decided to move from Fox Hill County to Littlewoods County. Similar to small business families' rationale, the ranking of schools was the most important factor in choosing where to live. As Mr. Wei Han pointed out, "The reason why we move to this county is because its schools rank high. We definitely want our children to go to good schools."

Mr. Wei Han and his wife believed that elementary school was very important for their children's education because having a solid foundation was crucial. They believed that their perspective is different from people who think high school is the most important.

> *Han Wei*: We moved here when my son was in 2nd grade. When we were searching for a house we only considered the ones in good school districts. The relevant elementary school must be good.
> *Ganquan Yao*: We believe to have solid foundation in education is very important.
> *Han Wei*: Some people say that high school is most important, but if kids did not want to study in elementary school they are not likely to study in high school.
> – Parent interview, Mr. Han Wei and Ms. Ganquan Yao

The specific reason why they left Fox Hill County was because they were disappointed by the Fox Hill County's inability to offer a Magnet Program for their son when he was in 1st and 2nd grade. The approach the school used for their son was to let him keep skipping grades, which the couple believed to be harmful for developing the boy's social skills. After consulting with their Chinese friends, they moved to Littlewoods County when their son was in 2nd grade. These

parents have beliefs about what constitutes a good district. In addition to their attention to the quality of the schools, their criteria include low Hispanic and Black population, which may reflect a racial bias. It is possible that this parent's real concern is opportunity structure – to seek a district with high quality of education, less crime, etc. She incorrectly interpreted this opportunity structure in terms of racial composition. Her perspective of Hispanic and Black population does not represent my standpoint.

> Before we moved here we lived in Fox Hill County. My son was in 1st grade at that time he was learning faster. However, that county only has a Magnet Program after about 5th grader (I am not exactly sure). The school had to focus on educating the general students [not the talented kids]. So they told my son to skip a grade. Then my son went to 2nd grade. However, half a year later, they suggested that my son skip again because he was doing so well. Male students mature later and we think skipping grades too frequently was not good for developing his leadership. We had a friend who lived in Littlewoods County and told us that this county has great elementary schools, nice teachers, low Hispanic and Black populations, and so on. Then we visited some places here and thought it's a good place. – Parent interview, Ms. Ganquan Yao

In this case, it must be pointed out that economic capital was not the only form of capital involved when Mr. Han Wei and Ms. Ganquan Yao decided where to live because cultural capital and social capital were also required. First, in terms of using cultural capital, due to their educational backgrounds they had the knowledge to judge the quality of education their son was receiving. They were not satisfied with the previous county's education so they had the motivation to move somewhere else. They also visited some schools before making a decision to move which suggests, again, they had the knowledge to judge what a good school should be like. Second, in terms of utilizing social capital, they consulted a Chinese friend for information about choosing a school. This activity exemplifies how this family obtained useful information from

their Chinese community.

Working families and transitional families, unlike small business families and settled professional families who can purchase houses in good school districts, also managed to live in what they believed to be good school districts despite their economic difficulties. If they have a house they may rent rooms to other people to balance the living costs or they may share the house with extended families members. If they do not have a house they may choose to live in apartments by paying monthly rents or even lodge in friends' home. For example, Ms. Maggie Shao's (TR) family managed to purchase a house in Littlewoods County[12] despite financial hardship. In order to save money, they rented out their master bedroom to a Chinese couple while Ms. Maggie Shao and her husband lived in the basement. Another evidence of her family's economic struggle was their relatively lower capacity to purchase goods for their home and family. She and her husband had been planning to replace their 1995 car with a newer one for a long time but could not do so due to their tight budget. These decisions enable them to live in Littlewoods County.

> [The reason we moved here] was because the school district is good. We moved here for our children … The real estate is more expensive—houses in good school districts are always expensive. You will be able to know the status of the school district by reviewing the school reports from the whole [the state] school reports. – Parent interview, Ms. Maggie Shao

Ms. Li Pan (TR) was working in a non-profit organization and her husband was not permitted to work legally in the United States due to immigration restrictions. This couple had

[12] It was the same county where the two settled professional families (Ms. Yan Sun, and Mr. Wei Han) were living.

always lived in an apartment after they moved to American with their son. During the time of the study, they had just moved from Springfield County to Fox Hill County, where they believed there were better schools. They believed that having a good environment is important for a child's healthy development and said that they will never move back to the Springfield County.

> We will never move back to Springfield County but we may move to better places. Even though we settled for what we had and let him develop naturally by himself but, to be honest, we still want him to grow up in a relatively good environment. – Parent interview, Mr. Gao Fan

> If the others kids are using drugs, he will be influenced. Just as I said before, I know some people who grow up in a family where all family members are using drugs -- all three generations. If you do not want to develop, and it is easy to limit your perspectives, and then you cannot see beyond your nose. So I believe the environment is crucial. – Ms. Li Pan

One working family, Mr. Hai Liu's (WK) family, who was working as a chef for a Chinese restaurant, neither had a house nor rented an apartment. Instead, this family stayed with the family of one of Mr. Hai Liu's best friends. The male householder of the family originally came from the same village as Mr. Hai Liu. His friend assigned Mr. Hai Liu and his wife a room in upstairs and divided the living room into two parts: one part was used as the living room and the other part became the bedroom of Mr. Hai Liu's son – Xueliang, (WK).

In this case, Mr. Hai Liu turned to his Chinese friend for assistance, an application of social capital that he established before immigration. Mr. Hai Liu's example suggests that utilizing social capital to some degree may balance a family's lack of economic capital because without his friend's help he would not have been able to manage to send his son to a good (even though not the best) school district. Chinese low-income immigrant parents' efforts to try to send

their children to good school districts have also been studied by Louie (2004). In Louie's dissertation, a participating student said his parents wanted to send him to a good school but they could not manage to live there. Their strategy was to ask a close Chinese friend who lived in that school district to adopt their son. So this student officially became a child of his parents' friend's family and thus could attend the good school. Despite having finished all the required paper work, the student still lives with his genetic parents.

Mr. Hai Liu's limited economic capital also influenced his expectations for the schools that Xueliang had been attending. Compared to the previously mentioned families, Mr. Hai Liu seems to have had relatively lower expectation of the school because he believed that the high school that his son attended was not a particularly strong school.

> If he meets some problem [in school] we will change schools for him. It has not got to be a very good school district – I am open to that issue. The school which my son is attending is just in the middle level among high schools in [the state]. – Parent interview, Mr. Hai Liu

Mr. Hai Liu obviously knew that a high level of economic capital would enable a family to relocate to the best high schools and he realized that he did not possess enough economic capital to purchase a house in those districts. Mr. Hai Liu reflected how wealthy Chinese immigrant families moved to Hardy County for its fruitful educational resources, while he could not do that.

> Some families may sacrifice more than my family. I know that. Many kids go to famous high schools, such as the ones from families with wealth or intellectuals. If they do not live in [the state], they will move there. Hardy County ranks top in the 10 in the whole country, with excellent high schools. They would buy houses there in order to send their children to those good schools. However, we cannot afford to buy a house there. – Parent interview, Mr. Hai Liu

Mr. Hai Liu had the potential opportunity to open his own restaurant in another state– a dream for many Fujianese immigrants that would have improved his economic situation, but that may have jeopardized his son's education. He made the decision that his son's education should not be harmed and thus gave up the idea of opening his own restaurant.

> We can move anytime. We have no roots in the United States so it is easy to move any time. I had an opportunity to open my own restaurant, but I did not do that because I needed to move to other state in order to open a restaurant. It would be a hit to Xueliang's education so we decided to stay here. – Parent interview, Mr. Hai Liu

Obviously, Mr. Hai Liu's son, Xueliang, was aware of his parents' concern about his education and the reasons why his family stopped moving to new places.

> I stay[ed] in that school for three years and I'm doing so well and my father says it's not a good idea to change another school for the last year … He didn't think that's a very good idea to change because if I change, I had to experience again with my teachers. – Student interview, Xueliang

Ms. Xuehua Hou's (TR) family, the only family living in Springfield County, a county many parents believed to have many poor schools, were extremely disappointed with the school and even considered moving. Ms. Xuehua Hou's family purchased a small house in Springfield County – mainly due to lower prices during the U.S. economic recession. However, Ms. Xuehua Hou was dissatisfied with the school her son attended, which is, according to her, already the best elementary school in the area, especially for its mathematics education. In terms of mathematics, Ms. Xuehua Hou asserted that her son learned nothing from that school and his son's mathematics knowledge came from her and her husband's teaching. Ms. Xuehua Hou's perception of the school's mathematics instruction reflected her knowledge of mathematics, an

indicator of cultural capital that helped her to make a judgment of the quality of the school. Her family had considered moving to a better school district but it was not feasible.

> No, he cannot go to another school because the County has specified the school district. You can only go to the ones relevant to your school district. You cannot go the schools that are not in your school district … I have considered moving but my situation is complex. You see, my husband does not work in this area. – Parent interview, Ms. Xuehua Hou

Summary. Small business families had sufficient economic capital and purchased houses in multiple locations, which enabled their children to attend better schools. Settled professional families' rich cultural capital enabled them to judge school quality. Their dissatisfaction with previous schools motivated them to move to better schools. Their economic capital helped to transfer the motivation into reality when they purchased expensive houses in good school districts. In contrast, transitional professional families and working families tended to use other strategies to achieve their goal of sending their children to good school districts. One transitional professional family did purchase a house in good school district; however, they needed to rent their master room to balance their economic burden. Another transitional professional family chose to rent an apartment in a good school district. One working family lived with a close friend's family in order to send their son to a middle level high school. The only family who still lived in the "bad school district" was discouraged by the mathematics education his son received at his school were considering moving.

**Hiring Tutors**

In this study, *hiring tutors* refers to parents' hiring academic tutors for their children in order to improve their academic achievement. Because hiring private tutors requires payment, a

family's willingness and the activities of hiring a private tutor indirectly reflect the family's economic status, and thus is considered as an indicator of economic capital. More than half of the participating families hired private tutors for their children for non-school activities, such as piano, skating, and SAT preparation. The section focuses on three families because the tutoring in these families is for academic subjects, especially involving mathematics content.

Three families hired tutors for their children especially when their parents believed their children were struggling in mathematics. They also both hired SAT tutors for their children when they were about to take the SAT. Even Asian parents who had little schooling provided educational opportunities for their children by hiring tutors who are often college students (Cheng et al., 1992). The first family was Alice's (SM) family whose parents finished no more than middle school. When Alice was in 3rd grade, she was an average student and then her parents decided to hire a tutor for her. Alice wrote:

> When I was in elementary school, I remember being average, getting average grades and scores. I guess my parents didn't like that because during the third grade, they hired a tutor for me. She was my neighbor, a senior in high school. – Student essay, Alice

However, according to Alice, the degree to which the tutor actually helped was unclear but she admitted after being tutored in 3rd grade she began to take school seriously and her grades began to improve. Alice continued,

> I don't really remember what she told me but after the third grade, school seemed to matter. I just realized that I needed to do well in school and it was important. My grades became better. All As and one or two Bs counts as pretty good grades, right? – Student essay, Alice

Even though parents spend money and time to hire tutors, children's responses to this

activity are not always positive. For example, Alice implied that while the tutor her parents hired for her in 3rd grade may have been helpful for her education, she was not happy. Alice complained that her parents made this decision without her permission and made her feel guilty because if she did not do well her parents perceived it was a waste of money. Alice expressed her resistance to this in her essay about how her parents pushed her to feel guilty.

> There is one thing that nags at me though. When I was being tutored, I remember my parents saying things like, "You better study! We're paying her $10 an hour to tutor you! Don't waste our money!" Back then, it made me feel guilty and sad. It might have motivated me too. I can't tell anymore. But, now when I think about it, it makes me a bit angry. Waste their money? It's not like I asked for them to hire a tutor for me. They constantly do things that I never asked them to do and then complain to me when I don't appreciate it. Seriously? I didn't ask for it. I know they mean to do things that are best for me, but how do I appreciate it when it seems like a new chore for me? – Student essay, Alice

When Alice was preparing for the SAT, her parents hired a private SAT tutor for her, mainly for her English writing. Alice's parents also attempted to hire a private SAT mathematics tutor for her. Alice commented that the tutor was a good teacher, but when she asked her some questions the tutor just gave her the answer instead of explaining why she chose that answer.

Another parent who hired a SAT tutor was Ms. Yan Sun. She was aware of the differences between American parents' and Chinese parents' perspectives toward hiring tutors. In her opinion, even talented kids may have problems so hiring a tutor is necessary, while American parents may feel embarrassed to hire tutors because they think only students having significant difficulties need a tutor.

> Chinese teach students differently than Americans. We cannot always follow kids' preferences because they have limits. Even for talented kids they may have many problems. In China, there is syllabus for every subject which guides what to teach.

> Anyway, we are different than Americans. Americans will feel embarrassed if they tell others that they are hiring tutors for kids. They think only kids who are left behind need tutors. We are different than them. – Parent interview, Ms. Yan Sun

According to Ms. Yan Sun's philosophy of hiring a tutor, Kyle clearly needed a SAT tutor because he was going to take the exam soon. In fact, many Chinese American parents perceive SAT to be the most important test before they go to college. As a result, Ms. Yan Sun hired a SAT tutor for Kyle – the one who tutored her elder daughter. She commented that the SAT tutor was widely known in her Chinese ethnic circle thus her hiring of this tutor also indicated a use of social capital. Ms. Yan Sun was satisfied with this tutor.

> Kyle is going to take the SAT soon and he has attended many SAT programs. I think I still prefer the Chinese way of education. In America, students usually do not prepare for SAT specifically, but I think there are many skills for this test. I hired a tutor for him who was from China. She was a college instructor who taught foreign language in a Chinese institution. She has been teaching students in a one-to-one way for six or seven years. She is very experienced and she teaches Kyle once a week … She has tutored Kyle several times. Kyle believed it was effective. She has the experiences and skills and she assigned exercises to Kyle. When Kyle was doing the problems she was observing. Then she knew what matters Kyle considered, what he did not consider and which problems he skipped. As a result, the tutor can strengthen the practices based on his weaknesses, his characteristics, and the specific questions. – Parent interview, Ms. Yan Sun

Interestingly, Ms. Yan Sun's satisfaction with the Chinese tutor contrasts sharply with her dissatisfaction with her previous experience of hiring several American tutors. She once ordered 20 hours of tutoring online—tutors from different subject came to her home to help Kyle. However, because these American tutors did not prepare anything in advance and only answered questions, she did not perceive it was productive. As a result, they did not even finish the ordered 20 hours.

> I had hired a science tutor for Kyle. I ordered it online, say, 20 hours. They provided

> multiple options for customers. It means you can choose tutors to help in any subject you want. It has not only science but everything else. I ordered 20 hours and we did not use all of the 20 hours until now. We used several hours for social study and several hours for chemistry. The tutors were White (not Chinese) and they came to my home, face-to-face. They tutored in a different way than Chinese tutors. Usually Chinese tutors choose the content for tutoring. These American tutors did not prepare anything and just answered your questions. We think it was not a productive way so we did not use them anymore. –Parent interview, Ms. Yan Sun

A parent from the other small business family, Mr. Xian Zhou (SM), received little education in China and could not directly help his children's mathematics education when they went to higher grades. Nevertheless, he used more flexible strategies to help his children's education.

First, he informally hired some Chinese teachers in his son's school to help him. Due to his difficulties in English, he could not communicate effectively with most of his children's teachers but he managed to get to know some of the Chinese teachers in his children's school. Then he asked a Chinese teacher to take care of his son after school because the Chinese teacher would stay for one or two hours after school was dismissed. Mr. Xian Zhou said, "Our English is too bad to communicate with American teachers. So we only do this with Chinese teachers." When his son had questions he could ask the Chinese teacher for help. In return, Mr. Xian Zhou would pay the teacher a certain amount of money in appreciation.

> The Chinese teacher's class was dismissed at 2:00p.m. but he would stay until 4:00p.m.. Then I persuaded him to take care of Alex and we would pay him accordingly. I asked him, "How much do you need?" And he replied, "You can just pay me $20 each time because I would stay here anyway." Then I asked him when he was going to leave and he said 4:00p.m.; then I picked up Alex at 4:00p.m.. Sometimes I asked him to take Alex away on weekends. However, when his working schedule changed this kind of opportunities vanished. –Mr. Xian Zhou

Second, Mr. Xian Zhou implemented a lodging strategy to hire a tutor for his children. Because Mr. Xian Zhou has been successful in his Chinese restaurant, he managed to build a close relationship with another educated couple (but with limited income). During the summers or after school, he sent his son Alex (SM) to live with this family and paid them a sum of money. When the couple tutored their own son (in math and reading), who was one or two years older than Alex, they also tutored Alex.

> She's like almost my aunt kind of, like I just call her my aunt because we're really close. And like before I was like young, he [father] would send me to her house in the summer or apartment before. Like when I was very young, second, third and fourth grade, right after school, my parents would drive me to her apartment and then I would do my homework there because of two reasons: she has a son like one or two years older than me, like he could help me; and also because my mom and dad didn't have the time to look after me. – Student interview, Alex

> I had considered finding some families where Alex can lodge mainly because we had too little knowledge. It would be best if the adopting family also had children because they also needed to take care of their own children and could not find good jobs. So they could take care of their own children and my children. Then we asked them how much do you ask for and we would pay them accordingly. We used to pay $1500 per month which included my children's food. They stayed there from Monday to Friday and we picked them back on weekends. The adopting family did not have good jobs and the cost of food for our children was not high. So it was financially beneficial for the adopting family. It was also good for us. It is win-win for both sides. – Parent interview, Mr. Xian Zhou

In addition to providing Alex with academic tutoring, the educated couple also helped Mr. Xian Zhou's children in other aspects of education. For example, Mr. Xian Zhou asked them to purchase suitable books for Alex and reimbursed them later.

> Sometimes, my dad would ask her if like she had anything to give, if she could buy anything to help me and she would buy like SAT books or possibly other books to, math and a few easy stuffs and English and a few easy stuffs like that. – Student interview, Alex

Lastly, Mr. Xian Zhou wanted to grasp any opportunity that might be beneficial for his children's education. He had a very concrete intention of taking advantage of the Chinese ethnic community. One reason he decided to let his son participate in this dissertation project is because he believed it would make Alex more knowledgeable. Mr. Xian Zhou was always seeking opportunities to hire people to tutor his children, not only for academic subjects but also for extracurricular activities. For example, because he thought the kids had too much free time and they also had interests in drawing, he was seeking to hire drawing tutors for his children. During the parent interview, he asked me for help to find a tutor for them and repeatedly expressed his inability to find the proper tutor.

Mr. Xian Zhou's use of the Chinese ethnic community actually went far beyond the scope of his children's education. He said that it was through the Chinese ethnic community that he successfully invested in real estate and kept earning money by renting houses to other people.

> Mr. Zhou told me that they know a lady who is a professional. She took care of Alex when he was young and provided them lots of information about education, such as buying SAT books. Mr. Zhou said in his circle, they don't have skill to educate kids and that is why he needed the other circle—where the lady belongs to—to help them. He explained that he knew people from different circles and that is how he purchased houses. Mr. Zhou also said through participating in this study, Alex will be more knowledgeable. – Observation note, Liang

However, not all personal networks worked in the way he wished. According to Mr. Xian Zhou, most of his neighbors are outstanding in some special field, such as piano and photography. He said that one of his neighbors (who is white) was one of top 20 photographers in the whole country. However, he could not communicate with that neighbor due to his limited English. He said, "I can only nod to foreigners largely due to language barrier. Otherwise, it

would be great opportunities for us."

Summary. Three families hired academic tutors for their children. Alice's parents hired tutors for her when she was young and when she was preparing for SAT. Kyle's parents hired both American tutors as well as Chinese tutors for him. However, his mother Ms. Yan Sun preferred the Chinese much more than the American tutors. Alex's father's strategy of hiring tutors was more informal and more diverse which included paying Chinese immigrant teachers in Alex's schools for extended care, and lodging in ethnic Chinese educated families.

**Alice's Family: Educational Foundation and College Tour**

This subsection analyzes how Alice's families used their economic capital and social capital in two activities: one relating to their participation with an ethnic educational foundation and the other relating to a college tours taken by Alice's families and two other families.

**Educational foundation**. Alice's (SM) family is closely associated with an organization called Changdao Village Education Foundation. This foundation was founded by Chinese immigrants who originally came from Changdao Village in Fujian Province. Many of these immigrants are stockholders who invested in real estate in American cities such as Philadelphia. These properties were rented out and part of the rent was used to develop the education foundation. In additional, members of the village also donate money, which enables their children or their relatives' children to qualify for the awards from the foundation. Students can receive hundreds or thousands of dollars in awards by showing excellence in academic achievement such as high GPA, high SAT scores, college entrance, graduate school entrance, and earning advanced degrees. The foundation holds an annual ceremony shortly after Chinese New

Year in Philadelphia. At this event, winners are announced and given monetary awards. Because the foundation requires members' donations in order to have their children (or relatives) eligible for the awards, it can be treated as an indicator of economic capital. Also, because this educational foundation is an ethnic organization that is only open to the qualified families, it is also an indicator of social capital.

Alice's grandfather and (sometimes her father as well) donated hundreds of dollars each year, enabling Alice and her siblings to be eligible for the foundation's awards. Alice described how her grandfather's donation enabled her and her siblings to participate in the foundation.

> Any student who has relatives in this cooperation in which the relatives sign them up [is eligible]. My grandpa, he is a part of it. And he donated like a $300 to this place, donated $300 to them. And he, that $300 allows my dad to enroll us into trying to receive this, the money, like. –Student interview, Alice

Alice and her siblings did not disappoint their parents and grandparents because she and her sisters often receive awards from the foundation.

> I'm getting five hundred dollars next year for my SAT score and then they're giving me another two hundred dollars because I'm in high school getting good grades; that's seven hundred dollars I'm getting from them but I don't think I'll be able to use it because it's all in check form … Betty got straight As. Carla got straight As too. As long they have grading scales A, B, C. You can like mail in the report card you can get money. And Carla got $100 and Betty $100. –Student interview, Alice

According to Alice, her parents and grandparents, to some degree, may perceive their donations as a kind of investment because they may receive their investment back in the form of these awards. Alice estimated that her family has donated about $2,000 so far; they have earned $1,500 back so her father hopes they can earn $500 more.

> But by now we earned back like almost fifteen hundred dollars, adding up all my money,

> adding up all the money that we got back and even now, my cousins from [the state], they qualify too now so we're just getting half of the money back, Grandpa always has to put more money in too so, but I always get more money because I'm a high school student so therefore I get two hundred dollars instead of a hundred for middle schools and something like that so yeah and SAT score, my dad said, all he cared about was it had to be twenty hundred so I can qualify to get five hundred dollars from that. – Student interview, Alice

Alice's mother, Cindy (SM), perceived that the awards from the foundation could motivate children to study harder; their donations have been basically earned back.

> We purchased some stocks from the foundation and we donated hundreds of dollars every year. The amount we donated was basically the same the amount of kids' rewards. I think the rewards from this foundation can positively influence kids' to learn industriously. – Parent interview, Ms. Cindy Cao

Nevertheless, this donation and award cycle is more attractive to parents than to children. Alice's parents restricted the use of the award money by telling them "I'll save it for you this time". In fact, the reward money comes in a check, and children cannot directly access the money. When Alice asked her mother for twenty dollars from her reward money for pizza her mother refused and told her "Oh, no we already used all of your money, we bought you some clothing." In the end, the money went into the parents' hands and Alice became indifferent toward these awards.

> I mean I'm getting five hundred dollars next year for my SAT score and then they're giving me another two hundred dollars because I'm in high school getting good grades, that's seven hundred dollars I'm getting from them but I don't think I'll be able to use it because it's all in check form. –Student group interview, Alice

**College tour**. Because Alice (SM) was going to apply to colleges and universities soon, in order to encourage children to apply to top colleges and universities, Alice's family and other two families (one is Alice's cousins' family, and another family is originally from the same

village in China where Alice's family came from) rented two large cars and toured Ivy League universities (not include Brown). According to Alice's mother, Cindy, she did not want the children to focus only on the flagship state college; they should be aware of the fact there are many better institutions to consider. Cindy (SM) confidently said no matter what institution Alice would finally go to, her family would be able to afford the costs.

> Sam's cousin said that if kids only stay in this area they are not likely to know the world outside and they may think the flagship state college is the only option and not aware of the fact there are many better, and top 10 colleges and universities. No matter if they are able to be enrolled in these top institutions, we must organize a trip to have a tour of some of the best institutions. We took kids from our three families: three daughters of Sam's cousin's, three girls from my family, and kids from another family. We wanted them to experience institutions which are better than the flagship state college. However, if they are only accepted by the flagship state college after they tried their best we will still be satisfied. We are OK with that. – Parent interview, Ms. Cindy Cao

> Wendy also shared many of her family photos. Two sets of photos deserve special attention. One set of photos shows that the Changs and other families (who are their fellow-villagers—from the same Xiang in Cangzhou, Fujian) visited seven top universities on the east coast last year, including Harvard, MIT, Yale, Columbia, Princeton, and Pennsylvania. Wendy said that the purpose of this visit is to tell the kids that there are many good universities deserve their considerations, that is, they should not only focus on [the state]. – Observation note, Liang

Summary. First, Alice's family actively participated in an ethnic educational foundation and her mother believed this activity could become a stimulus for her children's education. This foundation is exclusively for families who originally came from the same village in China, and the membership of the foundation requires monetary donations, which suggest that a family's economic status largely influences its eligibility. Second, in order to increase students' awareness of prestigious colleges in the United States, Alice's families and two other families organized a tour to several of the best colleges and universities on the East coast. The other two families

actually came from the same place where they originally came from in China (one family was also Alice's relative). There must have been some common need within these families to conduct this trip, and there must have been some discussion about which institution they were going to visit.

**Discussion**

This chapter examined how participating families used their economic capital to positively influence their children's general and mathematics education in three components: living in good school districts; hiring well-educated people (mainly ethnic Chinese immigrants) for their children's academic learning; and, participating in an ethnic educational foundation and a college tour in order to stimulate their children's interest in pursuing academic success and entering prestigious colleges or universities.

First, in term of family location, higher income families can afford to purchase houses in good school districts while lower income families need to use other approaches to achieve the same goal of allowing their children to attend good public schools. One lower income family, however, managed to purchase a house in a good school district and rented their master bedroom to others. Another family chose to live in an apartment. One family shared the house with their extended families. Another family lodged in a best friend's home. Another family, living in a "bad" school district, was very dissatisfied with the school and was considering moving.

Even though a family's decision about where to live is directly linked to its economic capital, the other two forms of capital are also often involved. In terms of cultural capital, parents need educational knowledge to judge the quality of a school. In terms of social capital, some

parents consulted their friends to seek a better school and one family even lodged his family in the home of one of his best friends, which became a partial substitution of economic capital.

Second, in terms of hiring tutors, three of the higher income families hired academic tutors for their children. Though the fourth higher income family did not hire a tutor for their daughter, they did spend more than ten thousand dollars for their daughter to learn ice skating. Lower income families either did not hire any kind of tutor for their children or only hired non-academic tutors at for shorter or less frequent lessons (for example, hired a piano teacher for half an hour every week).

When parents hired tutors, they often needed to use both economic capital and social capital simultaneously. Ms. Yan Sun was not satisfied with the performance of the American tutors. So she used her Chinese ethnic network to find Chinese immigrant tutors that she highly valued. In Mr. Xian Zhou's case, because he cannot communicate with many people in the United States due to lack of English proficiency (which is an indicator of cultural capital), he was restricted to look within the Chinese ethnic community for help about his children's education and about other aspects of life. His case indicates a sophisticated application of social capital within the ethnic Chinese immigration community. His case also suggests that lack of a form of cultural capital (English language) can became a barrier to using social capital despite the possession of substantial economic capital. For Alice's family, when they needed a mathematics tutor they went to the Chinese language school and asked for help, which also indicates that the implementation of economic capital often requires the usage of social capital.

Finally, one family actively participated in two activities: participation in an ethnic

educational foundation and going on a college tour with their ethnic fellows. In both activities, the participants were the ethnic Chinese immigrants who originally came from the same villages in China. These people, despite their limited education, were able to form a network where people help each other (regarding children's education, business and other aspects of life). It is probably partially due to this mutual assistance that these immigrants were able to establish successful businesses in the United States. As Mr. Xian Zhou commented, "Our village fellows were really helpful – they were willing to loan you money when you needed it, especially the time when you just arrived this county." These two activities both require monetary input and participation of these ethnic fellows, and thus exemplify that how social capital and economic capital can intertwine and work together.

Frequently economic capital alone could not achieve the families' goals and required the simultaneous use of social capital. For example, some families obtained information about good school districts from other Chinese immigrant families. It was through their Chinese immigrant network that they found tutors (who were well-educated Chinese immigrants) for their children. One family's participation in an educational foundation and college tour also occurred within a Chinese immigrant community. Furthermore, for small business families, their high level of economic capital could balance their lack of cultural capital (at least in the aspect of education): they could hire tutors to teach their children and participate in costly educational activities (educational foundation and college tour). Sometimes, the use of social capital can balance the lack of economic capital; for example, one parent lodged with his friend's family in order to send his son to a good school.

# Chapter 8: Discussion

In Chapters 4 to 7, I analyzed how Chinese immigrant parents conceptualize U.S. mathematics education, and how Chinese immigrant families use cultural capital, social capital, and economic capital to influence their children's mathematics education. It is important to review the findings, to examine how these findings are essentially linked together, and to explore the significance of the study. In this chapter I first critically summarize the previous results. Next I compare the four types of families in terms given in the four results chapters (Chapters 4 to 7): parents' conception of U.S. mathematics education, and use of cultural capital, economic capital, and social capital to influence their children's general and mathematics education. In this way, I will illustrate how different families with different parental educational backgrounds and different levels of capital conceptualize U.S. mathematics education and use their capital for their children's mathematics education. This section will explore diverse Chinese immigrant families and their involvement in their children's education in a deeper level which has not been substantially addressed in many research studies (Louie, 2004a; Siu, 1992a; Weinberg, 1997; Yin, 2007).

## Parents' Conceptions of U.S. Mathematics Education

Parents, both less educated and highly educated, shared similarities and differences in their conceptions of U.S. mathematics education. First, they all agreed that Chinese (and Chinese American) students achieve at high levels in mathematics and American students lag behind. They were skeptical about the efficiency and organization of the U.S. mathematics class that I showed to them in the video discussion activity since within the same amount of time the

Chinese teacher covered much more content. They all praised the policy of acceleration in the United States that allows high-achieving students to skip grade levels if they are doing well in mathematics.

Second, generally speaking, less educated parents were much less critical than highly educated parents about U.S. mathematics education. For example, less educated parents tended to appreciate how the American teacher and students communicated with each other and the American teachers' willingness and openness in replying to students' questions. Highly educated parents, on the other hand, were much more critical of U.S. mathematics education, believing that mathematics education in the United States has been unable to meet the needs of high-achieving students despite the acceleration policy. They also did not appreciate the way that U.S. teachers taught (e.g., group work) because they thought it was inefficient, ill-suited for mathematics, and could not guarantee participation. Some highly educated parents also believed that mathematics teachers should teach the content thoroughly and deeply, suggesting that they need to offer additional materials other than textbooks to students.

The reason why these two groups of parents hold different perspectives towards U.S. mathematics education can be explained by their educational experiences in China prior to immigration. None of the less educated parents received more than a middle-school education in China and their memories of educational experiences in China were negative. These experiences included teachers who were very strict and did not pay attention to lower achieving students (including themselves). As a result, their performance suffered in mathematics. The highly educated parents, however, believed that their education (at least mathematics education) in

China was strong and that the teachers were outstanding and offered to answer students' questions even after classes. Because of their different education experiences, the two groups of parents differently compared U.S. mathematics education (either in the video discussion activity or their own children's mathematics education) with their pre-immigration mathematics education in China. The less educated parents perceived more positive aspects of U.S. mathematics education (such as the teacher-students communication and equity issues). The highly educated parents tended to perceive more negative aspects of U.S. mathematics education (such as the efficiency of class, classroom organization, and group work).

The parents' contrasting perceptions of U.S. mathematics also influenced the degree to which they trusted the U.S. mathematics education system. The highly educated parents believed the U.S. mathematics education had failed to meet their children's needs in mathematics so they had to take action on their own, such as providing tutoring and assigning extra mathematics tasks to their children. These parents, due to their high level of educational attainment, were able to provide compensation for what they believed to be the inadequacy of their children's school's mathematics education. This issue is discussed further when cultural capital is analyzed.

Compared to highly educated parents, the less educated parents had lower levels of educational attainment, so they knew their capacity to help their children in academic subjects (including mathematics) was limited. However, they still wished their children to get academic help so they chose to encourage their children to take advantage of their schools' resources, such as asking the teachers for help if they have questions. Their children also knew they could not rely on their parents for direct academic assistance so they had to find other channels. For

example, one student usually stayed one or two hours after school (his parent encouraged him to stay longer in school) in his calculus teacher's classroom. In this way, he could ask his calculus teacher questions if he had any. Another student often skipped lunch in order to meet her teacher for help. The two students with less educated parents explicitly expressed their wish that their parents knew more about mathematics content and about the U.S. school system so they could ask or better communicate with their parents about school related issues.

**Cultural Capital and Family Involvement**

Parents' previous educational experience and attainment not only influenced how they conceptualize U.S. mathematics education but also largely affected their capacity to invest cultural capital into their children's mathematics education. Parents' education is an important indicator of cultural capital. Less educated parents and highly educated parents have striking differences in their own educational attainment. As a result, their capacity to use this aspect of cultural capital for their children's mathematics education was also different. For nearly all parents, mathematics was the only subject in which they could help their children. According several studies, Asian American parents, no matter what level their previous educational attainment was, were able to tutor their children's mathematics to some degree (Cheng et al., 1992; G. Li, 2002; Pan et al., 2006; Siu, 1993). However, these studies do not differentiate the tutoring activities between highly educated parents and less educated parents. This study finds that the highly educated parents could tutor their children to a much higher level of mathematics. One highly educated parent even asserted that in terms of mathematics her child learned nothing from school and his mathematics knowledge was from family education. Some parents spent a

lot of time and energy to help their children catch up in mathematics when they failed a mathematics exam—the family did not resort to their mathematics teachers for help, instead, they decided to conquer the difficulty on their own. The children from this group were aware of the fact that their parents had the capacity to help them in mathematics so they asked them for help. As one student pointed out, when he met a problem he never asked his teacher but rather asked his parents for help.

The less educated parents, on the other hand, tended to tutor their children mathematics content when they were young because they were only able to tutor lower level content, such as the multiplication tables. Two of the less educated parents only finished 5-6 years education in China, but they said they were able to help their children in mathematics because Chinese students usually learn higher level mathematics than their American peers in the same grade.

Overall parents' mathematics tutoring was very helpful for students' development in mathematics capacity, especially when students were learning the basic mathematics concepts (such as the multiplication tables) in lower grades. When a student's mathematics knowledge accumulates, he or she may be able to teach himself or herself and relies less on parents. Students' mathematics capacity at primary school has substantial effect on their learning in secondary school. That was why less educated parents could play a very positive role in helping their children learn mathematics.

However, some parents and students noticed a side effect of parental tutoring—the difference between parents' mathematics and their teachers' mathematics. Before immigrating, parents learned their mathematics content in China, which was somewhat different than the way

the content was taught in the United States; when parents tutored their children they were sometimes confused between the two ways. These confusions may be rooted in the systematic differences between U.S. and Chinese mathematics education (Ma, 1999).

Parents' educational attainment also suggested their capacity to use other forms of cultural capital such as local libraries (such as books, digital recordings, and study rooms) and books (such as textbooks written in Chinese and SAT reparations books). In this aspect, less educated families, again, could not use other supporting resources, such as libraries and books, in as sophisticated a manner as highly educated families. The children from less educated parents could not find what they wanted in libraries but highly educated parents could easily and flexibly use libraries resources such as checking out algebra books and pedagogical multimedia recordings to help their children learn mathematics. Less educated families owned fewer books than highly educated families. Specifically, the working family parents seldom bought any books for their children. The small business family parents bought some books for their children but they did not know what books to choose so they asked their children to choose their own books or asked highly educated parents to buy the books for them and then reimbursed them.

Interestingly, a family's cultural capital was not static but dynamic. However, the dynamic aspect of cultural capital was not seen in current literature in education. When the less educated families immigrated to the United States, some family members went to school and thus their cultural capital began to accumulate. That was the case for the two small business families. They had some extended families members who graduated from college decades after immigrating. As a result, the younger family members could ask these educated members for

academic assistance. For example, one student often asked her uncle who had a bachelor's degree for help in mathematics and she also discussed calculus problems with one of her cousins who was a college freshman. Another student, when he had difficulty in mathematics, especially with geometry proofs, would ask to his cousin for help. In this study, academic assistance from extended family members only happened in these small business families. Generally speaking, the highly educated families tended to be nuclear families in the United States and immigrated to America through the technical immigration system, which requires high skill and education. The less educated families tended to have a large network of extended family members and many of the less educated parents immigrated to the United States through family immigration. The large extended families could be a helpful resource both for children's education and for business. When members of the extended family went to school, the whole family's cultural capital accumulated. If they had close ties with each other, the newly obtained cultural capital could be used to help younger extended family members. Interestingly, the use of extended family members' education did not happen in the two working families who also have large extended families in the United States. My interpretation is that for families with relatively disadvantaged economic and social status, their capacity and confidence to use ethnic social networks is relatively low and their extended families members may not want to interact with them closely.

For families with more than one child, the children might help each other in academic subjects. This phenomenon again suggests that the educational attainment aspect of cultural capital (actually in both highly educated and less educated families) evolves as children or extended family members went to school. However, sometimes there was a tension between the

elder siblings and the younger siblings because the elder ones wanted the younger ones to do the mathematics problems by themselves while the younger one tended to rely on the elders.

Other important aspects of cultural capital include the families' strictness toward their children, their monitoring of their children, and their aspirations of their children's higher education and career. All of the parents were strict regarding their children's education and behaviors, as reported by both parents and children. Parents and other elder family members often monitored children's activities in order to keep them on track.

Studies about Asian Americans often omit the variation of aspirations between different Chinese or Asian American families and only focus on the comparison between Asian American families and white families (Kao, 1995; Mau, 1997). However, although all parents tended to have high aspirations for their children's education, the degree of their aspirations was different across the working families, small business families, and highly educated families. The aspirations for higher education from the two working families were much lower than other families. One working family considered community college as long as it could provide what the student wanted to learn – to become a nurse or medical assistance. They believed that attending a community college would be less expensive. The student from the other working family also planned to become health/medical assistant and her family would have been satisfied if she went to the flagship state college.

Highly educated families and the two small business families were much more ambitious about higher education and their children's careers. One small business parent pointed out his son should at least attain a Masters' degree. Another small business parent wanted her

daughter to become a doctor or lawyer because they were considered stable and high income jobs. However, the two small business families, despite their ambitious goals for their children's education, believed there were pathways to success besides education. One parent said she hoped that her daughter would attend the best college or universities in America; no matter how much it would cost, they could afford it. She continued to say, however, that if her daughter could not find a proper position after college graduation she would sponsor her daughter to open a small business. The other small business parent commented that these days even people with Masters' degrees could not find jobs and he did not believe his son would earn more than him before he was thirty years old. Highly educated families hoped their children would attend the best colleges and universities in America. For some transitional professional families, a primary reason why they decided to immigrate to the United States was to give their children better educational opportunities, especially in higher education. Since these parents attended the best colleges or universities in China, they definitely wanted their children to attend world-class institutions in the United States. For them, attending a community college would not be an option for their children. In fact, their goal was the most prestigious university or colleges, such as Harvard University or John Hopkins University. As one parent pointed out, "if my son went to the flagship state college it would be shameful for us." Highly educated parents definitely ruled out the possibility of running a Chinese restaurant for their children's future career.

**Social Capital and Family Involvement**

All participating families used some aspect of social capital for their children's general and mathematics education. One common approach was to send their children to supplementary

education programs that not only provide Chinese language but many academic subjects such as English and mathematics (Zhou, 2007; Zhou & Kim, 2006; Zhou & Li, 2003). However, the effect of attending such programs was complex: some children believed it helped to some degree in mathematics and English; many criticized being forced to attend such programs. To some of them, it was merely a waste of time and money. However, these negative aspects of attending such supplementary program are not sufficiently addressed in current research that only emphasized (and many times, overestimated) the positive effects of such programs but completely ignored the cost of attending such programs (Zhou, 2007; Zhou & Kim, 2006; Zhou & Li, 2003). Besides sending children to supplementary education programs, parents also exchanged educational information with other Chinese immigrants such as choosing proper teachers, schools, and even buying books.

**Economic Capital and Family Involvement**

Studies suggest that family income matters for children's education but not as much as education and parents' aspiration (Davis-Kean, 2005; Duncan & Magnuson, 2005; Tsui, 2005). However, in what aspects a family economic status influences children's education largely remains unexplored. This study addresses how families use economic capital to influence their children's general and mathematics education.

The involvement of social capital described above had little relationship to the financial status of families. The use of social capital can be better understood when it occurs together with economic capital. All participating parents believed that it was crucial to live in a good school district in order to send their children to better schools (Louie, 2004a). However, to live in a

good school district, financial investment, a form of economic capital, was needed. For high income families, this was not a problem but for lower income families it was a challenge. The approaches for lower income families included: renting rooms to others; living in an apartment; sharing a house with extended family members; and lodging in a friend's home. For some families, social capital played an important role when families decided where to live. Some families consulted other Chinese immigrant families to learn more information about good school districts. One family lived in the home of the father's friend; both originally came from the same small village in China.

Higher income families also spent money to hire tutors to teach their children academic subjects (including mathematics) and sports. Again, they often used the Chinese immigrant social network to hire tutors who were also Chinese immigrants. One highly educated parent placed more trust in Chinese tutors than American tutors (in the same way they perceive the Chinese mathematics education and U.S. mathematics education). One small business parent always intended to provide better educational opportunities for his children. However, due to his English language barrier, he could not properly communicate with many other parents. As a result, he paid Chinese teachers or highly educated parents to tutor his children.

Another small business family participated in a Chinese ethnic educational foundation and invested financially to enable their children to be eligible for this foundation. They believed it would be a good way to motivate their children to study harder. A group of the parents, who came from the same town in China, organized a college tour in order to make their children aware of the best universities and colleges. These activities indicate that when families invest

their economic capital into their children's education they also often needed to use ethnic social capital. The economic capital alone might not be able to be transformed smoothly into the cultural capital they desired.

Many times economic capital alone would not be sufficient and required the simultaneous input of social capital. For example, some families obtained information on good school districts from other Chinese immigrant families. It was through their Chinese immigrant network they found tutors (who were well-educated Chinese immigrants) for their children. It was also through ethnic Chinese community some families participated in the educational foundation and conducted a college tour. Furthermore, for small business families, their high level of economic capital could balance their lack of cultural capital (at least in the aspect of education): they could hire tutors to teach their children and participate in costly educational activities (educational foundation and college tour). Sometimes, the use of social capital can balance the lack of economic capital—one parent lodged with his friend's family in order to send his son to a good school.

**Comparison across Four Types of Families**

In this section, I discuss the conceptions of U.S. mathematics education for each type of family, and their use of cultural capital, economic capital, and social capital in their children's general and mathematics education. These participating parents all believed that education was extremely important for their children but their different levels of the three forms of capital largely influenced how they were involved in their children's general and mathematics education. But generally speaking, the parents were trying to use whatever capital they possessed to do the

best for their children.

**Working families.** *Conception.* Parents from working families had low levels of educational attainment. They tended to have a negative perspective towards Chinese mathematics education because they believed Chinese teachers did not pay attention to weaker students' needs and were too strict to be accessible to students. They preferred the American way of teaching mathematics, which had more student-teacher interaction. Overall, they tended to trust the U.S. schools so they often encouraged their children to ask their teachers questions if needed.

*Cultural capital.* According to the definition of cultural capital, parents' education, expectations and attitude towards education are important components. These parents, due to their limited amount of mathematics knowledge and high workload, could not teach their children much mathematics. When their children were young, they attempted to teach their children basic mathematics knowledge. One parent taught her daughter multiplication. The other working family parent was working in Japan, so it was difficult for him to participate in his son's mathematics education directly. However, he attempted to teach at least some basic knowledge via phone to his son. These parents seldom purchased any books for their children. One parent occasionally took her daughter to libraries, and the other family never used the libraries. These parents had to work for long hours so they were not able to directly monitor their children, but they regularly called their children to make sure they were on the correct track. One parent could only meet his son about one hour each week. Compared to other types of families (small business families, transitional professional families, and settled professional families) these two

working families had lower aspirations for their children's colleges and future careers. For one working family if the child went to a community college they would still be satisfied as long as it was inexpensive and the child could learn the knowledge that would enable him to become a male nurse. The child from the other working family planned to be a medical assistant and she would be very happy if she went to the flagship state college. I believe these two families' relatively lower aspiration of their children was largely associated with their lower level social economic status.

*Social capital.* In this study, social capital refers to access to and use of networks in which Chinese immigrant families (mainly parents) interact with other Chinese immigrant families (mainly others parents but may also include Chinese immigrants without children), especially with the purpose of supporting their children's education. Working families' main social capital relies on the network with their fellow-villagers who originally came from the same small villages in China. However, they may also use broader Chinese immigrant social networks, such as the supplementary educational programs. One U.S. born student from one of the two working families had attended the Future Chinese School for Chinese language and SAT preparation courses. But during the time of this study, she stopped attending because her coursework from her regular high school began to increase. The other student (who came to United States at age of 12 and was already fluent in Chinese) never attended any type of supplementary educational program. Despite this, his father encouraged him to attend one SAT preparation program. The student declined to attend, partially because of the economic burden. These two families sometimes consulted other families for educational information. However,

due to their limited social circle (which was mainly relatives, fellow-villagers or colleagues), long work hours, and even limited amount of economic capital, they did not obtain much educational information from other families.

*Economic capital.* According to the definition, economic capital refers to Chinese immigrant families' possession and power to use economic resources, such as cash, credit, assets, real estate, and businesses. Working families, due to their lower level income, tended to have a lower level of economic capital. Neither of the two working families owned a house of their own, but both families managed to live in a middle-level or upper-level school district (according to them, but not the best district in the area). One of the working families lived with another family. The other working family shared a house with extended family members. In one aspect, sharing housing suggested that the families had limited economic capital. On the other hand, it indicated that a proper application of social capital would help to balance the deficiency of economic capital because without the cooperation of their friends or extended families, it would be difficult for them to live in a house in a relatively good school district.

**Small business families.** *Conception.* The parents of small business families had similar educational experiences as working family parents and preferred the American mathematics class in the video discussion. They also tended to trust U.S. mathematics education.

*Cultural capital.* Small business families' educational attainment was similar to that of working families, no more than middle school. However, due to their higher level of economic capital, compared to working families, the small business families were able to transform their economic capital into cultural capital in some aspects such as buying books for their children.

Largely due to their economic capital, they also tended to have higher levels of aspiration for their children's higher education and careers.

Like working families, the small business parents attempted to tutor their children in the lower level mathematics content. They also either took or encouraged their children to visit local libraries. However, the children seldom found the books they intended to borrow in the libraries possibly due to the lack of knowledge about library resources. In order to help their children prepare for the SAT, they asked their children to find appropriate books and they just paid for them. Obviously, compared to working families, small business families' possession of economic capital enabled them to have more access to cultural capital. However, their limited educational content knowledge (such as mathematics and English language) prohibited them from further assisting their children's academic endeavors—they did not know how to choose books for their children either in bookstores or in the libraries. These two families were strict with their children—for example, in terms of their control of their children's computer game playing. They also monitored their children's other activities closely. Compared to working families, these two families had higher education and career aspirations for their children. One parent said obtaining a Masters' degree would be minimum requirement for his son; another family had taken a college tour to the seven best colleges or universities in order to broaden their children's perspectives on college applications (the family also hoped that the participating students would become a lawyer or doctor to earn lots of money).

The higher aspirations of these two families were largely strengthened by their substantial amount of economic capital. Because they were successfully running businesses they

had the financial capacity to pay the tuition as long as their children could be enrolled in the best institutions. Their higher level of economic status allowed them to set higher goals than their own economic achievement. However, despite their higher aspirations for their children, to some degree they were suspicious of the function of higher education. One parent commented that if her daughter could not find a desirable position after college graduation, her family would support her by helping her to open a small business. The other parent though, still set a Masters' degree as the minimum goal for his son and commented that these days many people could not find a position even with a Masters' degree and he believed that it was impossible for his son to exceed his own income before thirty years of age. This makes sense because their success in business was not a result of higher education but through hard work, shrewd business mind, and, most important, families' (and fellow-villager or relative's) support.

Interestingly, these two small business families both have extended families members who have either graduated from colleges or were attending colleges and the two participating students received substantial academic assistance from their extended families members (such as in geometry and calculus). This suggests that small business families' cultural capital was not static but dynamic and that their extended families' possession of cultural capital accumulated as more members attended more school. In contrast, even though the two working families also had large extended families in the United States and lived near them for many years, there was no evidence that each of them received a substantial amount of academic assistance from any extended family members. One of them reported they have a white relative (through marriage) who had a doctoral degree and worked as a math teacher, the participating child rarely received

academic help from him.

*Social capital.* Compared to working families, small business families have broader ethnic social networks that enable them to do more for their children. These two parents had greater opportunities to get to know more people (including Chinese immigrants) because they were Chinese restaurant owners. Furthermore, their economic capital was relatively high so they could easily send their children to any supplementary educational program and would request that their friends buy educational materials and would reimburse them. The two small business families repeatedly sent their children to the Future Chinese School for both Chinese language and SAT preparation courses. As one parent pointed out, she could not teach her daughter SAT content so she repeatedly sent her to the program because each year the SAT practices were different. These two families also substantially used their ethnic Chinese network to exchange learning materials for their children. For example, one parent's friend attended another SAT class and she requested a copy of the problems for her daughter to work on. Another parent also asked his friends to choose and buy books from China and then reimbursed them.

*Economic capital.* Overall, the two small business families possessed a relatively high level of economic capital. This advantage not only allowed them to obtain more cultural capital and builder stronger social networks than the working families, they could also use it more directly to help their children's general and mathematics education. The two small business families each owned more than two houses so they could choose to live in the one located in the better school district and rent the others to make money. They also hired academic tutors for their children. One family hired a tutor when the participating student was struggling in mathematics

when she was in 3rd grade and they also hired a tutor for SAT preparation. The other small business parent hired tutors in a nontraditional ways including: (a) seeking highly educated ethnic Chinese immigrant students to tutor his children; (b) sending his children to other highly educated families during off-school times so when the host parents tutor their own children they also tutor the children from this small business families; and (c) paying money to Chinese teachers in his son's regular school to provide extra academic help after school Another small business family participated in an ethnic educational foundation and got rewards when the children had good scores on their annual report cards. They also had a college tour to motivate their children's aspirations of higher education. These two small families both had a relatively high level of economic capital so despite their limited cultural capital, they were able to "purchase" the cultural capital by hiring tutors and purchasing books. However, largely due to their English language barrier, the two families were not able to extend their "transformation" of economic capital into cultural capital and extend it to non-Chinese ethnic context. As one parent pointed out, even though many of his neighbors were highly educated with specific specialties (such as photography or piano), he was not able to use those connections to tutor his children. In fact, the two families' use of economic capital was accompanied by their use of ethnic social capital: one family was only able to hire Chinese tutors, while the other one conducted the educational foundation and college tour both with their fellow-villagers or relatives.

**Transitional professional families.** *Conception.* Transitional professional family parents received higher education before immigration (most obtained another advanced degree in the United States.). They were much more critical of U.S. mathematics education than the

working family and small business family parents. Because they believed the mathematics education they received in China was of high quality, when they compared their experiences with U.S. mathematics education (both in response to the video and their general conceptions) they believed that U.S. mathematics education failed to meet high achieving students' needs and pointed out multiple negative aspects. In fact, these parents' pre-immigration educational experiences not only influenced how they conceptualized U.S. mathematics but also their use of cultural capital.

*Cultural capital.* Overall, transitional professional families had a higher level of cultural capital mainly due to the parents' high level of educational attainment. The transitional professional family parents not only could tutor basic mathematics content but also more advanced levels. Because they did not trust U.S. mathematics education and they had the capacity to tutor their children, they tended to tutor their children intensely. One parent even pointed out how her son learned nothing from school in mathematics and all his knowledge in mathematics was taught by her or her husband. Students in these families tended to ask their parents when they had problems in mathematics. In fact, they usually had no mathematics difficulty in school; they had mathematics difficulty when they were doing the extra problems assigned by their parents. Compared to working families and small business families, transitional families have more books (from purchasing or loan) and could use the libraries' resources expertly. They checked out Algebra textbooks and mathematics pedagogical digital recordings for their children. These parents were strict with their children and closely monitored their children's activities. Like small business families, they all have high aspirations for their

children; however, they believed that their children should attend prestigious universities and go into professional fields. Work such as running Chinese restaurants was absolutely not an option for their children. This differs from the two small business families who, despite valuing higher education, were also either skeptical of the function of higher education or prepared for his or her child to run a small business.

*Social capital.* Unlike less educated parents, whose major ethnic network was their fellow-villagers, transitional professional families' social capital predominantly existed within their relationships with other Chinese immigrants families who had similar social economic backgrounds. Besides sending their children to the Future Chinese School to study both Chinese language and SAT mathematics, they use their network with other educated parents to help their children. Two parents reported that they shared educational information from other families, especially in the Chinese language school. Another parent asked her friend in China to mail learning materials for her son (including mathematics practice books).

*Economic capital*. Transitional professional families tended to have a relatively low level of economic capital mainly due to work limitations. In fact, two families only had one parent who could legally work in the United States. Among the three transitional professional families, only one family had both parents working. However, even for this family, one of parents was facing a lay off. None of parents in the three transitional families held permanent residency. Despite economic difficulty, these families were trying to live in a school district with quality education for the sake of their children's education. One family struggled to purchase a house in a good school district but had to rent the master bedroom. Another family chose to live

in an apartment that was affordable to them. The third family purchased a small house in what the mother believed was a bad school district and was extremely dissatisfied with the school her son was attending. She even considered moving to a better school district. However, because her husband was working in another state, it was difficult for her to relocate. These parents did not spend lots of money to hire tutors for their children for academic or extracurricular activities because it would increase their financial burden and they could tutor mathematics to their children by themselves. One parent said she spent $45 for half an hour piano class for her son each week and she believed it was too expensive.

**Settled professional families.** *Conception.* Parents from settled professional families have similar perspectives towards U.S. mathematics education as the transitional professional families. They believe U.S. mathematics education failed to meet their children's needs and, thus, they had to provide extra help for their children on their own. They also appreciated the value they received in China and criticized the American mathematics education.

*Cultural capital.* These parents, due to their high level of educational attainment, had a higher level of cultural capital, which was also close to those of transitional professional families. They tutored their own children in mathematics, used library resources, were strict with their children, monitored their children's schoolwork, and had high aspirations for their children. The father in one participating family spent lots of time in the summer to tutor his son because he failed in the previous semester's mathematics exam. When the student was preparing for the SAT he again tutored him. The father in another family also tutored his daughter in mathematics. However, both the parents and the children suggested there were confusions because the parent's

mathematics and the school's mathematics were different. This issue occurred with several other families as well and deserves further analysis. The two families' parents preferred their children to enter STEM related fields or became doctors because the parents were in a STEM field, but they were also open to other areas as long as they children would have a stable income. However, one student said if he ended up running a Chinese restaurant his parents would not be happy.

*Social capital.* Similar to transitional professional families, settled professional families, except for communicating with their colleagues, tended to mainly socialize with Chinese people with similar backgrounds. They use the network to influence their children's education in several aspects, including sending their children to supplementary educational programs, sharing educational resources and information (such as college applications) with other Chinese immigrant parents, and chatting with other Chinese parents about children's education. These two families also were nuclear families.

*Economic capital.* The two settled professional families have lived in the United States for at least 18 years, both have a stable occupation and income thus possessed a relatively high level of economic capital. Like small business families, these two families could use their economic strength to support their children's development in academia and non-academia. They purchased expensive houses that were located in school districts that had quality public education. They also spent a large sum of money to hire tutors or coaches for their children for either academic purpose or extracurricular activities. One parent hired Chinese tutors to help the student to prepare for SAT (even though the student's father was also helping him). The other

family spent more than $10,000 to hire a skating coach for their daughter. Like small business families, their use of economic capital was accompanied by their use of social capital; they consulted their Chinese immigrant friends about the quality of school districts.

# Chapter 9: Conclusions

This chapter first addresses the significance of this study, followed by a discussion of its implications. Finally, I address the limitations of the study and describe possible future research directions.

## Significance

This study contributes to the literature in several areas. First, this study examined the role of family in the mathematics education for Chinese American students. Overall, Chinese American and other Asian American students' mathematics achievement have been consistently reported as topping indicators of achievement (Chen & Stevenson, 1995; National Center for Education Statistics, 2011; Yan & Lin, 2005). However, their educational experiences remain a mystery to the public (Rong & Preissle, 1998; Tuan, 1999). Most previous research examining Asian American students' (or Chinese American students in particular) mathematics education used quantitative research methods that usually could not piece together the big picture of these students' mathematics educational experience (Whang & Hancock, 1994; Yan & Lin, 2005). By using qualitative methods, this study was able to provide a deeper level of analysis and explored multiple factors that influenced these students' mathematics education.

Second, it contributes to the literature in Chinese American studies. Most previous related studies have focused on a bimodal pattern of Chinese American population, that is, the middle class families and working class families (Siu, 1993; Yin, 2007). This study examined the mathematics education of the four types of Chinese immigrant families: working families, small business families, transitional professional families, and settled professional families. Among the

four types of families, the small business families' and transitional professional families' educational experiences are largely missing in most relevant literature. Particularly, the few studies that briefly touch upon the topic of Chinese American students' mathematics education only focus on a particular group of Chinese American families (Li, 2005). This study, however, besides addressing the previous two groups (roughly the working families and settled professional families) of Chinese Americans, also analyzes the mathematics education of these two missing groups, small business families and transitional professional families.

Third, this study also developed some aspects of the three forms of capital (cultural capital, social capital, and economic capital) and also contributed to the application of theories of capital in new ways. On the one hand, it exemplifies the relationship between indicators of capital and capital, that is, addressing the issue of how to measure capital (Furstenberg & Kaplan, 2007). Unlike many other studies (Davis-Kean, 2005; Graaf et al., 2000; Morgan & Sørensen, 1999), which only focus on a few aspects of one or two forms of capital, this study addressed three forms of capital, each with multiple indicators. For example, when conducting research about Asian American students, some researchers (Zhou, 2007; Zhou & Kim, 2006; Zhou & Li, 2003) only looked at the supplementary educational programs and argued that cultural and structure (i.e. attending these supplementary programs) could explain Chinese American, Korean American, and Vietnamese American students' achievement. Some researchers or reporters argue that cultural can explain Asian American students' success (Kristof, 2006; Siu, 1992a). In terms of understanding Chinese American students' educational experience, this study went much further than previous studies since it addressed three forms of

capital each with multiple indicators. For example, Zhou and her colleagues (Zhou, 2007; Zhou & Kim, 2006; Zhou & Li, 2003) failed to mention the negative aspects attending the supplementary educational programs and also overlooked many other important aspects of Chinese American students' education such as of the direct parental tutoring and the influence of economic capital.

**Implications**

This study has several implications for a broad range of stakeholders. First, this study has educational and non-educational implications of Chinese American families who live in areas with high concentrations of Chinese and Asian American populations, such as New York City, San Francisco, Los Angeles, and Chicago. This study illustrates that different types of families possess different amounts of cultural capital, social capital, and economic capital. As parental education and family income (which largely gauge cultural capital and economic capital respectively) could not be easily increased within a short period of time, Chinese immigrant families and communities could benefit from strengthening their social capital to support their children's education (Putnam, 2001). In fact, the proper application of social capital may serve to balance the inadequacy of economic and cultural capital. For example, one working family lived with a friend's family so the child could attend a high school with quality education. Furthermore, families' use of economic capital is often accompanied by the use of social capital. For example, it is through their Chinese ethnic network that some parents found academic tutors for their children.

Unlike many other ethnic groups (such as Korean American and Jewish American) in

which religion (in reality, it is the churches) serves an important role in tying their communities together, Chinese Americans lack such a common concern to bring them together. As this study suggests, the less educated families mainly interact with their fellow-villagers and the highly educated families predominantly communicate with other highly educated families. The Chinese language school seemed to be the only place where the two groups met with each other regularly. Further, based on my observation of the Future Chinese School, the two groups had few interactions with each other while their children were attending the same classes. The less educated parents (e.g., Chinese restaurants workers and owners) sat with their colleagues, relatives, and fellow-villagers while the highly educated parents tended to be alone or occasionally talked to other professional parents. Despite this, Chinese language school is considered to be a successful example of how Chinese immigrants use social capital—the highly educated Chinese immigrants built such programs to promote the education for the whole Chinese immigrant community. Chinese language schools are often cited as positive elements for Chinese American students' success in mathematics (Bower, 1987). However, I think Chinese language schools place too much emphasis on children's academic training (such as SAT and Chinese language) and skills (such as playing violin and Martial Art) but do not pay enough attention to develop a child's healthy personality.

I propose that Chinese American families should participate in more Chinese ethnic networks with parents of different social economic backgrounds and build more non-profit organizations to promote children's development (not only for academic purpose but also for children's full psychological and social development). If the less educated families and highly

educated families could interact and help each other more, the whole community could benefit from the increased social capital. Less educated families can get educational support for their children via attending supplementary education program (which is affordable even for working families) and hiring tutors, which will eventually augment the family's cultural capital. Highly educated families may also need less educated families in other non-academic aspects because the later run Chinese or Asian restaurants, supermarkets, and even car maintenance center.

Second, this study sheds new light on how to define family involvement (or parental involvement). According to many studies, parental or family involvement suggests a direct cooperation between parents and teachers or school (Department of Education, 1994; Epstein, 1995). The results of this study suggest that families can be involved in children's mathematics education successfully without direct connections to schools and teachers. Some parents may occasionally attend parent-teacher conferences, but, overall, there was little interaction between them (Chang & Shimizu, 1995; Siu & Feldman, 1996). Less educated parents encouraged their children to ask their teachers questions and stay longer at school. The highly educated parents, despite their dissatisfaction with the U.S. mathematics education' inability to address the needs high achieving students which their children belong to, rarely publicly addressed their concerns but instead took their own action to help their children, such as assigning additional exercises and tutoring their children by themselves. In Chinese culture, teachers should be highly respected by both students and parents because the teachers are educating the students. Once the students are at home, it is the family's (parents and other seniors) role to monitor the students' homework completion. There is no tradition for parents to volunteer in schools. Research indicates that in

the United States, for Asian American families, family involvement is negatively associated with students' achievement because they interact with teachers only when the students were struggling or making trouble in school (Desimone, 1999; Mau, 1997). One student in this study confirmed this and said there was no need for her parents to become involved in her school activities and only when one was in trouble would the teacher ask the parents to come to the school.

The results of this study suggest that participating families were playing a crucial role in their children's mathematics education either directly or directly. All parents had higher aspirations for their children (though the degree varied between different types of families) and attempted to use whatever capital they have to support their children's general and mathematics education. Research has also indicated that Chinese American parents have a high level participation in the community and family based activities (Chang & Shimizu, 1995; Cheng et al., 1992; Siu, 1992a; Siu & Feldman, 1996).

The real issue is not whether or not parents go to school but rather if they care about children's education and what they do for them. As one parent pointed out, it is important to tell children that we care about their education and it is important for him to do his part. One student concluded his essay by saying that the reason why Chinese (American) students succeed in mathematics is because their parents have higher aspirations for them and their children also have a strong desire not to disappoint their parents. Thus, the traditional approach of defining family involvement should be modified at least for Chinese Americans.

Third, parents' emphasis on SAT preparation illustrates how Chinese immigrant parents were struggling to balance their pre-immigration understanding of the Chinese college entrance

examination and their adopted society's college entrance system, which, I believe closely links to even broader U.S. social issues. One common feature of family involvement in this study was parents' emphasis on helping children to prepare for the SAT examination. Except for the two families with only elementary-school aged children, nearly all parents did something to help their children better prepare for the SAT (one working family parent asked his son to attend a supplementary educational program but the child refused). They sent their children to the Future Chinese School to take the SAT preparation classes. They purchased SAT preparation books for their children and hired tutors (who were also Chinese immigrants) for their children. Some also tutored their children on their own.

This phenomenon has several implications. First, parents' pre-immigration educational experience in China fundamentally influenced how they perceive the role of the SAT in college applications. In China, college entrance examination may be the most important exam for a student who plans to go to college. For nearly all senior high school students, their college entrance examination scores determine which university of college he or she could attend. This exam is only available once a year. Some parents believed that the SAT must have the same function as the Chinese college entrance examination and thus they pushed their children heavily to prepare for this test and required them to retake it if they were not satisfied with the scores. Some parents directly linked the SAT scores to which colleges or universities one would be able to attend. For example, one parent said to her daughter like this, "You cousin had higher SAT score than you. Even she could not get accepted by John Hopkins University, you do not even need to try." For some parents, the SAT seemed to be the only requirement for U.S. college

entrance and based on that score one could easily tell which institution one could attend. Second, some parents were aware that the SAT was only one of the requirements colleges and universities looked at, but they still believed that the SAT was a crucial component of the college application and thus the child needed to prepare for it years before the real test and must have a decent score (which was often more than 2200) in order to attend prestigious institutions. A parent complained that the U.S. college entrance is actually more competitive than the Chinese situation because one not only had to have high SAT scores but also had to have development in other aspects of life such as music and sports. He said, “In China, all you need is a good score which is actually easy.” Third, due to the fact that U.S. college entrance was not based solely on SAT scores, some parents complained that they were confused by the U.S. college entrance systems because they did not know what the schools were looking for in potential students. One parent (who had been in the United States for more than a decade) protested that she knew some Black students who went to excellent colleges or universities with much lower SAT scores than some of his Chinese friends’ children who were rejected. According to her, her friends’ children were outstanding students in all aspects. Since her son would apply for colleges soon, she was very worried about it. In her eyes, the U.S. college entrance system lacked fairness. Chinese immigrant parents’ struggle in understanding the role of the SAT reflects a confusing adjustment from their previous experience in China to the U.S. educational system. This confusion and dissatisfaction suggested Chinese Americans’ (and other Asian American) transition to a new society was far from straightforward but full of conflicts and struggle. I believe that higher education institutions and other relevant governmental departments could address the issue of college education for Asian

Americans and other relevant groups (Espenshade & Radford, 2009).

Fourth, this study provides implications for parents, community, and educators on what might be done to better help these families, especially those with limited cultural, social and economic capital. Even though this study was about Chinese American families, the method of analysis can be applied to families with different ethnicities. Realistically, within a short amount of time little can be done to dramatically change a family's parental education and income status. However, there is something that parents, community, and educators can do to help. First, in terms of cultural capital, if families want their children to succeed in education the parents should let their children know that they care about their education. Also if parents can help by tutoring their children in mathematics when they are young it would be very helpful to the students' future development in mathematics learning. Schools should encourage parents' participation in their children's mathematics education, especially in the early grades. Second, communities could do more to promote children's education. For example, ethnic groups could build a strong tie for families to help each other and identify organizations such as supplementary educational program or education foundations. Local libraries could provide not only the appropriate resources (including mathematics resources – books and digital recordings) but also adequate educational opportunities to families such as instruction on how to use the library resources effectively. Third, this study indicates that students from less educated families tended to rely heavily on the mathematics teachers because they could not get help from their parents as much as the children of highly educated families. This finding suggests that educators could pay attention to the students' family background and schools could provide extra time and assign

tutors (it could be regular mathematics teachers or local college students) to students.

The fifth implication is that U.S. mathematics education may serve students better in the light of the insights from Chinese mathematics education. On one side, parents tended to believe that Chinese students were outperforming their American peers and pointed out multiple problems associated with U.S. mathematics education. Among these critiques, a big issue is the use of group work and classroom organization. Parents (especially highly educated parents) asserted that group work was not necessarily needed for every mathematics class and efficiency was critical for a successful class. Highly educated parents also believed that the U.S. mathematics education failed to meet the needs of high-achieving students because teachers had to focus on the average students. The less educated parents, however, preferred the way that U.S. teachers interact with students and how the U.S. education system addressed equity issues because their pre-immigration educational experience was negative since they were low performing students in China. These two groups of parents have contrasting concerns and both deserve serious consideration. One challenge the U.S. mathematics education community faces is to seek an approach to balance the different needs of students with different backgrounds (such as education, economic, and language). I think that school mathematics education should first teach the content at an appropriate pace then seek additional channels to address the needs of lower achieving students' needs because if the teacher taught too little content to students it would be a disservice to everyone. Second, particularly, the use of mathematics textbooks had been criticized by both highly educated parents and less educated parents: the teachers did not follow the textbooks, which is an obstacle when parents attempt to help their children. U.S.

education and broader society could do something to better address this issue; the implementation of the Common Core State Standards may be the answer.

Sixth, I believe that Chinese mathematics education can learn something from U.S. mathematics education. They can apply policies that allow students to accelerate, like those that were appreciated by nearly all participating parents. There is no lack of talented Chinese students but the rigid educational policy in China prohibits them from coursework in more advanced mathematics content, such as Calculus. I believe providing more accessibility to advanced mathematics courses for Chinese students would have a positive impact on the whole country's scientific endeavors. Furthermore, Chinese schools can assign some sections for group work, which is beneficial for developing cooperation, creativity, and presentation capacity, but are widely believed to be what most Chinese students lack. Chinese teachers could be more accessible and friendly to students, so students (especially low achieving students) do not need to muster up the courage to ask questions.

Seventh, this study suggested that American parents can learn something from the participant families. For example, even less educated parents can help their children in certain ways: manage to live in a good school district (through rent if they cannot afford); monitor students' homework; and encourage students to ask teachers questions and stay in school longer. In addition, even though some general immigrant parents may have difficulty helping in subjects other than math due to English language barrier, they can participate in students' mathematics education because the numerical aspect of mathematics is nearly universal.

Lastly this study pushes us to deeply rethink the model minority myth for Asian

Americans. On the one hand, it reaffirmed Asian Americans' model minority myth on an empirical basis. These parents used whatever resources they have to help their children's general and mathematics education. On the other hand, the findings in study cannot simply be extended to the broader population of Asian Americans because this study did not include low-achieving students' participation. Moreover, the model minority label means much more than students' academic achievement and parents' practices. There are many challenges that Asian American families are facing or have experienced. Some studies found that Asian American are regarded as permanent foreigners and underrepresented in administrative positions (Rong & Preissle, 1998; Suzuki, 1989). Historically, many Chinese Americans worked as railway builders in the American West and were blocked by mainstream American society for a long time (Sohoni, 2007).

**Limitations**

This study suffers from several limitations. First, although this study extended the previous literature from two types of Chinese American families to four types of Chinese American families, it still could not address adequately the diversity of the Chinese American population. For example, this study did not address the mathematics education of the students from very recent (e.g., less than 3 years) immigrant families. Also, in this study, all of the Chinese immigrant families resided in an eastern middle-Atlantic metropolitan area. It is possible that the mathematics education situation for families in other locations (such as California, Chicago, and Texas) may be different than those in this study. For example, in Flushing's Chinatown, some Chinese immigrants may not have time to participate in their children's

education due to long working hours. Second, this study only had nine participating families. It would be better to have more participants to see if the findings could be generalized to some degree. Lastly, although I planned to enroll students with various mathematics capacities, I could not find low achieving students to participate in the study and all participating students were high achieving students. It is possible that families with high achieving students were more confident and interested in participating in the study. Therefore, the low achieving Chinese American students' mathematics educational experiences were not addressed in this study.

**Future Research Directions**

There are three possible future research directions. The first direction is to conduct research with a larger group of Chinese American families in the area where this study was conducted. If there are more participants in each type of family it will be helpful to test the major findings and also confirm or modify the four types of Chinese immigrant families. The second direction is to apply this research analysis to other areas with high concentrations of Chinese and Asian American populations. Such research may tell us whether the findings are location restrictive because Asian and Chinese American populations in other locations in the United States may have different demographic and historical patterns. For example, the Chinese Americans on the west coast (such as San Francisco Bay area) may have different lifestyles than those in New York City areas. Furthermore, future research could include both high achieving and low achieving students because low achieving students' family involvement may be fundamentally different than high achieving students' family involvement. In fact, during the study, one parent pointed out that there were many students from Chinese immigrant families in

New York City Flushing Chinatown were struggling in education and hardly have any parental monitoring of their daily activities. Third, because this study is essentially a qualitative study that illustrated a detailed picture of a relatively small group of Chinese immigrant families' involvement in their children's mathematics education, it could not provide a broader picture about how Chinese immigrant families participated in their children's mathematics education by using their cultural capital, social capital and economic capital. It would be beneficial to conduct a quantitative study or mixed method study to address the same set of research questions, especially guided by the findings in this research. For example, one set of questions could be about families' location which include where they live, why they choose the location, how did they know about that location, and if they are satisfied with that location in terms of their children's general and mathematics education. Lastly, the theoretical framework of this study could be applied to other ethnic families and Chinese or Asian American families together. Then we can compare how different ethnic families conceptualize and apply the three forms of capital differently (or similarly) to influence their children's general and mathematics education, and explore the underlying reasons behind their different or similar practices and conceptions. Such research will be beneficial for researchers to know more about the fundamental reasons for the mathematics achievement gaps across different ethnic or racial groups.

# Appendices

## Appendix A: Parent Survey

Interview No.____

General Questions

1. I have at least one child attending primary school or secondary school.
   (a). Yes, (b). No
2. I am the _____ of the child[13] in questions 1.
   (a). Father, (b). Mother , (c). Other _____
3. I have been in the United States for _____ years.
   (a).Less than 5, (b).5~10, (c).10~15, (d).15~20, (e).More than 20, (f). U.S. born
4. My current status in U.S. is _____.
   (a). U.S. citizen, (b). U.S. permanent resident, (c). H1B, or J1 visa holder, (d). Other_____
5. My highest education is _____.
   (a).Less or equal than high school, (b). Some colleges,
   (c). College graduation, (d). Master's degree,
   (e). Doctoral degrees (e.g., Ph.D., M.D.), (f). Other_____
6. My spouse's highest education is _____.
   (a).Less or equal than high school, (b). Some colleges,
   (c). College graduation, (d). Master's degree,
   (e). Doctoral degrees (e.g., Ph.D., M.D.), (f). Other_____
7. My occupation is _____.
   (a). Jobless, (b). Manual worker, (c). Business owner, (d). Professionals, (e). Other ___
8. My spouse's occupation is _____.
   (a). Jobless, (b). Manual worker, (c). Business owner, (d). Professionals, (e). Other ___
9. My annual household income is _____.
   (a). Below $29,999, (b). $30,000~$49,999, (c). $50,000~$74,999,
   (d). $75,000~$99,999, (e). $100,000~149,999, (f). Above $150,000.
10. I am satisfied with my child's overall achievement.
    (a). Strongly disagree, (b). Disagree, (c). No opinion, (d). Agree, (e). Strongly agree
11. I am satisfied with my child's mathematics achievement.
    (a). Strongly disagree, (b). Disagree, (c). No opinion, (d). Agree, (e). Strongly agree

Home-related Questions

12. During a typical week, I talk to my child about education for _____.
    (a). Never, (b). 1~2 times, (c). 3~4 times, (d). 5 times or more.
13. During a typical week, I (or my spouse) help(s) my child to finish his or her homework for _____.
    (a). Never, (b). 1~2 times, (c). 3~4 times, (d). 5 times or more.

[13] Please answer all questions primarily base on the oldest child who is attending $4^{th}$ ~ $12^{th}$ grade.

14. During a typical week, I (or my spouse) help(s) my child to finish his or her math homework for _____.
    (a). Never, (b). 1~2 times, (c). 3~4 times, (d). 5 times or more.
15. (If applicable) I have provided special support for my child's/children's SAT (math, reading and writing) such as buying books, hiring tutors, or participating after school programs.
    (a). Strongly disagree, (b). Disagree, (c). No opinion, (d). Agree, (e). Strongly agree

Community-related Questions

16. During a typical month, I communicate with other Chinese families (such as extended families and friends) about how to help my child's education for _____.
    (a). Never, (b). 1~2 times, (c). 3~4 times, (d). 4~5 times, (e). 5 times or more.
17. My families participate at least one Chinese ethnic association or organization, such as Chinese weekend school, Chinese church, or *tongxianghui*[14].
    (a). Strongly disagree, (b). Disagree, (c). No opinion, (d). Agree, (e). Strongly agree.
18. I send my child to extracurricular activities.
    (a). Strongly disagree, (b). Disagree, (c). No opinion, (d). Agree, (e). Strongly agree
19. I believe it is beneficial for my families to participate these associations or organizations in terms of my child's education.
    (a). Strongly disagree, (b). Disagree, (c). No opinion, (d). Agree, (e). Strongly agree

Schools-related Questions

20. During a typical semester, I communicate with my child's teachers (any subject) for _____.
    (a). Never, (b). 1~2 times, (c). 3~4 times, (d). 4~5 times, (e). 5 times or more.
21. During a typical semester, I communicate with your child's math teacher for _____.
    (a). Never, (b). 1~2 times, (c). 3~4 times, (d). 4~5 times, (e). 5 times or more.
22. I participate in school-based activities for my child's study, such as attending parent-teacher meetings.
    (a). Strongly disagree, (b). Disagree, (c). No opinion, (d). Agree, (e). Strongly agree
23. I am familiar with my child' math classes, such as the topics in math classes.
    (a). Strongly disagree, (b). Disagree, (c). No opinion, (d). Agree, (e). Strongly agree

Other Questions

24. I would like to participate in a face-to-face interview? (Note: The interview will last about 2 hours and you will be paid $15 for your time, see Form XX for detail).
    (a). Yes, (b). Not sure, (c). No
25. I permit the researcher to observe my home in terms of how my spouse and I get involved in my child/children's education. (Note: Your family will get $50 in total for researchers' 4-7 times visit).
    (a). Yes, (b). Not sure, (c). No

Attention: If your answers from #24 to #25 include any "Yes" or "Not sure", please provide the

[14] Transnational hometown societies established Chinese immigrants.

following information. Otherwise the researcher will not be able to pay you. Your information will not be released to other people.

Name (English): _____; Name (Chinese):_____

Place or birth: _____(Country), _____ (Province), _____ (City).

Address: Street_____, Apt. #. _____

City_____, State_____, Zip Code_____

Phone number (home):_____; Phone number (other): _____

Email:_____

Family population: _____; Number of Children: _____.

Names, grades and gender of Children (who is attending K-12 school):

Name:_____; Grade:_____; Gender:_____

Name:_____; Grade:_____; Gender:_____

Name:_____; Grade:_____; Gender:_____

Name:_____; Grade:_____; Gender:_____

**Appendix B: Student Survey**

Interview No.____

General Information

1. I am at _____.
   (a). Less of equal $6^{th}$, (b). $6^{th}$ ~ $8^{th}$ grade, (c).$9^{th}$ ~ $10^{th}$ grade, (d). $11^{th}$ ~ $12^{th}$ grade
2. I am a _____.
   (a). Boy, (b). Girl.
3. I have been to the United States for _____.
   (a) U.S. born, (b). 4 years or less, (c). 4~8 years, (d) 8 years or more.
4. I live with _____.
   (a) Both parents, (b). Father only, (c). Mother only, (d). None of them
5. The highest educational level of my father is _____.
   (a) Less or equal than middle school, (b). Some high School,
   (c). Finish High school, (d). Less than 4 years college,
   (e). Finish 4 years College, (f). Master' degree or higher
6. The highest educational level of my mother is _____.
   (a). Less or equal than middle school, (b). Some high School,
   (c). Finish High school, (d). Less than 4 years college,
   (e). Finish 4 years College, (f). Master' degree or higher
7. My father's occupation is _____.
   (a). Jobless, (b). Manual worker, (c). Business owner, (d). Professionals, (e). Other ___
8. My mother's occupation is _____.
   (a). Jobless, (b). Manual worker, (c). Business owner, (d). Professionals, (e). Other ___
9. My family's economic status is _____.
   (a). Very difficulty, (b). Difficult, (c). Moderate, (d). Good, (e). Very good, (f). Don't know
10. My performance of mathematics at school is _____.
    (a). Very poor, (b). Poor, (c). Moderate, (d). Good, (e). Very good, (f). Excellent.
11. Mathematics is important to me among all subjects.
    (a). Strongly disagree, (b). Disagree, (c). No opinion, (d). Agree, (e). Strongly agree.

Home-related Questions

12. In my family, _____ spends most time on my education.
    (a) Father, (b). Mother, (c). Other guidance (d). Other
13. During a typical week, my parents check my homework for _____.
14. Never, (b). 1~2 times, (c). 3~4 times, (d). 5 times or more.
15. During a typical week, I receive direct help from family members (e.g., parents, siblings, and other family members) to study (for all subjects, such as homework) for _____.
    (a). Never, (b). 1~2 times, (c). 3~4 times, (d). 5 times or more.
16. During a typical week, I receive direct help from family members (e.g., parents, siblings, and other family members) to study mathematics for _____.
    (a). Never, (b). 1~2 times, (c). 3~4 times, (d). 5 times or more.

Community-related Questions

17. Besides Chinese School, I am attending (or have you ever attended in the past year) any other after schools programs, such as cram schools.
    (a). No, (b). Yes.
18. Outside of my regular school, I am attending (or have attended) the following extracurricular activities _____.
    (a). None,
    (b). Chinese language,
    (c). Art related (e.g., music, and dancing)
    (d). Sport related (e.g., martial arts, and swimming),
    (e). Academic related (SAT reading or mathematics)
    (f). Other _____.
19. My parents attempt to get additional resources for your study by their personal networks with other parents (e.g., sharing study materials, buying books).
    (a). Strongly disagree, (b). Disagree, (c). No opinion, (d). Agree, (e). Strongly agree
26. I receive help to study from my ethnic friends or extended family members.
    (a). Strongly disagree, (b). Disagree, (c). No opinion, (d). Agree, (e). Strongly agree

School-related Questions

20. During a typical semester, my parents and my all teachers contact with each other for ____.
    (a). Never, (b). 1~4 times, (c). 5~8 times, (d). 8 times or more.
21. During a typical semester, my parents and my math teacher contact with each other for ____.
    (a). Never, (b). 1~4 times, (c). 5~8 times, (d). 8 times or more.
22. My parents are familiar with my life at school.
    (a). Strongly disagree, (b). Disagree, (c). No opinion, (d). Agree, (e). Strongly agree
29. My parents usually participate in school related activities, such as parent-teacher conference.
    (a). Strongly disagree, (b). Disagree, (c). No opinion, (d). Agree, (e). Strongly agree

Other Questions

23. I would you like to participate in a face-to-face interview. (Note: The interview will last about 1-3 hours and you will be paid $15 for your time, see Form XX for detail).
    (a). Yes, (b). Not sure, (c). No
24. I agree to write three essays for this research. (Note: The first 15 people send the essays to me will be paid $15 for your time on writing the essay, see Form XX for detail).
    (a). Yes, (b). Not sure, (c). No
25. I would like to let the researcher to observe what I usually do at home with my parents' permission. (Note: The participant family will get $50 in total for researchers' 4-7 times visit).
    (a). Yes, (b). Not sure, (c). No

Attention: If your answers from #22 , #23 and #24 include any "Yes" or "Not sure", please provide the following information. Otherwise the researcher will not be able to pay you. Your information will not be released to other people.

Name (English): _____; Name (Chinese):_____

Address: Street_____
Apt. No. _____
City_____
State_____
Zip Code_____
Phone number (home):_____; Phone number (other): _____
Email:_____
Father's name:_____; Mother's name:_____

**Appendix C: Student Narrative Writing**

Essay Writing

These three narrative essays are expected to show how your family (such as your parents, grandparents, siblings, and extended family members), your community (such as Chinese language schools, Chinese churches, and other ethnic organizations), and your family's connection with your school influence you, your general education, and your mathematics education. You should think deeply how these three elements (family, community, and family-school connection) mean for you. It is important for you to express your truth feelings and thoughts. Again, there is no right or wrong responses, all you need to do are to let your real voices heard.

Each essay should be about two pages (single space) in A4 format. Electronic version is preferable. You will have 8 weeks to finish these essays. If you need additional time and have any question, please feel free to contact the researcher.

Essay 1: My family and I
Essay 2: My community and I
Essay 3: My family and my school

**Appendix D: Interview Questions for Parents**

I have some questions about how you participate with your child's study at three aspects: home, community, and school. I will emphasize on his or her mathematics study. Please try to answer questions with examples and stories. Please feel free to me your true feelings and thoughts. There no right or wrong answers to these questions. I appreciate all of your responses.

General information

1. Can you make an introduction of yourself?
2. How do you describe yourself as a person, a father or mother?
3. What is your educational background? Highest level math courses.
4. What is the reason for your family to immigrate to U.S.? How long have you been in the U.S.?
5. What do you do for living? Are you satisfied with your current life?
6. Are you satisfied with your child's study? (And math?)
7. Do you know which math course your child is taking?

Home-based activity

8. What do you usually do in daily parenting practice? Tell me a story about your parenting.
9. Have you ever tutored them math?
10. In your opinion, what is the most important thing for your child's to achieve in academic study? Explain your idea.
11. In your opinion, what is the best way to study math?
12. If you child failed in a math test, what is your response?
13. Do you think family is important for your child's study? What do you do to build a family environment for your child's study?
14. Do you have communication difficulties with your child?
15. What are your expectations for your child? (Higher education and career).
16. Where do you live? Is it related to your choose of your child's school?
17. What sacrifices have you done for your child?
18. Do you think your child understand your sacrifice?
19. Do you have a good relationship with your child?
20. Compared to the mainstream American family, do you perceive any different approach in parenting?

Community-based activity

21. Is your child attending any Chinese school? (For which subject?) Why do you send him or her to Chinese school?
22. What other extracurricular does he or she attend? Why?
23. Do you exchange experience about your children's education with other families? Give me an example.

School-based activity

24. Are you satisfied with the math education your child receives from school? Why? How do you know your child' performance in school?

25. What do expect your child to know about math in school? Why?
26. If there any communication between you and your child's teachers? Give me some examples.
27. Do you think it is important to contact school?
28. Do you perceive you to be a partner with school?
29. What are the difficulties for you to contact school?

30. Is there other thing you want to tell me?

**Appendix E: Interview Questions for Students**

I have some questions about your educational experiences in general and mathematics experience in particular. I will focus on three aspects: home, community, and school. Please try to answer questions with examples and stories. Please feel free to me your true feelings and thoughts. There no right or wrong answers to these questions. I appreciate all of your responses.

General Questions

1. Can you make an introduction of yourself?
2. Are you a happy person?
3. How do you describe yourself as a student and a child in your family?
4. What is your favorite subject? Why?
5. What is the subject you dislike most? Why?
6. You know like math? Why?
7. How are you doing in math? Too easy or too hard?
8. What other students or teachers think your ability in math?
9. What math courses are you taking now?
10. Do you think math is important for you? Why?
11. What are you looking to learn from math? Is it useful for you?
12. In your opinion, what is the most important factor for your study?

Home-based Activities

13. Do your parents check your homework?
14. Do they help you with your math homework if you have difficulties to finish?
15. What other resources do you parents provide you for your study? Such as buying additional academic related books, hiring tutors? Give me an example.
16. If you failed at a math test, what will your parents do? Give me an example.
17. Which language do you speak with your parents? Do you have difficulties to communicate with your parents about your schooling in general and math study in particular? Give me an example.
18. What are your parents' expectations for you? What is your own expectation?
19. Do your parents compare you to other students?
20. Are you happy with your parents' involvement in your study?
21. Do you think your parents push you to study? How?
22. Do you understand why your parents do the way they do?
23. Besides your parents, who else you can get support for your study (say, siblings, uncles and aunts)? (And math study)? Give me an example.
24. Do you think family plays an important role for your study? Give me an example.
25. What aspects do you proud of Chinese culture? Why?
26. Do you think it is positive or negative to be a Chinese American?
27. Do you perceive any differences between your family and other mainstream American family? Yourself and other students?

Community-based Activities

28. What extracurricular activities are you attending? Are you happy with them?
29. Are you attending Chinese school? For which subjects? Are you happy to go to Chinese school?
30. How long have your attended Chinese schools?
31. Do you think it is helpful for your study? Give me an example.

32. Do you share study information with other Chinese families, such as exchange learning materials? Give me an example.

School-based Activities

33. Which school are you attending? Do you like your school?
34. Who do you usually hang out?
35. Do you like your math classes in your school? Explain your reasons.
36. Is there any communication between your parents and your teachers, say math teacher? Give me example.

37. Is there anything else you want to tell me?

# References


Abe, J. S., & Zane, N. W. S. (1990). Psychological Maladjustment among Asian and White American College Students: Controlling for Confounds. *Journal of Counseling Psychology, 37*(4), 437-444.

Aldous, J. (2006). Family, Ethnicity, and Immigrant Youths' Educational Achievements. *Journal of Family Issues, 27*(12), 1633-1667.

Andersen, L., Brisson, I., Portner, C., & Verner, D. (2010). Methedology and data. In D. Verner (Ed.), *Reducing poverty, protecting livelihoods, and building assets in a changing climate: Social implications of climate change Latin America and the Caribbean (Directions in development)* (pp. 440): World Bank Publications.

Auerbach, S. (2007). From Moral Supporters to Struggling Advocates. *Urban Education, 42*(3), 250-283. doi: 10.1177/0042085907300433

Bankston III, C. L., & Min, Z. (2002). Social Capital as Process: The Meanings and Problems of a Theoretical Metaphor. *Sociological Inquiry, 72*(2), 285-317.

Bourdieu, P. (1986). The forms of capital. In J. G. Richardson (Ed.), *Handbook for Theory and Research for the Sociology of Education* (pp. 241-258): Greenwood Press.

Bower, B. (1987). Asian languages aid mathematics skills. *Science News, 132*(12), 183.

Brand, D. (1987). Education: The New Whiz Kids. *TIME*.

Chang, L., & Shimizu, W. (1995). LEP parents as resources: Generating opportunity to learn beyond school through parental involvement. In L.-R. L. Cheng (Ed.), *Integrating Language and Learning for Inclusion: An Asian/Pacific Focus (Culture, Rehabilitation, and Education)* (pp. 256): Singular Publishing Group.

Chen, C., & Stevenson, H. W. (1995). Motivation and Mathematics Achievement: A

Comparative Study of Asian-American, Caucasian-American, and East Asian High School Students. *Child Development, 66*(4), 1215-1234.

Cheng, L., Trueba, H. T., & Ima, K. (1992). *Myth or Reality: Adaptive Strategies of Asian Americans in California*: Falmer Press.

Chua, A. (2011a). *Battle Hymn of the Tiger Mother*: Penguin Press HC, The.

Chua, A. (2011b). Why Chinese Mothers Are Superior - WSJ.com, *The Wall Street Journal*. Retrieved from http://online.wsj.com/article/SB10001424052748704111504576059713528698754.html

Coleman, J. S. (1988). Social Capital in the Creation of Human Capital. *American Journal of Sociology, 94*, S95-S120. doi: 10.2307/2780243

Crosnoe, R. (2001). Academic Orientation and Parental Involvement in Education during High School. *Sociology of Education, 74*(3), 210-230.

Davis-Kean, P. E. (2005). The Influence of Parent Education and Family Income on Child Achievement: The Indirect Role of Parental Expectations and the Home Environment. *Journal of Family Psychology, 19*(2), 294-304. doi: 10.1037/0893-3200.19.2.294

Department of Education, W. D. C. (1994). Strong Families, Strong Schools: Building Community Partnerships for Learning. A Research Base for Family Involvement in Learning from the U.S. Department of Education.

Desimone, L. (1999). Linking Parent Involvement with Student Achievement: Do Race and Income Matter? *Journal of Educational Research*, *93*(1), 11-30.

Diamond, J., Wang, L., & Gomez, K. (2004). African-American and Chinese-American Parent Involvement: The Importance of Race, Class, and Culture / Browse Our Publications / Publications & Resources / HFRP - Harvard Family Research Project. *Family*

*Involvement Research Digests*. http://www.hfrp.org/publications-resources/browse-our-publications/african-american-and-chinese-american-parent-involvement-the-importance-of-race-class-and-culture

DiMaggio, P. (1982). Cultural Capital and School Success: The Impact of Status Culture Participation on the Grades of U.S. High School Students. *American Sociological Review, 47*(2), 189-201. doi: 10.2307/2094962

Duncan, G. J., & Magnuson, K. A. (2005). Can Family Socioeconomic Resources Account for Racial and Ethnic Test Score Gaps? *The Future of Children, 15*(1), 35-54. doi: 10.2307/1602661

Eisenhardt, K. M. (1989). Building theories from case study research. *The Academy of Management Review, 14*(4), 532-550.

Epstein, J. L. (1995). School/family/community partnerships: Caring for the children we share. *Phi Delta Kappan, 76*(9), 701-712.

Espenshade, T. J., & Radford, A. W. (2009). *No Longer Separate, Not Yet Equal: Race and Class in Elite College Admission and Campus Life*: Princeton University Press.

Fejgin, N. (1995). Factors Contributing to the Academic Excellence of American Jewish and Asian Students. *Sociology of Education, 68*(1), 18-30.

Finn, J. D. (1998). Parental engagement that makes a difference. *Educational Leadership, 55*(8), 20-24.

Foner, N., & Kasinitz, P. (2007). The second generation. In M. C. Waters, R. Ueda & H. B. Marrow (Eds.), *The new Americans: A guide to immigration since 1965* (pp. 270-282): Harvard University Press.

Fuligni, A. J. (1997). The Academic Achievement of Adolescents from Immigrant Families: The

Roles of Family Background, Attitudes, and Behavior. *Child Development, 68*(2), 351-363.

Fuligni, A. J., Yip, T., & Tseng, V. (2002). The impact of family obligation on the daily activities and psychological well-being of Chinese American adolescents. *Child Development, 73*(1), 302-314.

Furstenberg, F. F., & Kaplan, S. B. (2007). Social Capital and the Family. In J. T. Jacqueline Scott, Martin Richards (Ed.), *The Blackwell Companion to the Sociology of Families* (pp. 218-232): Blackwell Publishing Ltd.

Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory; strategies for qualitative research*. Chicago,: Aldine Pub. Co.

Graaf, N. D. D., Graaf, P. M. D., & Kraaykamp, G. (2000). Parental Cultural Capital and Educational Attainment in the Netherlands: A Refinement of the Cultural Capital Perspective. *Sociology of Education, 73*(2), 92-111. doi: 10.2307/2673239

Harpham, T., Grant, E., & Thomas, E. (2002). Measuring social capital within health surveys: key issues. doi: 10.1093/heapol/17.1.106

Hess, R. D., Chang, C.-m., & McDevitt, T. M. (1987). Cultural variations in family beliefs about children's performance in mathematics: Comparisons among People's Republic of China, Chinese-American, and Caucasian-American families. *Journal of Educational Psychology, 79*(2), 179-188. doi: 10.1037/0022-0663.79.2.179

Hu, A. (1989). Asian American Studies Center - Journal Article (Vol. 15, pp. 243-257): UCLA Asian American Studies Center Press.

Huntsinger, C. S., Jose, P. E., & Larson, S. L. (1998). Do parent practices to encourage academic competence influence the social adjustment of young European American and Chinese

American children? *Developmental Psychology, 34*(4), 747-756. doi: 10.1037/0012-1649.34.4.747

Huntsinger, C. S., Jose, P. E., Larson, S. L., Balsink Krieg, D., & Shaligram, C. (2000). Mathematics, vocabulary, and reading development in Chinese American and European American children over the primary school years. *Journal of Educational Psychology, 92*(4), 745-760. doi: 10.1037/0022-0663.92.4.745

Jencks, C., & Phillips, M. (1998). *The Black-White Test Score Gap*: Brookings Institution Pres.

Jensen, R. (1969). How Much Can We Boost IQ and Scholastic Achievement - Harvard Educational Review - Volume 39, Number 1 / Spring 1969 - Harvard Education Publishing Group. *Harvard Educational Review, 39*, 1-123.

Kao, G. (1995). Asian Americans as Model Minorities? A Look at Their Academic Performance. *American Journal of Education, 103*(2), 121-159.

Kao, G., & Rutherford, L. T. (2007). Does Social Capital Still Matter? Immigrant Minority Disadvantage in School-Specific Social Capital and its Effects on Academic Achievement. *Sociological Perspectives, 50*(1), 27-52. doi: 10.1525/sop.2007.50.1.27

Kristof, N. D. (2006). The model students, *The New York Times*.

kuyou.com (Producer). 视频:《一次函数》课堂教学示范课. Retrieved from http://v.youku.com/v_show/id_XNDI2Nzc2NzI0.html

Kwong, P. (1987). *The new Chinatown* (1st ed.). New York: Hill and Wang.

Lee, S. (1994). Behind the model-minority stereotype: Voices of high- and low-achieving Asian American students. *Anthropology & Education Quarterly, 25*(4), 413-429.

Lee, S. J. (1994). Behind the Model-Minority Stereotype: Voices of High- and Low-Achieving Asian American Students. *Anthropology & Education Quarterly, 25*(4), 413-429.

Lee, S. J. (1996). *Unraveling the 'Model Minority' Stereotype: Listening to Asian American Youth*: Teachers College Press.

Leung, K., Lau, S., & Wai-Lim, L. (1998). Parenting styles and academic achievement: A cross-cultural study. *Merrill-Palmer Quarterly, 44*(2), 157.

Lew, J. (2006a). *Asian Americans in class: Charting the achievement gap among Korean american youth*: Teachers College Press.

Lew, J. (2006b). Burden of Acting Neither White Nor Black: Asian American Identities and Achievement in Urban Schools. *Urban Review, 38*(5), 335-352.

Li, G. (2002). *East is East, West is West? (Rethinking Childhood)*: Peter Lang.

Li, G. (2005). Other People's Success: Impact of the "Model Minority" Myth on Underachieving Asian Students in North America. *KEDI Journal of Educational Policy, 2*(1), 69-86.

Li, G. (2006). What Do Parents Think? Middle-Class Chinese Immigrant Parents' Perspectives on Literacy Learning, Homework, and School-Home Communication. *School Community Journal, 16*(2), 27-46.

Li, J. (2009). Forging the Future between Two Different Worlds: Recent Chinese Immigrant Adolescents Tell Their Cross-Cultural Experiences. *Journal of Adolescent Research, 24*(4), 477-504.

Lo, L. (2009). Perceptions of Asian immigrant families of children with disabilities towards parental involvement. In C. C. Park, R. Endo & X. L. Rong (Eds.), *New Perspectives on Asian American Parents, Students, and Teacher Recruitment (HC) (Research on the Education of Asian and Pacific American)* (pp. 236): Information Age Publishing.

Louie, V. (2001). Parents' Aspirations and Investment: The Role of Social Class in the Educational Experiences of 1.5- and Second-Generation Chinese Americans. *Harvard*

*Educational Review, 71*(3), 438-474.

Louie, V. S. (2004a). *Compelled to excel : immigration, education, and opportunity among Chinese Americans*. Stanford, Calif.: Stanford University Press.

Louie, V. S. (2004b). *Compelled to excel: immigration, education, and opportunity among Chinese Americans*. Stanford, Calif.: Stanford University Press.

Ma, L. (1999). *Knowing and Teaching Elementary Mathematics: Teachers' Understanding of Fundamental Mathematics in China and the United States (Studies in Mathematical Thinking and Learning Series) 1st (first) Edition by Ma, Liping [1999]*: Routledge.

Mau, W.-C. (1997). Parental Influences on the High School Students' Academic Achievement: A Comparison of Asian Immigrants, Asian Americans, and White Americans. *Psychology in the Schools, 34*(3), 267-277.

Morgan, S. L., & Sørensen, A. B. (1999). Parental Networks, Social Closure, and Mathematics Learning: A Test of Coleman's Social Capital Explanation of School Effects. *American Sociological Review, 64*(5), 661-681. doi: 10.2307/2657368

Muller, C. (1995). Maternal Employment, Parent Involvement, and Mathematics Achievement among Adolescents. *Journal of Marriage and Family, 57*(1), 85-100.

National Center for Education Statistics. (2009). United States ranks 31st in mathematics on Program for International Student Assessment (PISA). http://www.africanamericancommunication.com/PDF/USRanks31inMath.pdf

National Center for Education Statistics. (2011). NAEP Mathematics Assessment. http://nces.ed.gov/nationsreportcard/mathematics/

National Center for Education Statistics. (2013a). Program for International Student Assessment (PISA) - Overview. from http://nces.ed.gov/surveys/pisa/

National Center for Education Statistics. (2013b). Trends in International Mathematics and Science Study (TIMSS) - Overview. from http://nces.ed.gov/Timss/

Obama, B. (2011). State of the Union Speech 2011. http://www.whitehouse.gov/state-of-the-union-2011

Ogbu, J. U. (1978). *Minority education and caste : the American system in cross-cultural perspective*. New York: Academic Press.

Ogbu, J. U. (1983). Minority Status and Schooling in Plural Societies. *Comparative Education Review, 27*(2), 168-190.

Ogbu, J. U., & Simons, H. D. (1998). Voluntary and Involuntary Minorities: A Cultural-Ecological Theory of School Performance with Some Implications for Education. *Anthropology & Education Quarterly, 29*(2), 155-188.

Pan, Y., Gauvain, M., Liu, Z., & Cheng, L. (2006). American and Chinese Parental Involvement in Young Children's Mathematics Learning. *Cognitive Development, 21*(1), 17-35.

Paul, A. M. (2011). Tiger Mom: Amy Chua Parenting Memoir Raises American Fears - TIME. *Time*.

Peterson, W. (1966a). Success story of one minority group in U.S., *U.S. News & World Report*, pp. 73-76.

Peterson, W. (1966b). Success story, Japanese-American style, *New York Times*.

Portes, A. (2003). Social Capital: Its Origins and Applications in Modern Sociology. *http://dx.doi.org/10.1146/annurev.soc.24.1.1*. doi: 10.1146/annurev.soc.24.1.1

Putnam, R. D. (2001). *Bowling Alone: The Collapse and Revival of American Community*: Touchstone Books by Simon & Schuster.

Rong, X. L., & Preissle, J. (1998). *Educating immigrant students : what we need to know to meet*

*the challenges*. Thousand Oaks, Calif.: Corwin Press.

Sheldon, S. B., & Epstein, J. L. (2005a). Involvement Counts: Family and Community Partnerships and Mathematics Achievement. *Journal of Educational Research, 98*(4), 196-206.

Sheldon, S. B., & Epstein, J. L. (2005b). Involvement Counts: Family and Community Partnerships and Mathematics Achievement. *Journal of Educational Research, 98*(4), 196.

Siu, S.-F. (1992a). How Do Family and Community Characteristics Affect Children's Education Achievement? The Chinese-American Experience. *Equity and Choice, 8*(2), 46-49.

Siu, S.-F. (1992b). Toward an understanding of Chinese-American educational achievement: A literature review. Report No. 2. Wheelock Coll, Boston M. A.: Center on Families, Communities Schools and Children's Learning.

Siu, S.-F. (1993). Taking no chances: Profile of a Chinese-American family's support for school success. Wheelock Coll, Boston M. A.: Center on Families, Communities Schools and Children's Learning.

Siu, S.-F. (1996). Questions & answers: What research says about the education of Chinese American children: Center on Families, Communities Schools and Children's Learning.

Siu, S.-F., & Feldman, J. A. (1996). Patterns of Chinese American Family Involvement in Young Children's Education. Final Report. Report No. 36: Center on Families, Communities Schools and Children's Learning

Boston Univ, M. A. School of Education.

Smith, L., & Billiter, B. (1985). Asian-American emphasis on education paying off, *Los Angeles Times*.

Sohn, S., & Wang, X. C. (2006). Immigrant Parents' Involvement in American Schools: Perspectives from Korean Mothers. *Early Childhood Education Journal, 34*(2), 125-132.

Sohoni, D. (2007). Unsuitable Suitors: Anti‐Miscegenation Laws, Naturalization Laws, and the Construction of Asian Identities. *Law & Society Review, 41*(3), 587-618. doi: 10.1111/j.1540-5893.2007.00315.x

Sue, S., & Okazaki, S. (1990). Asian-American Educational Achievements: A Phenomenon in Search of an Explanation. *American Psychologist, 45*(8), 913-920.

Sullivan, A. (2001). Cultural capital and educational attainment. doi: 10.1177/0038038501035004006

Suzuki, B. H. (1977). *Education and the Socialization of Asian Americans: A Revisionist Analysis of the 'Model Minority'Thesis*: Amerasia Journal.

Suzuki, B. H. (1989). Asian Americans as the: "Model Minority": Outdoing Whites? Or Media Hype? *Change, 21*(6), 12-19.

Tsui, M. (2005). Family Income, Home Environment, Parenting, and Mathematics Achievement of Children in China and the United States. *Education and Urban Society, 37*(3), 336-355.

Tuan, M. (1999). *Forever Foreigners or Honorary Whites?: The Asian Ethnic Experience Today*: Rutgers University Press.

UCLA, & Carnegie Foundation (Producer). (1995). US 1 graphing linear equations. Retrieved from http://timssvideo.com/58

US Department of Education. (2004). *Parental involvement: Title I, Part A--Non-regulatory guidance*.

Uyematsu, A. (1971). The emergence of yellow power in America. In W. Amy, F. Odo & E.

Tachiki (Eds.), *Roots: an Asian American Reader* (pp. 9-13). Los Angeles.

Wan, Y. (1996). Bearing the Image of Model Minority: An Inside Look behind the Classroom Door.

Weinberg, M. (1997). *Asian-American education : historical background and current realities*. Mahwah, N.J.: L. Erlbaum Associates.

West, J. M. (2000). Increasing Parent Involvement for Student Motivation.

Whang, P. A., & Hancock, G. R. (1994). Motivation and Mathematics Achievement: Comparisons between Asian-American and Non-Asian Students. *Contemporary Educational Psychology, 19*(3), 302-322.

Wikipedia. (2013). Chinese American. from http://en.wikipedia.org/wiki/Chinese_American

Wu, E. H. (2008). Parental Influence on Children's Talent Development: A Case Study with Three Chinese American Families. *Journal for the Education of the Gifted, 32*(1), 100-129.

Yan, W., & Lin, Q. (2005). Parent involvement and mathematics achievement: Contrast across racial and ethnic groups. *Journal of Educational Research, 99*(2), 116-127.

Yao, E. L. (1985). A Comparison of Family Characteristics of Asian-American and Anglo-American High Achievers. *International Journal of Comparative Sociology (Brill Academic Publishers), 26*(3/4), 198-208.

Yin, R. K. (2002). *Case study research: Design and methods* (Third ed. Vol. 5): Sage Publications, Inc.

Yin, X.-h. (2007). China: People's Republic of China. In M. C. Watersis, R. Uedais, H. B. Marrowis, R. D. Albais & R. Waldinger (Eds.), *The new Americans: A guide to immigration since 1965.* (pp. 340-354). Cambridge.

Ying, Y.-W., Lee, P. A., Tsai, J. L., Hung, Y., Lin, M., & Wan, C. T. (2001). Asian American College Students as Model Minorities: An Examination of Their Overall Competence. *Cultural Diversity & Ethnic Minority Psychology, 7*(1), 59-74.

Zhou, M. (2007). Divergent origins and destinies: Children of Asian immigrants. In S. J. Paik & H. J. Walberg (Eds.), *Narrowing the achievement gap: Strategies for educating Latino, Black, and Asian students* (pp. 109-128). New York: Springer.

Zhou, M., & Kim, S. S. (2006). Community Forces, Social Capital, and Educational Achievement: The Case of Supplementary Education in the Chinese and Korean Immigrant Communities. *Harvard Educational Review, 76*(1), 1-29.

Zhou, M., & Li, X.-Y. (2003). Ethnic language schools and the development of supplementary education in the immigrant Chinese community in the United States. *New Directions for Youth Development, 2003*(100), 57-73.