tion of
ericans

eries Editors

c Americans (2002)
and Stacey J. Lee

hooling (2003)
and Stacey J. Lee

cation:
ty (2005)
d A. Lin Goodwin

Learning (2007)
Lee, and Xue Lan Rong

Recruitment (2009)
nd Xue Lan Rong

Asian American Education—Identities, Racial Issues, and Languages

edited by

Xue Lan Rong
University of North Carolina

and

Russell Endo
University of Colorado

Information Age Publishing, Inc.
Charlotte, North Carolina • www.infoagepub.com

Library of Congress Cataloging-in-Publication Data

Asian American education : Asian American identities, racial issues, and languages / [edited by] Xue Lan Rong, Russell Endo.
p. cm. -- (Research on the education of Asian Pacific Americans)
Includes bibliographical references.
ISBN 978-1-61735-461-8 (pbk.) -- ISBN 978-1-61735-462-5 (hardcover) -- ISBN 978-1-61735-463-2 (e-book)
1. Asian Americans--Education. 2. Asian Americans--Ethnic identity. = 3.Asian Americans--Social conditions. 4. Asian Americans--Languages. I. Rong, Xue Lan. II. Endo, Russell.=20
LC2632.A845 2011
371.829'95073--dc23

2011016525

Printed in the United States of America

CHAPTER 1

TENTH GRADE MATH ACHIEVEMENT OF ASIAN STUDENTS

Are Asian Students Still the "Model Minority"?— A Comparison of Two Educational Cohorts

Cohorts Claudia Galindo and Suet-ling Pong

Our study compares data twelve years apart to examine whether recent Asian American students' academic achievement can uphold over time the model minority label commonly associated with this group, since past research mostly conducted in the 1980s and 1990s has shown their academic success. We draw on data from the National Educational Longitudinal Study (NELS: 88) and the Educational Longitudinal Study (ELS: 02) to study two educational cohorts of Asian adolescents who were 10th graders in 1990 and 2002, respectively. We find that Asian students' math achievement significantly decreased between 1990 and 2001 and that the initial math advantage of Asian students over White students observed in 1990 disappeared in 2002, particularly for students with foreign-born parents. Although English proficiency and the school environment account for

Asian American Education—Identities, Racial Issues, and Languages, pp. 1–29

cohort differences in the Asian-White achievement gaps, family socioeconomic status and parental educational expectations are the strongest predictors. We discuss the implications of these findings for educators.

Asian students have been promoted by the mass media as the "model minority" for about 5 decades, triggering much debate in academia (Chou & Feagin, 2008; Hurh & Kim, 1989; Kao, 1995; Kitano & Sue, 1973; Li & Wang, 2008). This controversial label is most often used by public commentators to describe a high degree of academic achievement of Asian American students, which serves to prove correct the meritocratic view that hard work and talent are rewarded in the United States. Among academics, this label has been debunked as a "myth" (Chou & Feagin, 2008; Li & Wang, 2008). Researchers have documented wide variations in school performance by the country of origin (Rong & Preissle, 2009) as well as serious academic and school adjustment problems among some Asian subgroups (Lee, 2001; Ngo & Lee, 2007; Thao, 1999; Walker-Moffat, 1995). Scholars also warned that the label can divide minority groups or pit them against each other, instead of helping unite minority groups to work together.

Despite rejection of this broad-brush label, Asian American students as a group tend to exhibit a high degree of educational success that feeds the model minority image. Previous scholarly studies have found that Asian American students out-perform all other racial/ethnic minority students, and sometimes even non-Hispanic White students (Kao, 1995; Pong, Hao, & Gardner, 2005; Steinberg, Dornbusch, & Brown, 1992). However, the results of the Asian-White achievement gaps are mostly based on data collected in the 1980s and 1990s. Currently, it is not clear whether more recent data can uphold the model minority image in academic achievement.

One demographic characteristic unique to Asian Americans is the large percentage of foreign-born individuals in the Asian population. Among school-age children, almost 90% of Asian Americans were foreign-born or children of immigrants in the year 2000. This school-age figure is well above the national average of 20%, and it is also higher than the comparable figure of 70% among Hispanics (Rong & Preissle, 2009). Immigrant status is thus an important trait of Asian American students. Furthermore, previous studies suggest that the Asian effect on academic achievement is actually the immigrant effect (Kao, 2004; Kao & Tienda, 1995).

Immigrants arrive in the United States at different periods of time and with different resources. Earlier waves of Asian immigrant parents are likely to differ from Asian immigrant parents arriving in recent years,

especially in terms of their education and job skills (Borjas, 1985). Changes in immigrant selectivity would have implications for children from immigrant families because the resources available to children for their education depend on the resources possessed by parents. Thus far, we know little about cohort differences in Asian students' academic achievement (Glick & White, 2003 is a rare exception).

Using two educational cohorts of Asian adolescents who were born about a decade apart and were 10th graders in 1990 and 2002 ("cohort" hereafter), our study addresses the question of cohort differences in the Asian-White achievement gap. Specifically, we ask three major questions: (1) Did the Asian math achievement change over the two cohorts of adolescents in 1990 and 2002, relative to academic achievement of non-Hispanic White adolescents? (2) Did family characteristics, English proficiency, and school characteristics of Asian students also change across cohorts? (3) If so, did family characteristics, English proficiency, and the school environment account for cohort differences in the Asian-White math achievement gap?

These questions aim to examine whether the Asian students' academic success that earned them the model minority image was a unique historical occurrence, or something that has happened in the past. We focus on math achievement test scores because math represents in-school learning more so than other content areas and math scores data are comparable across cohorts between NELS and ELS. Additionally, some may also argue that test scores are a more objective measure than one's GPA. In this chapter, we first review Asian American students' academic achievement, with special attention to generational differences. Then, we present several important demographic characteristics of Asian American children in the 2000 Census and discuss how changes in demographics over time may have implications for the Asian-White achievement gap.

ASIAN AMERICAN STUDENTS' ACHIEVEMENT A REVIEW OF THE LITERATURE

Today, one out of five students in K-12 school is an immigrant child or child of immigrants (Zhou, 1997). The influx of immigrant children into the U.S. public school system has generated a great deal of concern about their school success and adaptation. This concern is particularly relevant to Asian Americans because of the high percentage of Asian school children living in immigrant families.

Previous studies on Asian American students' math test scores did not differentiate these students by their immigrant status. These studies

showed that the math achievement scores of Asian American students exceeded those of non-Hispanic White American students (Stevenson et al., 1990), given similar socioeconomic status (Chen & Stevenson, 1995; Kao, 2004; Pong & Hao, 2007). The Asian-White achievement gap is even larger for students with the lowest level of parental education. Whereas non-Hispanic White students whose father did not finish high school had much lower math test scores than did their counterparts whose father had a high school education, Asian students' math test scores do not differ by whether their fathers complete high school (Chen & Stevenson, 1995). As mentioned above, a large percentage of Asian-American students have immigrant parents, the Asian students' math advantage is likely an immigrant advantage.

Other large-scale quantitative research has compared school performance or attainment of immigrants of different countries of origin, or the 1st-, 2nd-, and 3rd-plus generations of Asian students (e.g., Kao & Tienda, 1995; Pong et al., 2005; Rong & Grant, 1992), comparing 1st generation, foreign-born children to the U.S.-born, 2nd- and 3rd-plus children (Vernez & Abrahamse, 1996), or comparing immigrants' children of the 1st and 2nd generation to the U.S.-born children with native parents (3rd generation, Hao & Bonstead-Bruns, 1998). Some authors even differentiate the immigrant groups further into 1.5 or the preschool generation (Glick & White, 2003), while others use the length of residence in the United States as a proxy for generations (Hirschman, 2001). Regardless of the definition of what constitutes the comparison groups, a basic question common to these studies is: how well do Asian American children, especially immigrant children, perform in school? Because education provides immigrants the major channel of socioeconomic mobility, the question of the educational progress of immigrant children helps to answer a more fundamental question of how immigrant groups assimilate into American society.

With regard to their countries of origin, Asian students' achievement differs significantly, with Chinese, Korean, and Japanese students outperform Hmong, Cambodian, and Laotian students in GPA (Rumbaut, 1995) and standardized test scores (Harris, Jamison, & Trujillo., 2008). When Asian American students are divided into different generations for comparisons, the results supported unequivocally the "immigrant paradox" in education, that is, earlier generations perform better than later generations. It is paradoxical because low performance of earlier generations would be predicted given their lower socioeconomic status and lack of English language skills. On the contrary, a number of studies on immigrants' children have found first-generation students to perform academically as well as or better than their U.S.-born counterparts (Rumbaut, 1995; Schwartz & Stiefel, 2006; Vernez & Abrahamse, 1996). When the

U.S.-born children are divided into second and higher generations, the second generation has outperformed both first and third generations in unadjusted math, reading, and science tests (National Center for Education Statistics, 1999). This immigrant paradox appears to be the strongest and most consistent among Asian students (Harris et al., 2008; Kao, 2004; Pong, 2003).

The immigrant paradox continues to exist after adjustment for socioeconomic status and other family or parental factors. Second-generation Asian students outperform their third generation co-ethnic or White peers in GPA and math grades, and perform just as well in socioeconomic status—adjusted reading grades (Pong et al., 2005). Socioeconomic status—adjusted achievement is not different between the first and second generations (Bankston & Zhou, 2002; Fuligni, 1997; Kao & Tienda, 1995), and both of these earlier generations outperform the later generations in virtually all subjects except reading (Hao & Bonstead-Bruns, 1998; Kao, 2004).

Zhou and Bankston's (1998) study of Vietnamese children provides the most well-known example of the immigrant paradox. First-generation Vietnamese students have low socioeconomic status and attend poor inner-city schools. However, Vietnamese youngsters who adhere to traditional ethnic culture, such as respect for parents and elders, are more likely to excel in school. Controlling for their unfavorable background factors has revealed even higher achievement among these Vietnamese students, increasing their academic distance from their third-generation peers and third-generation White students.

Many explanations have been given for Asian American students' achievement, including their cultural traits, Confucian ideology, their dual frame of reference, support from co-ethnic communities, and the structure of opportunity in the United States (see reviews in Kao & Thompson, 2003; Rong & Preissle, 2009; Zhou & Kim, 2006). From our review above, it is clear that the extraordinary Asian academic achievement is concentrated mainly in the 1st and 2nd generations. The *immigrant optimism* hypothesis, proposed by Kao and Tienda (1995), is particularly relevant here. Parental immigrant status is the driving force for Asian children's school success. Immigrant parents have high hopes for their children's future, which is a source of support for their children's higher school achievement. Regardless of the youth's place of birth and ethnicity, having immigrant parents is associated with higher academic achievement. In the next section, we examine the demographic characteristics of Asian Americans, especially their salient feature of being a primarily immigrant population.

CONTEMPORARY DEMOGRAPHICS OF ASIAN STUDENTS

Since the passing of the Hart Celler Act in 1965, Asian immigrants have arrived in the United States in large numbers, and are now the second largest source of immigration following Latino immigrants. As shown in Table 1.1, the Asian population is heterogeneous; it is made up of people from more than 18 countries of origin. The Chinese and Filipinos are the largest groups, followed by the Japanese, Asian Indian, Korean, and the Vietnamese. However, age distribution differs across origin groups. Among children aged 5-18, the largest groups are the Chinese and Korean with each group making up 17% of the Asian child population. The next largest groups are Filipinos and Asian Indians, each occupying 15%. These four groups alone make up about 64% of the total Asian child population. It is important to bear in mind that the characteristics of the "average" Asian child likely reflect characteristics of these four groups.

Table 1.1. The Asian Population Composition in 1990 and 2002 (in Percentages)

Country of Origin	*1990*	*2000*
Chinese	23.8	[a]23.0
Filipinos	20.4	19.9
Japanese	12.3	9.7
Asian Indian	11.8	16.0
Korean	11.6	10.3
Vietnamese	8.9	10.3
Laotian	2.2	1.7
Cambodian	2.1	1.7
Thai	1.3	1.3
Hmong	1.3	1.6
Burmese	0.1	0.1
Sri Lankan	0.2	0.2
Bangladeshi	0.2	0.5
Malayan/Malaysian	0.2	0.2
Indonesian	0.4	0.5
Pakistani	1.2	1.7
Nepalese	–	0.1
Okinawan	–	0.1
Taiwanese	–	1.2
Other (not specified)	2.1	3.1

[a] Not including Taiwanese.

Note: Data from the Census 1990 and 2000; adapted from Barnes and Bennett (2002, p. 9), and U.S. Department of Commerce (1993, p. 4.).

S OF ASIAN STUDENTS

n 1965, Asian immigrants have
nbers, and are now the second
atino immigrants. As shown in
eneous; it is made up of people
e Chinese and Filipinos are the
Asian Indian, Korean, and the
differs across origin groups.
groups are the Chinese and
of the Asian child population.
Asian Indians, each occupying
out 64% of the total Asian child
d that the characteristics of the
eristics of these four groups.

ion Composition in
rcentages)

1990	*2000*
23.8	[a]23.0
20.4	19.9
12.3	9.7
11.8	16.0
11.6	10.3
8.9	10.3
2.2	1.7
2.1	1.7
1.3	1.3
1.3	1.6
0.1	0.1
0.2	0.2
0.2	0.5
0.2	0.2
0.4	0.5
1.2	1.7
–	0.1
–	0.1
–	1.2
2.1	3.1

ed from Barnes and Bennett (2002,
4.).

Based on the 2000 Census data compiled by Rong and Preissle (2009), we highlight below a few important demographic features of school-age Asian children aged 5-18. First, the majority of Asian school-age children are 2nd generation (62%), that is, U.S.-born children with foreign-born parents. The foreign-born children (1st and 1.5 generations included) make up about 28% and only 10% of Asian children are U.S.-born with native parents (3rd-plus generation). However, the likelihood of being foreign born is higher in Asian children from particular countries or cultures with over 95% of children of Korean, Asian Indians, Hmong, and Vietnamese descent being more recent arrivals who are either immigrant children or children of immigrants.

Additionally, the 2000 Census indicates that Asian children have diverse socioeconomic statuses and parental education levels based upon their country or their parent's country of origin. In general, the four largest Asian groups of children fare quite well socioeconomically, but some smaller groups of Asian children do not. Compared to the national average, poverty rates among the four largest Asian groups of children, especially Filipino and Asian Indian, are much lower, and family incomes among three of the four largest groups (Chinese, Korean, and Asian Indian) are higher. Asian Indian, Filipino, and Korean children also have parents whose education level is higher than the national average. However, three small Asian groups of Hmong, Cambodian, and Laotian children, each of which makes up 2 to 3% of the total Asian child population, are not as fortunate. These groups are more likely to have low levels of both family income and parental education. Over 40% of the Hmong or Cambodian population lives in poverty. The condition for foreign-born Hmong children is particularly disconcerting. About 59% of these children have fallen under the poverty line, compared to 15% of the national average. However, the one area where all Asian children are similar is their desirable family situation in terms of living with two parents. The 2000 Census shows that all Asian children, regardless of their socioeconomic status and nativity are uniformly more likely to live in two-parent households than U.S. children as a whole.

With regard to language, Asian children are much more likely than U.S. children as a whole to speak a home language other than English. The percentage of children using non-English at home is about 75% and 65% for the two largest groups of Chinese and Korean children, respectively. Despite that fact, self-reported English proficiency of these two groups of children is about the same as or slightly higher than the national average, suggesting that many of them are bilingual. The other two large Asian groups of children, the Asian Indians and Filipinos, are more likely to rate themselves higher than the national average in their English proficiency. Even Cambodian and Laotian children reported English proficiency that is

similar to the national average (Rong & Preissle, 2009). This is not to say that Asian children experience no English difficulty. For example, only 4% of Hmong children use English at home and their self-reported English proficiency is lower than the national average (Rong & Preissle, 2009). Also, research showed that the limited English skills of some Korean or Chinese children was an important factor, among other variables, associated with their difficulties in school (Fung-Arto, 2007; Lew, 2006).

The above demographic portrait suggests that, on average, Asian children have family characteristics signifying higher socioeconomic status and better education than the average U.S. child. Although the majority of Asian children have immigrant parents, their English proficiency may not be compromised. In fact, some of these children have the benefits of being bilingual. Here we do not intend to ignore the disadvantaged groups of Cambodian, Laotian, and particularly Hmong children, but it is important to acknowledge that, as a group, Asian children are *on average* more advantageous socioeconomically and linguistically than U.S. children as a whole. High socioeconomic status, residence in two-parent families, bilingualism, and English proficiency are found to be positively associated with student achievement (Blau & Duncan, 1967; Coleman, 1990; Galindo, 2010; McLanahan & Sandefur, 1994; Pong, 1997; Portes & Hao, 1998; Wang & Goldschmidt, 1999; White, 1982). Also, Asian immigrant parents are a selective group because of their ambitions to take advantage of opportunities in the United States, including schooling for their children (Lew, 2006; Park, 2003). Many Asian immigrant parents may rely on their children to do well in school and obtain good jobs as part of a family economic survival strategy (Kibria, 1993). Thus, we would expect Asian children, on average, to achieve quite well in school. That said, we must also acknowledge that we have been comparing Asian children to U.S. children as a whole. The latter is an ambiguous reference category that includes a great deal of diversity. In our analysis below, we will use the non-Hispanic White children as the reference group and examine the Asian-White achievement gap over time.

IMMIGRANT SELECTIVITY

We suspect that the socioeconomic and linguistic advantage of Asian children may change more quickly over time than in any other ethnic group. Because Asian children are overwhelmingly 1st and 2nd generations, their family characteristics are very much tied to the nature of Asian migration and the characteristics of Asian immigrants, which are vulnerable to immigration policies and the context of reception. Migration scholars have long been interested in the overtime change in socioeconomic

eissle, 2009). This is not to say
difficulty. For example, only 4%
nd their self-reported English
rage (Rong & Preissle, 2009).
glish skills of some Korean or
among other variables, associ-
Arto, 2007; Lew, 2006).
sts that, on average, Asian chil-
g higher socioeconomic status
S. child. Although the majority
their English proficiency may
e children have the benefits of
to ignore the disadvantaged
ularly Hmong children, but it is
, Asian children are *on average*
d linguistically than U.S. chil-
s, residence in two-parent fam-
cy are found to be positively
u & Duncan, 1967; Coleman,
efur, 1994; Pong, 1997; Portes
99; White, 1982). Also, Asian
cause of their ambitions to take
States, including schooling for
Many Asian immigrant parents
chool and obtain good jobs as
(Kibria, 1993). Thus, we would
eve quite well in school. That
ve been comparing Asian chil-
is an ambiguous reference cat-
. In our analysis below, we will
e reference group and examine
e.

CTIVITY

guistic advantage of Asian chil-
nan in any other ethnic group.
gly 1st and 2nd generations,
n tied to the nature of Asian
mmigrants, which are vulnera-
of reception. Migration schol-
time change in socioeconomic

status of migrants from the same country of origin. The migration theory proposed by Douglas Massey and his colleagues (1993) argued that immigrants are more likely to be positively selected in terms of socioeconomic status during the initial stage of migration to a host country. To be a pioneer one needs not only resolve but resources to start a new life in a new land. Once these pioneers settle, they set up a network of support for newcomers, especially for family members and other relatives. Subsequent migrants do not have to incur as much psychological or financial costs as earlier migrants. Therefore, subsequent migration streams are likely to be less positively or even negatively selected along the socioeconomic dimension. This prediction has received support in studies of Mexican (Feliciano, 2005) and Chinese immigrants (Liang & Morooka, 2004).

Liang and Morooka's (2004) research on emigration from China is worth noting. They examine emigration from the Fujian province which has been sending many immigrants to the United States. Comparing the emigrants' social characteristics in the Chinese 1990 and 1995 censuses, they found that emigration became less selective along socioeconomic status over time. Recent emigrants in 1995 were more likely to have a rural background and less education than were emigrants in 1990. This research is relevant to Asian Americans in the U.S. since the Chinese population is the largest Asian subgroup. It is therefore reasonable to predict that selectivity by socioeconomic status among Asian students in the U.S. will reduce over cohorts.

Additionally, some theorists argued that current U.S. immigration policies contribute to the increase of Asian immigrants from lower socioeconomic backgrounds (Liu & Cheng, 1994; Martin & Midgley, 2006). The earlier waves of post-1965 Asian immigrants came to the U.S. primarily under the economic provisions of immigration policies, which tended to favor those who were better-educated and had good job skills. However, later waves of immigrants were able to use family reunification provisions of immigration policies to come to the United States. Therefore, later waves of immigrants tend to be more diverse in terms of their socioeconomic backgrounds (Borjas, 1985).

An alternative explanation is related to the refugee status of some Asians (especially Southeast Asians) coming to the United States. The first wave of Asian refugees, around 1975, often came with skills and education that aided their economic assimilation and social mobility; later waves however were more diverse, often lacking education and job skills (Lew, 2006; Park, 2003). This immigration pattern may be another contributing factor to declines in Asian selectivity.

As a result, Asian parents increasingly arrive in the U.S. with less education and job skills, which would have negative consequences for their children's education. To find empirical support for immigrant selectivity

over time, our study compares the socioeconomic status and other related characteristics of two educational cohorts of adolescents born more than a decade apart. Not only do we find evidence of the change in immigrant selectivity over time, we also find its association with the decline in Asian students' advantageous academic achievement over White students.

DATA AND METHODS

We analyzed data of tenth graders from the National Educational Longitudinal Study (NELS: 88) and the Educational Longitudinal Study (ELS: 02) collected by the National Center for Education Statistics (NCES). Both databases gathered information every 2 years on students' family, neighborhood, and school characteristics from a nationally representative sample of high school students. NELS gathered information on a sample of students who entered eighth grade in 1988. Although there was attrition between eighth and 10th grade, the 10th grade NELS sample was refreshened such that it is nationally representative and can be compared to the base-year 10th grade sample in ELS, which was collected in 2002. Because both studies on high school sophomores were conducted 12 years apart, their data allowed for a cross-cohort comparison of student achievement. For methodological details, see National Center for Education Statistics (2007).

Sample

Our analysis focused on math achievement of Asian 10th grade students in 1989-90 (NELS) and in 2001-02 (ELS). We analyzed a total of 10,756 NELS students from 913 schools and 8,603 ELS students from 713 schools. The total number of Asian students in NELS and ELS analyzed in this paper were 910 and 1,397, respectively. The majority of the Asian sample in both cohorts had Chinese and Southeast Asian origins. Additionally, we observed an important prevalence of Filipino and Koreans in 1990 and 2002, respectively. Non-Hispanic native White students were included as the reference group. All other race/ethnicities and White students who have foreign-born parents were excluded from this study.

Variables and Measures

We measured math achievement using 10th grade *math test scores*. NELS and ELS 10th grade math tests were based on the same content areas

(arithmetic, algebra, geometry/ measurement, data/probability, analytical geometry, and precalculus) and cognitive process (knowledge, understanding/comprehension, and problem solving). Common items in ELS and NELS allowed the construction of equated test scores based on the Item Response Theory (IRT). The ELS study reported the NELS-equated math scores that estimated how ELS students would have performed if they were given the NELS math test. Thus, the NELS 10th grade IRT math scores are comparable to the ELS 10th grade IRT math scores. These were the math scores we used to compare achievement patterns across cohorts.

Asian students' *generational status* was measured in four categories: 1st-, 1.5, 2nd, and 3rd-plus generations. Both the 1st and 1.5 generations were foreign-born individuals who were born to foreign-born parents. The difference is that the former came to the U.S. when they were 6 years old or more, while the 1.5 generation came to the U.S. when they were younger than 6. This classification is important because although 1.5 generation children were foreign-born, they were likely to have all their education in the U.S. Their academic achievement was expected to be similar to that of the 2nd generation who were children born in the U.S. to foreign-born parents. The 3rd-plus generation were U.S.-born children of U.S.-born parents. About 2% of either NELS or ELS Asian students in our sample were missing information about generational status. These students were kept in the sample and were specified by a dummy variable in multivariate analysis.

To capture Asian students' family, we analyzed the following family characteristics. *Family type* was measured by four dummy variables: child living with two biological parents (reference group); two parents, one biological; just one biological parent; or other (e.g., guardian or adoptive parents). The family structure was further measured by the *number of siblings*. *Parent's educational level* was measured as an ordinal variable with values from "1" to "6", where "1" indicates some high school and "6" indicates doctorate-level study. We also analyzed family *socioeconomic status* using a continuous composite measure (mean of 0 and standard deviation of 1) based on father's and mother's education, income, and occupation. To analyze the language environment at home, we included a dummy variable indicating whether the student lived in an English-speaking home. Finally, we measured *parent's educational expectations* for children's schooling based on a an ordinal measure indicating how far in school parents believed their child would go with values from "1" to "5", where "1" indicates some high school and "5" indicates graduate study. Less than 1% of students in our sample were missing information about socioeconomic status, family type, and parents' educational expectations, and less than 5% of students in our sample were missing information about num-

ber of siblings. These students were kept in the sample and are indicated by a dummy variable in multivariate analysis.

To capture Asian students' school environment we analyzed the following variables: sector, region, as well as socioeconomic, racial minority and immigrant composition of the schools. Students attending public schools were compared to those enrolled in private institutions and variables for urban, suburban or rural schools were studied. To measure school composition characteristics, we aggregated students' information within each school. Immigrant and racial minority compositions refer to the percentage of students living with foreign-born parents and Hispanics and Black students within each school, respectively.

Child-level variables included age in years, gender, and English proficiency. Age and gender were included in all regression models as control variables. Because the NELS and ELS study do not include an objective measure of English proficiency, we used a proxy based on students' subjective report of their ability (very well, well, not well, not at all) in understanding spoken English, speaking, reading, and writing English. Students in this study were defined as non proficient in English if they self reported below "very well" for at least one of the categories.

Analytical Plan

First, we conducted descriptive statistics of the main variables to understand the family and school environments of Asian children in 1990 and 2002. Second, we estimated several regression models using HLM software (Raudenbush & Bryk, 2002) to study the White-Asian achievement gaps and the association between family and school environments and changes in the achievement gaps. We used two-level hierarchical linear modeling (HLM) with students representing the level-1 units and schools representing the level-2 units. HLM gives valid and accurate estimates when dealing with nested data (as in this case where students are nested within schools) because it takes into account the complex structure of the error terms (Raudenbush & Bryk, 2002). With nested data, Ordinary Least Squares analyses tend to overestimate the levels of significance given that the assumption of independence of variables is violated. Individuals within social contexts—such as in schools, tend to be more alike than if the sample of students was randomly selected.

To analyze whether Asian students' math achievement changed between 1990 and 2002, we estimated two statistical models per time period presented in Table 2. We first analyzed the difference in achievement between White and Asian students (Models 1a and 1b). We then expanded this mode to include 1st, 1.5, 2nd, and 3rd-plus generations (Models 2a and

2b). Finally, we conducted multivariate hypothesis tests to test whether there were differences across time periods. To analyze whether family characteristics, English proficiency, and the school environment account for cohort differences in the Asian-White math achievement gap, we estimated four different models presented in Table 1.5. In model 3 we only included information about generational status and time period (i.e., 1990 and 2002). In model 4, we added family background variables (i.e., socioeconomic status, type of family, and number of siblings). In models 5 and 6, we added parents' educational expectations and language variables, respectively. Finally, in model 7 we added school variables.

RESULTS

Gaps in Math Achievement Between Asian and White Students in 1990 and 2002

As Model 1a Table 1.2 indicates, there was a statistically significant Asian-White achievement gap in the earlier cohort of 1990, with Asian students showing better math achievement than White students. The math achievement gap was 4.4 points in favor for Asian students in this year. When we disaggregated Asian students by their generational status, as in Model 2a, all Asian students with foreign-born parents had statistically significant higher math achievement than did White students, but Asian-origin students with U.S. born parents showed similar math test scores as did White students. The math advantage equaled 2.6 points for 1st generation, 3.8 points for 1.5 generation, and 7.6 points for 2nd generation Asian students, respectively.

In contrast, in the later cohort of 2002, the Asian students' math advantages observed in 1990 disappeared. Model 1b shows no statistically significant math differences between White and Asian students. A similar tendency of lack of math difference was observed for Asian students from different generational statuses. All Asian students, regardless of generation, had math scores that were not statistically significant vis-à-vis the mean score of White students in 2002.

We also tested the null hypothesis that the math achievement gaps between Asian and White students did not change between 1990 and 2002 (see Table 1.2, between cohort contrast column). With the exception of third-generation Asian students (the math achievement gap was not discernable between cohorts), all the Asian-White math achievement gaps have gotten worse between these two cohorts. Clearly, these results suggest that the model minority label does not apply anymore to the average Asian student and that the initial math advantage of Asian students

Table 1.2. Gaps in 10th Grade Math Achievement by Generational Status (Unstandardized Coefficients)

	NELS 1990		*ELS 2002*		*Between Cohort*
	Model 1a	*Model 2a*	*Model 1b*	*Model 2b*	
Asian	4.35***		− 0.03		a
	(0.49)		(0.40)		
1st generation		2.57**		−1.19+	a
		(0.87)		(0.69)	
1½ generation		3.79***		−0.31	a
		(0.80)		(0.71)	
2nd generation		7.56***		0.58	a
		(0.78)		(0.49)	
3rd+ generation		1.29		0.11	
		(1.43)		(1.42)	

Note: Models 1a and 2a were estimated using only NELS data and models 1b and 1b were estimated only using ELS data. 3rd-plus generation Whites are the omitted reference group, so all coefficients are gaps relative to that group. The between cohort contrast tested whether the math achievement gaps between 1990 and 2002 were statistically significant (Significant at .05 level (or lower) are specified as: A). To analyze the between cohort contrast we created a person-cohort data with a dummy variable indicating whether the student was in the NELS or ELS sample. Robust standard errors in parentheses (SE). *P*-values are based on estimations with robust standard errors.

$+ p \leq .10$, $* p \leq .05$, $** p \leq .01$, $*** p \leq .001$.

observed in 1990 disappeared in most cases by 2002. In the next section, we explored family, English proficiency, and school characteristics to try to explain why Asian students' math achievement decreased sharply between these two cohorts.

Asian Students' Families in 1990 and 2002

As Table 1.3 indicates, Asian students had socioeconomic advantages in the earlier cohort of 1990, relative to White students. These students were also more likely to live in two biological-parent families and were less likely to live in single-parent families. Asian students also had parents with statistically significant higher educational expectations than did White students.

After disaggregating Asian students by generational status, we found that 2nd generation Asian students experienced even greater family

Achievement by Generational
d Coefficients)

ELS 2002		Between Cohort
Model 1b	*Model 2b*	
– 0.03		a
(0.40)		
	–1.19+	a
	(0.69)	
	–0.31	a
	(0.71)	
	0.58	a
	(0.49)	
	0.11	
	(1.42)	

NELS data and models 1b and 1b were
n Whites are the omitted reference
roup. The between cohort contrast
n 1990 and 2002 were statistically signif-
d as: A). To analyze the between cohort
mmy variable indicating whether the
ndard errors in parentheses (SE). *P*-val-
errors.

ses by 2002. In the next section,
and school characteristics to try
achievement decreased sharply

d 2002

ad socioeconomic advantages in
te students. These students were
l-parent families and were less
sian students also had parents
cational expectations than did

y generational status, we found
perienced even greater family

advantages than did foreign-born Asian students (we combined 1st and 1.5 generations here because separate analyses did not change the conclusions of our findings) in 1990. On average, 2nd generation students had statistically significant higher socioeconomic levels and showed a higher incidence of two-biological parent families than did foreign-born students. Similarly, 2nd generation Asian students had fewer siblings at home than did foreign-born Asian students.

In contrast, in 2002 a somewhat different pattern was observed when comparing Asian students' family characteristics to White students'. Asian students still had parents with higher educational expectations and were more likely to live with their two biological parents than White students. However, the fact that Asian students showed lower socioeconomic levels than White students may suggest that some Asian parents may have difficulty providing good educational opportunities and access to resources for their children in 2002. As in 1990, there were stronger disadvantages in socioeconomic status for foreign-born Asian students than for 2nd generation Asian students.

Moreover, there were important differences in Asian students' family characteristics between the two cohorts. The initial advantages of Asian students' family environment observed in 1990, diminished significantly by the later cohort. Although Asian students in 1990 still had parents with higher educational expectations and were more likely to live with their two biological parents than were White students, these advantages were less pronounced in 2002. In contrast, in 2002, Asian children lived in homes with fewer economic resources than did Asian students in 1990. These patterns were observed for all Asian students, regardless of generation.

Asian Students' English Proficiency in 1990 and 2002

As expected, Asian students were more likely to live in non-English speaking homes and not be proficient in English than White students in both cohorts (see bottom part of Table 1.3). In 1990, foreign-born and 2nd generation Asian students were equally as likely to live in English-speaking homes but a lower proportion of 2nd generation Asian students were nonproficient in English. In 2002, higher proportions of 2nd generation Asian students were living in English speaking homes and were also English proficient, relative to foreign-born Asian students.

After comparing the two cohorts of Asian students, we observed a higher incidence of English speaking homes but a lower incidence of English proficiency in 2002 than in 1990, which imply the existence of important linguistic disadvantages. This pattern was observed for both foreign-born and 2nd generation Asian students.

Table 1.3. Descriptive Statistics of Family Characteristics (Mean or Percentages)

	NELS (1990)					*ELS (2002)*					
	White	*Asian*	*Asian Foreign*	*Asian 2nd Gen*	*Within Cohort*	*White*	*Asian*	*Asian Foreign*	*Asian 2nd Gen*	*Within Cohort*	*Between Cohort*
SES	0.18 (0.74)	0.27 (0 .89)	0.28 (0.87)	0.54 (0.89)	abc	0.24 (0.68)	0.01 (0.86)	−0.15 (0.89)	0. 08 (0.85)	abc	Efg
% two biological parents	73.15 (44.32)	83.54 (37.10)	83.13 (37.49)	87.42 (33.21)	abc	66.26 (47.28)	70.44 (45.65)	68.84 (46.36)	70.96 (45.43)	ac	Efg
% two-parents, 1 biological	11.83 (32.30)	4.93 (21.66)	4.58 (20.93)	3.37 (18.08)	abc	14.68 (35.40)	11.45 (31.86)	11.01 (31.33)	11.47 (31.89)	abc	Efg
% single-parent family	13.56 (34.24)	9.07 (28.74)	9.16 (28.88)	7.98 (27.13)	abc	16.58 (37.20)	13.31 (33.99)	14.18 (34.92)	13.31 (34.00)	ac	Efg
% other	1.45 (11.96)	2.46 (15.51)	3.13 (17.44)	1.23 (11.03)		2.47 (15.52)	4.80 (21.38)	5.97 (23.72)	4.25 (20.19)	abc	Efg
# of siblings	2.06 (1.43)	2.10 (1.48)	2.35 (1.66)	1.75 (1.13)	bc	2.09 (1.39)	2.18 (1.70)	2.20 (1.75)	2.23 (1.67)		G
Parent's expectations	3.75 (0.90)	4.25 (0.87)	4.26 (0.89)	4.37 (0.80)	abc	4.22 (0.75)	4.45 (0.70)	4.44 (0.72)	4.49 (0.66)	abc	Efg
% English home language	95.62 (20.46)	19.12 (39.35)	8.77 (28.32)	9.73 (29.68)	abc	99.08 (9.53)	30.57 (46.09)	18.84 (39.14)	29.18 (45.49)	abc	Efg
%English nonproficient	1.35 (11.54)	28.19 (43.23)	32.94 (47.06)	16.41 (37.10)	abc	0.05 (6.75)	36.44 (48.14)	51.12 (50.03)	30.17 (45.93)	abc	Efg
Sample size	9,846	910	422	329		7,206	1,397	536	706		

Note: Descriptive statistics are based on nonmissing cases. Within cohort differences significant at .05 level (or lower) are specified as: a (White vs. Asian), b (White vs. Asian foreign-born students), and c (White vs. Asian 2nd generation). Between cohorts differences significant at .05 level (or lower) are specified as: e (Asian in 1990 vs. Asian in 2002), f (Asian foreign-born in 1990 vs. Asian foreign-born in 2002), and g (Asian 2nd generation in 1990 vs. Asian 2nd generation in 2002). Standard deviations are in parentheses.

Asian Stud

Table 1.4
between Asi
dents were n
than White
greater conc
White stude
dents experi
ment and sc

However,
White stude
also have a l
students. As
greater conc
White studer
attended sch

The scho
and the soci
dents' socioe
we observed
attended in
note that a
less desirable
higher conc
qualified tea
Asian studen
the earlier c
more likely t

Asian Studies and Environmen

In this sec
ciency, and
achievement
shows the HI
ples of the tw
tion White st
(Cohort 02),
2002 and 19
ational Statu

	(1.43)	(1.48)	(1.66)	(1.13)		(1.39)	(1.70)	(1.75)	(1.67)		
Parent's expectations	3.75 (0.90)	4.25 (0.87)	4.26 (0.89)	4.37 (0.80)	abc	4.22 (0.75)	4.45 (0.70)	4.44 (0.72)	4.49 (0.66)	abc	Efg
% English home language	95.62 (20.46)	19.12 (39.35)	8.77 (28.32)	9.73 (29.68)	abc	99.08 (9.53)	30.57 (46.09)	18.84 (39.14)	29.18 (45.49)	abc	Efg
%English nonproficient	1.35 (11.54)	28.19 (43.23)	32.94 (47.06)	16.41 (37.10)	abc	0.05 (6.75)	36.44 (48.14)	51.12 (50.03)	30.17 (45.93)	abc	Efg
Sample size	9,846	910	422	329		7,206	1,397	536	706		

Note: Descriptive statistics are based on nonmissing cases. Within cohort differences significant at .05 level (or lower) are specified as: a (White vs. Asian), b (White vs. Asian foreign-born students), and c (White vs. Asian 2nd generation). Between cohorts differences significant at .05 level (or lower) are specified as: e (Asian in 1990 vs. Asian in 2002), f (Asian foreign-born in 1990 vs. Asian foreign-born in 2002), and g (Asian 2nd generation in 1990 vs. Asian 2nd generation in 2002). Standard deviations are in parentheses.

Asian Students' School Environments in 1990 and 2002

Table 1.4 shows that although private school enrollment was similar between Asian and White students in the earlier cohort of 1990, Asian students were more likely to attend higher socioeconomic status (SES) schools than White students. Similarly, Asian students attended schools with a greater concentration of immigrant and racial minority students than White students. Further analysis showed that 2nd generation Asian students experienced important school advantages in terms of private enrollment and school composition, relative to foreign-born Asian students.

However, in 2002, Asian students were significantly less likely than White students to attend private schools and the schools they attended also have a higher concentration of poor students, compared with White students. Asian students in the later cohort also attended schools with a greater concentration of immigrant and racial minority students than did White students. In 2002, foreign-born and 2nd generation Asian students attended schools that were not much different from each other.

The schools children attend often reflect where their families reside and the socioeconomic resources their families have. Because Asian students' socioeconomic levels were less advantageous in 2002 than in 1990, we observed less desirable characteristics of the schools Asian students attended in 2002 than those schools attended in 1990. It is important to note that a greater concentration of poor or immigrant students is not less desirable in itself, but the main problem is that usually schools with a higher concentration of minority students are more likely to have less qualified teachers and fewer educational resources (Orfield & Lee, 2006). Asian students in the later cohort were less likely than Asian students in the earlier cohort to attend private school. Similarly, Asian students were more likely to attend higher SES schools in 1990 than in 2002.

Asian Students' Families, English Proficiency, and School Environments and the Asian-White Math Achievement Gaps

In this section we focused on analyzing whether family, English proficiency, and school environment impact changes in the Asian-White achievement gaps between the two cohorts (from 1990 to 2002). Table 1.5 shows the HLM results of the multivariate analysis on the combined samples of the two cohorts of Asian and White students. The 3rd-plus generation White students were the reference group. The upper part of the table (Cohort 02), showed the average differences in math text scores between 2002 and 1990 for all students. The next section of the Table 1.5 (Generational Status in 1990), showed the math achievement gaps between

Table 1.4. Descriptive Statistics of School Characteristics

	NELS (1990)					*ELS (2002)*					
	White	*Asian*	*Asian Foreign*	*Asian 2nd Gen*	*Within Cohort*	*White Asian*	*Asian*	*Asian Foreign*	*Asian 2nd Gen*	*Within Cohort*	*Between Cohort*
Urban	21.06 (40.78)	43.63 (49.62)	44.79 (49.79)	43.16 (49.61)	abc	23.94 (42.67)	44.17 (49.68)	47.20 (49.92)	44.33 (49.71)	abc	
Suburban	41.38 (49.25)	45.60 (49.83)	45.26 (49.83)	47.11 (50.00)	ac	50.76 (50.00)	50.25 (50.02)	46.46 (49.92)	51.28 (50.02)		e
Rural	37.56 (48.43)	10.77 (31.02)	9.95 (29.97)	9.73 (29.68)	abc	25.30 (43.48)	5.58 (22.97)	6.34 (24.40)	4.39 (20.50)	abc	efg
Average SES	0.09 (0. 50)	0.17 (0.56)	0.05 (0.54)	0.31 (0.56)	ac	0.15 (0.41)	0.02 (0.48)	-0.04 (0.46)	0.03 (0.49)	abc	efg
Private	14.09 (34.79)	15.28 (35.99)	8.29 (27.61)	20.97 (40.77)	bc	27.09 (44.45)	10.45 (30.60)	7.46 (26.30)	9.92 (29.91)	abc	e g
% Immigrants	10.61 (12.76)	37.46 (26.01)	42.23 (26.44)	37.03 (24.17)	abc	13.65 (14.76)	57.38 (28.77)	57.50 (30.23)	59.87 (27.15)	abc	efg
% Blacks & Latinos	10.86 (15.52)	20.43 (20.71)	25.21 (22.27)	16.79 (17.95)	abc	13.86 (15.93)	24.53 (20.39)	24.91 (20.43)	24.96 (20.57)	abc	e g
Sample size	9,846	910	422	329		7,206	1,397	536	706		

Note: Descriptive statistics are based on nonmissing cases. Within cohort differences significant at .05 level (or lower) are specified as: a (White vs. Asian), b (White vs. Asian foreign-born students), and c (White vs. Asian 2nd generation). Between cohorts differences significant at .05 level (or lower) are specified as: e (Asian in 1990 vs. Asian in 2002), f (Asian foreign-born in 1990 vs. Asian foreign-born in 2002), and g (Asian 2nd generation in 1990 vs. Asian 2nd generation in 2002). Standard deviations are in parentheses.

Whites and Asian
section (Generatio
gaps between Whi
1990 and 2002.
impact of family a
Model 3 indicat
2002. Regardless
scored about 5 poi
cient in Model
decreased betwee
this finding applie
"Generation * Co
were statistically si
The math achieve
Asian students bet
tistically significan
the findings preser
between White and
Figure 1.1.

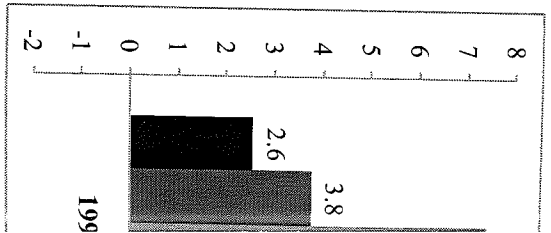

Figure 1.1. Math ach
generational status an

Whites and Asian students of different generations in 1990. The following section (Generation * Cohort 02), showed the differences in achievement gaps between Whites and Asian students of different generations between 1990 and 2002. The remaining two sections of the table showed the impact of family and school characteristics.

Model 3 indicates that math achievement decreased between 1990 and 2002. Regardless of race/ethnicity and generational status, students scored about 5 points lower in 2002 than in 1990 (see "Cohort 02" coefficient in Model 3). Particularly, Asian students' math achievement decreased between the two cohorts relative to White students; however, this finding applies only to Asian students with foreign-born parents (see "Generation * Cohort 02" coefficients where the only coefficients that were statistically significant are those for 1st, 1½, and 2nd generations). The math achievement gap between White and the 3rd-plus generation Asian students between 1990 and 2002 was 1.7 points, but it was not statistically significant different. The between-cohort analysis corroborated the findings presented in Table 1.2. The differences in math achievement between White and Asian students in 1990 and 2002 are represented in Figure 1.1.

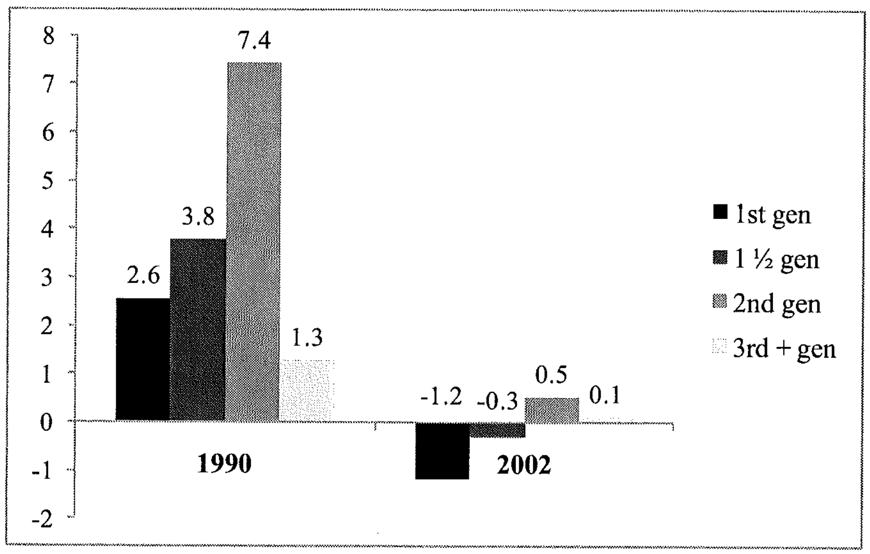

Figure 1.1. Math achievement differences between White and Asian students, by generational status and Cohort (1990 and 2002)

In Model 4, we added family characteristics to the previous model to analyze whether these variables account for the decline in the Asian-White math achievement gaps from 1990 to 2002, signifying the decline of Asian achievement relative to White achievement. Family characteristics explain about 15%, 20%, and 30% for 1st, 1.5, and 2nd generation Asian students, respectively, of the over time decline in the Asian-White achievement gap. To estimate these percentages we compared the coefficients from Models 3 and 4 of the "Generation * Cohort 02" section (for example, for 2nd generation students, [(6.89-4.91) *100/6.89]). As seen in the descriptive findings in Table 1.3, the 2002 cohort had lower socioeconomic status than did the 1990 cohort. Therefore, after taking into account family socioeconomic status, the between-cohort achievement gap narrowed.

Additionally, parents' educational expectations further accounted for the reduction of the math achievement gap between cohorts for 1st and

Table 1.5. Multilevel Analysis of 10th Grader's Math Achievement

	Model 3	*Model 4*	*Model 5*	*Model 6*	*Model 7*
Cohort 02	–4.95***	–4.74***	–6. 90***	-6.93***	–7.04***
	(0.31)	(0.23)	(0.23)	(0.23)	(0.23)
Generational Status (in 1990)					
1st generation	2.56**	5.14***	2.15**	3.35***	3.51***
	(0.87)	(0.84)	(0.83)	(0.92)	(0.92)
1½ generation	3.77***	4.41***	2.13**	2.79***	2.77***
	(0.80)	(0.80)	(0.74)	(0.83)	(0.82)
2nd generation	7.42***	6.26***	4.84***	5.52***	5.44***
	(0.78)	(0.67)	(0.67)	(0.75)	(0.75)
3rd + generation	1.28	–0.34	–0.29	–0.17	–0.27
	(1.43)	(1.33)	(1.32)	(1.31)	(1.30)
Generation * Cohort 02					
1st generation* cohort 02	–3.75***	–3.22**	–2.00+	–1.81+	–1.99+
	(1.11)	(1.10)	(1.07)	(1.07)	(1.07)
1½ generation * cohort 02	–4.08***	–3.25**	–2.79**	–2.69**	–2.74**
	(1.07)	(1.06)	(0.99)	(1.01)	(1.02)
2nd generation * cohort 02	–6.89***	–4.91***	–4.98***	–4.90***	–4.84***
	(0.92)	(0.81)	(0.82)	(0.82)	(0.82)
3rd + generation * cohort 02	–1.17	-1.06	-1.55	-1.51	–1.50
	(2.01)	(1.86)	(1.86)	(1.86)	(1.84)
Family Characteristics					
Socioeconomic status		5.69***	3.75***	3.71***	3.54***
		(0.13)	(0.13)	(0.13)	(0.13)

aracteristics to the previous model to unt for the decline in the Asian-White 0 to 2002, signifying the decline of e achievement. Family characteristics or 1st, 1.5, and 2nd generation Asian ne decline in the Asian-White achieve-ntages we compared the coefficients ation * Cohort 02" section (for exam-6.89-4.91) *100/6.89]). As seen in the he 2002 cohort had lower socioeco-cohort. Therefore, after taking into us, the between-cohort achievement

l expectations further accounted for ent gap between cohorts for 1st and

10th Grader's Math Achievement

Model 4	*Model 5*	*Model 6*	*Model 7*
4.74***	–6. 90***	-6.93***	–7.04***
(0.23)	(0.23)	(0.23)	(0.23)
.14***	2.15**	3.35***	3.51***
(0.84)	(0.83)	(0.92)	(0.92)
.41***	2.13**	2.79***	2.77***
(0.80)	(0.74)	(0.83)	(0.82)
.26***	4.84***	5.52***	5.44***
(0.67)	(0.67)	(0.75)	(0.75)
–0.34	–0.29	–0.17	–0.27
(1.33)	(1.32)	(1.31)	(1.30)
3.22**	–2.00+	–1.81+	–1.99+
(1.10)	(1.07)	(1.07)	(1.07)
3.25**	–2.79**	–2.69**	–2.74**
(1.06)	(0.99)	(1.01)	(1.02)
.91***	–4.98***	–4.90***	–4.84***
0.81)	(0.82)	(0.82)	(0.82)
-1.06	-1.55	-1.51	–1.50
1.86)	(1.86)	(1.86)	(1.84)
69***	3.75***	3.71***	3.54***
0.13)	(0.13)	(0.13)	(0.13)

Two-parents, 1 biological	–1.47***	–1.23***	–1.24***	–1.16***
	(0.25)	(0.24)	(0.24)	(0.24)
Single-parent family	–0.43+	–0.69***	–0.70***	–0.67**
	(0.22)	(0.21)	(0.21)	(0.21)
Other	–2.03***	–1.80***	–1.75**	–1.64**
	(0.57)	(0.54)	(0.54)	(0.54)
# of siblings	–0.05	0.02	0.03	0.03
	(0.06)	(0.06)	(0.06)	(0.06)
Parent's expectations		4.51***	4.52***	4.51***
		(0.11)	(0.11)	(0.11)
English Home language			0.53	0.50
			(0.43)	(0.43)
English nonproficient			–1.58**	–1.63**
			(0.51)	(0.51)
School Characteristics				
Suburban				0.32
				(0.29)
Rural				0.24
				(0.34)
Private				1.44***
				(0.31)
% Immigrants				1.98**
				(0.71)
% Black and Latinos				–4.31***
				(0.66)

Note: Third-plus generation Whites are the omitted reference group, so all coefficients are gaps relative to that group. We included gender and age as control variables. Robust standard errors in parentheses (*SE*). *P*-values are based on estimations with robust standard errors.

$+ p \leq .10$, $* p \leq .05$, $** p \leq .01$, $*** p \leq .001$.

1.5 generation Asian students (Model 5). Parents' educational expectations reduced the between-cohort difference in math achievement between White students and 1st generation Asian students by about 45% [(3.75-2.00) *100/3.75]. The Asian-White achievement gap in 1990 was no longer significantly different from the Asian-White achievement gap in 2002. The 1.5 generation Asian-White students math achievement gap between the two cohorts was reduced by 14%. Thus, the decrease in the Asian-White difference in parental expectations has important implications for the between-cohort achievement gaps.

In contrast, English limited proficiency did not seem to have a major impact in reducing the between-cohort achievement gaps, in the face of family characteristics and parents' educational expectations (Model 6).

Only for the 1st generation students, we observed a reduction of about 10% of the Asian-White achievement gap between 1990 and 2002. In Model 7, we added school variables. Although we observed some significant associations of school characteristics on math achievement, these variables did not help explain the between-cohort Asian-White math achievement gaps above and beyond the impact of the family characteristics that we observed in previous models.

Turning away from explaining the changes in math achievement gaps between 1990 and 2002, it is worth noticing that there were important contributions of some family and school characteristics to math achievement, regardless of the cohort analyzed. On average, students attending private schools showed better math outcomes relative to students in public schools. Also, students had lower math scores in schools with higher concentrations of Hispanic and Black students, but students had higher math scores as the concentration of immigrant students increased (after taking into account the presence of Hispanic and Black students in schools).

Additionally, student's math achievement increased by between 3 and 5.5 points as socioeconomic level increased. Students living in two-parent families but with only one biological, in single-parent families, or in other family arrangements displayed weaker math achievement, compared with students with two biological parents (the reference group). Parents' educational expectations were also positively associated with higher math achievement (increase of approximately 4.5 points) but nonproficiency in English was associated with lower math achievement (decrease of about 1.5 points). Schools' characteristics were also related to math test scores.

CONCLUSIONS

Our findings inform current discussions over Asian students' educational outcomes and the controversial label, "model minority." We further previous research on Asian students' education by analyzing their math achievement in two different time periods: 1990 and 2002. We then studied their family and school characteristics, and examined the impact of these variables on Asian and White achievement gaps. As a result, four important findings emerged from this study.

First, Asian students' math achievement significantly decreased between 1990 and 2001. In 1990, Asian students, particularly those with foreign-born parents, showed significantly better math achievement than did White students. However, in 2002 the Asian students' math advantages observed in 1990 disappeared. In the later cohort, no significant math achievement differences were observed between White and Asian

e observed a reduction of about
ap between 1990 and 2002. In
hough we observed some signifi-
ics on math achievement, these
tween-cohort Asian-White math
impact of the family characteris-

anges in math achievement gaps
ticing that there were important
l characteristics to math achieve-
. On average, students attending
omes relative to students in pub-
ath scores in schools with higher
udents, but students had higher
nigrant students increased (after
Hispanic and Black students in

nent increased by between 3 and
sed. Students living in two-parent
single-parent families, or in other
ath achievement, compared with
reference group). Parents' educa-
y associated with higher math
4.5 points) but nonproficiency in
achievement (decrease of about
also related to math test scores.

ONS

over Asian students' educational
odel minority." We further previ-
cation by analyzing their math
ds: 1990 and 2002. We then stud-
ics, and examined the impact of
ievement gaps. As a result, four
udy.

evement significantly decreased
students, particularly those with
tly better math achievement than
the Asian students' math advan-
n the later cohort, no significant
served between White and Asian

students. Clearly, the educational advantage and the model minority image usually associated with Asian students do not uphold, at least for 10th graders.

Second, Asian students' family and school characteristics also changed between the two cohorts, especially in regard to their economic conditions. In 1990, Asian students, on average, not only experienced important economic and social capital advantages because of having additional material and parental resources at home, but their outcomes may also be positively affected by the encouragement and support that parents with high educational expectations usually provide for their children. However, the later 2002 cohort of Asian students had substantially lower family socioeconomic conditions. Although the later cohort was still more likely than White students to live with two biological parents and to have high educational expectations from parents, they tended to have lower socioeconomic status. In the case of Asian students, we found not only that their socioeconomic levels decreased between cohorts but we also found that their socioeconomic disadvantages were related to school disadvantages. After comparing the two cohorts of Asian students, we found a significant decrease in private school enrollment and an increase in attendance in schools with lower SES students and higher concentration of minority students. Thus, it is plausible that Asian students in 2002 were more likely to attend lower-quality schools (i.e., school with a higher concentration of poverty, less qualified teachers, or with fewer resources) than in 1990.

Third, Asian students' English proficiency also decreased between 1990 and 2002, although the proportion of Asian homes where English was the main language increased between the same time periods. The increase in limited English proficiency among Asian students is particularly problematic. Unlike Latino immigrants, most of whom communicate in Spanish, Asian immigrants are linguistically very diverse and they lack a dominant language resulting in a difficulty with offering bilingual education to Asian students. At the same time, many Asian students are limited in English proficiency and unable to follow English instructions in class. Furthermore, they are not able to participate in meaningful learning interactions, or to engage in inquiry processes that further learning.

Fourth, although English proficiency and the school environment somewhat account for cohort differences in the Asian-White achievement gaps, family characteristics, including socioeconomic characteristics and parents' educational expectations had the strongest impact. This finding corroborates previous research showing the pervasive effect of family socioeconomic conditions for learning outcomes when families live under poverty conditions. Overall, students from low socioeconomic environments are more likely to obtain lower grades, more likely to be retained,

drop out of high school, and have lower levels of educational attainment than students from economically privileged families (Guo & Harris, 2000; Kao & Thompson, 2003; Lee & Burkham, 2002). However, our results also support the lasting and independent effects of parents' expectations on children's performance. It seems plausible that parents' expectations are indicative of the family norms and values that exist within the home context in which children are raised (Yan & Lin, 2005). Parents' expectations may also reflect parents' general attitudes toward schooling and their belief about the importance of education for social mobility.

It is important to note that although Asian students' academic achievement decreased between 1990 and 2002, relative to White students, these students still showed similar math achievement as did White students in 2002. We also know from previous research that White students as a whole tend to have stronger educational outcomes than other minority students. If the migration theory that we introduced earlier is correct that immigrant selectively tends to be negative for later waves of immigration, then the decline of Asian achievement may continue. Future studies should further explore whether Asian achievement decline is consistent and prevalent.

IMPLICATIONS FOR EDUCATORS

This study has provided evidence that Asian adolescent students in 10th grade experienced declining achievement relative to White students, from 1990 to 2002. Some of the achievement decline could be explained by cohort differences in Asian students' family characteristics, parental expectations, and English proficiency. These findings are based on math achievement scores so we may be providing an incomplete assessment of Asian students' achievement changes during this time period. Future studies are needed to analyze achievement patterns using alternative measures, including reading achievement scores, GPA, dropout rates and educational attainment. Future studies should also take into account the diversity of the Asian population and should not only focus on Asian American students as one pan-ethnic group. Regardless of these limitations, several implications for educators surface from these results.

First, educators and policymakers should pay more attention to the new sociodemographic trends among Asian immigrants. A significant demographic change in the characteristics of the Asian population seems to be affecting the educational experience of recently-arrived Asian children. Also, educators need to be trained to realize that not all Asian students are able to live up to the "model minority" label. Today's Asian students are much less likely to meet the expectation of the "model minority" image than Asian students a decade ago. Some Asian groups,

r levels of educational attainment
ged families (Guo & Harris, 2000;
ıam, 2002). However, our results
nt effects of parents' expectations
ausible that parents' expectations
values that exist within the home
ın & Lin, 2005). Parents' expecta-
l attitudes toward schooling and
ıcation for social mobility.
Asian students' academic achieve-
2, relative to White students, these
evement as did White students in
ırch that White students as a whole
ɔmes than other minority students.
ed earlier is correct that immigrant
er waves of immigration, then the
inue. Future studies should further
cline is consistent and prevalent.

R EDUCATORS

Asian adolescent students in 10th
ment relative to White students,
vement decline could be explained
ıts' family characteristics, parental
These findings are based on math
viding an incomplete assessment of
during this time period. Future
vement patterns using alternative
ent scores, GPA, dropout rates and
s should also take into account the
d should not only focus on Asian
group. Regardless of these limita-
rs surface from these results.
should pay more attention to the
g Asian immigrants. A significant
istics of the Asian population seems
ience of recently-arrived Asian chil-
ıed to realize that not all Asian stu-
ɔdel minority" label. Today's Asian
eet the expectation of the "model
a decade ago. Some Asian groups,

such as Hmong, Cambodian, and Laotian students may have increased in population over time. These groups have high dropout rates (Rong & Preissle, 2009), and they lag behind other Asian subgroups in academic achievement (Harris et al., 2008). Appropriate remedial and supplemental education may help these students to catch up, and counseling services may assist them to fight the psychological pressure, such as depression or alienation, when these students cannot reach a high level of academic success as predicted by the "model minority" label.

At the same time, educators should avoid singling out the Hmong, Cambodian, and Laotian subgroups for their educational disadvantages. On the one hand, it may lead to negative labeling and stereotyping for these groups. On the other hand, educators should not overlook the socioeconomic and linguistic differences within groups. A salient example is the Chinese students who tended to concentrate in either end of the socioeconomic spectrum (Kasinitz, Mollenkopf, Waters, & Holdaway, 2008). Whereas many Chinese students have high income and educated parents, many others live in poor families with low parental education. Some Chinese students are fluent bilinguals, while a large number of them are not proficient in English. Recognizing that Asian students as a group are very diverse in socioeconomic status and linguistic background is extremely important for teachers and educational administrators, so that they do not lose sight of the disadvantaged Asian students who are overshadowed by their advantaged peers.

Our analysis reveals declining Asian parents' expectations for their children's education, relative to White parents' expectations, when we compared the two cohorts of students. The lower parental expectations from immigrant parents appeared to account for the narrowing of the Asian-White achievement gap. Epstein (2001) argued that the home and school constitute "overlapping spheres of influence" on children's development and academic achievement, and that the degree to which educators and family members maintain positive relationships with one another helps determine children's academic success. Therefore, school outreach efforts to reach Asian parents and to encourage family involvement may be an important way to influence parents' educational expectations and to improve Asian students' educational success. We recommend that schools should make a serious attempt to educate parents, particularly immigrant parents, by showing them the power of high expectations for their children. Vignettes based on the self-fulfilling prophecy (Rist, 2000) can be told, and workshops can be held for parents to help them overcome concerns about their children's future education.

Finally, one could argue that although Asian adolescent students' high degree of academic achievement has declined over time, the recent 2002 cohort still exhibited an achievement level as high as the level of White

students who tend to outperform all other students. This may suggest that there is no need for educators to be concerned. However, we believe that this view encourages mediocrity. It is crucial that educators learn to identify all sources of excellent achievement. Good students should be rewarded and used as role models, and any useful information about reasons for high achievement should be used to design innovative curriculum and instructional strategies that aim at educational excellence for all.

REFERENCES

Bankston, C. L., & Zhou, M. (2002). Doing well: Self-esteem and school performance among immigrant and nonimmigrant racial and ethnic groups. *International Migration Review, 36*, 389-415.

Barnes, J. S., & Bennett, C. E. (2002). *The Asian population: 2000 census 2000 brief* Retrieved from http://www.census.gov/prod/2002pubs/c2kbr01-16.pdf

Blau, P., & Duncan, O. D. (1967). *The American occupational structure*. New York, NY: Wiley.

Borjas, G. (1985). Assimilation, changes in cohort quality, and the earnings of immigrants. *Journal of Labor Economics, 3*, 463-489.

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*, 1215-1234.

Chou, S. R., & Feagin, J. R. (2008). *The myth of the model minority: Asian Americans facing racism.* Boulder, CO: Paradigm.

Coleman, J. S. (1990). *Equality and achievement in education*. San Francisco, CA: Westview Press.

Epstein, J. 2001. *School, family, and community partnerships: Preparing educators and improving schools*. Boulder, CO: Westview Press.

Feliciano, C. (2005). Educational selectivity in U.S. immigration: How do immigrants compare to those left behind? *Demography, 42*, 131-152.

Kibria, N. (1993). *Family tightrope: The changing lives of Vietnamese Americans*. Princeton, NJ: Princeton University Press.

Fuligni, A. J. (1997). The academic achievement of adolescents from immigrant families: The role of family background, attitudes, and behavior. *Child Development, 68*, 351-363.

Fung-Arto, G. (2007). Academically at-risk English language learners of Chinese background: A pilot Study. In C. C. Park, R. Endo, S. Lee, & X. L. Rong (Eds.), *Asian American education: Acculturation, literacy development, and learning* (pp. 155-166). Charlotte, NC: Information Age.

Galindo, C. (2010). English language learners' math and reading trajectories in the elementary grades. In E. Garcia & E. Frede (Eds.), *Young English language learners: Current research and emerging directions for practice and policy* (pp. 42-59). New York, NY: Teachers College Press.

Glick, J. E., & White, M. J. (2003). The academic trajectories of immigrant youths: Analysis within and across Cohorts. *Demography, 40*, 759-784.

Guo, G., & Harris, K. M. (2000). The mechanisms mediating the effects of poverty on children's intellectual development. *Demography, 37*, 431-447.

Hao, L., & Bonstead-Bruns, M. (1998). Parent-child differences in educational expectations and the academic achievement of immigrant and native students. *Sociology of Education, 71*, 175-198.

Harris, A. L., Jamison, K. M., & Trujillo, M. H. (2008). Disparities in the educational success of immigrants: An assessment of the immigrant effect for Asians and Latinos. *The Annals of the American Academy of Political and Social Science, 620*, 90-115.

Hirschman, C. (2001). The educational enrollment of immigrant youth: A test of the segmented-assimilation hypothesis. *Demography, 38*, 317-336.

Hurh, W. M., & Kim, K. C. (1989). The "success" image of Asian Americans: Its validity, and its practical and theoretical implications. *Racial and Ethnic Studies, 12*, 512-538.

Kasinitz, P., Mollenkopf, J. H., Waters, M. C., & Holdaway, J. (2008). *Inheriting the city: The children of immigrants come of age*. New York, NY: Russell Sage Foundation

Kao, G. (1995). Asian American as model minorities? A look at their academic performance. *American Journal of Education, 103*, 121-159.

Kao, G. (2004). Parental influences on the educational outcomes of immigrant youth. *International Migration Review, 38*, 427-449.

Kao, G., & Thompson, J. S. (2003). Racial and ethnic stratification in educational achievement and attainment. *Annual Review of Sociology, 29*, 417-442.

Kao, G., & Tienda, M. (1995). Optimism and achievement: The educational performance of immigrant youth. *Social Science Quarterly, 76*(1), 1-19.

Kitano, H., & Sue, S. (1973). The model minorities. *The Journal of Social Issues, 29*, 1-9.

Lee, S. (2001). More than 'model minority' or "delinquents": A look at Hmong American high school students. *Harvard Educational Review, 71*, 505-528.

Lee, V. & Burkham, D. (2002). *Inequality at the starting gate: Social background differences in achievement as children begin school*. Washington, DC: Economic Policy Institute.

Lew, J. (2006). *Asian Americans in class: Charting the achievement gap among Korean American youth.* New York, NY: Teachers College Press.

Li, G. & Wang, L. (2008). *Model minority myth revisited: An intersdiciplinary approach to demystifying Asian American educational expereinces.* Greenwich, CO: Information Age.

Liang, Z., & Morooka, H. (2004). Recent trends of emigration from China: 1982-2000. *International Migration, 42*(3), 145-164.

Liu, J. M., & Cheng, L. (1994). Pacific rim development and the duality of post-1965 Asian immigration to the United States. In P. Ong, E. Bonacich, & L. Ceng (Eds.), *The new Asian immigration in Los Angeles and global restructuring* (pp. 74-99). Philadelphia, PA: Temple University Press.

Martin, P., & Midgley, E. (2006). Immigration: Shaping and reshaping America. *Population Bulletin, 61*(4), 1-28.

Massey, D. S., Arange, J., Hugo, G., Kouaouci, A., Pellegrino, A., & Taylor, E. (1993). Theories of international migration: A review and appraisal. *Population and Development Review, 19*, 431-466.

McLanahan, S., & Sandefur, G. (1994). *Growing up with a single-parent: What hurts, what helps?* Boston, MA: Harvard University Press.

National Center for Education Statistics. (1999). *Generational status and educational outcomes among Asian and Hispanic 1988 eighth graders*. Washington D.C.: Office of Educational Research and Improvement, U.S. Department of Education. Retreived from http://nces.ed.gov/pubs99/1999020.pdf

National Center for Education Statistics. (2007). *Education longitudinal study of 2002 (ELS:2002) base-year to second follow-up data file documentation* (NCES 2008-347). Washington DC: Office of Educational Research and Improvement, U.S. Department of Education. Retrieved from http://nces.ed.gov/pubs2008/2008347.pdf

Ngo, B., & Lee, S. J. (2007). Complicating the image of model minority success: A review of Southeast Asian American education. *Review of Educational Research, 77*, 415-453.

Orfield, G., & Lee, C. C. (2006). *Racial transformation and the changing nature of segregation. report for the civil rights project*. Cambridge, MA: The Civil Rights Project at Harvard University. Retrieved from http://www.swannfellowship.org/research/files07/racialtransformation.pdf

Park. C. C. (2003). Educational and occupational aspirations of Asian American students. In C. C. Park, A. L. Goodwin, & S. J. Lee (Eds.), *Asian American identities, families, and schooling* (pp. 135-156). Greenwich, CO: Information Age.

Pong, S. (1997). Family structure, school context, and eighth-grade Math and Reading achievement. *Journal of Marriage and the Family, 59*, 734-746.

Pong, S. (2003). *Immigrant children's school performance*: Population Research Institute working paper series, Penn State University. Retrieved from http://www.pop.psu.edu/general/pubs/working_papers/psu-pri/wp0307.pdf

Pong, S., & Hao, L. (2007). Neighborhood and school factors in the school performance of immigrants' children. *International Migration Review, 41, 206-241.*

Pong, S., Hao, L., & Gardner, E. (2005). The proles of parenting styles and social capital in the school performance of immigrant Asian and Hispanic adolescents. *Social Science Quarterly, 86*, 928-949.

Portes, A., & Hao, L. (1998). E Pluribus Unum: Bilingualism and loss of language in the second generation. *Sociology of Education, 71*, 269-294.

Raudenbush, S. W., & Bryk, A. (2002). *Hierarchical linear models. Applications and data analysis methods*. Thousand Oaks, CA: SAGE.

Rist, R. C. (2000). HER Classis: Student social class and teacher expectations: The self-fulfilling prophecy in ghetto education. *Harvard Educational Review 70*, 257-301.

Rong, X. L., & Grant, L. (1992). Ethnicity, generation, and school attainment of Asians, Hispanics, and non-Hispanic Whites. *Sociological Quarterly, 33*, 624-636.

Rong, X. L., & Preissle, J. (2009). *Educating immigrant students in the 21st century: What educators need to know.* Thousand Oaks, CA: Corwin Press.

Rumbaut, R. G. (1995). The new Californians: Comparative research findings on the educational progress of immigrant children. In R. G. Rumbaut & W. A. Cornelius (Eds.), *California's immigrant children : theory, research, and implications for educational policy* (pp. 17-70). San Diego, CA: Center for U.S.-Mexican Studies, University of California.

Schwartz, A. E., & Stiefel, L. (2006). Is there a native gap? New evidence on the academic performance of immigrant students. *Education Finance and Policy, 1*, 17-49.

Steinberg, L., Dornbusch, S. M., & Brown, B. B. (1992). Ethnic differences in adolescent achievement. *American Psychologist, 47*, 723-729.

Stevenson, H. W., Lee, S. Y., Chen, C., Lummis, M., Stigler, J., Fan, L., et al. (1990). Mathematics achievement of children in China and the United States. *Child Development, 61*, 1053-1066.

Thao, P. (1999). *Hmong education at the crossroads*. New York, NY: University Press of America.

U.S. Department of Commerce. (1993). *We the Americans: Asians*. Washington, DC: Economics and Statistics Administration, Bureau of the Census. Retrieved from http://www.census.gov/apsd/wepeople/we-3.pdf

Vernez, G., & Abrahamse, A. (1996). *How immigrants fare in U.S. education*. Santa Monica, CA: RAND.

Walker-Moffat, W. (1995). *The other side of the Asian American success story*. San Francisco, CA: Jossey-Bass.

Wang, J., & Goldschmidt, P. (1999). Opportunity to learn, language proficiency, and immigrant status effects on mathematics achievement. *Journal of Educational Research, 93*, 101-111.

White, K. R. (1982). The relationship between socio-economic status and academic achievement. *Pyschological Bulletin, 91*, 461-481.

Yan, W., & Lin, Q. (2005). Parent involvement and mathematics achievement: Contrast across racial and ethnic groups. *Journal of Educational Research, 99*, 116-127.

Zhou, M. (1997). Growing Up American: The challenge confronting immigrant children and children of immigrants. *Annual Review of Sociology, 23*, 63-95.

Zhou, M., & Bankston, C. (1998). *Growing up American: How Vietnamese children adapt to life in the United States*. New York, NY: Russell Sage Foundation.

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*, 1-29.