The Gender Gap and Asian American Achievement

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September 22, 2014

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Abstract

Little is known about whether a gender gap in achievement exists among Asian Americans and how it may contribute to Asian American academic success over whites. Data from the ECLS-K and ELS are combined to describe patterns in academic performance from kindergarten to high school. Preliminary findings suggest that the Asian American advantage in schools is due to: 1) the relative success of Asian girls and 2) Asian boys not doing as poorly as white boys. Stratifying by mothers' education reveals no evidence of an Asian advantage among children of the best-educated mothers: white boys do as well as Asian boys and white girls do as well as Asian girls. Among the children of the least skilled, an Asian advantage is observed but this advantage is primarily driven by the achievement of Asian girls. Asian boys, however, do as poorly as white boys and white girls.

Introduction

Intense attention has been paid to the "problem with boys" or the widely documented underachievement of boys relative to girls in education (Buchmann et al., 2008; DiPrete and Jennings 2012; Legewie and DiPrete, 2012). Some scholars have characterized this rising gender inequality in education as signaling the "rise of women" (DiPrete and Buchmann 2013). For example, girls are either equaling or outpacing boys in terms of electing rigorous coursework in high school (Xie and Shauman 2003; Catsambis 2005). At the same time, they are obtaining higher grades than boys from elementary through high school (Perkins et al 2004). Girls attain higher levels of ultimate educational attainment than boys because they more likely to graduate high school (Snyder and Dillow 2007) and attend and complete college (Buchman and DiPrete 2006).

Left largely unexamined in the literature is the question of whether similar gender gaps exist among Asian Americans and how such a gap contributes to the Asian American advantage over whites in education. Answering these questions is important for Asian American scholarship because despite of the fact that Asian American academic success is widely documented, there is still no commonly agreed upon explanation for this phenomenon (Sue and Okazaki 1990). Better understanding the sources of their achievement over whites moves us closer to an explanation. The case of Asian Americans also offers an interesting vantage point for understanding processes that generate gender inequalities in education by offer insight into whether certain groups better mitigate the biological and/or socio-cultural factors that put boys at a disadvantage in schools.

The current study seeks to address four related questions: 1) Is there a gender gap in Asian American academic achievement and how does it compare to the gender gap among whites?, 2) to what extent does a gap (or the absence of a gap) contribute to the Asian American advantage in achievement relative to whites?, 3) does the direction and degree of the gender gap vary by family SES?, and 4) to what extent do differentials in the gender gap in non-cognitive skills (i.e. academic

effort, orientation towards learning, social and behavioral skills) and cognitive ability explain differentials in the gender gap in achievement between Asians and white?

The current study combines two nationally representative longitudinal studies, the Early Childhood Longitudinal Study, Kindergarten Cohort (ECLS-K) and the Education Longitudinal Study (ELS), to compare Asian American and white students in their educational trajectories from kindergarten through high schools. Achievement outcomes are measured in terms of teacher ratings of classroom performance in reading and math (from the ECLS-K) and in terms of grade point average or GPA (from the ELS). Cognitive ability is measured using standardized tests in reading and math. Teacher reports of students' classroom behavior and students' self-reports of work ethic and orientation towards learning measure social and behavioral skills.

Preliminary results offer interesting findings. For both whites and Asians, girls outperform boys. Moreover, differentials in the gender gap between whites and Asians contribute to the overall Asian advantage over whites. Specifically, the findings show that the Asian-white gap in academic achievement can be attributed to: 1) the achievement successes of Asian girls relative to all others and 2) the fact that Asian boys are not doing as poorly as white boys. Stratifying by mothers' education reveals important variation by social class. There is no evidence of an Asian advantage among children of the best-educated mothers. Among these children, white boys do as well as Asian boys and white girls do as well as Asian girls. Among the children of the least skilled (mothers without a high school diploma), an Asian advantage is observed but this advantage is primarily driven by the achievement of Asian girls. Asian boys, on the other hand, do as poorly as white boys and white girls. This finding suggests that Asian boys of low skilled parents are a group whose relative vulnerability and disadvantage have been overshadowed by the popular image of Asian Americans as model minorities who have achieved unparalleled academic success.

2. Data and Methods

The ECLS-K is a national, longitudinal study of a cohort of students who entered kindergarten in 1998. Students were interviewed in kindergarten and in the first, third, fifth and eighth grades. The ELS is a national cohort of high school sophomores in 2002 with re-interviews in 2004. Both surveys over-sampled Asian Americans. The study analyzes a sample of Asian American and white students in the same school environments. This means that all white (Asian) students had to have attended a school where at least one Asian American (white) student was also surveyed. Individuals who had missing values for academic achievement in any wave are excluded. Individuals with missing values for cognitive ability and/or academic effort in 2 or more waves in the ECLS-K are also excluded. In the ELS, individuals with missing values for cognitive ability and effort at baseline are excluded. For those included in the final sample, multiple imputations were used to compute missing values. The final analytical sample for the ECLS-K consists of 1,368 whites and 244 Asians who were continuously followed from Kindergarten to 8th grade. The final analytical sample for the ELS consists of 2,878 whites and 745 Asians. The sample of Asians Americans from the ELS is large enough to conduct analysis of Asian ethnic groups and for stratification by mothers' education; the sample from the ECLS-K is not.

Measurement of academic achievement in the ECLS-K came from teachers' ratings of students in terms of their proficiency in reading, math and general knowledge/science (1="Not yet proficient," 5="Proficient") from kindergarten to 8th grade. In the ELS, we use GPA (grade point average) from 9th to 12th grade. Cognitive ability is measured using Item Response Theory (IRT) scores derived from standardized tests of math and reading. Although academic achievement and cognitive ability measurements are highly correlated, they differ in source of information. Whereas measurement of academic achievement was given by teachers, measurement of cognitive ability

came from standardized tests. Tests are administered in the ECLS-K at each wave. In the ELS, they are administered only when students are in 10th grade.

Various indicators were use to measure non-cognitive skills or a class of behaviors, orientations and attitudes towards academic effort, motivation and orientation towards learning. To measure academic effort, I rely on teachers' evaluations of students' classroom behavior and attitudes. In the ECLS-K, I use the *approaches to learning scale*, which is based on teacher ratings of students' attentiveness, task persistence and eagerness to learn on a four-point scale. In the ELS, math and reading teachers were asked two questions aimed at capturing students' work habits and motivation. The first item asked teachers to rate students in terms of their attentiveness on a four-point scale ranging from never attentive to attentive all the time. The second asked teachers whether they agreed or disagreed that the student works hard for his/her grades. Responses to these two questions were combined using an additive index, with each response assigned equal weight. Finally, following measures were used to capture *orientation towards learning*: students' responses to three survey items asking the extent to which they agreed to the statement that (a) they "need to be born with ability to be good at math," (b) they "learned to be good at math," and (c) their parents expected them to succeed. Responses were measured on a 4-point scale with higher values indicating greater agreement. Measures of achievement, cognitive ability and non-cognitive skills are standardized at each wave to have a mean of zero and standard deviation of one.

All analyses compare Asian and white students who attend the same school rather than students who attend different schools. This method addresses two sources of bias: (a) differences in the types of schools that Asian Americans and whites are likely to attend (e.g. school quality, course difficulty, socio-demographic composition of student body) and (b) self-selection of Asian Americans into school districts. Restricting analysis to within-school comparisons reduces the Asian-

white gap in academic achievement and academic effort. Therefore, within-school estimates are methodologically conservative estimates.

Preliminary Results

Figure 1 plots the predicted academic achievement scores by race and sex using estimates obtained from school-fixed effect regressions. These results are not adjusted for additional controls. Kindergarten to 8th grade estimates are obtained from the ECLS-K and 9th grade to 12th grade estimates are obtained from the ELS. The results show a significant gender gap among Asian and white students. Among whites, we see that the gender gap becomes statistically significant by 5th grade and that it continues to grow into high school. Among Asians, the gender gap is only significant in high school and stays relatively constant from 9th to 12th grade. While both Asian boys and white boys underperform relative to their female counterparts, Asian boys are not underperforming as poorly as white boys. In fact, Asian boys are not significantly different that white girls. The findings suggest that the overall Asian American advantage in achievement is driven by the relative success of Asian American girls and by the fact that Asian boys are not doing as poorly as white boys.

Because Asian immigrants to the United States are overrepresented at the low and high end of the educational distribution (Goyette et al., 2009), it is important to stratify analysis by mothers' education. Figure 2 show the stratified results from school-fixed effects using 9th grade GPA as measures of academic achievement. The results show significant variation by mothers' education. Strikingly, we see no evidence of an Asian advantage in achievement among children of the most educated mothers. For example, among children of the highest educated mothers, Asian girls do not significantly differ from white girls and Asian boys do not significantly differ from white boys. The same is true for children with mothers with some post-secondary schooling. An Asian advantage is observed for children of less educated mothers. For example, among the children of mothers who

are high school graduates, the Asian advantage is driven both by the achievement success of Asian girls and boys. They do as well as white girls in schools. White boys however underperform relative to everybody else. Among children of the least educated mothers or those without a high school diploma, Asian boys perform as poorly as white girls and boys. Asian achievement advantages among the least educated is driven by the relative high achievement of Asian girls. This final finding suggests that Asian boys from low SES families are a group whose disadvantage in schools has largely gone unnoticed because of the relatively high achievement of their female, Asian counterparts.

Future work

The underperformance of boys has been attributed to gender norms that characterize academic engagement and demonstrating effort in school as un-masculine. These norms reward girls for working hard for their grades but labels boys, especially boys from lower and working-class backgrounds, who do so as "pussies" and "fags" (Pascoe 2007). Recent work on Asian American achievement has suggested that strong academic engagement and work ethic primary explanations the Asian American advantage in achievement relative to whites (Hsin and Xie 2014; Liu and Xie 2014). These studies show that Asian American students put forth greater academic effort because they are more likely to believe that academic success is the product of effort rather than of innate ability. They show that these differences in attitudes and beliefs, along with immigration status, play a greater role in explaining Asian American achievement over whites than differences in cognitive ability or family SES.

Future work will apply this framework to understanding the gender gap by race/ethnicity. Specifically, future work will determine whether a gender gap among Asians and whites exist in attitudes and values regarding work and achievement and whether such differences explain disparities in achievement by gender and ethnicity. Using the ELS, additional analysis will also be

conducted to disaggregate the pan-Asian category into Asian ethnic subgroups. Doing so will allow

for better understanding of the inherent heterogeneity that exists within the Asian American

community.

Figure 1. Predicted Achievement by Race and Gender from Kindergarten to 12ᵗʰ grade
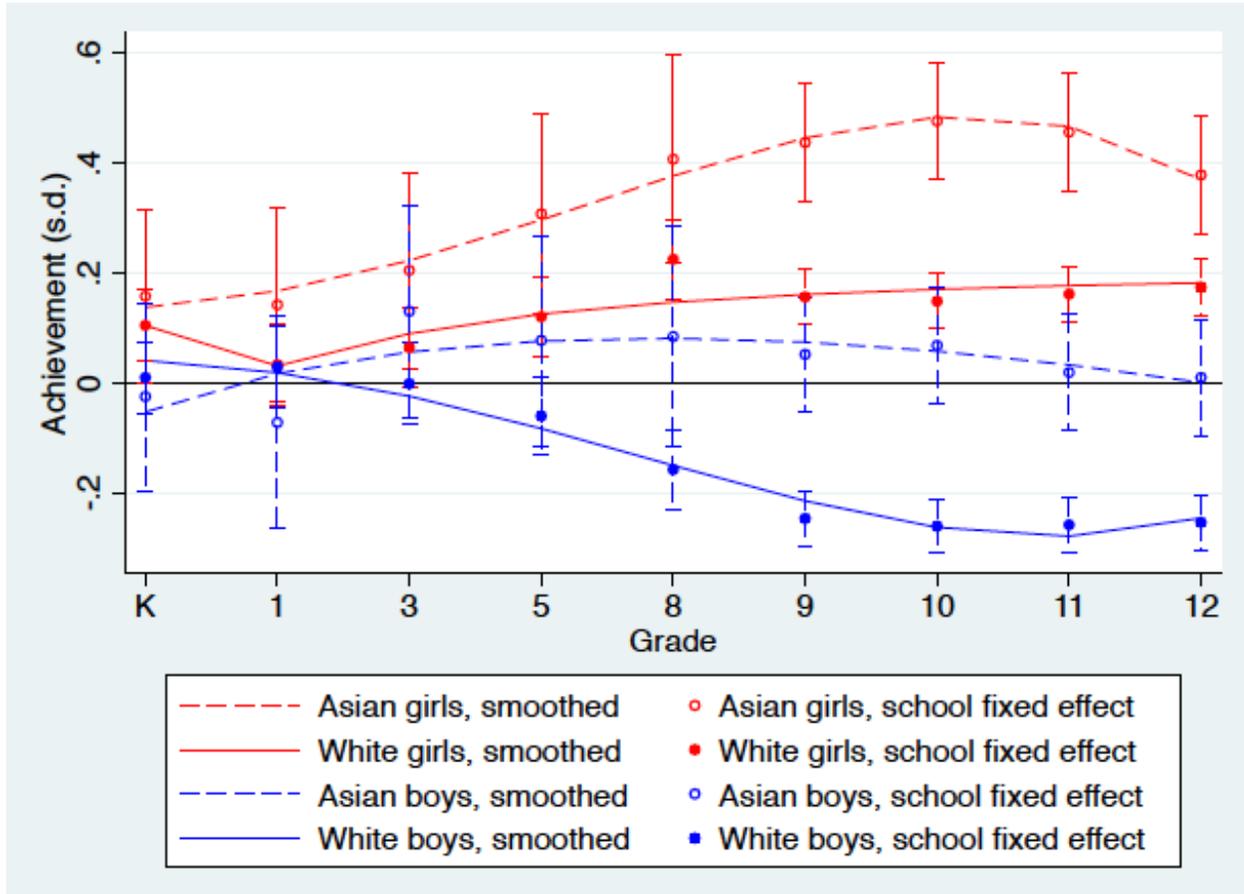
Note: From kindergarten to 8th grade, academic achievement is measured by teacher ratings of student performance in math, reading and general knowledge/science. Starting in 9th grade, academic performance is measures by GPA. All measures were standardized. Red hollow dots are predicted scores from unadjusted school fixed effect regressions; red solid dots are predicted scores for white girls; blue hollow dots are for Asian boys and blue solid dots are for white boys. Colored lines indicate estimates that are smoothed using local polynomial functions. 95% confidence intervals are plotted. Kindergarten to 8ᵗʰ grade estimates use the ECLS-K (N=1,368 whites and 244 Asian Americans). 9ᵗʰ grade to 12ᵗʰ grade estimates use the ELS (N=2,878 whites and 745 Asians).

Figure 2. Predicted Achievement by Race and Gender and Mothers' Education, 9th Grade GPA
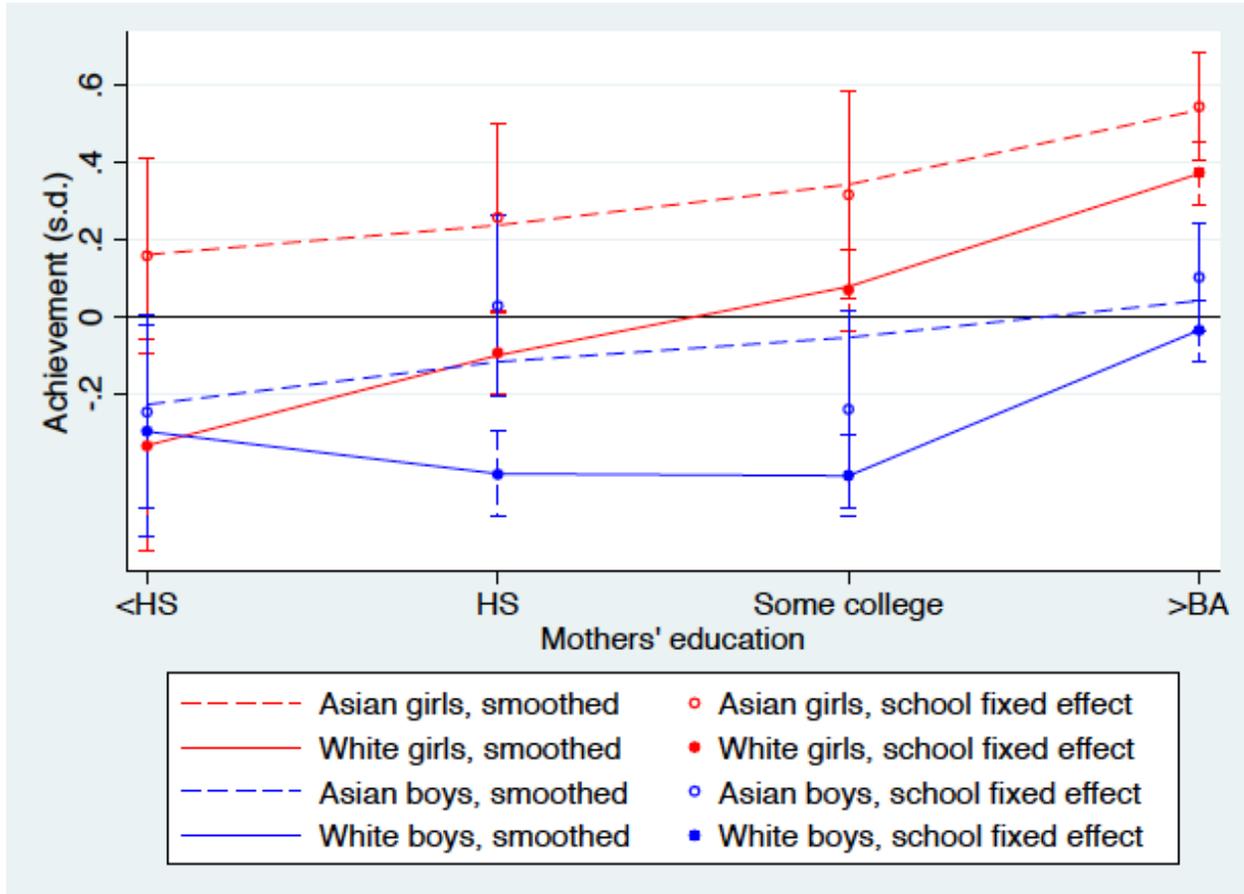
Note: Achievement is measured as standardized 9th grade GPA. Red hollow dots are predicted scores from unadjusted school fixed effect regressions; red solid dots are predicted scores for white girls; blue hollow dots are for Asian boys and blue solid dots are for white boys. Colored lines indicate estimates that are smoothed using local polynomial functions. 95% confidence intervals are plotted. Categories of mothers' education are: less than high school (<HS), high school graduate but no further schooling (HS), some post-secondary schooling (some college) and college degree or more (>BA). 95% confidence intervals are plotted. Sample size is 2,878 whites and 745 Asians.

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