The Fragile Families and Child Wellbeing Study changed its name to The Future of Families and Child Wellbeing Study (FFCWS). Due to the issue date of this document, FFCWS will be referenced by its former name. Any further reference to FFCWS should kindly observe this name change.

Asian Children's Verbal Development: A Comparison of Three Countries

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Abstract

Using longitudinal data from three countries - the United States, the United Kingdom, and Australia – we document White-Asian differences in verbal development from early to middle childhood to assess whether the Asian academic advantage extends to verbal skills during childhood. We find that the children of Asian immigrant mothers do not have a clear advantage over Whites. Rather, how they perform seems to be age and context specific. In the United States, Asian children begin school with higher verbal scores than Whites, but their advantage erodes over time. In the United Kingdom and Australia, Asian children show an initial disadvantage at school entry, but their scores grow at a faster rate and converge towards those of White children. Much of the observed White-Asian difference in verbal development is due to differences in parents' socioeconomic status.

(Words: 135)

Introduction

Asian Americans have been heralded "model minorities" because of their educational and economic success (Sakamoto et al. 2009; Goyette and Xie 1999). This perception is largely rooted in the academic success of Asians Americans in the Science, Technology, Engineering, and Math (STEM) fields. Prior work has consistently shown that Asian American students score higher on standardized tests of mathematical abilities, have higher grades, enroll in four year universities in higher rates, are overrepresented in STEM fields; and have higher rates of college completion (Eaton and Dembo 1997; Kao and Thompson 2003; Xie and Goyette 2003).

The evidence for White-Asian differences in verbal performance is, however, somewhat more mixed, with some researchers finding evidence of an advantage at school entry (Fryer and Levitt 2004, Wang 2008) and others finding a verbal disadvantage during adolescence and beyond (Goyette and Xie 1999, Sakamoto et al. 2009). Although these studies suggest a convergence and even a reversal in the verbal performance of Asian American and White children, most studies are based on cross-sectional data and do not examine with-in person changes over time, making it hard to determine exactly when and if such a convergence or reversal occurs (Han 2008 is an exception). A second limitation of the existing literature is that most studies of Asian children's academic performance have been conducted in the United States. Thus, we do not know if the Asian model minority hypothesis extends beyond the United States. If the Asian advantage persists in other countries, including countries where Asian parents have lower socio-economic status, this finding would reinforce a fundamental claim behind the Asian model minority hypothesis; namely, that something about the Asian culture helps generate the superior academic performance of Asian children.

We extend the existing literature by documenting trajectories in White-Asian differences in verbal ability during early and middle childhood in the United States, the United Kingdom, and Australia. Using growth curve models, we ask whether (1) the verbal advantage of Asian American children wanes by middle childhood, (2) the pan-ethnic pattern in verbal ability holds for the various Asian subgroups in the United States and extends outside of the United States in settings with different immigration policies that result in differential socioeconomic selectivity among Asian immigrants; and (3) White-Asian differences in verbal trajectories persist net of socioeconomic differences for all three countries. These analyses will allow us to gage the pervasiveness of the Asian model minority hypothesis and Asian academic advantage.

Past Research

Does the verbal advantage of Asian American children emerge by early childhood and wane by middle childhood?

The Asian model minority hypothesis is based primarily on studies of the academic performance of Asian Americans during adolescence and adulthood. Studies have consistently shown that Asian Americans score higher on standardized tests of mathematical ability, have higher grade point averages, enroll in four year colleges at higher rates, are overrepresented in STEM fields, and have higher rates of college graduation (Caplan et al. 1991; Fuligni 1997; Hsia 1988; Kao 1995; Xie and Goyette 2004; Zhou and Bankston 1998). This body of work, however, has found that Asian American students score lower on standardized tests of verbal ability than their White peers (Goyette and Xie 1999; Sakamoto et al. 2009).

Over the past decade, scholars have begun to study the academic performance of Asian children at earlier ages as a way of gaining insight into when the advantage emerges, how it changes over time, and what mechanisms are driving it (Han 2008). These studies emphasize the

importance of early and middle childhood as critical periods for the development of cognitive skills that are important for future academic achievement (Duncan et al. 2007; Guo and Harris 2000; Keane and Wolpin 1997; Wang 2008; Sun 2011). Interestingly, this body of work finds that Asian American children perform better in verbal assessments than their White peers (Fryer and Levitt 2004; Wang 2008). Using data from the Early Childhood Longitudinal Study – Birth Cohort (ECLS-B), Wang (2008) finds that Asian American children score higher in literacy tests than all other groups at age 4. Similarly, Fryer and Levitt (2004) find that Asian children have higher reading scores in kindergarten than Whites (Fryer and Levitt 2004). They also find that White-Asian gap in reading scores are not as large in first grade as it is in kindergarten (Fryer and Levitt 2004) and that there are virtually no White-Asian differences in verbal scores by the Spring of third grade (Fryer and Levitt 2006). The key limitation of these studies is that they infer racial differences in academic trajectories by comparing the size of the racial gap in mean test scores at different points in time (Curran et al. 2010).

To date, Han's (2008) is the only study to use growth curve models to document White-Asian differences in verbal development during early and middle childhood in the United States. Using data from the ECLS-K, she compares the development of verbal and math skills of immigrant children (including Asian children in the various subgroups) with those of US-born groups (Han 2008). She finds that Asian children begin kindergarten with a clear advantage over Whites in terms of math and reading scores. However, while the advantage in math scores increases over time, the reading advantage declines over time, with the verbal scores of Asian Americans converging with those of Whites by third grade. Han's full model includes many

covariates capturing parent's socioeconomic position[1]; however, because her primary goal was to evaluate the effects of schools on children's academic trajectories, she does not explicitly discuss how parent's socioeconomic status shapes academic trajectories. In fact, her results do not show the coefficients for parent's socioeconomic controls, although she acknowledges the fact that family background may be a more important determinant of the White-Asian gap in academic achievement than school characteristics (Han 2008: Notes for Model 3 in Table 2).

In sum, recent studies offer a more mixed picture of how Asian Americans fare relative to Whites with respect to verbal performance. Combined, the studies seem to suggest that Asian Americans perform better than their White counterparts before or at school entry, but this advantage declines over time. Furthermore, two important yet largely unanswered questions are (1) when do Asian American children experience this convergence/reversal in relative verbal performance and (2) how does parents' socioeconomic position account for White-Asian differences in verbal development. Our cross-national study will focus and explicitly discuss the impact of family background in generating White-Asian differences in verbal development across three countries.

Does the Asian academic advantage extend to all subgroups?

Asian subgroups do not universally have an academic advantage relative to Whites. Past studies have shown that how Asians fare relative to Whites depends on national origin (Kao 1995; Goyette and Xie 1999). Prior work has shown that Chinese, Korean, and Southeast Asian

[1] We include similar covariates to our models with controls for parent's socioeconomic status. Our model and Han's model differ in the fact that we include mother's employment status and parent's linguistic proficiency. Han also does not show the coefficients for parent's socioeconomic status and includes a note that she added these covariates for the full model.

adolescents have a math advantage over Whites andperform equally as well in verbal scores as Whites (Kao 1995). Filipinos, Japanese, and South Asians have comparable verbal and math scores as Whites, while Pacific Islanders have worse verbal and math scores as Whites (Kao 1995). These differences are attributed to disparities in family socioeconomic position and parenting behavior, including parent's ability and willingness to invest in children's education and college expectations (Kao 1995; Goyette and Xie 1999; Sakamoto et al. 2009). These studies, however, focus primarily on outcomes during adolescence and beyond. They also rely primarily on cross-sectional data.

An exception to this pattern can also be found in the work by Han (2008), who studies the verbal development of immigrant children in the United States, including Asian children in the various subgroups. She finds that the verbal scores of all Asian children increase at a slower rate than those of Whites. Asian subgroups, however, differ in how slow their scores increase relative to Whites and whether they start with a disadvantage relative to Whites. Specifically, East and South Asian children start school with a considerable verbal advantage over their White peers, but their scores also appear to increase at a considerably slower pace. Thus, although these children continue to have a verbal advantage over Whites, the gap is smaller by middle childhood. Southeast Asians start school with verbal scores similar to Whites and their scores increase at about the same pace as Whites. Thus, their scores are similar to Whites in middle childhood. Other Asians start school with a verbal disadvantage over Whites and their scores also increase at a slower pace. Thus, the gap in verbal scores between Whites and other Asians increases over time. Yet, as mentioned earlier, Han's study does not assess the extent to which variation in parent's socioeconomic position across Asian subgroups explains disparities in verbal development across Asian subgroups.

Does the model minority hypothesis extend to the United Kingdom and Australia?

Although Asian immigrants dominate the global share of international immigrants, surprisingly little is known about how Asian children fare outside of the United States. Thus an important contribution of our study is to determine how Asian children are doing academically in other countries. Our decision to use Australia and the United Kingdom as platforms to determine whether Asian children have an academic advantage over Whites is driven in equal measure by the availability of potentially comparable data and by the similarity in cultural and historical roots between the three host countries, including English language use and size of the Asian immigrant population.

Despite their cultural and historical similarities, the three countries differ markedly in ways that are likely to affect academic achievement. First, they differ in terms of the socioeconomic characteristics of the Asian immigrants they attract. Most Asian immigrants enter the United States under the high-skilled visa category, which primarily facilitates the entry of individuals with college or more advanced degrees (Regets 2001). This selectivity regime means that Asian American parents are disproportionately college educated as compared with other groups (Sakamoto et al. 2009). As a result of their educational advantage, Asian parents may be able to provide their children with similar, if not greater, levels of educational resources as Whites. In Australia, the chief goal of the immigration policy is to attract semi- and high-skilled workers in industries with labor shortages (Walsh 2008). Although Asian immigrants into Australia are less positively selected than Asian immigrants into the United States, they appear to have higher levels of education than the overall Australian population (Choi et al. 2012). In the United Kingdom, immigration policy is driven by a colonial past and draws heavily from

Commonwealth countries, such as countries in the Indian subcontinent (Layton-Henry 2001)[2] . Because they are not specifically selected on grounds of skill, Asian immigrants to the United Kingdom show greater heterogeneity in educational and socioeconomic characteristics, and thus it is unclear how they compare with native-born Whites. The cross-national differences in selection criteria imply that Asian Americans will be the most advantaged in terms of education while Asians in the United Kingdom will be the least advantaged.

Second, there are marked cross-national differences in the English proficiency of Asian immigrants in the three countries, which has implications for both the long-term socioeconomic status of parents and consequently children's academic performance. Past studies have found that children of immigrant parents with limited linguistic proficiency underperform academically relative to their counterparts whose parents are more proficient in their host country's language (Washbrook et al. 2012). The United States does not have any requirements about language proficiency, whereas Australia places a strong emphasis on English proficiency as a criterion for admission. The United Kingdom does not use English proficiency as a criterion for admission, but it disproportionately draws its immigrant population from Commonwealth countries that have educational system similar to that in the United Kingdom, including the language of instruction. The cross-national differences in language selection regimes imply that Asian immigrant parents in the United Kingdom will be least disadvantaged and Asian immigrants in the United States will be the most disadvantaged in terms of English proficiency.

Empirical evidence from the United Kingdom and Australia

Past studies documenting the achievement of Asian children in Australia and the United Kingdom are sparse and the few exceptions that exist seldom make the distinction between math

[2] This pattern has changed with the expansion of the European Union, but British Millennium Cohort Study (MCS) cover the period prior to the expansion of the European Union.

and verbal scores, focusing on total exam scores. One of these exceptions is Cobb-Clark's work (2010), which shows that Australian youth from non-English-speaking households score higher in their college entrance exams than their Australian-born peers and immigrant youth from English-speaking households. Although this study does not specifically compare the educational attainment of Asian and White Australians, we can make inferences about the White-Asian gap, as most non-English speaking immigrants to Australia are East Asian immigrants and most Australian born youths are Whites.

There is also evidence that Asian youth have an educational advantage over White youth in the United Kingdom. Sammons (1995) finds that Asians have lower reading and math scores relative to Whites at age 7; however, their reading and math scores have surpassed those of Whites by age 16. Like in the United States, the Asian academic advantage does not appear to apply universally to all Asian subgroups in the United Kingdom. Connolly (2006) and Gillborn and Mirza (2000) find that East Asian and Asian Indian adolescents between the ages of 16 and 19 have higher test scores than do Whites. In contrast, adolescents with Pakistani and Bangladeshi backgrounds have lower test scores than Whites (Connolly 2006; Gillborn and Mirza 2000).

Taken together, these studies suggest that Asian children in Australia have an educational advantage over Whites. In the United Kingdom, we may expect that Asian Indians will have lower scores than Whites at young ages, but their verbal scores converge towards and even surpass those of Whites at older ages. In contrast, Pakistani/Bangladeshi will have lower scores than Whites at all ages.

What role does parent's socioeconomic position play in engendering the Asian American academic advantage?

Two broad explanations have been proposed to explain the academic advantage of Asian children in the United States. The first explanation argues that the Asian advantage is due to parent's socioeconomic status. According to this explanation, Asian American children have more educated parents and come from higher income families than children from other race/ethnic groups because US immigration policy favors highly skilled immigrants from Asia (Xie and Goyette 2004; Sakamoto et al. 2009). Thus, Asian children perform better in school because their parent's more favorable socioeconomic background gives them greater access to educational resources (Kao and Thompson 2003; Sakamoto et al. 2009). Although socioeconomic background explains a considerable portion of the White-Asian gap in educational achievement, Asian children continue to have an educational advantage over Whites, net of socioeconomic controls (Kao 1995; Goyette and Xie 1999).

The second explanation proposes that Asian parents assign greater symbolic and instrumental value to education than other groups in the United States because they view educational credentials as a way to overcome racial discrimination and achieve socioeconomic integration in the United States (Kao 1995; Sakamoto et al. 2009; Sue and Okasaki 1990). These values are then transmitted to children and reinforced through parenting practices that emphasize the importance of education and promote attitudes, skills, and behaviors conducive to academic success (Chao 1994; Huntsinger et al. 1997; Sakamoto et al. 2009).

Taken together, the evidence suggests that both explanations contribute to the academic advantage of Asian children over Whites. It should also be noted that these explanations are not mutually exclusive and that some of the parenting behaviors of Asian immigrants may partially

reflect their higher socioeconomic position. In this study, we only empirically examine the first explanation which attributes White-Asian differences in test scores to the socioeconomic advantage of Asian Americans because there are very few questions on parenting practices that are asked consistently across the three waves of data in the three birth cohort studies[3].

Data and Methods

Data

Our study uses data from (1) the American Early Childhood Longitudinal Study – Kindergarten Cohort (ECLS-K); (2) the Longitudinal Study of Australian Children – Kindergarten Cohort (LSAC-K); and (3) the British Millennium Cohort Study (MCS).

The ECLS-K[4] is a national study that follows 21,409 children who enrolled in kindergarten programs in the U.S. in the fall of 1998. This survey oversamples Asian Pacific Islanders and asked the main caregiver (usually the mother) to provide detailed reports about family's socioeconomic status. Follow-up interviews were conducted in the spring of 1999, 2000, 2002, 2004, and 2007, and for a subsample, fall of 1999. These years roughly correspond to data collection at ages 5, 6, 7, 9, 11, and 14. Assessments in reading and math were collected

[3] We conducted some supplementary analysis which considered the extent to which White-Asian differences in levels of parenting involvement explain disparities in trajectories of verbal development. In these analyses, we account for parenting involvement by using a measure for frequency of reading to the child, which is the only measure found in three or more waves of the three birth cohort studies. The results from these analyses suggest that Asian parents read less frequently to their children than their White counterparts. They also show that parental involvement explains little of the White-Asian differentials in trajectories of verbal development. It is, however, unclear whether parental involvement has little effect on White-Asian differences in trajectories of verbal development because it really does not have an effect or we can only use frequency of reading to capture parental involvement. These results are available upon request.

[4] http://nces.ed.gov/ecls/

in all waves. We limit our analysis to information obtained at ages 5, 7, and 9 because (1) we wish to capture the developmental trajectories of verbal scores during early and middle childhood and (2) we wanted equally spaced time points in the three countries.

The LSAC-K is a nationally representative study that follows approximately 5,000 children born between March 1999 and February 2000 and attending kindergarten in Australia in 2004 (Soloff et al. 2005). Parents provided detailed reports about their socio-demographic characteristics. Peabody Picture and Vocabulary Tests (PPVT) were also conducted at each wave. Interviews were conducted at ages 4, 6, and 8. Unfortunately, LSAC only collected math assessments (i.e., ARS scores) at ages 6 and 8.

The MCS is also a national birth cohort study of 18,818 children born in the United Kingdom between September 2000 and August 2001. The main caregivers (usually the mother) were first interviewed when the child was 9 months old and they were asked to provide information about the family's socioeconomic position. Follow-up interviews were conducted with the main caregiver when the child was ages 3, 5, and 7. The British Ability Scales Naming Vocabulary tests (BAS-NV) were collected at ages 3, 5, and 7. Unfortunately, math assessments scores were not collected at age 7.

These data sources are well-suited for the present analyses because they collected verbal test scores in three or more waves of data. Second, these studies include detailed information on key socio-demographic determinants of academic performance: parent's education, employment marital status, and household income. Finally, each dataset is nationally representative allowing us to document cross-national differences in the pattern of White-Asian variation in children's academic trajectories.

Analytic Sample

Our analytic sample includes native-born children of native-born White and Asian immigrant mothers. We limited our sample to native-born children because verbal assessments may not accurately capture the cognitive and academic skills of recent immigrant children. We also excluded children who were not residing with their biological mothers based on prior work that shows that step parents make fewer monetary and non-monetary investments on their step children (Cherlin 2004). We also excluded Asian children with native-born Asian mothers because: (1) the LSAC-K does not report race/ethnic identifiers for Australian-born mothers and (2) ECLS-K collected information about grandparent's region of birth, which prevent us from disaggregating US-born Asian mothers into regional subgroups [5]. Second, we restricted our sample to Asian children from a subgroup with close to 50 sampled respondents. Third, we limited our sample to children for whom verbal scores are available in all three waves. The ECLS-K administered Oral Language Development Scales (OLDS) to children having non-English language backgrounds and did not administer reading assessments to those who did not make a predetermined cutoff point (Han 2008). Over time, children from non-English language backgrounds increasingly met the pre-determined cutoff points and all children took the verbal assessment by the third grade (Rathbun and West 2004; Han 2008). The distinct exclusion rates of children from non-English backgrounds across waves may overstate the reading scores in earlier waves. By limiting our sample to children for whom verbal scores are available in all

[5] Preliminary analyses for the US and UK also examined the academic trajectories of children with native-born Asian mothers. We found that the trajectories of native-born Asian children fall consistently in between those of native-born Whites and Asian immigrants. These results are available upon request. We could not perform these analyses for Australia because LSAC-K does not collect information about the racial characteristics of Australian-born mothers.

three waves, we limit our exposure to this potential bias. Fourth, we excluded children who are substantially older or younger than their peers at the time of the assessment because their scores may be age dependent. Finally, we restricted our sample to those children whose mothers provided valid information regarding their country of birth.

Using STATA's mi command, we conducted multiple imputation to handle missing data with five imputed datasets. Less than 1% of the sampled respondents had missing information with respect to mother's and children's characteristics across all waves of the three datasets. The rates of missing data are higher for father's characteristics: approximately 11% for the US, 14% for the UK, and 12% for Australia for the distinct waves of the three datasets.

Combined, these steps yield a sample size of 6,176 children in the United States (5,891 Whites; 256 Asians); 5,763 children in United Kingdom (5,310 Whites; 453 Asians); 2,887 children in Australia (2,661 Whites; 226 Asians). We use the term "Asian children" to refer to children with Asian immigrant mothers, regardless of their own or their father's race, ethnicity, and nativity status. We apply an analogous strategy when we discuss "White children".

Measures

Outcome variables

Children's *verbal ability* is measured using the reading item response theory scores from the ECLS-K, the BAS-NV scores from the MCS, and the PPVT scores from the LSAC-K. Because the scores are each measured in units that have no natural interpretation and are not comparable across countries, they are standardized into Z-scores at each wave. If the main coefficient for Asian (or Asian subgroup) is positive, then Asian children have an initial academic advantage over Whites. If the interaction between Asian (or Asian subgroup) and age is positive, then their scores are increasing at a faster pace.

Independent variables

Mother's race/ethnicity. Using mothers' self-reports of race, ethnicity, and nativity status, we distinguish between children with native-born White and Asian immigrant mothers[6]. In these analyses, we restrict our Asian sample to children of immigrant mothers because U.S. and Australian data do not include information about grandparent's country/region of birth, which prevent us from disaggregating native-born Asian mothers into regional subgroups.

Mother's region of birth. Using self-reports about their country of birth, we further disaggregate Asian children depending on their mother's region of birth. In the United States and Australia, we disaggregate Asian children into three groups: East Asian, South Asian, and Southeast Asian. For the United Kingdom, we distinguish between Asian Indian and Pakistani/Bangladeshi children based on prior findings which argue that Pakistani/Bangladeshis fare worse academically than Asian Indians and Whites (Sammons 1995).

It is noteworthy that we cannot further disaggregate Asian immigrant mothers by the duration of stay in the United States because our sample size is not large enough to disaggregate the data by both: national origin groups and duration of stay in the United States.

Parent's socioeconomic position. We document White-Asian differences in parent's socioeconomic status by describing differences in each parent's education and employment status, mother's English proficiency, and household income. We select these socioeconomic

[6] We use mother's race/ethnicity, instead of father's race/ethnicity or the combined parent's race/ethnicity, to classify the children. This decision is made in consideration of children residing in single parent families, who usually reside with mothers and for whom information about father's race/ethnicity may be missing. Because endogamy (i.e., marriages within race/ethnic groups) is the most dominant form of marital sorting, the addition of father's race/ethnicity yields the same results. These results are available upon request.

dimensions because they have been previous identified as key determinants of the economic wellbeing of immigrants and are the criteria to get a high-skilled visa in these countries (Regets 2001; Sakamoto et al. 2009). We consider both mother's and father's education and employment status due to variations in the gender selective nature of immigration flows across Asian subgroups and the consequent differences in the primary visa holder's gender.

Mother's education. We distinguish children into five categories depending on their mother's education (High school dropout; high school graduate; some college; college graduate; and graduate degree in US and Australia; Lack qualifications, GCSE grades D-G, O level, A level, and (5) first or higher degree in the UK). *Father's education*[7] is defined analogously.

Mother's English proficiency. We classify US and Australian children into three categories depending on their mother's linguistic proficiency (Limited, good, and near native or native-speaker). We classify children in the UK into three categories based only reports about the main language spoken at home (English only, English and another, and only another).

Mother's employment status distinguishes between employed and unemployed mothers. *Father's employment status* is defined analogously**.**

Household income distinguishes children into four categories depending on their household income (Lowest, second, third, and highest quartile[8]).

Our multivariate analyses also include several demographic controls. Our models controls for *child's gender* (female vs. male); *child's birth weight* (less than 2500 g vs. 2500+ g); *child's preschool attendance* (attended center-based care before kindergarten vs. did not);

[7] MCS collected information about mother's partners at each wave. For our UK analyses, father's education refers to the educational characteristics of mother's partners at 9 months. Father's employment refers to the employment status of the mother's partner at each wave.

[8]All datasets report categories of income. We tried to approximate quartiles for the entire sample.

mother's age at the focal child's birth (< 20; 20-24; 25-29; 30-34; 35+); *mother's marital status* (unmarried vs. married); and *number of siblings*.

Methods

We estimate a two level growth curve models to document White-Asian disparities in verbal development in the United States, United Kingdom, and Australia. This strategy allows us to estimate White-Asian differences in initial scores (i.e., intercepts) and rate of growth over time (i.e., slopes) (Han 2008). The level-1 equation in our growth curve models describe within-individual changes in test scores (i) over time (t) and can be represented as follows:

$$y_{i\,t} = \alpha_i + \beta_i t + \gamma_t w_{i\,t} + \varepsilon_{i\,t} \quad (1)$$

Children's verbal development (y_{it}) are characterized by a unique intercept (α_i) and a linear time-dependent slope (β_i). To capture the effects of time-varying covariates on children's verbal development, we add $\gamma_t w_{it}$, which represents the effect of time-varying covariates w_{it} on the verbal scores at time t for each i^{th} individual (Curran and Willoughby, 2003).

The level-2 equation models variation in verbal scores between Asian and White children (i.e. across individual effects). Formally, the level-2 relationships can be represented as follows:

$$\alpha_i = \alpha_0 + \alpha_1 x_{i1} + \alpha_1 x_{i2} \ldots \alpha_k x_{i\,k} + u_i \quad (2)$$

$$\beta_i = \beta_0 + \beta_1 x_{i1} + \beta_1 x_{i2} \ldots \beta_k x_{i\,k} + v_{i\,t} \quad (3)$$

These equations state that the random intercepts (α_i) and slopes (β_i) are a function of time-invariant covariates (x_{ik}) and error terms (u_{it}, v_{it}), respectively. Age was centered so that the initial status refers to the wave when the assessments are first collected in each of the three countries: age 5 in the US, age 3 in the UK, and age 4 in Australia.

For each country, we fitted two successive models to answer the questions: (1) how does the verbal development of Asian children differ from those of Whites? and (2) whether White-

Asian disparities in verbal development persist net of socioeconomic controls. More specifically, Model 1 includes mother's race/ethnicity, age, the interaction between mother's race/ethnicity and age, and demographic controls. Model 2 adds parent's socioeconomic status to Model 1. All analyses are weighted.[9]

Because each country uses a distinct assessment tool to measure verbal ability, we cannot use our results to assess cross-national differences in (Asian) children's absolute skill level. Instead, we can assess how the verbal skills of Asians compare with those of Whites living in the same country, and later, determine how the pattern of White-Asian disparities in compares across the distinct countries. A similar approach was used by Washbrook et al. (2012).

Results

Does the verbal advantage of Asian American children emerge by early childhood and wane by middle childhood?

We begin our analyses by examining how the verbal development of Asian children in the United States compares with that of Whites during early and middle childhood. Our results, presented in Figures 1A and 1B [10], shows that Asians have higher initial reading scores than

[9] Our models account for clustering of time points within individuals. Yet, we are unable to account for clustering arising due to the sampling design because STATA's multiple imputation (mi) command is incompatible with svy commands (STATACorp 2011). Robustness checks, however, reveal that models employing the multiple (mi) imputation command (without the svy command) and the models employing the svy command (without the mi command) yield virtually the same results, suggesting that the additional employment of svy commands will likely not have a sizable impact on our results.

[10] The predicted scores presented in Figures 1A through Figure 3B are computed from Model 1 in Tables 7 through 9. They are consistent with our descriptive findings.

Whites, but their scores grow at a slower rate, and their advantage over Whites has almost disappeared by age 9.

Figures 1A and 1B go here.

When we disaggregate Asian children into various subgroups, we find that the verbal development of East Asian, South Asian, and Southeast Asian children (relative to Whites) does not deviate from the pattern observed for the pan-ethnic group. The only difference among subgroups is the size of the initial advantage (intercept) and the pace of growth (slope). Among the Asian subgroups, South Asians have the largest initial advantage over Whites, but their scores also grow at a slower rate compared to other subgroups. Conversely, Southeast Asians have the smallest initial advantage over Whites, but their advantage also erodes at a slower pace than other groups. Given their considerable initial advantage over Whites, South and East Asian children retain their advantage over Whites by age 9. This, however, is not the case for Southeast Asians whose initial advantage over Whites is small: Whites have surpasses Southeast Asians by age 9. These results are mostly consistent with those presented by Han (2008).

Does the model minority hypothesis extend to the United Kingdom and Australia?

Figures 2A and 2B describe White-Asian disparities in verbal development in the United Kingdom. Here, the pattern is opposite of that observed in the United States. Asian children in the United Kingdom have lower initial verbal scores than Whites, but their scores improve at a faster pace and converge with those of Whites by age 7. When we disaggregate Asian children by country of origin, we find that the pattern of White-Asian disparities in verbal development holds for both Asian subgroups, including Pakistani/ Bangladeshi children. As in the US, the subgroups only differ with respect to the size of their initial scores and pace of growth. Consistent with prior work, Pakistani/Bangladeshi children have a larger initial disadvantage

over Whites than do their Asian Indian peers (Sammons 1995). However, contrary to our expectations, their scores increase at a faster rate than those of Asian Indians and Whites. Due to their faster pace of growth, the scores of Asian Indians have surpassed those of Whites, and Pakistani/Bangladeshi scores appear to be converging with those of Whites by age 7.

Figures 2A and 2B go here.

We now turn our attention to White-Asian differences in verbal development in Australia. Our results, presented in Figure 3A, show that the pattern of White-Asian variations in Australia is strikingly similar to that observed in the United Kingdom: Asian children have an initial disadvantage over Whites, but their scores grow at a faster rate than Whites. The only difference between the verbal development of Asian children in the United Kingdom and Australia is that the initial academic disadvantage and relative pace of growth of Australian-born Asians are not as pronounced as those of Asian children in the United Kingdom.

Figure 3A goes here.

Next, we document disparities in the verbal development of Whites and various Asian subgroups in Australia. Figure 3B presents the results. The verbal development of the various Asian subgroups in Australia does not deviate from the trajectories observed for the pan-ethnic group of Asians. Like in the US and UK, the subgroups differ only with respect to the size of the initial scores and rates of growth. An in-depth comparison of the verbal development of Asian subgroups reveals that South Asians have a smaller initial disadvantage over Whites than the other subgroups. However, unlike the US and UK where the subgroup with the highest initial scores also have the slowest pace of growth, the scores of South Asians do not grow at a slower rate than those of other subgroups. Specifically, their rate of growth is similar to that of

Southeast Asians and faster than that of East Asians. In fact, East Asians have the largest initial disadvantage over Whites and the slowest rate of growth.

Figure 3B goes here.

Taken together, our results on verbal development offer a more mixed and complicated picture about the academic performance of Asian children relative to Whites than the model minority story would suggest. How Asian children fare relative to Whites in terms of verbal ability appears to be an age- and context-specific phenomenon. Asian American children initially have higher verbal scores than Whites, but their scores increase at a slower pace and converge with those of Whites over time. In contrast, Asian children in the United Kingdom and Australia are initially disadvantaged with respect to verbal skills than Whites, but their scores grow at a faster pace and converge with those of Whites. Interestingly, the verbal development of Asian subgroups all follow the same pattern as those observed for the population of pan-ethnic Asians in the receiving countries, with the only subgroup differences being in the size of the gap in initial scores and the rate of growth.

What role do parent's socioeconomic position play in engender White-Asian differences in verbal development?

Are Asian parents more socioeconomically advantaged than Whites?

We next examine whether Asian parents in the three countries have a socioeconomic advantage over White parents when their children are in early and middle childhood. We begin by describing our US results. As shown in Table 1, Asian American parents are more socioeconomically advantaged than Whites in several dimensions. The Asian advantage is most pronounced with respect to parent's education and household income. For instance, half of Asian mothers have a college degree, as compared to only a third of Whites. Nearly 40 percent of

Asian children reside in households at the top quartile of the income distribution, as compared to just under 30 percent of White children. There are two exceptions to the socioeconomic advantage of Asian American over White parents. First, despite their higher levels of education, Asian American parents are employed at equal, if not lower, rates relative to Whites. Ninety-five percent of Asian fathers are employed, as compared to 97 percent of White fathers. Second, Southeast Asian parents are more disadvantaged than Whites across several additional socioeconomic domains, including household income and mother's education. These results are consistent with past reports about the socioeconomic characteristics of Asian Americans (Sakamoto et al. 2009).

Table 1 goes here.

Next, we determined whether Asian parents in the United Kingdom are also socioeconomically advantaged relative to Whites. Table 2 presents our UK results. Contrary to the US, Asians in the United Kingdom are more disadvantaged than Whites across several socioeconomic dimensions, including parent's education, household income, and mother's employment status. About 60 percent of Asian mothers do not have any educational qualification, as compared with 17 percent of White mothers. A closer examination of the socioeconomic differential between Asian subgroups and Whites reveal that although both Asians subgroups are socioeconomically disadvantaged relative to Whites; Pakistani/ Bangladeshi parents are also considerably disadvantaged relative to Asian Indians. In fact, the magnitude of the differential between Asian Indian and Pakistani/ Bangladeshi parents far exceeds the differential between Asians Indians and Whites. This finding is underscored by subgroup differences in the distribution of household income. Just under half of children born to Pakistani/Bangladeshi mothers resided in households at the lowest quartile of the income

distribution, as compared with 17 percent of White children and 23 percent of Asian Indian children.

Table 2 goes here.

We now turn our attention to White-Asian disparities in Australia. Our results, presented in Table 3, reveal a more complicated pattern of socioeconomic differentials than was found in the other two countries. Asian parents in Australia are advantaged relative to Whites in education and employment status. For example, forty-five percent of Asian fathers have a college degree, as compared to 23 percent of Asian fathers. In contrast, Asian families are considerably more disadvantaged than their White counterparts in household income. For instance, 36 percent of Asian children reside in households with the lowest quartile of income, as compared to 26 percent of White children. An in-depth examination of the Asian subgroups reveals that the socioeconomic gap between Whites and Asian subgroup largely follows the pattern observed for the pan-ethnic population of Asians. An exception to this pattern can be observed in the educational characteristics of Southeast Asian parents, who do not display a clear educational advantage over Whites. Because Southeast Asians are a bifurcated group with respect to education, they are more likely than whites to be present in both the lowest and highest category of education. A quarter of Southeast fathers did not graduate from high school and 43 percent of them have a postsecondary degree, as compared with 17 and 23 percent of Whites.

Table 3 goes here.

In sum, Asians American parents are more socioeconomically advantaged than Whites, whereas Asians in the United Kingdom are more disadvantaged than Whites. Australia offers a more complicated story with Asians being advantaged in terms of education and employment but disadvantaged with respect to household income.

To what extent do parents' socioeconomic positions account for White-Asian differences in children's verbal development?

Our final step is to assess the extent to which White-Asian differences in parental socioeconomic position can account for differences in verbal development. Table 4 presents the series of growth curve models described above. We begin by describing the US results in Panel A. Because we summarized the results from Model 1 in Figures 1A and 1B, we focus on the results from Model 2, which adds socioeconomic controls to Model 1. We find that differences in parents' socioeconomic position explain all the White-Asian differences in initial scores. In fact, net of socioeconomic controls, the initial verbal scores of Asian American children may even trail behind those of Whites. Socioeconomic controls also explain all of the White-Asian disparities in the pace of growth in reading scores. In more in-depth analyses unreported here, we found that parent's education and household income account for nearly all the White-Asian gap in initial scores; whereas, mother's linguistic proficiency accounts for nearly all the White-Asian gap in pace of growth. This result is consistent with the view that socioeconomically advantaged parents are more likely to engage in activities promoting literary skills prior to school entry and Asian children's initial advantage are the product of their parent's socioeconomic class (Lareau and Weininger 2008; Farkas and Hibel 2008). However, their advantage may erode over time due to their family linguistic environment, which cannot reinforce the material learned in school. A closer examination of the impact of parent's socioeconomic characteristics for the various subgroups reveals that the gap in initial scores and growth rates between Whites and Asian subgroups disappears with the addition of socioeconomic controls. Southeast Asians are the only exception to this pattern, with their initial scores trailing behind by 0.43 standard deviations than those of Whites, even net of socioeconomic controls.

Table 4 goes here.

We now turn our attention to White-Asian disparities in verbal development in the United Kingdom. Our results, which are presented in Panel B, reveal that parent's socioeconomic characteristics have similar effects on White-Asian disparities in the United Kingdom as they do in the United States. Much in the same manner as our US results, parent's socioeconomic status explains a considerable portion of the White-Asian gap in initial scores and growth rates. Net of socioeconomic controls, the initial academic disadvantage of Asian children decreases from 1.62 to 0.82 standard deviations, which is a 51 percent [100*(-1.62+0.82)/1.62 ≈ 51%] reduction from the academic gap observed in Model 1. Parent's socioeconomic characteristics also explain a sizable portion of the White-Asian differences in growth rates, albeit to a smaller extent than the gap in initial scores. Net of socioeconomic controls, the White-Asian gap in rate of growth decreases from 0.75 to 0.51 standard deviations, which is a 32 percent [100*(0.75-0.51)/0.75 ≈ 32 %] reduction from the gap observed in Model 1. This pattern appears to hold for both Asian subgroups.

We conclude by examining the impact of parent's socioeconomic status on White-Asian differences in verbal development in Australia. Panel C in Table 4 shows the results. Much in the same manner as our US and UK results, parent's socioeconomic status explains a considerable portion of the gap in initial scores and rates of growth. Net of socioeconomic controls, the initial academic disadvantage of Asian children decreases from 0.68 to 0.52 standard deviations, which is a 22 percent [100*(-.68+.52)/.66 ≈ 22 %] reduction from the gap observed in Model 1. The pace of growth decreases from 0.28 to 0.24 standard deviations, which is a 15 percent [100*(0.28-0.24)/0.28 ≈ 15 %] decline from the academic gap observed in Model

1. These findings hold for all Asian subgroups with the effects being particularly large for South Asian children.

Taken together, our results suggest that differences in socioeconomic positions explain a sizable portion of White-Asian gap in initial scores and growth rates. This is true for all three countries, but socioeconomic controls appears to have the largest effect on White-Asian disparities in verbal scores in the United States and the smallest effect on White-Asian disparities in verbal scores in Australia.

Conclusions

The goal of this paper is to shed light to the pervasiveness of the Asian academic advantage. We accomplish this goal by (1) assessing whether the verbal advantage of Asian American children wanes by middle childhood; (2) determining whether the pan-ethnic pattern in verbal ability holds for all Asian subgroups and extends outside of the United States; and (3) examining whether White-Asian differences in verbal trajectories persist net of socioeconomic differences for all three countries.

Our results offer a more complicated picture of White-Asian differences in academic achievement than that offered by the Asian model minority hypothesis. Like Han (2008), we find that Asian Americans initially have higher verbal scores than Whites, but their scores increase at a slower pace over those of Whites and their advantage disappears by middle childhood. Consistent with the inference by Sammons (1995), we find the opposite pattern for the White-Asian differences in academic trajectories in the United Kingdom and Australia: they start out with an initial disadvantage, but their scores increase at a faster pace and their disadvantage over Whites disappears by middle childhood. In conjunction, these findings suggest that Asian children do not have a clear advantage over Whites with respect to verbal

skills. Instead, how they fare in terms of verbal skills relative to Whites depends on their age and context. The existence of striking cross-national variations in White-Asian differences in academic trajectories highlights the importance of immigrant selectivity and context of reception in shaping the academic outcomes of the children of immigrants. It should, however, be noted that despite cross-national variations in White-Asian differences in initial scores and speed of growth in verbal scores, the story that we observe across the three settings is one of convergence. That is, children with an initial disadvantage improve at a faster pace while children with an initial advantage improve at a slower rate. This finding suggests that schools are fulfilling their role as the great equalizer, impeding the reproduction of social inequality by providing disadvantaged children resources unavailable at home (Mare 1995; Brand and Xie 2010).

Our results also reveal that the advantage in verbal scores of Asian American children erodes over time and completely disappears by middle childhood. In analyses unreported here, we also find that the initial advantage is largely attributable to the favorable socioeconomic position of Asian parents, whereas the faster rate of erosion is attributable to mother's lack of linguistic proficiency. These results, coupled with prior findings showing that Asian American adolescents continue to have a disadvantage in verbal scores relative to Whites, highlight the importance of the family's linguistic environment for children's verbal development. The fact that the verbal scores of children whose mothers have limited English proficiency grow at a slower pace also suggests the importance of early childhood programs aimed at young children whose parents have limited linguistic proficiency.

We also find that the verbal development of all Asian subgroups follows the pattern observed for the pan-ethnic population of Asian, and that the only subgroup differential lies in the size of the initial gap and pace of growth. This finding suggests that prior work comparing

the academic performance of Asian subgroups at a single point in time may have accentuated differences in the academic performance of Asian subgroups. Similarities in the academic trajectories of the various Asian subgroups suggest that the pan-ethnic population of Asian children may share a common subset of constraints and opportunities that influence their verbal development. It also highlights the importance of systematically observing the academic trajectories of Asian children longitudinally.

Finally, our results provide support for the argument that White-Asian disparities in verbal performance are partly due to White-Asian differences in socioeconomic conditions. In all three countries, parent's socioeconomic positions explain a large portion of the White-Asian initial test score gap and pace of growth. It should, however, be noted that the effect of socioeconomic position is considerably more pronounced in the United States than in the other countries. This pattern may arise, in part, because Asian immigrants in the United States are particularly positively selected or because socioeconomic resources are more important determinants of academic performance in the United States. We cannot, however, state with certainty whether or not this is the case given the fact that (1) we cannot conduct cross-national analyses with the same assessment tools and (2) we do not have nuanced measures about parental educational investments. We believe that this may be a worthwhile endeavor for future cross-national work with strong implications for educational policy and for academic work aimed at understanding the mechanisms giving rise to the Asian academic advantage.

A few limitations of our analyses should be kept in mind when interpreting our findings. First, the assessments in the three datasets are not fully comparable. Although each dataset captures children's verbal ability, they measure distinct dimensions of verbal ability (i.e. vocabulary, letter recognition, and reading combination for the US; vocabulary for the UK and

Australia). To minimize this problem, we focus on White-Asian variations within countries and later compare the pattern of variation across countries. Second, the assessments were collected at different ages (i.e., 5, 7, and 9 for the US; 4, 6, and 8 for Australia; and 3, 5, and 7 for the UK), which may partly explain differences in growth patterns. Third, our study focuses on a specific aspect of academic achievement – "verbal achievement" - because this is the only achievement outcome available prior to school entry in all three countries and available at 3 or more time points in all three datasets. We recognize that other dimensions of academic performance, such as math skills, teacher evaluations, and socio-behavioral skills, also influence children's overall academic performance. We also acknowledge that White-Asian disparities in the trajectories of these dimensions may differ from those of verbal test scores and that parent's socioeconomic status may have a distinct impact on these other outcomes. We recommend that future work examine White-Asian disparities in the trajectories of these academic dimensions and answer these questions.

In conclusion, our findings offer a more nuanced picture about the academic performance of Asian children. With respect to verbal skill, Asian children do not appear to have a clear advantage over Whites during early and middle childhood. Rather, the educational performance of Asian children is an age- and context-specific phenomenon that is due in large part to the socioeconomic advantage of Asian parents.

TABLES

Table 1. Group Differences in Socioeconomic Characteristics, United States

	White-Asian		Asian Subgroups		
	US-Born White	Foreign-born Asian	East Asian	South Asian	Southeast Asian
	(N=5,891)	(N=256)	(N=69)	(N=45)	(N=142)
A. Father's education (%)					
Less than high school	7	7	2	2	11
High school graduate	31	20	15	22	22
Some college	27	18	14	6	26
BA	20	30	31	26	31
MA or higher	14	25	39	44	10
Total	100	100	100	100	100
B. Father's employment					
% employed	97	95	96	100	94
C. Mother's linguistic proficiency (%)					
Limited	0	22	36	4	20
Good	0	63	41	83	68
Near Mastery/Native speaker	100	15	23	13	11
Total	100	100	100	100	100
D. Household income (%)					
Lowest	25	24	18	8	34
Second	20	19	15	20	21
Third	26	20	28	18	16
Highest	29	37	40	54	29
Total	100	100	100	100	100
E. Mother's education (%)					
Less than high school	5	11	6	2	17
High school graduate	27	19	20	13	20
Some college	35	20	30	14	17
BA	22	35	25	37	40
MA or higher	11	15	18	34	6
Total	100	100	100	100	100
F. Mother's employment					
% employed	71	70	52	69	81

Notes: (1) Percentages are weighted. Number of observations is not weighted. (2) The totals may not add to 100 percent due to rounding. (3) Father's and mother's education are time-invariant covariates. Father's and mother's employment, mother's language proficiency, and household income are time-varying covariates. The time-varying covariates and White-Asian and Asian subgroup differences in socioeconomic characteristics changes little with time. Therefore, we report the average socioeconomic characteristics across the distinct time points.

Table 2. Group Differences in Socioeconomic Characteristics, United Kingdom

	White-Asian		Asian Subgroups	
	UK-Born White	FB-South Asian	Asian Indian	Pakistani/ Bangladeshi
	(N=5,310)	(N=453)	(N=112)	(N=341)
A. Father's education (%)				
None	17	38	18	46
GSCE A-D	13	8	3	10
O level	34	20	22	20
A level	16	16	25	12
First or higher degree	19	18	32	13
Total	100	100	100	100
B. Father's employment				
% employed	91	83	85	79
C. Mother's linguistic proficiency (%)				
English only	99	6	14	4
English and other	1	67	65	68
Other only	0	26	28	28
Total	100	100	100	100
D. Household income (%)				
Lowest	17	41	23	47
Second	27	34	32	35
Third	26	13	23	9
Highest	31	12	21	9
Total	100	100	100	100
E. Mother's education (%)				
None	11	58	47	63
GSCE A-D	12	3	2	3
O level	39	17	15	17
A level	20	11	14	10
First or higher degree	19	11	22	7
Total	100	100	100	100
F. Mother's employment				
% employed	57	22	44	14

Notes: (1) Percentages are weighted. Number of observations is not weighted. (2) The totals may not add to 100 percent due to rounding. (3) Parent's education and household language are time-invariant covariates. Parent's employment and household income are time-varying covariates. White-Asian and Asian subgroup differences in socioeconomic characteristics changes little over time. Therefore, we report the average socioeconomic distribution across the distinct time points.

Table 3. Group Differences in Socioeconomic Characteristics, Australia

	White-Asian		Asian Subgroups		
	Australian Born Whites	Foreign-Born Asian	East Asian	South Asian	Southeast Asian
	(N=2,661)	(N=226)	(N=63)	(N=66)	(N=97)
A. Father's education					
Less than high school	17	15	10	4	25
High school graduate	9	12	18	15	7
Some college	50	28	30	28	26
BA	13	24	28	19	25
MA or higher	10	21	13	35	18
Total	100	100	100	100	100
B. Father's employment					
% employed	94	95	97	97	92
C. Mother's linguistic proficiency					
Limited	0	44	63	30	40
Proficient	0	34	29	50	27
Native speaker	100	22	8	20	33
Total	100	100	100	100	100
D. Household income					
Lowest	26	36	37	34	38
Second	30	27	26	30	24
Third	25	18	15	16	21
Highest	19	20	22	21	18
Total	100	100	100	100	100
E. Mother's education					
Less than high school	25	18	20	4	25
High school graduate	13	10	9	7	13
Some college	37	28	31	42	17
BA	14	29	26	26	34
MA or higher	11	15	15	22	12
Total	100	100	100	100	100
F. Mother's employment					
% employed	68	54	54	56	53

Notes:
(1) Percentages are weighted. Number of observations is not weighted. (2) The totals may not add to 100 percent due to rounding. (3) Parent's education and household language are time-invariant covariates. Parent's employment and household income are time-varying covariates. White-Asian and Asian subgroup differences in socioeconomic characteristics changes little over time. Therefore, we report the average socioeconomic distribution across the distinct time points.

Table 4. Growth Curve Models Predicting Standardized Reading Scores

	A.UNITED STATES				B. UNITED KINGDOM				C. AUSTRALIA			
	MODEL 1: Only demographic characteristics		**MODEL 2**: Model 1 + SES		**MODEL 1**: Only demographic characteristics		**MODEL 2**: Model 1 + SES		**MODEL 1**: Only demographic characteristics		**MODEL 2**: Model 1 + SES	
	β	β/se	β	β/se	β	β/se	β	β/se	β	β/se	β	β/se
I. WHITE-ASIAN DIFFERENCES												
Differences in initial scores (Whites)												
Foreign-born Asian	0.48	7.77	-0.21	-1.15	-1.62	-36.95	-0.82	-7.95	-0.68	-10.66	-0.52	-6.81
Differences in growth rates (White)												
Foreign-born Asian	-0.17	-5.60	0.06	0.61	0.76	28.41	0.51	7.71	0.28	7.55	0.24	6.60
II. SUBGROUP DIFFERENCES												
Differences in initial scores (White)												
East Asian	0.71	6.09	0.05	0.25	-	-	-	-	-0.85	-7.31	-0.63	-4.89
South Asian	1.17	8.12	0.17	0.72	-	-	-	-	-0.49	-4.28	-0.39	-3.21
Southeast Asian	0.15	1.83	-0.43	-2.30	-	-	-	-	-0.70	-7.39	-0.56	-5.63
FB Indian	-	-	-	-	-1.23	-14.79	-0.65	-5.52	-	-	-	-
FB Pak/Bangladesh	-	-	-	-	-1.75	-35.15	-0.93	-8.51	-	-	-	-
Differences in growth rates (White)												
East Asian	-0.18	-3.19	0.00	-0.04	-	-	-	-	0.28	4.15	0.26	3.8
South Asian	-0.40	-5.61	-0.13	-1.12	-	-	-	-	0.23	3.53	0.19	2.83
Southeast Asian	-0.09	-2.26	0.13	1.32	-	-	-	-	0.30	5.6	0.28	5.05
FB Indian	-	-	-	-	0.69	13.49	0.46	6.14	-	-	-	-
FB Pak/Bangladesh	-	-	-	-	0.78	25.61	0.54	7.72	-	-	-	-

Notes:
1) Analyses are weighted. (2) Test scores are standardized at each wave. (3) Whites are the reference category (4) Model 1 also includes controls for child's gender, child's birth weight, children's enrollment in preschool, mother's marital status, and mother's age at birth. Model 2 adds parent's socioeconomic position to Model 1. (5) Tables A2A and A2B reports the coefficients for parent's socioeconomic status. (6) A version of this table with all covariates is available upon request.

FIGURES

FIGURE 1A. White-Asian Differences in Standardized Reading Test Scores, United States

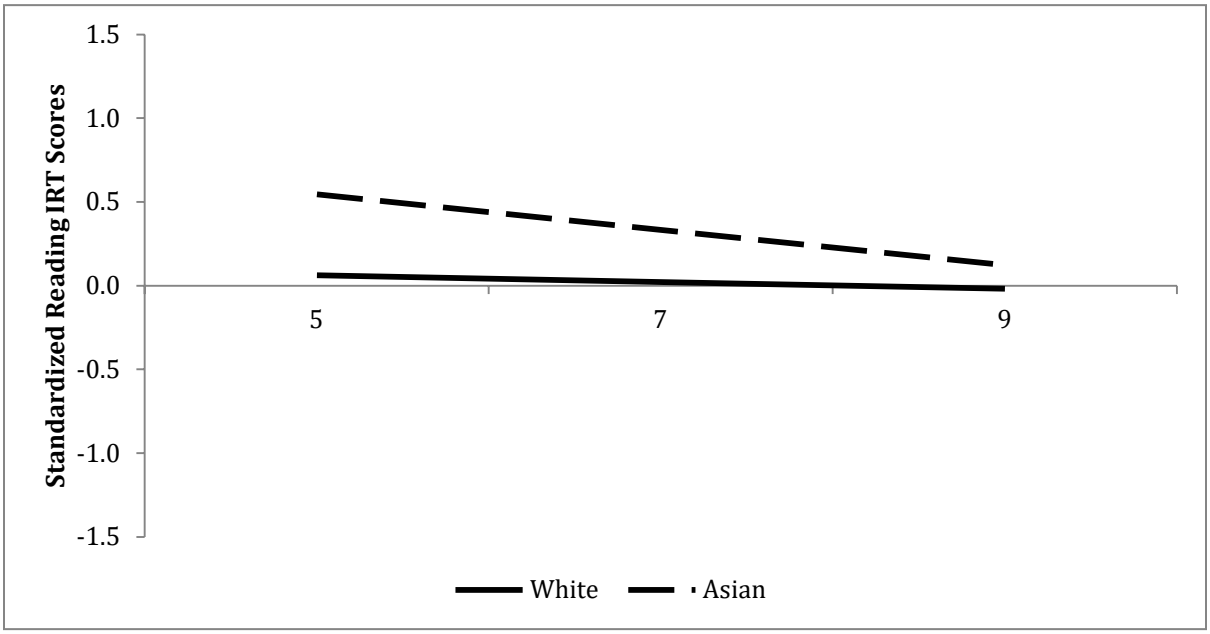
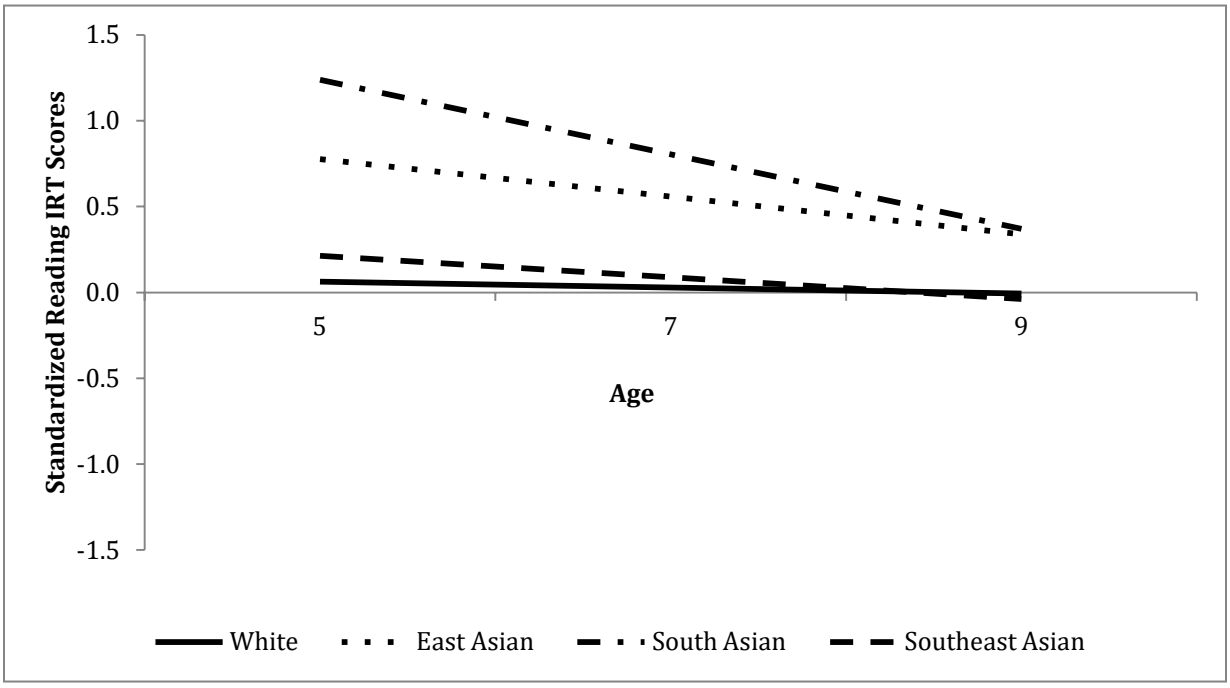


FIGURE 1B. Subgroup Differences in Standardized Reading Test Scores, United States



Note: Figures represent weighted predicted standardized reading test scores obtained from growth curves with demographic controls (Model 1). The academic trajectories from Model 1 mirror very closely the trajectories obtained from the descriptive results.

FIGURE 2A. White-Asian Differences in Standardized Verbal Test Scores, United Kingdom

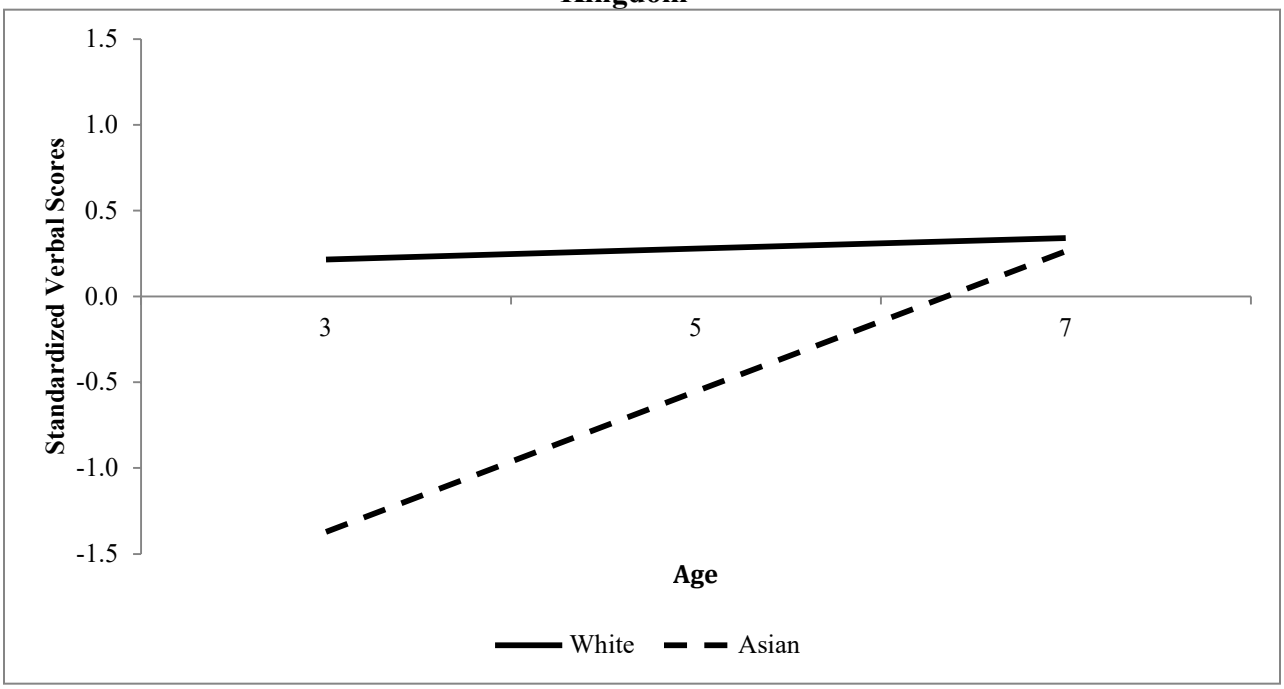
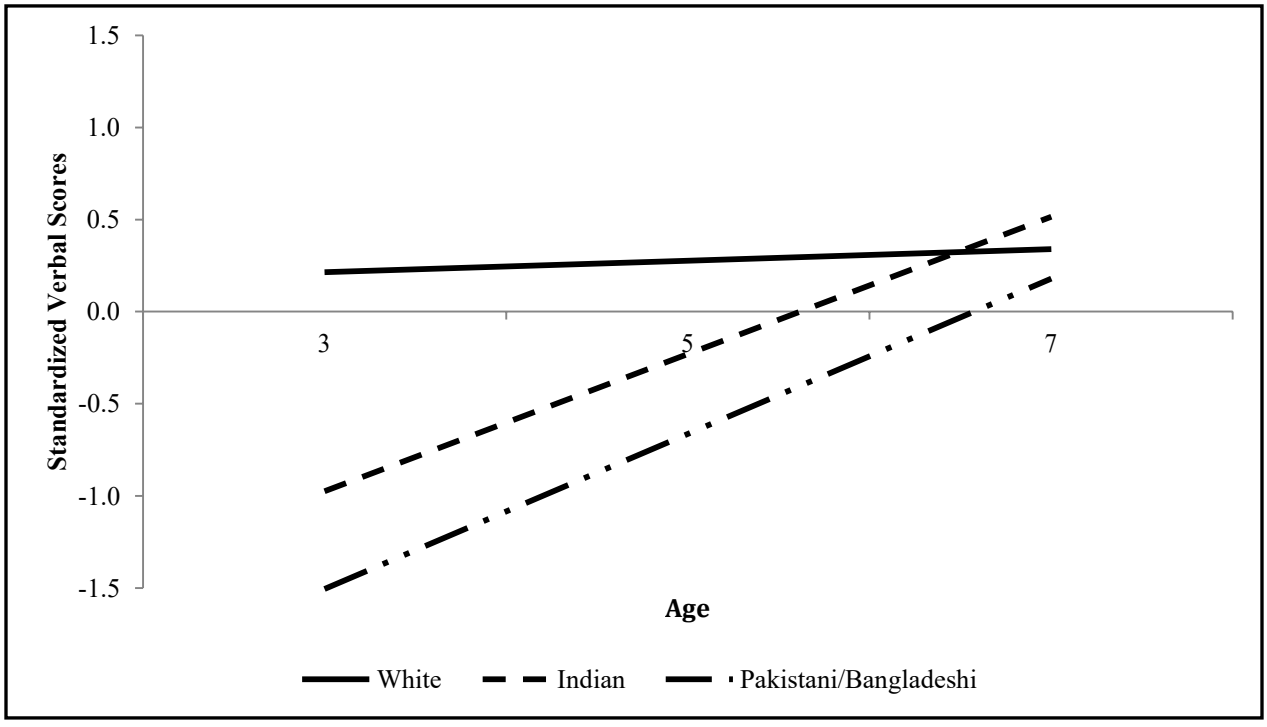


FIGURE 2B. Subgroup Differences in Standardized Verbal Test Scores, United Kingdom



Note: Figures represent weighted predicted standardized reading test scores obtained from growth curves with demographic controls (Model 1). The academic trajectories from Model 1 mirror very closely the trajectories obtained from the descriptive results.

FIGURE 3A. White-Asian Differences in Standardized PPVT Scores, Australia

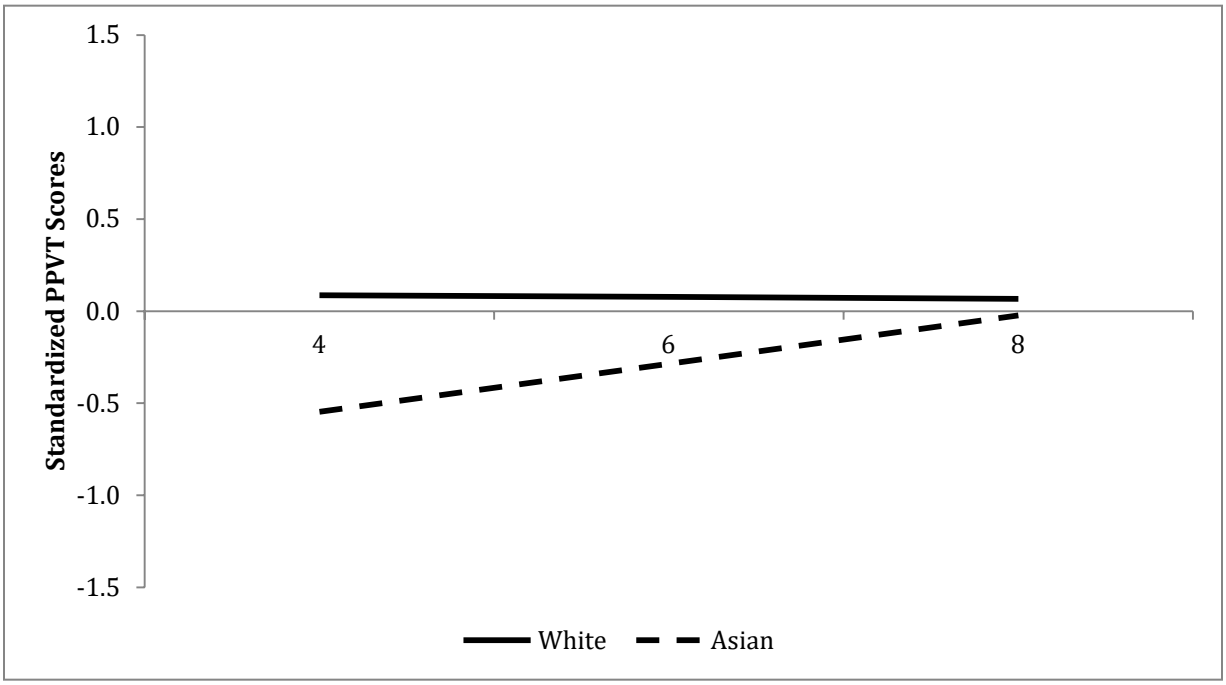
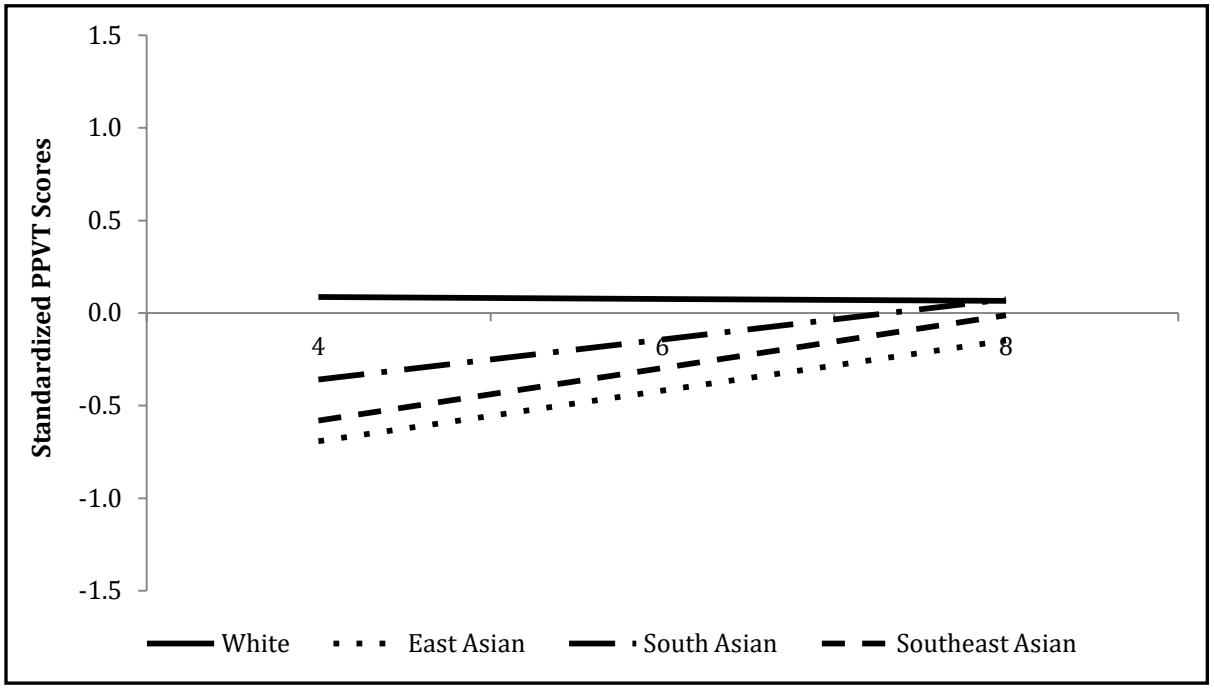


FIGURE 3B. Subgroup Differences in Standardized PPVT Scores, Australia



Note: Figures represent weighted predicted standardized reading test scores obtained from growth curves with demographic controls (Model 1). The academic trajectories from Model 1 mirror very closely the trajectories obtained from the descriptive results.

Appendices

Table A1. Group differences in Demographic Characteristics

	White-Asian		Asian Subgroups			
			East	South Asian		
	White	FB Asian	Asian	Indian	Pak/Bang	SEA
A. United States						
% Female child	49	50	52	47		51
% LBW	5	8	6	16		6
Mother's age at birth						
Less than 20	2	2	0	0		3
20 to 24	14	8	7	1		12
25 to 29	27	25	19	35		25
30 to 34	34	37	49	41		28
35+	22	28	26	22		32
Total	100	100	100	100		100
Pre-kindergarten						
% who attended	85	80	88	83		75
Mother's marital status						
% who married	86	90	97	100		83
B. United Kingdom						
Children's gender						
% Female child	50	54	-	48	55	-
Children's birth weight						
% LBW	6	12	-	14	12	-
Mother's age at birth						
Less than 20	6	3	-	4	3	-
20 to 24	13	28	-	33	28	-
25 to 29	28	36	-	33	36	-
30 to 34	33	20	-	25	20	-
35+	19	12	-	5	12	-
Total	100	100	-	100	100	-
Pre-kindergarten						
% who attended	52	71	-	68	71	-
Mother's marital status						
% who married	66	93	-	93	93	-
C. Australia						
% Female child	49	54	59	49		54
% LBW	6	6	1	16		4
Mother's age at birth						
Less than 20	2	0	0	0		0
20 to 24	11	4	1	6		5
25 to 29	31	32	26	41		31
30 to 34	37	30	32	32		28
35+	19	34	41	22		36
Total	100	100	100	100		100
% who attend preschool	97	96	91	99		98
Mother's marital status						
% who married	84	95	97	98		92

Notes: Weighted percentages.

Table A2A. Growth Curve Models Predicting Standardized Reading Scores, United States

	Model 1		Model 2	
	β	β/se	β	β/se
Mother's race/ethnicity (US-born Whites)				
Foreign-born Asian	0.48	7.77	-0.21	-1.15
Age	0.07	1.56	-0.10	-0.82
Mother's race/ethnicity*Age				
Foreign-born Asian*age	-0.17	-5.60	0.06	0.61
Father's education (Less than HS)				
High school graduate			0.08	1.20
Some college			0.20	3.16
College graduate			0.36	5.30
MA or higher			0.56	7.97
Father's education *Age				
High school graduate			0.04	1.25
Some college			0.07	2.21
College graduate			0.05	1.60
MA or higher			0.02	0.66
Mother's language proficiency (Limited)				
Good			0.37	2.62
Near Mastery/Native			-0.43	-1.98
Mother's language proficiency*Age				
Good*Age			-0.22	-3.07
Near Mastery/ Native*Age			0.08	0.71
Household income (Lowest)				
Second			0.05	2.58
Third			0.08	3.76
Highest			0.06	2.93
Mother's education (Less than HS)				
High school graduate			0.25	3.85
Some college			0.31	4.69
College graduate			0.43	6.06
MA or higher			0.62	8.01
Mother's education*Age				
High school graduate*Age			0.06	1.71
Some college*Age			0.08	2.41
College graduate*Age			0.10	2.79
MA or higher*Age			0.05	1.38
Mother's employment (Unemployed)				
Employed			-0.03	-2.08
Intercept	-0.48	-5.20	-0.28	-1.17

Table A2B. Growth Curve Models Predicting Standardized Reading Scores, United States

	Model 1		Model 2	
	β	β/se	β	β/se
Mother's subgroup (US-born White)				
East Asian	0.71	6.09	0.05	0.25
South Asian	1.17	8.12	0.17	0.72
Southeast Asian	0.15	1.83	-0.43	-2.30
Age	0.06	1.38	-0.10	-0.86
Mother's nationality*Age				
East Asian*Age	-0.18	-3.19	0.00	-0.04
South Asian*Age	-0.40	-5.61	-0.13	-1.12
Southeast Asian*Age	-0.09	-2.26	0.13	1.32
Father's education (Less than HS)				
HS graduate			0.08	1.17
Some college			0.20	3.18
College graduate			0.36	5.25
MA or more			0.55	7.75
Father's education*Age				
HS graduate*Age			0.04	1.27
Some college*Age			0.07	2.18
College graduate*Age			0.05	1.62
MA or more*Age			0.03	0.79
Mother's language proficiency (Limited)				
Good			0.40	2.68
Near Mastery/ Native			-0.40	-1.84
Mother's language proficiency				
Proficient*Age			-0.21	-2.82
Native*Age			0.08	0.69
Household income (Lowest)				
Second quartile			0.05	2.53
Third quartile			0.07	3.70
Fourth quartile			0.06	2.91
Mother's education (Less than HS)				
HS graduate			0.23	3.62
Some college			0.29	4.44
College graduate			0.42	5.90
MA or more			0.60	7.71
Mother's education*Age				
HS graduate*Age			0.06	1.86
Some college*Age			0.09	2.56
College graduate*Age			0.10	2.90
MA or more*Age			0.06	1.59
Employed mother			-0.03	-2.20
Intercept	-0.46	-5.00	-0.29	-1.20

Table A3A. Growth Curve Models Predicting Standardized Verbal Scores, UK

	Model 1		Model 2	
	β	β/se	β	β/se
Mother's race, ethnicity, and nativity (UK-born White)				
Foreign-born Asian	-1.62	-36.95	-0.82	-7.95
Age	-0.02	-0.75	-0.01	-0.14
Mother's race, ethnicity, and nativity*Age				
Foreign-born Asian*Age	0.76	28.41	0.51	7.71
Mother's education (None)				
GCSE A-D			0.22	4.83
O level			0.30	7.78
A level			0.41	9.33
First and higher			0.58	11.69
Mother's education*Age				
GCSE A-D*Age			-0.10	-3.26
O level*Age			-0.01	-0.60
A level*Age			-0.02	-0.73
First and higher *Age			-0.03	-0.91
Father's education (None)				
GCSE A-D			0.15	3.68
O level			0.19	5.31
A level			0.29	5.98
First and higher			0.28	5.32
Father's education*Age				
GCSE A-D*Age			-0.01	-0.26
O level*Age			0.01	0.54
A level*Age			0.04	1.51
First and higher *Age			0.12	4.09
Employed father			0.05	1.78
Employed mother			0.06	3.64
Household income (Lowest)				
Second			0.04	1.87
Third			0.04	1.76
Highest			0.08	2.91
Household language (English)				
English and other			-0.47	-4.78
Other			-0.70	-5.65
English and other*Age			0.23	3.64
Other*Age			0.29	3.58
Intercept	-0.23	-4.51	-0.62	-10.36

Table A3B. Growth Curve Models Predicting Standardized Verbal Scores, UK

	Model 1		Model 2	
	β	β/se	β	β/se
Race, Ethnicity, and Nativity (UK Born Whites)				
Foreign-born Indian	-1.23	-14.79	-0.65	-5.52
Foreign-born Pakistani	-1.75	-35.15	-0.93	-8.51
Age	-0.02	-0.76	-0.01	-0.17
Race, Ethnicity, and Nativity*Age				
FB Indian* Age	0.69	13.49	0.46	6.14
FB Pak/Bangladesh* Age	0.78	25.61	0.54	7.72
Mother's education (None)				
GCSE A-D			0.22	4.75
O level			0.29	7.72
A level			0.41	9.30
First and higher			0.58	11.63
Mother's education*Age				
GCSE A-D*Age			-0.10	-3.22
O level*Age			-0.01	-0.57
A level*Age			-0.02	-0.71
First and higher *Age			-0.03	-0.88
Father's education (None)				
GCSE A-D			0.15	3.65
O level			0.18	5.22
A level			0.28	5.90
First and higher			0.27	5.19
Father's education*Age				
GCSE A-D*Age			-0.01	-0.24
O level*Age			0.01	0.59
A level*Age			0.05	1.57
First and higher *Age			0.12	4.15
Employed father			0.05	1.79
Employed mother			0.06	3.52
Household income (Lowest)				
Second			0.04	1.80
Third			0.04	1.67
Highest			0.08	2.88
Household language (English)				
English and other			-0.44	-4.42
Other			-0.66	-5.24
English and other*Age			0.22	3.47
Other*Age			0.27	3.39
Intercept	-0.24	-4.55	-0.62	-10.30

Table A4A. Growth Curve Models Predicting Standardized Vocabulary Scores, Australia

	Model 1		Model 2	
	β	β/se	β	β/se
Mother's race/ethnicity (Australian-born White)				
Foreign-born Asian	-0.68	-10.66	-0.52	-6.81
Age				
Age	0.19	1.88	0.19	1.84
Mother's race/ethnicity*Age				
Foreign-born Asian*Age	0.28	7.55	0.24	6.60
Preschool (Did not attend)				
Attended	0.18	1.89	0.17	1.85
Attended *age	-0.03	-0.59	-0.04	-0.72
Number of siblings	-0.12	-9.71	-0.10	-8.03
Mother's marital status				
Married	0.14	3.13	0.08	1.74
Mother's education (Less than HS)				
High school graduate			0.14	2.51
Some college			0.12	2.41
College graduate			0.35	5.77
MA or higher			0.29	4.40
Mother's education*Age				
High school graduate*Age			-0.04	-1.05
Some college*Age			-0.06	-2.21
College graduate*Age			-0.06	-1.67
MA or higher*Age			0.01	0.17
Father's education (Less than HS)				
High school graduate			0.12	1.58
Some college			0.10	2.00
College graduate			0.31	4.59
MA or higher			0.21	2.85
Father's education *Age				
High school graduate			0.03	0.77
Some college			0.03	1.05
College graduate			0.09	2.19
MA or higher			0.13	3.13
Household income (Lowest)				
Second			-0.03	-1.06
Third			-0.02	-0.83
Highest			0.01	0.34
Mother's employment (Unemployed)				
Employed			0.01	0.61
Father's employment (Unemployed)				
Employed			0.00	-0.01
Mother's language proficiency (Limited)				
Some proficiency			0.27	2.03
Native			0.52	3.93
Intercept	-0.40	-2.28	-1.04	-4.64

Table A4B. Growth Curve Models Predicting Standardized Vocabulary Scores, Australia

	Model 1		Model 2	
	β	β/se	β	β/se
Mother's race/ethnicity (Australian-born White)				
East Asian	-0.85	-7.31	-0.63	-4.89
South Asian	-0.49	-4.28	-0.39	-3.21
Southeast Asian	-0.70	-7.39	-0.56	-5.63
Age				
Age	0.19	1.88	0.19	1.82
Mother's race/ethnicity*Age				
East Asian*Age	0.28	4.15	0.26	3.80
South Asian*Age	0.23	3.53	0.19	2.83
Southeast Asian*Age	0.30	5.60	0.28	5.05
Number of siblings	-0.12	-9.81	-0.10	-8.07
Mother's marital status				
Married	0.14	3.13	0.08	1.75
Mother's education (Less than HS)				
High school graduate			0.14	2.49
Some college			0.11	2.34
College graduate			0.35	5.76
MA or higher			0.28	4.36
Mother's education*Age				
High school graduate*Age			-0.03	-1.03
Some college*Age			-0.06	-2.16
College graduate*Age			-0.06	-1.67
MA or higher*Age			0.01	0.20
Father's education (Less than HS)				
High school graduate			0.11	1.54
Some college			0.10	1.97
College graduate			0.31	4.57
MA or higher			0.20	2.74
Father's education *Age				
High school graduate			0.03	0.81
Some college			0.03	1.08
College graduate			0.09	2.22
MA or higher			0.13	3.20
Household income (Lowest)				
Second			-0.03	-1.10
Third			-0.02	-0.83
Highest			0.01	0.34
Mother's employment (Unemployed)				
Employed			0.02	0.62
Father's employment (Unemployed)				
Employed			0.00	0.00
Mother's language proficiency (Limited)				
Some proficiency			0.25	1.80
Native			0.49	3.61
Intercept	-0.39	-2.23	-1.00	-4.42

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