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The Biracial Asian-American Advantage at School Entry

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Abstract: Asian-American students have some of the highest scores for standardized tests in American schools—a pattern that is commonly attributed to immigrant selectivity. We extend this line of inquiry by examining mixed-race couples and their children. Using both the ECLS-K cohorts of 1998 and 2010, we document the persistence of the Asian-American educational advantage over time by comparing the math and reading scores of white students (1998 n = 6700; 2010 n = 4500) with Asian-American (1998 n = 500; 2010 n = 600) and biracial Asian/white (1998 n = 150; 2010 n = 150) students at the start of elementary school. Surprisingly, in bivariate models, biracial Asian/white students have some of the highest math and reading scores. Socioeconomic factors are an important part of this advantage. When we examine parenting practices, we find that parenting works in opposite directions for biracial and monoracial Asian couples—decreasing the size of the biracial Asian/white educational advantage but increasing the size of the Asian-American advantage compared with their white kindergartener peers at school entry.

Keywords: achievement gaps; early childhood; Asian Americans; parenting

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1. Introduction

The Asian-American educational advantage in the United States has often been conceptualized as paradoxical—despite lower levels of parental support in childhood and lesser involvement in schools (and for some Asian-American groups, lower socio-economic resources), children in Asian-American households tend to outperform their white, US-born classmates on standardized math and reading tests and obtain higher levels of educational attainment (Kao and Thompson 2003; Lee and Zhou 2014; Gibbs et al. 2017; Kao 1995; Robinson and Harris 2014; Huntsinger and Jose 2009a, 2009b). Although considerable attention has been placed on understanding this Asian-American advantage (Lee 2015), less is known about the Asian-American experience in interracial households, even when more than a third of Asian marriages in the United States are interracial (Lee 2015; Livingston and Brown 2017; Lewis and Ford-Robertson 2010; Fryer 2007; Qian and Qian 2020). In addition, we know that resources and cultural experiences in biracial Asian households are different—most biracial families have socioeconomic advantages over monoracial Asian American households and unique cultural blending that may translate into different parental engagement and support for children (Cheng and Powell 2007), yet surprisingly little research has substantiated this possibility (see Koury and Votruba-Drzal 2014).

Thus, we seek to document if there is a biracial Asian-American advantage at school entry and to determine if the conventional factors employed to account for the Asian-American advantage over white children vary in the biracial Asian-American case. Specifically, we examine whether an Asian-American advantage persists across diverse households by examining math and reading scores, from kindergarten to 1st grade, across seven household types: monoracial households including children with two parents who are (1) white, (2) Asian-American, (3) African American, or (4) Latinx, and biracial households

where one parent is white and the other is (5) Asian-American, (6) African American, or (7) Latinx. To account for any advantages that might be associated with these household types (Qian and Qian 2020), we explore socioeconomic factors, familial relationships, and parental investment and involvement specifically for monoracial Asian-American and biracial Asian-American educational outcomes at the start of school. Furthermore, to determine if these patterns are period-specific, we compare patterns from 1998–2000 to 2010–2012. Although we do not engage directly with selectivity and culture claims about Asian-American advantage in this study, our aim is to descriptively document biracial children achievement at young ages in a way that can advance a more nuanced understanding of monoracial and biracial Asian-American advantage in the United States.

2. Immigration

In the past century, the United States has become more diverse, both racially and ethnically, attracting the largest number of immigrants in the world (United Nations 2020). This is, in large part, due to the passage of the 1965 Immigration Act (Hart-Celler Act 1965), which reduced restrictions on non-European immigration, allowing tens of millions of individuals from more diverse groups of nations to enter the United States (Suárez-Orozco and Suárez-Orozco 2009). Today, almost one in four school-aged children has at least one immigrant parent (O'Hare 2004; Kaiser Family Foundation 2017). Since 2000, Asian Americans have been the fastest-growing racial and ethnic group in the United States, and nearly 60% of Asian Americans are immigrants (Budiman and Ruiz 2021).

Children start school with resources that differ across social classes and across racial and ethnic groups (Lareau 2011). Historically, research has found that these resources help children succeed in school and work as an important mechanism for reproducing social advantages (Bourdieu 1986). However, class-based explanations for child educational performance are complicated by Asian-American educational achievement, as the Asian–white achievement gap cannot be explained by class resources alone (Gibbs et al. 2017; Sakamoto et al. 2009).

For decades, Asian-American students have performed better in school, even with limited socioeconomic resources (Sakamoto et al. 2009). This overachievement has been explained in a few important ways. Some research on the Asian-American educational advantage has focused on selectivity (and hyperselectivity) for understanding immigrant children's achievement in schools. As immigrant selectivity refers to the uniqueness of immigrants in comparison to their non-immigrating peers (Feliciano 2020), hyperselectivity suggests that some immigrants are not only select among people in their home countries but also among the host population of the country to which they immigrate (Lee and Zhou 2015). In other words, immigrants from Asian countries are not only positive education outliers in their host countries (Budiman and Ruiz 2021) but also in their home countries.

To illustrate, immigrants in the United States from Vietnam are less likely to have college degrees than Korean immigrants, but, as Lee (2015) observes, the degree of selectivity among Vietnamese immigrants is greater because non-immigrants in Vietnam are much less likely to have college degrees than Korean non-immigrants. Hyperselectivity is even more apparent among Asian Americans from South and East Asia, who have much higher education and income levels than white Americans because immigration law favors highly skilled Asian immigrants (Lo et al. 2019).

While hyperselectivity explanations of educational achievement focus on the unique resources that Asian immigrants bring with them to the United States, other scholars argue that the theory of selectivity minimizes important cultural explanations for high educational achievement (Sakamoto and Wang 2021; Kim and Kim 2023). Cultural explanations for Asian-American educational achievement point to unique characteristics of Asian culture, usually understood as higher educational expectations and aspirations (Goyette and Xie 1999; Hsin and Xie 2014; Sakamoto and Wang 2021). Asian-American families, compared to white US-born families, are more likely to have greater marital

stability, interdependence (Chao and Tseng 2002; Sakamoto et al. 2012), and parenting styles that exercise a considerable degree of control over their children's decision-making in a wide variety of academic and non-academic activities (Kao 2004; Pong et al. 2005; Hao and Bonstead-Burns 1998; Sun 1998).

Research using different ways to examine these cultural explanations has found some support, even when accounting for selectivity (Hsin and Xie 2014; Kim and Kim 2023). For example, Hsin and Xie (2014) found that both cultural orientation and immigrant status explain differences in academic effort between Asian and white students. Elsewhere, Kim and Kim (2023) found little evidence supporting hyperselectivity arguments and instead suggested that their findings were more "consistent with cultural explanations" (p. 16). These and other findings suggest that, at the very least, the Asian-American achievement gap is a product of a number of complex processes, requiring further examination.

As important as this debate has become, we argue that biracial Asian-American families represent an even more diverse interplay in how culture and selectivity matter for children's educational trajectories in a way that can complicate and challenge the conventional debate. This kind of focus is especially important, given the increase in interracial marriage over the past several decades (Lewis and Ford-Robertson 2010).

3. Interracial Households

There is little research on parenting in biracial homes (Cheng and Powell 2007). One important aspect of interracial households is marriage. Marriage markets can have a high degree of selectivity in terms of immigration status and education level; Qian and Qian (2020) found that, among interracial households, larger percentages of Latinx and Asian Americans (than African Americans) are involved in interracial marriages, suggesting that there are fewer cultural barriers in the marriage market (Lewis and Ford-Robertson 2010).

Assortative educational relationships also mean that parents in biracial marriages may adopt or integrate the beneficial aspects of each culture when developing their own child-raising strategies in the United States. Consequently, instead of these homes middling the advantages and disadvantages of two cultures, children from this type of family might enjoy the best of both worlds—having some degree of autonomy and independence, coupled with respect or filial piety for parents, which could, in turn, positively influence their academic outcomes (Cheng and Powell 2007). But as research on assortative mating suggests that marriages often match along important social boundaries (e.g., race, ethnicity, or socioeconomic status), and as we argue there may be negotiations around parenting strategies, intermarriage patterns may not be this simple, as these unions are complicated and can change, based on the size of minority populations (Schwartz 2013).

What we do know is that Asian American immigrant children tend to be more socially integrated than their parents, have greater familiarity with the dominant society, and show increased English language facility (National Research Council 1999), but often feel "partly ethnic and partly American but full members of neither group" (Healey et al. 2018, p. 56). However, we know even less about how biracial children experience these kinds of tensions. Cheng and Powell's (2007) study provides the best assessment to date of interracial families and how resources for young children vary across family types. They found that, with the exception of Black fathers/white mothers, parents in biracial families allocated greater resources to their children than monoracial parents—specifically investing in more educational goods, more cultural trips, and higher maternal investment. Thus, we extend this study by first replicating their work (and expanding the analysis to include both the ECLS-K 98 and ECLS-K 10) and, most importantly, testing whether these investments translate to higher academic returns for children at young ages, a critical limitation of the Cheng and Powell study.

4. This Study

In this study, we focused on school entry to document early biracial Asian-American educational achievement across two nationally representative studies in the United States.

The data are notable for their focus on educational outcomes and the kinds of ecological conditions experienced by children that might influence a child's educational development and preparation (Tourangeau et al. 2009). School entry to the first grade is a critical period in which the "home child" becomes the "school child", as family institutions first negotiate and then interact with school institutions (see Gibbs et al. 2017). This is also a period where parental involvement in school is highest (Robinson and Harris 2014).

With the first couple of years of schooling as our focus, we explore to what degree parenting and resources account for educational disparities across diverse racial/ethnic households, with a focus on the biracial Asian-American experiences of kindergarteners. We have developed three expectations, based on the existing literature:

(1) *There will be a monoracial Asian-American and a biracial Asian-American advantage (compared to white students) in math and reading scores at the start of school.*
(2) *The Asian-American and biracial Asian-American advantage (compared to white students) will stem largely from socioeconomic factors.*
(3) *Parenting factors (parental investment and parental involvement) will not account for the monoracial Asian-American advantage but will contribute to understanding the biracial Asian-American advantage (compared to white students).*

5. Data and Sample

For this study, we used data from the Early Childhood Longitudinal Study Kindergarten Class of 1998–1999 (ECLS-K 98) and the Early Childhood Longitudinal Study Kindergarten Class of 2010–2011 (ECLS-K 10). Both data sets were designed to examine children's early school experiences and development. Collecting information from children, parents, teachers, and schools, the ECLS-K 98 data used a multistage probability sample design to select a nationally representative sample of children attending kindergarten in the United States in 1998–1999 across approximately 1200 public schools. Likewise, data were similarly collected twelve years later in 2010–2011 across approximately 950 schools. Researchers followed up with the children in the first, third, fifth, and eighth grades. Original data collection included 21,400 children in the 1998 cohort and 18,200 in 2010. To isolate the potential impact of mixed-race parenting on children, children living with a single parent were excluded from our analyses. The final analytic sample size was 9750 for the 1998 cohort and 7650 for the 2010 cohort.

These data were appropriate for use in addressing the above research questions for the following reasons. First, ECLS-K is a nationally representative source of data on students' experiences in elementary school. As a crucial period for children's growth, the elementary school years are the focus of this study. For the present analyses, we examined math and reading scores at the beginning of kindergarten (fall) and the end of first grade (spring). Second, researchers sampled sufficient cases of parents with minority ethnic origins and/or foreign-born backgrounds, which made it feasible to analyze children born in interracial marriages. Third, we explore biracial students' math and reading scores across two waves of data.

Item-level missing data were treated with multiple imputations using chained equations (Enders 2010). The chained-equation approach to multiple imputation allows the imputation model to incorporate the distribution of the imputed variables. For example, dichotomous variables are modeled with logistic regression, ordered variables are modeled with ordered logistic regression, etc. Separate imputation models were estimated for the 1998 and 2010 cohorts. With just under 25 percent of observations having missing data in the 2010 cohort, we used 25 imputed datasets, separated by 100 burn-ins, as graphical diagnostics indicated that the imputation models converged well before that point (White et al. 2011). The analyses were completed on each of the 25 datasets separately and then combined using Rubin's rules with Stata's mi estimate command.

6. Measures

6.1. Dependent Variables

Cognitive Assessments: The assessment of math skills captures conceptual knowledge and problem-solving. This assessment measures number sense, properties, and operations. The assessment for reading captures basic reading skills (e.g., word recognition), vocabulary knowledge, and reading comprehension. Both math and reading assessments use item-response methods (IRT) to gauge the level of difficulty, discriminating ability, and "guess-ability" of each item (Tourangeau et al. 2009).

6.2. Independent Variables

To create a comprehensive set of independent measures, we derived much of our list from Cheng and Powell (2007), using the ECLS-K data from 1998 and 2010.

Race/Ethnicity of Parent. We compiled the parent racial/ethnic identification variable from roster data. Parents were asked to identify their racial/ethnic identity. We only included biological parents and parents who identified with only one race/ethnicity. We created the following categories: white parents, Asian parents, white and Asian parents, Black parents, white and Black parents, Latinx parents, and white and Latinx parents. Children's race was derived from parent reports of the parent's race/ethnicity.

Socioeconomic Factors. Socioeconomic factors were measured by household income, parent education level, and occupational prestige. Each responding parent reported their own and their partner's educational attainment. In both cohorts, the options were 8th grade or less; 9th to 12th grade; high school or equivalent (GED); vocational school or tech program after high school; some college; bachelor's degree; graduate or professional school, no degree; master's degree; doctorate or professional degree. For parental occupational prestige, we used separate continuous measures of mothers' and fathers' occupational prestige (z-scored; M = 0, SD = 1).

Income. Income was measured in the spring kindergarten wave. For the 1998 cohort, most of the parents who responded to the survey that had incomes of USD 32,500 or less reported their household income from the previous year in dollars. The remainder reported their income as being in categories of USD 5000 up to USD 40,000, between USD 40,001 and USD 50,000, USD 50,000 to USD 75,000, USD 75,001 to USD 100,000, USD 100,000 to USD 150,000, USD 100,001 to USD 200,000, or USD 200,001 or more. Responses were re-coded to the midpoint of the category range (the final category was recoded to USD 250,000). All values were rescaled up to units of USD 10,000 and were adjusted for inflation to their equivalent in 2019 dollars. For the 2010 cohort, the responding parent reported their income as being in categories of USD 5000 up to USD 75,000, USD 75,001 to USD 100,000, USD 100,001 to USD 200,000, or USD 200,001 or more. Responses were recoded to the midpoint of the category range (the final category was recoded to USD 250,000). All values were rescaled to units of USD 10,000 and adjusted for inflation to the equivalent in 2019 dollars to match the 1998 measure.

Parental Investments. The responding parent reported their material investments in their child's education and childcare. The number of children's books in the home was assessed during the fall period of kindergarten. The measure for the 1998 cohort was top-coded at 200. The 2010 cohort's measure was not top-coded, but we recoded any values over 200 to equal 200, so that the two measures would have a parallel construction. Having a computer in the home that the child used was assessed in the spring of the child's kindergarten period; this was coded 1 if there was a computer and 0 if there was not. Attending a private school was coded 1 if the child attended a private school and 0 if they attended a public school; this was assessed in the spring period of kindergarten. The responding parent indicated whether and what type of primary non-parental care was used for the child before entering kindergarten. If the child was involved in Head Start, another center-based program, or multiple center-based programs, they were coded 1 and coded 0 otherwise.

Parental Involvement. Seven items in the parent interview captured parental participation in school. The items included contact with the child's teacher or school (for any reason having to do with the child), presence at an open house (or back-to-school night), attendance at a meeting of parent-teacher institutes (for example, a parent-teacher association, or a parent-teacher organization), attendance at a regularly scheduled parent-teacher conference (or meeting with the child's teacher), participation in a school or class event (such as a play, sports event, or science fair), volunteering at the school (or serving on a committee), and participation in fundraising for the child's school. Response options were yes (1) or no (0) and each parent's school-based involvement was represented by the sum of the seven items.

Home Involvement. The responding parent reported during the spring of kindergarten how often they or someone in the household performed the following activities with the child: reading books, telling stories, singing songs, helping with arts and crafts, playing games or puzzles, talking about nature or conducting science projects, playing with construction toys, and practicing with numbers and letters. Responses were coded 1 "not at all", 2 "once or twice a week", 3 "3 to 6 times a week", and 4 "every day". Home involvement was the mean of these eight items and showed a Cronbach's alpha score of 0.70 for the 1998 cohort and 0.71 for the 2010 cohort.

Extracurricular Activities. The parent reported during the spring of kindergarten whether the child participated in music lessons, art lessons, organized clubs, organized athletics, drama classes, performing arts classes, dance lessons, and craft classes or lessons. Responses were coded 1 for yes and 0 for no. The extracurricular activities score was the sum of the eight items.

Educational Trips. The parent reported during the spring of kindergarten whether they had taken the child to visit the library or a bookstore, an art museum or historical site, the zoo, a concert, or a sporting event. Responses were coded 1 for yes and 0 for no. Educational trips were scored as the sum of the five items.

Familial Relationships—Warm/Close Moments with Child. The parent reported in the spring of kindergarten how true it was that they "often have warm, close times together [with their child]". Response options were 1 "completely true", 2 "mostly true", 3 "somewhat true", and 4 "not at all true". The responses were reverse-coded so that higher values indicated more agreement.

Express Affection for Child. The parent reported in the spring of kindergarten how true it was that they "express affection by hugging, kissing, and holding [their child]". Response options were 1 "completely true", 2 "mostly true", 3 "somewhat true", and 4 "not at all true". The responses were reverse-coded so that higher values indicated more agreement.

Discuss Religion/Traditions in the Home. The parent reported during the spring of kindergarten how often someone in the family talked with the child about the family's religious beliefs or traditions. Response options included 1 "never", 2 "almost never", 3 "several times a year", 4 "several times a month", and 5 "several times a week or more".

Number of Close Grandparents. In the fall period of kindergarten, the parent reported how many close grandparents the child had.

Parent Talks to Other Parents. In the spring of kindergarten, the parent reported how many of the other parents at their child's school they would frequently talk to, either in person, on the phone, by texting or emailing, or by using a social networking site.

Educational Expectations. The parent reported during the fall period of kindergarten how far they expected their child to progress in school. Responses for the 1998 cohort included: 1 "less than a high school diploma", 2 "graduate from high school", 3 "two or more years of college", 4 "college degree", 5 "master's degree or equivalent", and 6 "PhD, MD, or other higher degree". For the 2010 cohort, an additional response option, "vocational or technical school", was added between "graduating from high school" and "two or more years of college". This item was treated as a continuous variable for regression models.

Non-English Language Spoken at Home. The parent reported whether the primary language at home was either non-English, only English, or non-English and English equally. Responses were coded 1 if they reported non-English or non-English and English being spoken equally and 0 if only English was spoken.

Mother Born in the United States. The mother reported whether she was born in the United States. Responses were coded on 1 = born in the United States and 0 = not born in the United States.

Family Structure: Both Biological Parents at Home. A dichotomous variable was created from household roster data to indicate whether the child was living with both biological parents.

Father's and Mother's Ages. The father's and mother's ages in years were given by the responding parent in the fall period of the kindergarten assessment.

Number of Siblings. A count of the number of the child's siblings living in the home was created from the household roster data for the fall period of kindergarten assessment.

Child Characteristics. Age is the child's age in months in the fall period of kindergarten. The child's sex was measured as female or male, with female = 1 and male = 0. Health—the responding parent reported the child's health as 1 "poor", 2 "fair", 3 "good", 4 "very good", and 5 "excellent". The variable was reverse-coded so that higher values represented better health.

Child Has a Disability. The responding parent reported in the spring of kindergarten whether the child had a clinical disability; this was coded 1 for "yes" and 0 for "no".

7. Analytic Strategy

In this analysis, we first present descriptive statistics for all variables employed in the analyses to show the characteristics of the samples for the ECLS-K 1998 and ECLS-K 2010 data (Table 1). Then, we separate the results according to the racial/ethnic identification of the mother and father (Table 2). Next, we conduct OLS regression to explore those factors that might account for the Asian and Asian/white advantage for both reading and math at first grade, with separate analyses for the ECLS-K 1998 and the ECLS-K 2010 cohorts (Tables 3 and 4). The results for kindergarten entry are reported in Appendix A (Tables A1 and A2).

Table 1. Variable descriptions and descriptive statistics.

	ECLS-K 1998		ECLS-K 2010	
	Mean	**SE**	**Mean**	**SE**
Cognitive assessments				
Math (Kindergarten entry)	0.11	0.02	0.16	0.03
Math (Spring of first grade)	0.10	0.02	0.15	0.03
Reading (Kindergarten entry)	0.03	0.02	0.15	0.02
Reading (Spring of first grade)	0.08	0.02	0.14	0.03
Socioeconomic factors				
Income (in USD 10,000)	9.31	0.18	9.12	0.21
Mother's educational attainment	4.36	0.04	4.90	0.05
Mother's occupational prestige	2.88	0.04	2.89	0.06
Father's educational attainment	4.37	0.05	4.64	0.06
Father's occupational prestige	4.04	0.03	3.93	0.03
Parental investment				
Number of books in the home	78.84	1.29	80.22	1.64
Computer in the home	0.61	0.01	0.79	0.01
Child in private school	0.17	0.01	0.13	0.01
Child previously in daycare	0.56	0.01	0.57	0.01

Table 1. *Cont.*

	ECLS-K 1998		ECLS-K 2010	
	Mean	**SE**	**Mean**	**SE**
Parental involvement				
Home involvement	1.82	0.01	1.94	0.01
Educational trips	0.42	0.00	0.46	0.01
School involvement	0.64	0.01	0.71	0.01
Extracurricular activities	0.16	0.00	0.18	0.00
Familial relationships				
Warm/close moments with child	3.69	0.01	2.71	0.01
Express affection for child	3.88	0.01	2.91	0.01
Number of close grandparents	2.24	0.02	2.59	0.03
Discuss religion/traditions in home	3.93	0.02	3.75	0.03
Parent talks to other parents	2.35	0.05	2.57	0.09
Educational expectations for child	4.10	0.02	5.25	0.03
Non-English language spoken in home	0.14	0.01	0.17	0.01
Mother born outside the US	0.18	0.01	0.23	0.01
Family structure				
Both biological parents at home	0.89	0.01	0.95	0.00
Father's age	36.20	0.12	36.92	0.18
Mother's age	33.76	0.12	34.47	0.18
Number of siblings	1.52	0.02	1.58	0.03
Child characteristics				
Age (in months)	68.41	0.08	67.49	0.12
Female	0.48	0.01	0.49	0.01
Health	4.35	0.01	4.45	0.02
Child has a disability	0.14	0.00	0.19	0.01

Note: ECLS-K 1998 N = 9737. ECLS-K 2010 N = 7628. Results from 25 imputed datasets that incorporate the complex sample characteristics.

Table 2. Variable descriptions and descriptive statistics according to parent race ethnicity.

	White Parents				Asian Parents				White Parent and Asian Parent			
	ECLS-K 1998		ECLS-K 2010		ECLS-K 1998		ECLS-K 2010		ECLS-K 1998		ECLS-K 2010	
	Mean	**SE**	**Mean**	**SE**	**Mean**	**SE**	**Mean**	**SE**	**Mean**	**SE**	**Mean**	**SE**
Cognitive assessments												
Math (Kindergarten entry)	0.30	0.03	0.34	0.03	0.38	0.08	0.53	0.05	0.65	0.09	0.84	0.08
Math (Spring of first grade)	0.29	0.03	0.36	0.03	0.22	0.08	0.39	0.05	0.63	0.07	0.80	0.06
Reading (Kindergarten entry)	0.17	0.03	0.25	0.03	0.43	0.09	0.65	0.06	0.74	0.11	0.86	0.08
Reading (Spring of first grade)	0.20	0.02	0.28	0.03	0.44	0.07	0.46	0.04	0.78	0.08	0.74	0.08
Socioeconomic factors												
Income (in USD 10,000)	10.70	0.21	10.43	0.24	9.39	0.58	11.03	0.62	13.07	0.60	13.43	0.70
Mother's educational attainment	4.72	0.05	5.32	0.04	4.59	0.15	5.53	0.12	5.16	0.16	6.10	0.09
Mother's occupational prestige	3.07	0.05	3.12	0.08	2.80	0.16	2.77	0.11	3.00	0.19	3.37	0.18
Father's educational attainment	4.74	0.06	5.05	0.06	5.30	0.13	5.68	0.19	5.86	0.15	6.23	0.18
Father's occupational prestige	4.24	0.03	4.12	0.03	4.27	0.12	4.47	0.12	4.89	0.16	4.73	0.09
Parental investment												
Number of books in the home	96.36	1.20	99.47	1.44	44.67	2.73	49.16	2.67	93.36	4.46	104.17	5.49
Computer in the home	0.70	0.01	0.83	0.01	0.64	0.03	0.87	0.02	0.79	0.04	0.85	0.04
Child in private school	0.20	0.01	0.14	0.02	0.17	0.03	0.16	0.03	0.27	0.03	0.24	0.02
Child previously in daycare	0.58	0.01	0.59	0.02	0.54	0.04	0.61	0.02	0.60	0.03	0.71	0.05
Parental involvement												
Home involvement	1.88	0.01	2.01	0.01	1.65	0.03	1.73	0.03	1.86	0.03	2.01	0.02
Educational trips	0.43	0.00	0.46	0.01	0.44	0.02	0.47	0.01	0.46	0.02	0.49	0.03
School involvement	0.69	0.01	0.75	0.01	0.52	0.01	0.64	0.02	0.73	0.02	0.76	0.02
Extracurricular activities	0.19	0.00	0.20	0.00	0.10	0.01	0.16	0.01	0.23	0.02	0.22	0.02

Table 2. *Cont.*

	White Parents				Asian Parents				White Parent and Asian Parent			
	ECLS-K 1998		ECLS-K 2010		ECLS-K 1998		ECLS-K 2010		ECLS-K 1998		ECLS-K 2010	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Familial relationships												
Warm/close moments with child	3.68	0.01	2.72	0.01	3.65	0.03	2.70	0.03	3.72	0.04	2.76	0.03
Express affection for child	3.91	0.01	2.93	0.01	3.64	0.04	2.85	0.02	3.85	0.02	2.91	0.03
Number of close grandparents	2.48	0.02	2.91	0.03	1.60	0.06	2.10	0.07	2.22	0.09	2.55	0.12
Discuss religion/traditions in home	3.91	0.02	3.74	0.04	3.62	0.07	3.55	0.09	3.95	0.11	3.46	0.11
Parent talks to other parents	2.56	0.06	2.76	0.10	1.73	0.15	2.37	0.21	3.19	0.28	3.32	0.35
Educational expectations for child	3.98	0.02	5.01	0.02	4.63	0.06	5.78	0.07	4.29	0.09	5.53	0.05
Non-English language spoken in home	0.02	0.00	0.02	0.00	0.65	0.04	0.60	0.03	0.03	0.01	0.02	0.01
Mother born outside the US	0.04	0.00	0.05	0.00	0.93	0.02	0.93	0.02	0.36	0.04	0.57	0.04
Family structure												
Both biological parents at home	0.90	0.01	0.95	0.00	0.98	0.00	.99	0.00	0.96	0.01	1.00	0.00
Father's age	36.59	0.15	37.24	0.20	38.50	0.30	39.33	0.32	37.40	0.41	40.30	0.55
Mother's age	34.27	0.15	35.03	0.20	35.21	0.28	35.57	0.32	35.11	0.50	37.28	0.40
Number of siblings	1.45	0.02	1.54	0.03	1.78	0.13	1.24	0.07	1.39	0.08	1.23	0.04
Child characteristics												
Age (in months)	68.78	0.09	67.95	0.13	67.44	0.27	65.77	0.22	68.08	0.33	66.53	0.33
Female	0.48	0.01	0.48	0.01	0.49	0.03	0.55	0.02	0.46	0.03	0.47	0.04
Health	4.46	0.01	4.55	0.01	4.06	0.04	4.25	0.04	4.39	0.07	4.56	0.06
Child has a disability	0.16	0.01	0.21	0.01	0.06	0.01	0.09	0.01	0.12	0.02	0.13	0.02

Note: Results from 25 imputed datasets that incorporate the complex sample characteristics.

Table 3. Predicting kindergarten entry math scores: Unstandardized coefficients from linear regression.

	ECLS-K 1998						ECLS-K 2010					
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6 [a]**	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6 [a]**
Race-ethnicity of parents												
White parents	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Asian parents	0.084	0.073	0.251 *	0.286 **	0.230 *	0.324 ***	0.186 ***	0.108 **	0.310 ***	0.296 ***	0.229 ***	0.365 ***
	(0.115)	(0.091)	(0.104)	(0.106)	(0.090)	(0.091)	(0.055)	(0.041)	(0.052)	(0.051)	(0.043)	(0.054)
Asian parent and White parent	0.353 ***	0.171	0.304 **	0.271 **	0.166	0.186 *	0.502 ***	0.291 **	0.450 ***	0.475 ***	0.311 **	0.337 ***
	(0.102)	(0.096)	(0.098)	(0.099)	(0.093)	(0.093)	(0.105)	(0.099)	(0.102)	(0.106)	(0.098)	(0.090)
Black parents	−0.576 ***	−0.358 ***	−0.361 ***	−0.421 ***	−0.280 ***	−0.215 ***	−0.422 ***	−0.280 ***	−0.276 ***	−0.359 ***	−0.204 ***	−0.179 ***
	(0.046)	(0.038)	(0.036)	(0.042)	(0.035)	(0.036)	(0.057)	(0.049)	(0.056)	(0.052)	(0.050)	(0.043)
Black parent and White parent	−0.437 ***	−0.277 **	−0.288 **	−0.337 ***	−0.230 *	−0.177 *	−0.146	−0.093	−0.055	−0.080	−0.032	−0.102
	(0.115)	(0.101)	(0.091)	(0.100)	(0.092)	(0.087)	(0.111)	(0.099)	(0.096)	(0.101)	(0.094)	(0.095)
Latinx parents	−0.896 ***	−0.449 ***	−0.515 ***	−0.615 ***	−0.319 ***	−0.224 ***	−0.794 ***	−0.369 ***	−0.509 ***	−0.614 ***	−0.243 ***	−0.166 **
	(0.039)	(0.034)	(0.037)	(0.040)	(0.035)	(0.051)	(0.068)	(0.063)	(0.069)	(0.066)	(0.062)	(0.059)
Latinx parent and White parent	−0.174 **	−0.097	−0.096	−0.126 *	−0.067	0.002	−0.180 **	−0.100	−0.135 *	−0.152 **	−0.074	−0.051
	(0.064)	(0.061)	(0.061)	(0.060)	(0.059)	(0.057)	(0.058)	(0.053)	(0.057)	(0.057)	(0.052)	(0.048)
Socioeconomic factors												
Income (in USD 10,000)		0.016 ***			0.010 ***	0.00 9***		0.009 ***			0.007 **	0.006 *
		(0.002)			(0.003)	(0.002)		(0.002)			(0.002)	(0.002)
Mother's educational attainment		0.095 ***			0.065 ***	0.055 ***		0.090 ***			0.068 ***	0.056 ***
		(0.008)			(0.008)	(0.008)		(0.008)			(0.009)	(0.009)
Mother's occupational prestige		−0.001			−0.002	−0.005		0.016 **			0.018 **	0.014 **
		(0.006)			(0.006)	(0.006)		(0.006)			(0.006)	(0.005)
Father's educational attainment		0.078 ***			0.057 ***	0.051 ***		0.074 ***			0.063 ***	0.055 ***
		(0.008)			(0.008)	(0.008)		(0.009)			(0.009)	(0.009)
Father's occupational prestige		0.025 *			0.017	0.014		0.035 ***			0.030 ***	0.029 ***
		(0.010)			(0.010)	(0.010)		(0.009)			(0.009)	(0.008)
Parental investment												
Number of books in the home			0.003 ***		0.001 ***	0.001 ***			0.003 ***		0.001 ***	0.001 ***
			(0.000)		(0.000)	(0.000)			(0.000)		(0.000)	(0.000)
Computer in the home			0.338 ***		0.132 ***	0.121 ***			0.330 ***		0.210 ***	0.176 ***
			(0.026)		(0.026)	(0.028)			(0.040)		(0.036)	(0.036)
Child in private school			0.326 ***		0.155 ***	0.153 ***			0.145 **		−0.040	−0.037
			(0.049)		(0.042)	(0.037)			(0.055)		(0.054)	(0.050)
Child previously in daycare			0.162 ***		0.091 ***	0.091 ***			0.142 ***		0.047	0.052
			(0.023)		(0.024)	(0.021)			(0.031)		(0.032)	(0.027)
Parental involvement												
Home involvement				0.051 *	0.022	0.032				0.065*	0.026	0.032
				(0.022)	(0.019)	(0.021)				(0.031)	(0.028)	(0.031)
Educational trips				0.125 *	−0.066	−0.077				−0.039	−0.180 **	−0.192 ***
				(0.053)	(0.048)	(0.046)				(0.058)	(0.055)	(0.053)
School involvement				0.545 ***	0.256 ***	0.200 ***				0.479***	0.148 *	0.080
				(0.050)	(0.045)	(0.042)				(0.072)	(0.068)	(0.068)

Table 3. *Cont.*

	ECLS-K 1998						ECLS-K 2010					
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6 [a]**	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6 [a]**
Extracurricular activities				1.214 ***	0.606 ***	0.560 ***				0.953***	0.474 ***	0.446 ***
				(0.098)	(0.090)	(0.084)				(0.092)	(0.085)	(0.081)
Constant	0.300 ***	−0.787 ***	−0.337 ***	−0.448 ***	−1.003 ***	−5.793 ***	0.340 ***	−0.807 ***	−0.322 ***	−0.323 ***	−1.101 ***	−5.408 ***
	(0.026)	(0.047)	(0.030)	(0.045)	(0.057)	(0.222)	(0.030)	(0.061)	(0.058)	(0.071)	(.083)	(0.329)

Note: ECLS-K 1998 N = 9750. ECLS-K 2010 N = 7650. Results from 25 imputed datasets with incorporated complex sample characteristics. [a] Controls include warm/close moments with child, parent talks to other parents, discuss religion/traditions in home, express affection for child, number of close grandparents, educational expectations for child, non-English language spoken in home, both biological parents at home, number of siblings, father's age, mother's age, child's age, sex, health, whether child has a disability and whether the child's mother was born in the US. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 4. Predicting first grade spring math scores: Unstandardized coefficients from linear regression.

	ECLS-K 1998						ECLS-K 2010					
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6 [a]**	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6 [a]**
Race-ethnicity of parents												
White parents	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Asian parents	−0.065	−0.074	0.091	0.109	0.067	0.077	0.034	−0.029	0.165 **	0.126 *	0.101 *	0.119 *
	(0.096)	(0.077)	(0.087)	(0.090)	(0.076)	(0.090)	(0.054)	(0.041)	(0.052)	(0.053)	(0.046)	(0.055)
Asian parent and White parent	0.344 **	0.185	0.309 **	0.277 **	0.188	0.181	0.442 ***	0.272 ***	0.409 ***	0.420 ***	0.298 ***	0.286 ***
	(0.108)	(0.106)	(0.106)	(0.105)	(0.104)	(0.101)	(0.085)	(0.076)	(0.083)	(0.087)	(0.079)	(0.079)
Black parents	−0.710 ***	−0.522 ***	−0.502 ***	−0.575 ***	−0.427 ***	−0.381 ***	−0.651 ***	−0.542 ***	−0.502 ***	−0.599 ***	−0.449 ***	−0.464 ***
	(0.051)	(0.047)	(0.046)	(0.048)	(0.046)	(0.044)	(0.056)	(0.052)	(0.058)	(0.054)	(0.053)	(0.046)
Black parent and White parent	−0.498 ***	−0.360 **	−0.360 ***	−0.413 ***	−0.309 **	−0.285 *	−0.245 *	−0.208 *	−0.161	−0.186	−0.143	−0.201
	(0.113)	(0.113)	(0.105)	(0.116)	(0.112)	(0.113)	(0.109)	(0.103)	(0.099)	(0.104)	(0.100)	(0.103)
Latinx parents	−0.695 ***	−0.306 ***	−0.359 ***	−0.460 ***	−0.188 ***	−0.169 *	−0.778 ***	−0.432 ***	−0.524 ***	−0.633 ***	−0.310 ***	−0.330 ***
	(0.051)	(0.047)	(0.050)	(0.054)	(0.049)	(0.069)	(0.049)	(0.049)	(0.051)	(0.050)	(0.049)	(0.049)
Latinx parent and White parent	−0.212 ***	−0.145 *	−0.143 *	−0.174 **	−0.119*	−0.064	−0.204 ***	−0.139 *	−0.161 **	−0.181 **	−0.112 *	−0.101 *
	(0.063)	(0.060)	(0.062)	(0.059)	(0.059)	(0.057)	(0.059)	(0.055)	(0.057)	(0.056)	(0.053)	(0.047)
Socioeconomic factors												
Income (in USD 10,000)		0.013 ***			0.009 ***	0.007 ***		0.006 *			0.004	0.003
		(0.002)			(0.002)	(0.002)		(0.002)			(0.002)	(0.002)
Mother's educational attainment		0.084 ***			0.061 ***	0.053 ***		0.074 ***			0.055 ***	0.045 ***
		(0.008)			(0.008)	(0.009)		(0.009)			(0.010)	(0.010)
Mother's occupational prestige		0.001			0.000	−0.001		0.016 **			0.017 **	0.015 *
		(0.006)			(0.006)	(0.006)		(0.006)			(0.006)	(0.006)
Father's educational attainment		0.066 ***			0.050 ***	0.044 ***		0.0065 ***			0.056 ***	0.050 ***
		(0.009)			(0.009)	(0.008)		(0.009)			(0.009)	(0.009)
Father's occupational prestige		0.028 **			0.021	0.019		0.024 **			0.020 *	0.017 *
		(0.011)			(0.011)	(0.010)		(0.009)			(0.009)	(0.008)

Table 4. *Cont.*

	ECLS-K 1998						ECLS-K 2010					
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6 [a]**	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6 [a]**
Parental investment												
Number of books in the home			0.002 ***		0.001 ***	0.001 ***			0.003 ***		0.002 ***	0.002 ***
			(0.000)		(0.000)	(0.000)			(0.000)		(0.000)	(0.000)
Computer in the home			0.319 ***		0.133 ***	0.120 ***			0.257 ***		0.155 ***	0.131 ***
			(0.031)		(0.032)	(0.033)			(0.034)		(0.032)	(0.033)
Child in private school			0.191 ***		0.035	0.030			0.070		−0.081	−0.102 *
			(0.045)		(0.039)	(0.036)			(0.054)		(0.054)	(0.052)
Child previously in daycare			0.065 **		0.004	0.010			0.060 *		−0.016	−0.010
			(0.025)		(0.026)	(0.025)			(0.027)		(0.029)	(0.026)
Parental involvement												
Home involvement				0.028	−0.007	−0.002				0.047	0.004	−0.004
				(0.024)	(0.023)	(0.023)				(0.028)	(0.028)	(0.027)
Educational trips				0.139 **	−0.030	−0.049				0.011	−0.107 *	−0.134 **
				(0.053)	(0.053)	(0.050)				(0.051)	(0.050)	(0.049)
School involvement				0.578 ***	0.322 ***	0.272 ***				0.466 ***	0.204 **	0.167 *
				(0.056)	(0.050)	(0.050)				(0.077)	(0.074)	(0.074)
Extracurricular activities				0.853 ***	0.321 ***	0.350 ***				0.662 ***	0.284 ***	0.307 ***
				(0.091)	(0.089)	(0.087)				(0.078)	(0.076)	(0.081)
Constant	0.286 ***	−0.681 ***	−0.251 ***	−0.381 ***	−0.877 ***	−4.118 ***	0.358 ***	−0.573 ***	−0.186 **	−0.224 **	−0.838 ***	−3.101 ***
	(0.026)	(0.055)	(0.038)	(0.063)	(0.076)	(0.236)	(0.032)	(0.062)	(0.057)	(0.075)	(0.084)	(0.307)

Note: ECLS-K 1998 N = 9750. ECLS-K 2010 N = 7650. Results from 25 imputed datasets with incorporated complex sample characteristics. [a] Controls include warm/close moments with child, parent talks to other parents, discuss religion/traditions in home, express affection for child, number of close grandparents, educational expectations for child, non-English language spoken in home, both biological parents at home, number of siblings, father's age, mother's age, child's age, sex, health, whether child has a disability and whether the child's mother was born in the US. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

8. Results

8.1. Descriptive Statistics

Table 1 presents the descriptive statistics for all variables used in the analyses for both 1998 and 2010 data. Most measures changed little from the 1998 cohort to the 2010 cohort. There are two exceptions; the percentage of homes with a computer jumped from 61% to 79% and the parent's educational expectations of their child increased from 4.10 to 5.25. On the scale of expectations, this is a robust shift from essentially a college degree (4) to a master's degree or equivalent (5).

Table 2 reveals household differences across household types. We limited our comparisons to white parent households (WW), compared with Asian-American (AA) and biracial Asian/white households (AW). We found some striking patterns. First, math and reading scores are highest in Asian/white households, followed by monoracial Asian-American households. Specifically, in white households, kindergarten entry math scores are 0.30 and 0.34 standard deviations higher than for the average student in the sample for both the 1998 cohort and 2010 cohorts, respectively. In monoracial Asian-American households, the estimates are higher for math, at 0.38 (1998) and 0.53 (2010) standard deviations higher than the average student in the sample. In Asian/white households, the advantage is clear—0.65 and 0.84 standard deviations higher than the average student in the sample for the 1998 and 2010 cohorts, respectively. The clear biracial Asian/white advantage extends to reading scores and to estimates of math and reading at the end of first grade. At least descriptively, our results document the Asian-American advantage (as has been reported elsewhere), and, more importantly, the unique educational advantage of biracial Asian American students at the start of school.

Table 2 also reports differences according to socioeconomic factors, parental investment, parental involvement, familial relationships, educational expectations, and language spoken at home. Here, a potential explanation for the unusually large biracial Asian-American advantage takes shape. In 2010, average household incomes were substantially higher in biracial Asian-American homes (~USD 130,430), compared to white households (~USD 104,300) and monoracial Asian-American households (~USD 110,300). Likewise, the average education levels of the mother (6.10) and father (6.23) in biracial households was higher than in white (mother = 5.32 and father = 5.05) and monoracial Asian households (mother = 4.59 and father = 5.30).

Parental investment was also higher in biracial Asian/white homes compared with white and monoracial Asian-American households, as measured by the number of books (AW = 104; W = 99; AA = 49), the percentage in private school (AW = 24%; W = 14%; AA = 16%), and preschool/daycare (AW = 71%; W = 59%; AA = 61%). In terms of parental involvement, biracial Asian/white households were more similar to white than to monoracial Asian households, especially regarding home involvement (AW = 2.01; W = 2.01; AA = 1.73,) school involvement (AW = 0.76; W = 0.75; AA = 0.64), and extracurricular activities (AW = 0.22; W = 0.20; AA = 0.16). This suggests fairly uniform patterns, a departure from some of the varied parenting practices recorded between monoracial Asian and white households in previous years (Cheng and Powell 2007).

Regarding familial relationships, there is a similar pattern, especially in relation to parents talking to other parents. Also, biracial Asian/white and Asian-American households talked about religion/traditions in the home about as much as white households (AW = 3.46; W = 3.74; AA = 3.55). Interestingly, monoracial Asian-American parents had higher educational expectations (AW = 5.53; W = 5.01; AA = 5.78) and spoke a second language in the home (AW = 0.02; W = 0.02; AA = 0.60) in a larger percentage of households than in biracial Asian/white and white households.

To summarize, there is clear descriptive evidence that biracial Asian/white households have a combination of socioeconomic and parenting-related advantages that align more with white households in some instances, and with Asian households in other instances. As these results are descriptive and do not delineate which advantages uniquely matter when analyzing racial/ethnic differences in achievement, we turn to multivariate

analyses to simultaneously model the relationship between socioeconomic factors, parental investments, parental involvement, familial relationships, and other measures.

8.2. Multivariate Results

Tables 3 and 4 report the estimates of math scores at kindergarten entry and at the end of first grade. Reading results for biracial Asian/white students were similar and are reported in Appendix A (Tables A1 and A2). Here, we will primarily focus on the ECLS-K 2010 results, although we also report the ECLS-K 1998 results for comparison. For the ECLS-K 2010 bivariate results, children with one white parent and one Asian-American parent had a clear educational advantage compared to their white peers, at least when measured by standardized math at kindergarten entry (b = 0.502, $p < 0.001$) and at the end of first grade (b = 0.442, $p < 0.001$). In comparison, monoracial Asian-American students had a modest advantage in math at kindergarten entry (b = 0.186, $p < 0.001$) that was no longer significant at the end of first grade (b = 0.034, NS), compared to their white counterparts. At kindergarten entry, socioeconomic factors reduced the biracial Asian-American gap with white students in the kindergarten coefficient from b = 0.502 ($p < 0.001$) in Model 1 to b = 0.291 ($p < 0.01$) in Model 2. Likewise, socioeconomic factors reduced the Asian-American advantage (b = 0.186, $p < 0.001$ in Model 1 to b = 0.108 and $p < 0.01$ in Model 2).

Next, we explore the role of parental investment and involvement in Models 3 and 4, as shown in Tables 3 and 4. As expected, the monoracial Asian-American advantage only grew at kindergarten entry when accounting for parental investment (from b = 0.186, $p < 0.001$ to b = 0.310, $p < 0.001$) and at first grade (from b = 0.034, NS to b = 0.165, $p < 0.01$), and for parental involvement (from b = 0.186, $p < 0.001$ to b = 0.296, $p < 0.001$) and at first grade (from b = 0.034, NS to b = 0.126, $p < 0.05$), which is in line with other findings (see Gibbs et al. 2017). This is due to lower levels of monoracial Asian-American parental investment and involvement (see Table 2), which, when accounted for, can work to increase the size of their children's advantage.

Our full model includes all the measures used in the study. Remarkably, at least at the start of school (see Table 3, Model 6), the sizes of the monoracial Asian-American and biracial Asian/white advantage over white students are nearly identical in size when all factors and controls are accounted for in the full model (AW = 0.337, $p < 0.001$; AA = 0.365, $p < 0.001$), but the path to these advantages is distinct.

Finally, for comparison, when we examine other biracial households, we find that biracial students' educational outcomes fell between those of the corresponding monoracial groups. Thus, unlike biracial Asian/white students who educationally exceeded both their monoracial white and Asian-American counterparts at the start of school at the bivariate level, multi-racial Black/white and Latinx/white students had an achievement level that is lower than white students, but higher than their two monoracial peer groups. For example, when predicting kindergarten entry math scores (Table 3), at the bivariate level, Black students are about −0.422 standard deviation ($p > 0.001$) behind white students, and biracial Black/white students are about −0.146 standard deviations behind them (NS). Likewise, Latinx are about −0.794 ($p < 0.001$) standard deviations behind their white peers, whereas biracial Latinx/white students are about −0.180 ($p < 0.01$) behind them.

9. Discussion

Is there a monoracial and a biracial Asian-American advantage in math and reading scores at the start of school? We find limited evidence that the monoracial Asian-American skill advantage (compared to white students) is uniform at the start of school, at least for math. Reading advantages are more modest but are consistent. However, there is a nearly uniform biracial Asian-American advantage in both math and reading; for cohorts in the late 90s and early 2010s. This advantage is of a magnitude of about 0.50 standard deviation greater than white students. This is the first study to document such a consistent

finding and to use data this early in the educational trajectory of children, especially biracial children.

Does the Asian-American and biracial Asian-American advantage stem largely from socioeconomic factors? Generally, yes. Although the magnitude of the relationship varies, household income, parent education levels, and occupational prestige are important parts of the monoracial and biracial Asian-American advantage over white students in the first years of school.

And finally, do parenting factors vary in their relationship to the monoracial and biracial Asian-American advantage? Yes, and this is perhaps the most significant finding of this study. Parenting factors play a modest role in explaining the biracial Asian-American advantage, but do not account at all for the monoracial Asian-American advantage. Notably, there is relatively little evidence of a monoracial Asian-American advantage at the bivariate level. The advantage only emerges when accounting for parenting practices and related factors in multivariate models.

How do theories of selection and culture help explain student outcomes across these diverse households? We argue that these perspectives require important modifications when applied to biracial households—especially when considering the intimate lives of parents who are actively negotiating parenting strategies as relatively young parents with a diverse host of resources and cultural differences that they can employ. We found that monoracial and biracial Asian-American educational advantage persisted even after we included a host of measures designed to capture the features of what makes Asian immigrants a select group (i.e., higher parental educational attainment, occupational prestige, and household incomes), suggesting support for a cultural argument (Sakamoto and Wang 2021; Kim and Kim 2023). However, explaining any residual advantages (i.e., full models with controls, see Tables 3 and 4, and Model 6) as cultural is problematic—certain aspects of selection could also go unmeasured and may, therefore, play a role if appropriately conceptualized and measured.

It is notable that parental involvement does explain some of the biracial student advantage (at modest levels). Yet, for monoracial students, when we include measures of parental involvement, their advantage only increases. We think this suggests that mixed-race Asian-white couples employ the kinds of parenting practices that correlate well with school-readiness. We caution, however, that the measures of parenting in these data utilize Western-centric surveys of parenting, and more Asian-centric parenting practices (that may be important for child development) may be less well-represented by the conventional measures and surveys used in the United States.

Complicating these patterns is the reality that class and cultural practices are hard to parse, given that there is always racialized negotiation for racial/ethnic minorities and mixed-race couples as they strategize how to help prepare their child for success in institutions dominated by majority-group (white) cultural practices (Cartwright 2022), and available resources (associated with selectivity) can accelerate these kinds of strategizes in sometimes unknown ways.

In addition, as parents use their social class and cultural capital in the racialized social context of schools, minoritized racial groups may have unique cultural resources (e.g., community-derived resources) that they employ for the schooling process, which relate to their specific goals and interests (Yosso 2005). This could mean that for the parents in this study, the use of these resources could represent interactions among the types of resources that they have, how they interpret using them in the school context, and the goals that they have for their child, in ways that are not captured in the ECLS-K data. For example, while it is possible that parents may perceive the school's social/cultural context as coercive assimilation of their child (Cartwright 2022), immigrant Asian and white parents may perceive it differently and may employ community-based resources from immigrant communities in different ways. Thus, more work is needed to understand the racial dynamics of children's school context, especially for mixed-race Asian white

couples, whose use of social and cultural resources and their own cultural meanings of achievement are even more complex.

10. Conclusions

In the first two years of school, we found that biracial Asian/white students have some of the highest math and reading scores in the United States. As socioeconomic factors and parenting practices are an important part of this advantage, it is not for the same reason that monoracial Asian-American children excel so early in school. Asian-American students have a clear educational advantage over their white peers only when one accounts for their parents' lower levels of investment and involvement. Thus, the similar monoracial and biracial Asian-American advantages that we document (in our full models) reveal paths to advantage that vary in significant ways.

How many of these different pathways can be attributed to? As important as selectivity and culture explanations are for understanding either group's advantage (as we discuss above), we offer an alternative way to answer this important question. In short, finding a clear biracial Asian-American advantage so early in the educational experience demonstrates that selectivity and cultural claims are complicated. First, Asian/white mixed-race couples are part of select marriage markets that shape who marries whom, where couples live, and the parenting strategies that these partners will ultimately employ if they have children. Second, the balance of negotiating cultural practices in these settings is equally complex; they are based on the immigrant experience, country of origin, neighborhood and social network support, school climate, gender expectations, and a host of other cultural factors that influence beliefs, norms, and practices.

Thus, our goal here is not just to document the early educational outcomes of this growing population, but to complicate and expand theories of Asian advantage and high achievement in American schools. We hope that this work will motivate more inquiry (quantitative, qualitative, and mixed-methods research) into understanding the rich lives of biracial Asian/white children and their unique educational experiences. As Jiménez and Horowitz (2013) conclude about third-plus immigrant definitions of achievement, we likewise suggest that biracial achievement may "serve as a foil against which the meaning and status of an ethnoracial category is recast" (p. 849).

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Appendix A

Table A1. Predicting kindergarten entry reading scores: Unstandardized coefficients from linear regression.

	ECLS-K 1998						ECLS-K 2010					
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6 [a]**	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6 [a]**
Race-ethnicity of parents												
White parents	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Asian parents	0.252 *	0.242 *	0.414 ***	0.447 ***	0.397 ***	0.494 ***	0.400 ***	0.310 ***	0.524 ***	0.513 ***	0.439 ***	0.543 ***
	(0.119)	(0.098)	(0.109)	(0.112)	(0.098)	(0.100)	(0.072)	(0.065)	(0.067)	(0.071)	(0.066)	(0.073)
Asian parent and White parent	0.564 ***	0.394 **	0.520 ***	0.487 ***	0.388 **	0.397 **	0.600 ***	0.383 ***	0.550 ***	0.567 ***	0.403 ***	0.435 ***
	(0.144)	(0.140)	(0.139)	(0.141)	(0.136)	(0.134)	(0.111)	(0.109)	(0.116)	(0.115)	(0.111)	(0.110)
Black parents	−0.321 ***	−0.118 *	−0.123 *	−0.175 **	−0.046	−0.001	−0.108	0.037	0.038	−0.038	0.112 *	0.113 *
	(0.056)	(0.052)	(0.051)	(0.056)	(0.053)	(0.055)	(0.062)	(0.054)	(0.058)	(0.057)	(0.052)	(0.050)
Black parent and White parent	−0.301 **	−0.150	−0.164	−0.211 *	−0.111	−0.052	−0.192	−0.132	−0.105	−0.116	−0.070	−0.136
	(0.114)	(0.104)	(0.103)	(0.094)	(0.097)	(0.085)	(0.129)	(0.124)	(0.120)	(0.121)	(0.120)	(0.118)
Latinx parents	−0.783 ***	−0.364 ***	−0.428 ***	−0.517 ***	−0.238 ***	−0.138 *	−0.584 ***	−0.160 *	−0.310 ***	−0.394 ***	−0.037	0.007
	(0.042)	(0.039)	(0.040)	(0.042)	(0.039)	(0.054)	(0.070)	(0.068)	(0.070)	(0.069)	(0.066)	(0.080)
Latinx parent and White parent	−0.111	−0.040	−0.038	−0.063	−0.006	0.038	−0.161 **	−0.078	−0.115	−0.132 *	−0.052	−0.043
	(0.064)	(0.058)	(0.059)	(0.061)	(0.057)	(0.057)	(0.061)	(0.059)	(0.060)	(0.059)	(0.058)	(0.055)
Socioeconomic factors												
Income (in USD 10,000)		0.014 ***			0.009 ***	0.008 ***		0.006 *			0.003	0.003
		(0.002)			(0.002)	(0.002)		(0.003)			(0.003)	(0.003)
Mother's educational attainment		0.095 ***			0.068 ***	0.059 ***		0.093 ***			0.070 ***	0.055 ***
		(0.009)			(0.009)	(0.009)		(0.010)			(0.010)	(0.011)
Mother's occupational prestige		−0.003			−0.004	−0.010		0.006			0.009	0.003
		(0.006)			(0.006)	(0.006)		(0.006)			(0.006)	(0.006)
Father's educational attainment		0.070 ***			0.052 ***	0.049 ***		0.086 ***			0.075 ***	0.069 ***
		(0.009)			(0.009)	(0.009)		(0.012)			(0.012)	(0.012)
Father's occupational prestige		0.026 *			0.019	0.015		0.038 ***			0.034 ***	0.033 ***
		(0.011)			(0.011)	(0.011)		(0.009)			(0.009)	(0.009)
Parental investment												
Number of books in the home			0.002 ***		0.001 ***	0.001 ***			0.003 ***		0.001 ***	0.001 ***
			(0.000)		(0.000)	(0.000)			(0.000)		(0.000)	(0.000)
Computer in the home			0.276 ***		0.088 **	0.081 *			0.270 ***		0.139 ***	0.109 **
			(0.030)		(0.032)	(0.033)			(0.041)		(0.037)	(0.036)
Child in private school			0.328 ***		0.171 ***	0.163 ***			0.084		−0.101	−0.113
			(0.051)		(0.044)	(0.041)			(0.066)		(0.064)	(0.061)
Child previously in daycare			0.173 ***		0.106 ***	0.102 ***			0.183 ***		0.082 **	0.087 **
			(0.024)		(0.024)	(0.023)			(0.028)		(0.029)	(0.027)
Parental involvement												
Home involvement				0.082 ***	0.053 *	0.062 **				0.086 ***	0.047 *	0.040
				(0.024)	(0.022)	(0.022)				(0.024)	(0.023)	(0.026)
Educational trips				0.020	−0.160 **	−0.155 **				−0.045	−0.179 **	−0.180 **
				(0.053)	(0.050)	(0.050)				(0.057)	(0.058)	(0.056)

Table A1. *Cont.*

	ECLS-K 1998						ECLS-K 2010					
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6 [a]**	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6 [a]**
School involvement				0.441 ***	0.167 **	0.122 *				0.508 ***	0.185 *	0.093
				(0.057)	(0.054)	(0.053)				(0.067)	(0.073)	(0.072)
Extracurricular activities				1.253 ***	0.673 ***	0.521 ***				0.988 ***	0.523 ***	0.372 ***
				(0.102)	(0.094)	(0.088)				(0.094)	(0.094)	(0.093)
Constant	0.172 ***	−0.858 ***	−0.42 5 ***	−0.525 ***	−1.064 ***	−4.604 ***	0.253 ***	−0.915 ***	−0.374 ***	−0.471 ***	−1.238 ***	−4.718 ***
	(0.025)	(0.054)	(0.033)	(0.055)	(0.067)	(0.261)	(0.032)	(0.059)	(0.048)	(0.071)	(0.077)	(0.288)

Note: ECLS-K 1998 N = 9750. ECLS-K 2010 N = 7650. Results from 25 imputed datasets with incorporated complex sample characteristics. [a] Controls include warm/close moments with child, parent talks to other parents, discuss religion/traditions in home, express affection for child, number of close grandparents, educational expectations for child, non-English language spoken in home, both biological parents at home, number of siblings, father's age, mother's age, child's age, sex, health, whether child has a disability and whether the child's mother was born in the US. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A2. Predicting first grade spring reading scores: Unstandardized coefficients from linear regression.

	ECLS-K 1998						ECLS-K 2010					
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6 [a]**	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6 [a]**
Race-ethnicity of parents												
White parents	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Asian parents	0.236 *	0.221 **	0.367 ***	0.421 ***	0.352 ***	0.406 ***	0.175 ***	0.110 **	0.278 ***	0.285 ***	0.227 ***	0.190 ***
	(0.101)	(0.080)	(0.092)	(0.095)	(0.081)	(0.085)	(0.049)	(0.038)	(0.047)	(0.047)	(0.040)	(0.046)
Asian parent and White parent	0.576 ***	0.412 **	0.533 ***	0.508 ***	0.404 **	0.416 **	0.457 ***	0.282 ***	0.425 ***	0.431 ***	0.311 ***	0.244 **
	(0.134)	(0.126)	(0.130)	(0.131)	(0.124)	(0.130)	(0.092)	(0.084)	(0.092)	(0.093)	(0.085)	(0.080)
Black parents	−0.396 ***	−0.203 ***	−0.219 ***	−0.258 ***	−0.135 *	−0.111 *	−0.239 ***	−0.130 *	−0.115	−0.176 **	−0.062	−0.114 *
	(0.060)	(0.055)	(0.053)	(0.059)	(0.054)	(0.052)	(0.060)	(0.053)	(0.059)	(0.056)	(0.054)	(0.051)
Black parent and White parent	−0.282 **	−0.144	−0.158	−0.199 *	−0.108	−0.053	−0.176	−0.137	−0.101	−0.111	−0.078	−0.135
	(0.103)	(0.102)	(0.093)	(0.100)	(0.097)	(0.094)	(0.094)	(0.087)	(0.085)	(0.085)	(0.084)	(0.083)
Latinx parents	−0.622 ***	−0.243 ***	−0.313 ***	−0.378 ***	−0.138 **	−0.103	−0.675 ***	−0.319 ***	−0.446 ***	−0.500 ***	−0.206 ***	−0.231 ***
	(0.041)	(0.040)	(0.041)	(0.042)	(0.042)	(0.055)	(0.052)	(0.047)	(0.053)	(0.052)	(0.048)	(0.050)
Latinx parent and White parent	−0.124	−0.060	−0.062	−0.081	−0.036	0.009	−0.128 *	−0.059	−0.090	−0.100	−0.035	−0.045
	(0.069)	(0.067)	(0.069)	(0.065)	(0.066)	(0.063)	(0.057)	(0.054)	(0.056)	(0.056)	(0.053)	(0.051)
Socioeconomic factors												
Income (in USD 10,000)		0.011 ***			0.007 **	0.006 *		0.003			0.001	0.001
		(0.002)			(0.002)	(0.002)		(0.003)			(0.002)	(0.002)
Mother's educational attainment		0.081 ***			0.059 ***	0.052 ***		0.081 ***			0.060 ***	0.049 ***
		(0.009)			(0.009)	(0.009)		(0.010)			(0.010)	(0.010)
Mother's occupational prestige		−0.006			−0.007	−0.012 *		0.019 ***			0.021 ***	0.016 **
		(0.006)			(0.005)	(0.005)		(0.006)			(0.006)	(0.005)
Father's educational attainment		0.067 ***			0.051 ***	0.048 ***		0.067 ***			0.057 ***	0.050 ***
		(0.010)			(0.010)	(0.009)		(0.010)			(0.010)	(0.010)

Table A2. *Cont.*

	ECLS-K 1998						ECLS-K 2010					
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6 [a]**	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6 [a]**
Father's occupational prestige		0.042 ***			0.035 **	0.030 **		0.032 ***			0.028 **	0.027 ***
		(0.011)			(0.011)	(0.010)		(0.009)			(0.009)	(0.008)
Parental investment												
Number of books in the home			0.002 ***		0.000	0.000			0.002 ***		0.001 ***	0.001 ***
			(0.000)		(0.000)	(0.000)			(0.000)		(0.000)	(0.000)
Computer in the home			0.300 ***		0.119 ***	0.112 ***			0.297 ***		0.182 ***	0.161 ***
			(0.030)		(0.031)	(0.032)			(0.038)		(0.036)	(0.035)
Child in private school			0.276 ***		0.130 **	0.113 *			0.065		−0.097	−0.120
			(0.050)		(0.048)	(0.046)			(0.067)		(0.066)	(0.065)
Child previously in daycare			0.098 ***		0.036	0.042			0.068 *		−0.018	−0.007
			(0.025)		(0.024)	(0.023)			(0.027)		(0.028)	(0.027)
Parental involvement												
Home involvement				0.077 **	0.054 *	0.049				0.073 **	0.041	0.026
				(0.027)	(0.026)	(0.026)				(0.026)	(0.025)	(0.026)
Educational trips				0.030	−0.132 **	−0.137 **				−0.046	−0.158 **	−0.161 **
				(0.051)	(0.049)	(0.049)				(0.057)	(0.057)	(0.055)
School involvement				0.510 ***	0.264 ***	0.204 ***				0.481 ***	0.230 **	0.183 *
				(0.060)	(0.060)	(0.060)				(0.076)	(0.079)	(0.076)
Extracurricular activities				0.990 ***	0.485 ***	0.304 ***				0.882 ***	0.529 ***	0.307 ***
				(0.090)	(0.085)	(0.081)				(0.086)	(0.086)	(0.090)
Constant	0.203 ***	−0.775 ***	−0.305 ***	−0.488 ***	−0.996 ***	−3.522 ***	0.283 ***	−0.704 ***	−0.247 ***	−0.381 ***	−1.028 ***	−2.778 ***
	(0.025)	(0.052)	(0.037)	(0.062)	(0.077)	(0.259)	(0.027)	(0.054)	(0.050)	(0.072)	(0.080)	(0.352)

Note: ECLS-K 1998 N = 9750. ECLS-K 2010 N = 7650. Results from 25 imputed datasets with incorporated complex sample characteristics. [a] Controls include warm/close moments with child, parent talks to other parents, discuss religion/traditions in home, express affection for child, number of close grandparents, educational expectations for child, non-English language spoken in home, both biological parents at home, number of siblings, father's age, mother's age, child's age, sex, health, whether child has a disability and whether the child's mother was born in the US. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

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