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Article

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New evidence on son preference among immigrant households in the United States

Abstract

This paper provides new evidence on the acquisition and persistence of child gender preference among immigrant populations in the United States using Census and American Community Survey data. We first confirm the existing evidence of son preference among immigrant populations from South East Asia that was documented across multiple studies and samples. We then demonstrate several new empirical findings. First, Japanese immigrants exhibit daughter preference. Second, assortative matching between immigrant parents is associated with stronger gender preferences. Third, comparing male and female migrants who marry natives provides suggestive evidence that paternal preferences could be more to blame for son preference than maternal. Fourth, child gender preferences are strongest for migrants who arrive after childhood but do not appear to diminish with the duration of residence in the United States. Finally, while higher-order generations exhibit weaker son preference, there is a high degree of heterogeneity across groups. Most of the second- and higher-order generation immigrants assimilate more rapidly to US norms except Indian immigrant populations, which exhibit strong son preference among higher-order generations.

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1 Introduction

Son preference has been documented in many Asian countries including China, India, Japan, Korea, and Vietnam (Arnold and Zhaoxiang, 1986; Gupta, 1987; Aly and Shields, 1991; Haughton and Haughton, 1998; Edlund, 1999; Das Gupta et al., 2003; Jayachandran and Pande, 2017).¹ Studies show that parents in these settings often exhibit favoritism for sons over daughters both before and after birth, with dramatic economy wide consequences ranging from higher fertility, to imbalanced sex ratios, marriage market effects, and gender discrimination. Recent research has begun to demonstrate evidence of son preference in richer countries, such as South Africa, Canada, the United Kingdom, and the United States (Gangadharan and Maitra, 2003; Dubuc and Coleman, 2007; Dahl and Moretti, 2008; Abrevaya, 2009; Almond et al, 2013).

In the case of the United States, where son preference is less evident in the overall population in birth outcomes, only a handful of economic studies examine the issue, each varying slightly in sample and methodology. Typically, using immigrant groups to look for son preference in rich countries is an existing area of focus of the literature on son preference (Almond and Edlund, 2008; Abrevaya, 2009; González, 2018; Ost and Dziadula, 2016; Lillehagen and Lyngstad, 2018). One of the closest analyses is that of Almond et al. (2013), which estimates son preference in immigrant populations from South and East Asian countries in Canada using census data and finds higher sex ratios among first-generation immigrants who migrated in adulthood and higher sex ratios at third parity. Among native-born, Dahl and Moretti (2008) find that parents in the United States favor boys along behavioral dimensions of parents such as marriage patterns, whereas Abrevaya (2009) finds son preference, but only among Chinese and Indian immigrants' sub-populations. Abrevaya shows the unusually high boy-birth rates among third and fourth children in Chinese and Indian households and estimates the number of missing girls in the United States. Almond and Edlund (2008) find evidence of sex selection at the prenatal stage among Chinese, Korean, and Asian Indian immigrant parents in the 2000 US census. Blau et al. (2017) show that having a daughter first is associated with lower fertility for the whole population, higher rates of households headed by females, and positive fertility effects. Among immigrants, they find that households that have female as first born have higher fertility rates and are more likely to be living without a father but no evidence of gender selection. Some of these differences stem from nuances in approach across researchers and some from samples analyzed.²

While son preference is weak among native-born individuals, the evidence that immigrants from Asian countries exhibit son preference in the United States is startlingly robust across studies and arguably understudied given that this group alone accounts for roughly 7% of the overall population. Immigrants make an ideal population to study gender norms because they face a common set of laws, institutions, and gender norms upon arriving in the United States. They also carry with them many cultural and behavioral norms from their homeland.

¹ In the case of Japan, son preference appears to have given way to daughter preference along some dimensions (Fuse, 2013).

² For example, Dahl and Moretti (2008) present evidence of weaker forms of son preference among parents in the United States by estimating the effects of child gender on mothers' marital status and family structure using the 1960–2000 US Censuses. They find that a first-born girl is less likely to live with her father relative to a first-born boy due to the mother's lower probability of getting married, higher probability of being divorced, and a father's lower likelihood of obtaining custody of daughters. Abrevaya (2009) finds evidence of gender selection among Asian immigrant populations using both vital statistics and census data to estimate boy-birth percentages by birth order and country of migration.

In this paper, we first confirm and extend the findings of Almond and Edlund (2008) and Blau et al. (2017), showing that there is no evidence of son preference in the aggregate in the United States, nor among native-born individuals, nor among most immigrant populations—when measured by fertility stopping behavior and child gender. For parents who migrate specifically from countries in South, East, and Southeast Asia (abbreviated as SESE Asia), we document son preference, both among small and large size families, occurring through both mechanisms—fertility stopping and gender selection.³ Disaggregation reveals direct evidence of son preference among mothers from China, India, Korea, the Philippines, and Vietnam, but not among migrants from Japan in most samples.⁴ We additionally show that son preference in the form of a lower likelihood of marriage among mothers of daughters appears in all population groups, with larger effects along this dimension in the native-born population than among immigrant groups.

We then build on the literature in several ways. These include disaggregating across finer population groups, exploring assortative matching by contrasting the role of immigrant mothers and fathers, as well as examining how and when in life mothers develop son preference, the extent to which these preferences can persist after exposure to US society, and the degree to which they are transmitted intergenerationally. These tests produce several new empirical findings for the US immigrant population.

First, we show that Japanese migrants exhibit daughter preference. Studies have shown that the extent of son preference can change with evolving social values over time, including son preference in the cases of Japan and South Korea (Kureishi and Wakabayashi, 2011; Choi and Hwang, 2015). Indeed, recent research has confirmed a shift away from son preference (Kureishi and Wakabayashi, 2011) with some evidence of daughter preference now among certain groups in Japanese society (Fuse, 2013). Similarly, son preference in Korea has noticeably declined over time and consistent with this pattern, we find evidence of son preference among immigrants from Korea only when we examine the full period from 1980 to 2017. This association disappears when we restrict the sample to only recent American Community Survey (ACS) survey waves in the post-2010 period. At the same time, families with migrant mothers from other nations that exhibit son preference in their home country, namely those from China, India, the Philippines, and Vietnam, continue to manifest comparatively high levels of son preference.

Second, we explore a new avenue in the immigrant population with regard to son preference—the role of assortative matching between immigrant parents. We find that couples where both parents are immigrants from the same country exhibit significantly stronger son preference outcomes (or daughter preference in the case of Japanese migrants). We then extend the analysis and compare male and female migrants from SESE Asian countries who marry native-born individuals. This exercise reveals new and interesting patterns. Although these are highly selected samples of individuals and thus not to be taken as causal estimates, we find no evidence of son preference among the households of female mother migrants, whereas at the same time we do see evidence of child gender (both son and daughter) preference in the

³ We select these countries for particular focus because of previously documented son preference in the region, to be able to compare our findings with those in other studies, and because of their sufficient population sizes in the United States to produce reliable estimates.

⁴ These findings are also consistent with research outside of economics using the natality files of the vital statistics system that has identified skewed sex ratios for higher parity births in the United States among Chinese and Indian women (Howell et al., 2018).

households formed between male migrants and natives. These results do not prove paternal preferences matter more, but they provide suggestive evidence that paternal preferences are important for son preference outcomes and highlight the fact that further research is needed to understand the role of household bargaining and gendered preferences.

Third, we show that gender preferences are strongest in migrants who arrive after childhood, consistent with the recent analysis of Ost and Dziadula (2016). We extend this exercise to show that son preference does not appear to diminish with the duration of residence in the United States. For example, immigrant mothers who have resided in the United States for longer periods of time before giving birth are not less likely to exhibit son preference than their counterparts who give birth more quickly after arrival. Although there is limited research on timing of first birth since arrival and its impact on son preference in the US context or by economists in general, this finding is consistent with research outside of economics looking at sex ratios at birth among Indian immigrants to Canada, where duration of residence had no impact on the level of skew in M/F sex ratios at birth (Brar et al., 2017). Both of these findings are consistent with existing research in economics that shows that cultural characteristics can become ingrained—impervious to assimilation later in life, even after a longer duration of residence in the United States. For example, Hicks et al. (2015) show that gender norms regarding the allocation of household labor between men and women are acquired in childhood, and, once established, are relatively uninfluenced by the duration of exposure to US culture. Our results similarly suggest that son preference, like other attitudes about gender, is also commonly acquired in a similar critical early stage of life, and that these roles are relatively stable, once formed.

Fourth, we explore the extent to which son preference changes across generations. In related exercises, Blau et al. (2013) demonstrate intergenerational assimilation to native levels for fertility, education, and labor supply among migrants, whereas Bleakley and Chin (2010) find that greater English proficiency of immigrants leads to more rapid assimilation to US behaviors, including a higher probability of divorce and intermarriage and a lower likelihood of living in ethnic enclaves. Thus, it is plausible to expect that son preference among immigrant populations could vary along with the process of their general cultural assimilation in the United States and it is likely important to look at migrants from different countries individually (Blau et al., 2013). We show that higher-order generations exhibit weaker son preference, although there is a sizeable degree of heterogeneity across groups—second- and higher-order generation Chinese immigrants conform more rapidly to US norms, whereas Indian immigrant populations exhibit strong son preference among higher-order generations.

The remainder of the paper is organized as follows. Section 2 discusses the sample, assumptions, and data used. Section 3 looks for evidence of multiple forms of son preference across large and disaggregated immigrant population groups in the United States. Section 4 examines the formation, persistence, and intergenerational transmission of son preference. Section 5 concludes the discussion.

2 Sample and Data Summary

We employ Decennial Census and ACS Data since 1980 that are harmonized by IPUMS (Ruggles et al., 2020). The ACS is conducted yearly and includes information on education,

housing, jobs, immigration, and other demographic characteristics.⁵ For much of the analysis, we use the 1980, 1990, and 2000 Census as well as the 2001–2017 ACS.⁶ Data are available at the individual level with the identifiers linking to the structure of family and household. In US-born samples and any tables that contain them, we employ the 2012–2016 ACS 5-year Public Use Microdata to keep the analysis computationally tractable. It contains all cases from the annual 1% ACS samples for 2012, 2013, 2014, 2015, and 2016, and produces a sample size of approximately 5% of the US population.⁷

As is common in the literature on son preference using cross sectional survey data, to avoid the problem that some of the children may have already left the household at the time of the ACS survey, in the analysis, we define a family as a married mother with an eldest child at the age of 12 or younger living in the household. We also restrict the sample to mothers with an age between 18 and 40. Both of these choices limit the likelihood that sample selection or attrition would spuriously drive any results observed.

Table 1 presents summary statistics for the 2012–2016 ACS sample that includes native-born and immigrants. The resulting sample size for families with at least one child is 490,858.⁸ Household statistics are presented in Panel A. Household size, on average, is 3.99. Around 62% of mothers and 92% of fathers are in the labor force. Almost 93% of mothers attain high-school education or above and 46% of mothers have at least a bachelor's degree. Education attainments for fathers, at 89% and 39%, respectively, are lower than mothers.

The ACS provides information on each individual's place of birth, allowing us to define first-generation immigrants and to identify their country of origin. We decompose the sample into native-born individuals, first-generation immigrants, migrants from countries other than SESE countries, and migrants from these regions specifically.⁹ Statistics for these populations are presented in Panel B of Table 1. As the ACS also contains information on each person's ancestry and race, we construct a measure of higher-order generations of immigrants who claim their ancestry are from SESE Asia or as individuals who speak a specific Asian language at home or who identify as having at least one-third of their race from a country in these regions. Overall, 21% families have a foreign-born mother, 33% of whom are from a country in SESE Asia. Only for first-generation immigrants, the year of migration is available in the ACS. We use this variable to test whether the son preferences among immigrants vary as a function of age of migration and the duration of residence in the United States.

Individual age is reported for each household member. Using this information, we construct a detailed birth order for children in a family and record the gender of children for each. At each birth order, we construct variables for the conditions whether the family had another

⁵ The ACS includes questions not asked in the regular census. Response to the ACS survey is required by law.

⁶ We use the 2012–2016 ACS in Tables 2 and 3 to be consistent with previous studies, but it does not contain sufficient sample size when we disaggregate to analyze migrants from specific countries and because it is far more tractable empirically when we are examining the entire US sample (Tables 2 and 3). We keep the sample consistent within these tables, but then for the remainder of the tables which do disaggregated country of origin analysis, we use a larger sample employing more waves of ACS and the decennial censuses to better be powered to analyze specific subpopulations.

⁷ The primary difference between the 2010 census and the 2012–2016 ACS file for the purpose of this paper is the availability of detailed information on immigration and household structure.

⁸ Our unit of observation is household.

⁹ All countries and regions in SESE of Asia are considered once they are recorded in the ACS. It includes China, Hong Kong, Taiwan, Japan, Korea, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, Vietnam, Afghanistan, Bangladesh, Bhutan, India, Nepal, Pakistan, and Sri Lanka.

Table 1. ACS sample summary statistics

Panel A: Demographics	Mean	SD
Household size	3.99	0.98
Family income	98,810	89,883
Mother in labor force	0.62	0.49
Mother's age at marriage	27.87	5.86
Mother's age of first birth	26.61	4.74
Mother's education high school and above	0.93	0.25
Mother's education bachelor's degree and above	0.46	0.5
Father in labor force	0.92	0.27
Father's education high school and above	0.89	0.31
Father's education bachelor's degree and above	0.39	0.49
Panel B: Country of Birth/Ancestry		
First-generation immigrants	0.21	0.41
Year of migration	2000.7	9.68
Immigrants from East, SE Asian countries and regions	0.07	0.26
Immigrants from China	0.01	0.1
Immigrants from Japan	0.003	0.05
Immigrants from Korea	0.01	0.07
Immigrants from the Philippines	0.01	0.1
Immigrants from Vietnam	0.01	0.08
Immigrants from India	0.02	0.15
Higher-order generation immigrants (SE Asian countries)	0.02	0.14
Panel C: Household Fertility		
Number of children	1.91	0.89
% of household with all girls	0.3	0.46
% of household with all boys	0.32	0.47
% of household with mix	0.38	0.49

Notes: The sample covers families with married mothers between age 18 and 40, and with at least one child and the oldest one is 12 years old or younger in the United States. The unit of observations is the household, and there are 490,858 households in the sample.

Source: American Community Survey from 2012 to 2016.

child and whether the family had another male child.¹⁰ In the sample, the average household has 1.9 children; 30% of the families have only daughters and 32% of the households have only sons. The remainder, 38% of the families, have both daughters and sons. Household fertility statistics are presented in Panel C of Table 1.

Although we do not discuss them in detail for the purposes of brevity, Table 1 of Appendix produces summary statistics for the entire period 1980 to 2017 using both Census and ACS data. These statistics are not directly comparable to those in Table 1 as they (i) reflect the full period sample and (ii) include only households where one or both parents have been born in

¹⁰ When we estimate son preference for second children, families with twins and triplets at the first birth are excluded. When we estimate son preference for mother's having a third child, those with twins or triplets at the second and third birth order are excluded.

a SESE Asian country. The subsequent sections and table notes make it clear which sample is used in each analysis.

3 Evidence of Son Preference within the United States

3.1 Empirical Strategy

We begin the analysis within the following econometric framework:

$$Y_i = \beta_0 + \beta_1 AllGirls_i + \beta_2 X_i + \varepsilon_i \quad (1)$$

where i denotes married women between the age of 18 and 40 with at least one child, $AllGirls_i$ is a dummy variable indicating the gender of previous children as being all female, X_i are control variables, ε_i is the error term, β s are the coefficients, and, specifically, β_1 is the parameter of interest.

We consider two dependent variables of interest: *Fertility_i*, indicating whether family i had additional children within 6 years, and *Male child_i*, indicating whether the next child is a son.¹¹ For the “2nd child born” sample, we include families with at least one child, so if they had a second child within 6 years after the first child’s birth, *Fertility_i* equals 1, otherwise it is 0.¹² Similarly, in the “3rd child born” sample, we consider families with two and more children. If they have a third child within 6 years of the birth of the second child, then the dependent variable, *Fertility_i*, takes the value 1.¹³ We opt for OLS for ease of interpretation, and the predicted values for both sets of dependent variables estimated by the Linear Probability Model (LPM) are predominantly ranging between 0 and 1.¹⁴

The parameter of interest is the coefficient on *AllGirls_i*, an indicator variable assigned 1 when the previous children are all girls in family i . The coefficient indicates the difference in Y_i between families with all girls and those with at least one son. Arguably, it should provide an upper bound of the effects of son preference on family size because some families may have additional children simply to balance the gender pool of their children—an effect which may not be due to son preference. To isolate bias for sons from gender balancing preferences, in third birth order children analysis, we additionally include another specification that also controls for *Mix_i*, which indicates that the gender of the two previous children contains both a boy and girl, in the following regression equation:

$$Y_i = \beta_0 + \beta_1 AllGirls_i + \beta_2 Mix_i + \beta_3 X_i + \mu_i \quad (2)$$

Once this additional indicator is included, the omitted category becomes families with only boys. Thus, the coefficients on *AllGirls_i* and *Mix_i* indicate the difference between families with all girls or families with children of both sexes in comparison to the fertility of those with only sons. The coefficient on *AllGirls_i* then isolates son preference effects from any other preferences relating to gender balancing effects.

The vector of control variables, X_i , are standard to the literatures on fertility and son preference in general and contain variables that relate to the mother, household variables, and

11 We obtain similar results using five-year or seven-year window and present results for 6 years to be consistent with previous literature on son preference.

12 Twins are excluded from the sample.

13 Triplets and twins for the second and third child are excluded from the sample.

14 Of the predicted values, 98% are between 0 and 1.

geographic variable.¹⁵ Maternal variables include whether the mother has high-school and above education, whether the mother has at least a bachelor's degree, the mother's age, and the mother's age at marriage. Household variables include family income, father's education attainment captured by dummy variables for high school and above as well as bachelor's degree and above, and whether the head of household is male. We also include state dummies, to control the influence of regional factors on families' son preference, such as differences in state level access to abortion or differences in regional locations of ethnic enclaves.

3.2 Son Preference among Large Population Groups in the United States

Table 2 reports the influence of son preference on fertility for the full sample of families with an oldest child 12 years of age or younger in the United States, as well as for the sample of families where the mother is either native-born, or a first-generation immigrant, a non-SESE Asian immigrant, or a SESE Asian immigrant.¹⁶ In Table 2, we explore both mechanisms mentioned above. Specifically, the left panel provides the results of testing for fertility changes on the basis of the gender of earlier children and the right panel looks for evidence of gender selection—i.e. changes in the likelihood that each subsequent birth is male. Columns (1) and (4) examine the impact of the first child being a girl on the likelihood of the second birth and that birth being male, respectively. Columns (2) and (5) show the impact of the first two children being girls on the same outcomes for the third child, with Columns (3) and (6) additionally controlling for gender-balancing effects.

First, looking at the full sample of the US population, the coefficient of interest in front of all girls for mothers in Column (1) is close to zero and insignificant, indicating no strong influence of initial child gender on the decision to have a second child. The estimates in Column (2) suggest that those with two daughters are 3.2% points more likely to have a third child, but as can be seen in Column (3), this impact is entirely driven by a motivation among households for gender balancing.

Among the sample of only native-born mothers, the coefficient on all girls is actually negative and significant in both Columns (1) and (3). This suggests that the probability of having a second child within the next 6 years is 0.4% points lower if the first child of the family is a daughter. For the decision to have a third child, once accounting for gender balancing effects this rise to 0.8% points in Column (3). In both cases, there is no evidence of son preference in the United States when focusing on fertility choices and looking at these aggregate populations.

However, when we limit the sample to first-generation immigrants, this pattern is reversed. Focusing on the results in Columns (1) and (3), we see that having only a girl or girls leads to a positive and significant increase in the odds of a mother having another child, even after controlling for gender-balancing preferences. Disaggregating by region, we see that the overall effects observed in the immigrant population are driven by migrants from South East Asia. Among this population, mothers are 2.3% points more likely to have a second child if their first was a girl. Comparatively, the coefficient on all girls for immigrants from other countries is negative and not significant. While there is again strong evidence of gender-balancing desires

¹⁵ Haughton and Haughton (1998) demonstrate that these factors also affect families' fertility and should be controlled for in regression analysis.

¹⁶ The complete regression results with coefficients on all covariates are shown in Table A2 of Appendix.

Table 2 Son preference in the United States

Dep var.	Fertility			Male child		
	2nd child born	3rd child born	3rd child born	2nd child male	3rd child male	3rd child male
	(1)	(2)	(3)	(4)	(5)	(6)
Full Sample						
All girls	-0.002 (0.001)	0.032*** (0.002)	-0.004 (0.002)	-0.005*** (0.001)	0.019*** (0.002)	-0.003 (0.002)
Mix			-0.056*** (0.002)			-0.035*** (0.002)
Native-Born						
All girls	-0.004*** (0.002)	0.030*** (0.002)	-0.008*** (0.003)	-0.005*** (0.002)	0.018*** (0.002)	-0.005*** (0.002)
Mix			-0.060*** (0.002)			-0.037*** (0.002)
First-generation Immigrants						
All girls	0.006** (0.003)	0.038*** (0.004)	0.014*** (0.005)	-0.002 (0.003)	0.023*** (0.003)	0.008** (0.004)
Mix			-0.039*** (0.004)			-0.024*** (0.003)
First-generation Immigrants from Countries other than South East Asia						
All girls	-0.002 (0.004)	0.034*** (0.005)	0.007 (0.006)	-0.005 (0.004)	0.019*** (0.004)	0.002 (0.005)
Mix			-0.042*** (0.005)			-0.026*** (0.004)
South East Asian Immigrants						
All girls	0.023*** (0.005)	0.050*** (0.006)	0.031*** (0.008)	0.005 (0.005)	0.035*** (0.005)	0.024*** (0.006)
Mix			-0.029*** (0.006)			-0.017*** (0.005)

Notes: The dependent variable Fertility is equal to 1 for mothers having another child within 6 years of previous child's birth. *2nd Child Born* represents the sample of families with at least one child and may still have additional children after this window or a second birth. The unit of observations is the household, and the sample size for this regressions is 480,360; 383,683; 101,310; 66,718; 34,592, respectively. *3rd Child Born* represents the sample of families with at least two children and may have additional children later. The sample size is 308,378; 248,195; 63,093; 44,261; 18,832, respectively, for these regressions. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Source: American Community Survey from 2012 to 2016.

in immigrant populations, as well as among SESE Asian migrants, there is an even larger 3.1% point increase in the odds of having a third child if the first two are female.

Columns (4–6) replicate this strategy for another dependent variable, whether the next child is male.¹⁷ If households are practicing any gender selection in favor of males after female births, we would expect the coefficient on all girls to be positive. Focusing on the birth of a second child, the coefficients in front of all girls is negative, very small, and precisely estimated

¹⁷ Coefficients on covariates are shown in Table A2 of Appendix for the fertility regressions for interested readers but are otherwise excluded for brevity.

for the samples of families in the United States, natives, first-generation immigrants, and non-SESE Asian immigrants. However, for the sample of SESE Asian immigrants, the coefficient is positive but not significant. For families with at least two children, the coefficients on all girls are all positive and significant at 1% suggesting that SESE Asian immigrant mothers are particularly more likely to have a son as their third child if the previous two children are all girls relative to all boys. This result is consistent with sex selection or some form of greater maternal health investments during pregnancy when the fetus is male.

We conclude that there is little evidence for son preference among native-born mothers as well as most immigrant mothers through either fertility stopping decisions or from gender selection in the United States. At the same time, however, mothers who migrate from SESE Asian countries do exhibit behavior that is consistent with son preference. They are both more likely to have additional children if the previous children are all girls, and they appear to influence the gender of the third child if the first two are female.

It is also possible that son bias could manifest in other weaker forms of son preference than fertility timing and gender selection. Dahl and Moretti (2008) provide survey evidence that male parents prefer sons and demonstrate an effect that can be seen in parents' marital status, with marriage between parents more commonly occurring both before (only for those who may have learned the gender before birth) and after male births.

In Table 3, we present regressions in which the dependent variable is an indicator equal to 1 if a mother with at least one child is divorced, separated, or never married. As before, this is regressed on the gender of the previous children with the complete set of covariates from equation 3 as well as controls for number of children and for families with one child or more. Again, the coefficient of interest is the indicator variable All Girls, which is equal to 1 if the previous children are all daughters. The estimated coefficients on all girls in this linear probability model indicate the change in the probability of not being married for mothers of girls in comparison to those with a son. Here, the coefficients are all positive, and for the full sample, natives, as well as first-generation immigrants and non-SESE Asian immigrants they are significant at between 1% and 5% levels of significance. Consistent with the previous analysis, mothers are either more likely to marry or less likely to separate after having sons. Even though the magnitudes seem small, the percentage effects are actually very large, at 9.5%, 11%, 6.4%, 5.9%, and 5.3%, respectively, and are thus quite non-negligible.¹⁸ Although the estimates for the

Table 3 Child gender and mother's marital status

	Full sample	Natives	First-generation immigrants	Non-South East Asian immigrants	South East Asian immigrants
All girls	0.005*** (0.000)	0.006*** (0.001)	0.003** (0.001)	0.003*** (0.001)	0.002 (0.001)
Number of observations	1,112,703	874,581	249,433	171,255	78,178

Notes: The dependent variable is a dummy equal to 1 if the mother with at least one child is divorced, separated, or never married. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Source: American Community Survey from 2012 to 2016.

¹⁸ Of all mothers, 5.28% with at least one child are divorced, separated, or never married in the United States. This figure is 5.47% for native-born mothers, 4.69% for first-generation immigrants, 5.1% for non-SE Asian immigrants, and 3.77% for SE Asian immigrants.

subsamples of immigrants from SESE Asia are imprecisely estimated, they take the same sign and of similar magnitude.

An important caveat of this alternative approach to assessing son preference is that while consistent with Dahl and Moretti (2008), lacking more detailed records and panel data, we cannot rule out the alternative possibility that extraneous factors are driving the change in marriage patterns. For instance, sons could simply require more parental attention or resources to raise, and increased paternal childcare responsibilities may drive the lower levels of divorce in households with sons relative to those with daughters. Although this could still be classified as son preference, it is a much weaker version than that which shows up in the previous sections. We restrict the analysis to fertility timing and gender selection for the remainder of our paper, as our focus is on the development and persistence of son preference among immigrant populations, and there is less potential for these more stringent manifestations of son preference effects to be confounded by unobservables than the marital status results.

3.3 Disaggregating Son Preference among South, East, and Southeast Asian Immigrants in the United States

To better understand the sources of son preference among Southeast Asian immigrants, we decompose the sample into families who migrate from a specific country of origin as shown in Table 4. In order to achieve a larger sample, we now extend the analysis back to include Census and all ACS data since 1980. We also focus only on countries with large number of migrants to the United States so that we have sufficient samples to identify the effects should they exist. As discussed, we now run regressions on the sample of immigrant mothers who are from China, Japan, Korea, the Philippines, Vietnam, and India, respectively.

Several things immediately stand out. For families in which a mother is migrated from China and India, they are more likely to have a second child if the family had a girl first relative to having a boy first, unlike the opposite pattern among US natives. These effects dramatically strengthen when we turn to the third child. As can be seen in Column (3), they are indeed more likely to reflect son preference in this case, as they exist even when controlling for gender balancing. Chinese, Indian, Korean, Philippine, and Vietnamese migrant mothers all exhibit a noticeably higher propensity to have a third child when they have two daughters. These patterns are most clearly seen in Figure 1A, which plots the coefficients of interest and confidence intervals for each of the sets of regressions presented in Columns (1) and (3).

As can be seen on the right-hand side of Table 4, there is some evidence of gender selection among immigrant groups in the United States. Only Indian households demonstrate this effect for two-child households, but when we look at three-child households and control for balancing in Column (6), immigrant mothers from China, Korea, the Philippines, and India show some degree of male biased child sex ratios. Figure 1B graphically replicates the exercise of Figure 1A for the percentage of births which are male, making clear the patterns just described. We also construct a category for all other SESE Asian immigrants in the ACS not from the countries listed in Table 4, but the coefficients are not significant although it is unclear whether this is simply due to the small sample of these individuals.

These results suggest that there is a large degree of child gender preference both in fertility timing and in terms of skewed birth ratios among these populations in the United States, consistent with the studies discussed in the introduction—although decomposing across groups

Table 4. Son preference by maternal country of origin

Dep var.	Fertility			Male child		
	2nd child born (1)	3rd child born (2)	3rd child born (3)	2nd child born (4)	3rd child born (5)	3rd child born (6)
Chinese						
All girls	0.012* (0.006)	0.080*** (0.008)	0.069*** (0.009)	0.004 (0.005)	0.057*** (0.006)	0.050*** (0.007)
Mix			-0.018*** (0.007)			-0.010* (0.005)
Japanese						
All girls	-0.020* (0.011)	0.009 (0.014)	-0.030* (0.017)	-0.017* (0.010)	0.002 (0.011)	-0.013 (0.014)
Mix			-0.061*** (0.015)			-0.023* (0.012)
Korean						
All girls	0.012 (0.007)	0.066*** (0.009)	0.040*** (0.011)	0.007 (0.007)	0.033*** (0.007)	0.015* (0.009)
Mix			-0.041*** (0.009)			-0.027*** (0.007)
Philippine						
All girls	0.007 (0.006)	0.042*** (0.008)	0.024** (0.010)	0.002 (0.005)	0.028*** (0.007)	0.016* (0.008)
Mix			-0.029*** (0.008)			-0.018*** (0.007)
Vietnamese						
All girls	0.010 (0.007)	0.057*** (0.010)	0.026** (0.012)	0.005 (0.007)	0.024*** (0.008)	0.003 (0.010)
Mix			-0.047*** (0.010)			-0.032*** (0.008)
Indian						
All girls	0.018*** (0.005)	0.068*** (0.005)	0.056*** (0.006)	0.017*** (0.004)	0.048*** (0.005)	0.045*** (0.005)
Mix			-0.017*** (0.005)			-0.004 (0.004)

Notes: See Table 2 notes for definitions. The sample size for each group in Columns (1) and (4) is 25,936; 7,631; 17,474; 26,812; 16,910; 38,479, respectively. The sample size for each group in Columns (2, 3, 5, and 6) is 13,301; 4,267; 10,368; 15,092; 10,264; 19,890, respectively. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Source: Census and American Community Survey samples from 1980 to 2017.

reveals a larger degree of heterogeneity. Another interesting result of this decomposition is that Japanese migrants exhibit some degree of daughter preference. This can be seen in the outcomes for both fertility and child gender of second child births and for the third child births in fertility stopping behavior.

We replicate Table 4 using only the 2012–2016 ACS sample to get a sense of the idea whether these patterns continue today in the United States (results are presented in Table A3

Figure 1A Son preference—fertility timing; regression adjusted means with confidence intervals

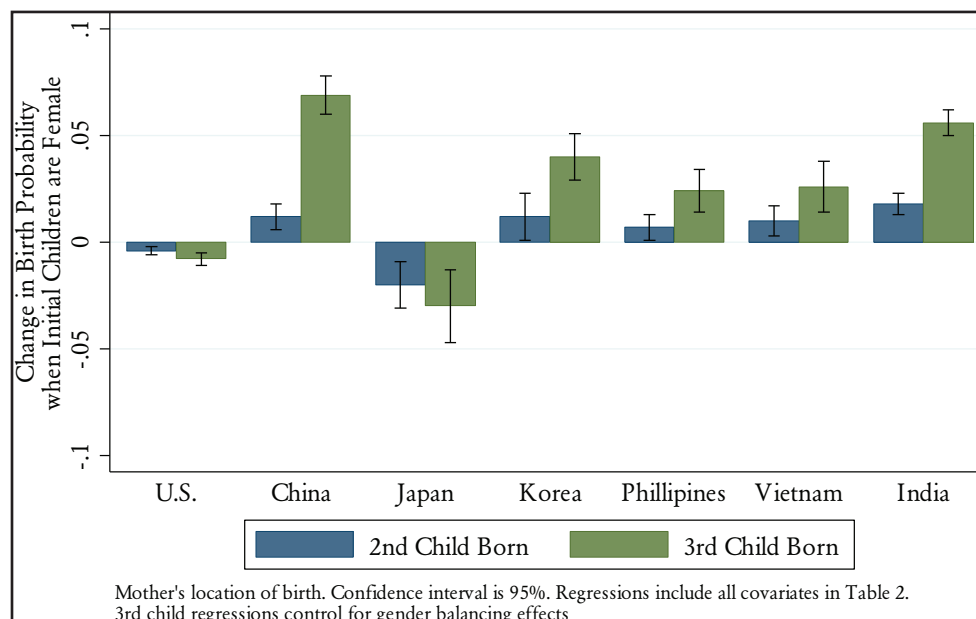
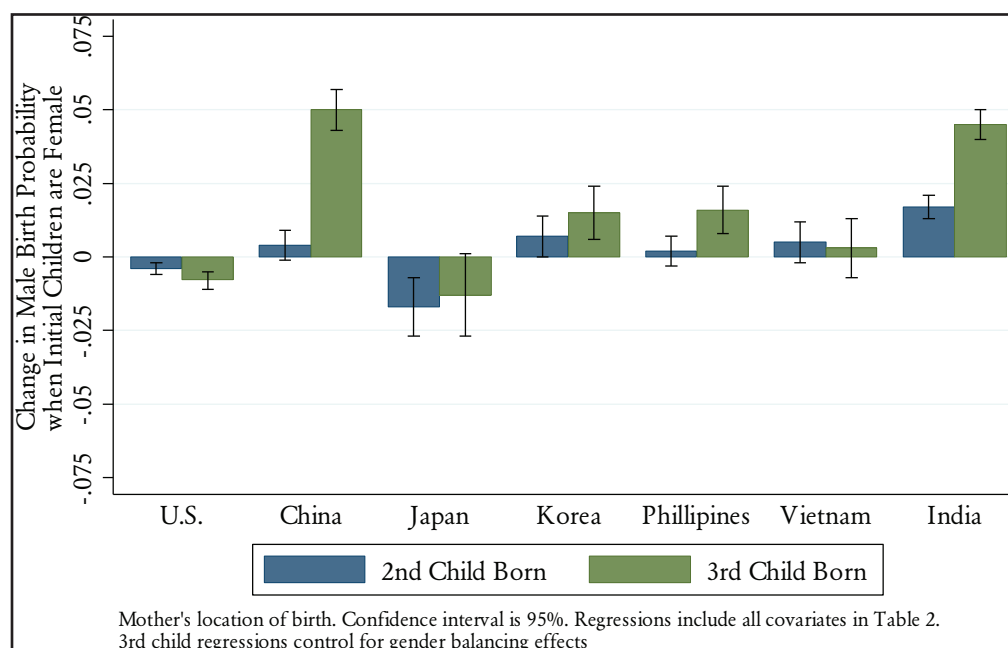


Figure 1B Son preference—male births, regression adjusted means with confidence intervals



of Appendix). The findings are largely similar with two exceptions. Korean households exhibit some son preference in the full sample but not in the recent year ACS samples, and there is no evidence of daughter preference among Japanese migrants in the most recent window either.

3.4 Assortative Matching, Maternal, and Paternal Preferences

In Table 5, we undertake a novel exercise that sheds some new light on the durability of son preference among immigrants in the United States. We re-estimate our main

Table 5 Son preference and parental background

Dep var.	Has 3rd child				3rd child is male			
	Main sample	Asian mom and dad	Asian mom and non-Asian dad	Asian dad and non-Asian mom	Main sample	Asian mom and dad	Asian mom and non-Asian dad	Asian dad and non-Asian mom
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Chinese								
All girls	0.069*** (0.009)	0.090*** (0.010)	0.003 (0.032)	-0.038 (0.060)	0.050*** (0.007)	0.068*** (0.008)	0.006 (0.025)	-0.015 (0.048)
N	13,301	10,456	1,172	491	13,301	10,456	1,172	491
Japanese								
All girls	-0.030* (0.017)	-0.064*** (0.025)	-0.011 (0.028)	-0.092* (0.055)	-0.013 (0.014)	-0.037* (0.020)	0.008 (0.022)	-0.083* (0.044)
N	4,267	2,067	1,708	545	4,267	2,067	1,708	545
Korean								
All girls	0.040*** (0.011)	0.053*** (0.013)	0.004 (0.024)	-0.009 (0.061)	0.015* (0.009)	0.026** (0.010)	-0.015 (0.019)	0.039 (0.049)
N	10,368	6,976	2,546	536	10,368	6,976	2,546	536
Philippine								
All girls	0.024** (0.010)	0.036*** (0.013)	-0.001 (0.018)	-0.017 (0.037)	0.016* (0.008)	0.026** (0.011)	0.005 (0.015)	0.069** (0.032)
N	15,092	8,872	4,474	1,320	15,092	8,872	4,474	1,320
Vietnamese								
All girls	0.026** (0.012)	0.027* (0.014)	-0.003 (0.042)	0.105 (0.069)	0.003 (0.010)	0.002 (0.011)	-0.001 (0.034)	0.065 (0.057)
N	10,264	8,406	937	431	10,264	8,406	937	431
Indian								
All girls	0.056*** (0.006)	0.057*** (0.007)	-0.069 (0.062)	0.020 (0.047)	0.045*** (0.005)	0.048*** (0.005)	-0.046 (0.055)	0.068* (0.036)
N	19,890	18,422	397	724	19,890	18,422	397	724

Notes: All regressions additionally control for mix. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Source: Census and American Community Survey samples from 1980 to 2017.

exercise— examining fertility effects and male birth ratios for third children (accounting for gender- balancing preferences), and further partition the sample of immigrant households in the United States. Specifically, we reproduce our previous estimates in Columns (1) and (5), and then in Columns (2) and (6) we contrast them with households in which parents are assortatively matched in that both are immigrants from the same country of origin. For clarity, it is worth reminding readers that our sample includes households with married mothers between the age of 18 and 40 with an eldest child at the age of 12 or younger living in the household. In our previous analysis, some of these mothers were married to other immigrants from their own country of origin, some from other countries, and some from the United States.

As can be seen from Table 5, the degree of child gender preference strengthens in magnitude in every case when we look at couples paired from the same country of origin in SE Asia. In the case of Japanese migrants that exhibited daughter preference in the overall sample,

households where both parents are immigrants are significantly more likely to have daughters than sons and more likely to have a third child after two boys.

In Columns (3) and (7), we restrict the sample to include households where the mother is a migrant from SE Asia but the father is native-born. In this case, we see no robust evidence of son preference among any of the households we examine. In Columns (4) and (8) we restrict to native-born mothers who marry immigrant fathers. Although this is our smallest sample, we observe several interesting things. First, we see some evidence of son preference among migrants from India and the Philippines as well as stronger fertility and sizeable gender effects in favor of daughters among the sample with Japanese dads.

Comparing the role of mothers and fathers is potentially interesting for a number of reasons, including the fact that fertility outcomes result from an intrahousehold bargaining process in which either spouse may have a greater degree of certain dimensions of influence or control (such as income or control over contraception). Unfortunately, just as migrants are a selected sample of individuals, these new grouping should be interpreted with caution, as there is likely a large amount of selection in the marriage market among individuals who migrate to the United States and they choose to marry either another immigrant or a native-born individual. For example, mothers and fathers from the same country are likely to have similar preferences and thus more likely to exhibit a cultural trait in their home country such as son preference.

In spite of this, at a minimum, our results are suggestive of a situation in which fathers exhibit at least some responsibility for son preference outcomes—as in the case of assortative matching the impact is strengthened, and some of the son preference manifests even when only the father is a migrant. Causal analysis to uncover the degree of maternal and paternal influence in driving son preference is likely a valuable avenue for future research.

4 The Formation, Persistence, and Intergenerational Transmission of Son Preference

Section 3 demonstrated that son preference, in the form of fertility timing and gender selection, appears among SESE Asian immigrant populations in the United States. As discussed in the introduction, many of the cultural and economic factors driving son preference have been explored in this set of origin countries. Less well-understood is why son preference would continue to manifest in the United States where old age support is stronger, cultural norms do not generally favor son preference, and where the gender gap is less stark. Immigrant populations thus make an ideal group for studying when son preference is acquired in life, how persistent son preference is, and whether or not it is transmitted, like many other cultural norms, from generation to generation. In this section, we explore these three questions in sequence.

4.1 The Formation and Persistence of Son Preference

We first consider the development of son preference and assimilation at the individual level, exploiting variation in an immigrant's age at arrival to the United States. The younger an individual is, the less time they will have had to grow up in a society where the son preference is the norm. In order to do this, we estimate a differences-in-differences regression according to

the following equation to capture the difference in son preference across immigrants arriving before and after age 9. We adopt age 9 because it has been shown to be a critical age period for both individual's fertility decision and for the acquisition of gender norms of behavior. Critical period hypothesis, developed by cognitive scientists, states that individuals learn languages more easily at a critical age range, between years 3 and 10 (Lenneberg, 1967), than older children. This hypothesis is supported and applied by Bleakley and Chin (2004, 2010) by exploiting variation in the age of immigrants at their time of immigration to the United States. They argue that timing of immigration is critical to a variety of social outcomes of immigrants such as wages, marriage status, and fertility decisions via the effects of English language skills and knowledge of American culture and institution. Age 9 is found to be the cutoff of the critical period. We set age 9 as the cutoff to be consistent with previous studies.¹⁹ Formally, our regression is specified as follows:

$$Y_i = \beta_0 + \beta_1 AllGirls_i + \beta_2 Mix_i + \beta_3 Age_Arrival_i + \beta_4 AllGirls_i \times Age_Arrival_i + \beta_5 Mix_i \times Age_Arrival_i + \beta_6 X_i + \eta_i \quad (3)$$

$Age_Arrival_i$ is a dummy variable, indicating whether or not mother i migrated to the United States after the cutoff age of 9.²⁰ The coefficient of interest is that in front of the interaction term of $AllGirls_i$ and $Age_Arrival_i$, and it can be interpreted as the change in the probability of having another child (or of the next child being male) should the previous children of family i be all girls specifically for mothers who have arrived at age of 9 and above compared to that change in probability for those who arrived at a younger age.

Table 6 provides results for fertility timing decisions and gender selection behavior, respectively, using the differences in the approach described in equation (3). Here we look at the population of migrants from South East Asia, excluding Japanese migrants given that the daughter preference we uncovered in the previous samples should attenuate any impact among other populations. As can be seen from Table 6, the estimated coefficients on arrived at age 9+ are significantly negative in both cases. This suggests that families who migrate at an older age tend to have fewer children than families who arrived at earlier age. One explanation for this could be the pressure from migration at these ages or selection into age of migration on the basis of economic outcomes not captured by our set of controls.²¹

As can be seen, the coefficients of interest, those on the interaction term of all girls and arrived at age 9+, are both positive and significant for the dependent variable fertility decision, both for the decision to have a second and third child for the broad sample of immigrants from Southeast Asia. The effect is strongest for third children. These effects are statistically significant and economically meaningful. To get a sense of the effect sizes, the estimates suggest that SESE Asian immigrant mothers who arrived in the United States after age 9 are 6.5% points more likely to have a third child when their first two children are girls.

The implications of this test can be most clearly seen in the two left panels of Figure 2, which flexibly plots regression adjusted coefficient estimates on all girls across mothers' age of

¹⁹ Hicks et al. (2015) also use age 9 as cutoff and find that immigrants' gender identities are acquired in early life.

²⁰ We obtain similar results when we select 8 or 10 years of age as the cutoff.

²¹ For example, maybe initially they spend more time and money on surviving in the new countries. They get married later, spend less time on children, and have stronger incentive to integrate into local community. Alternatively, individuals who migrate at older ages may experience different levels of familial pressure via communication and relationship structure with relatives than those who arrive at younger age.

Table 6 The acquisition of son preference beliefs over the life cycle

	Fertility	Male child
	(1)	(2)
2nd Child Born		
All girls	−0.008 (0.009)	−0.018** (0.008)
Arrived at age 9+	−0.110*** (0.006)	−0.060*** (0.006)
All girls*arrived at age 9+	0.021** (0.009)	0.027*** (0.008)
Observations	136,931	136,931
3rd Child Born		
All girls	−0.020 (0.014)	0.001 (0.012)
Arrived at age 9+	−0.138*** (0.011)	−0.066*** (0.008)
All girls*arrived at age 9+	0.065*** (0.015)	0.028** (0.012)
Mix	−0.084*** (0.012)	−0.037*** (0.010)
Mix*arrived at age 9+	0.060*** (0.013)	0.022** (0.010)
Observations	75,280	75,280

Notes: See Table 2 notes for definitions. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

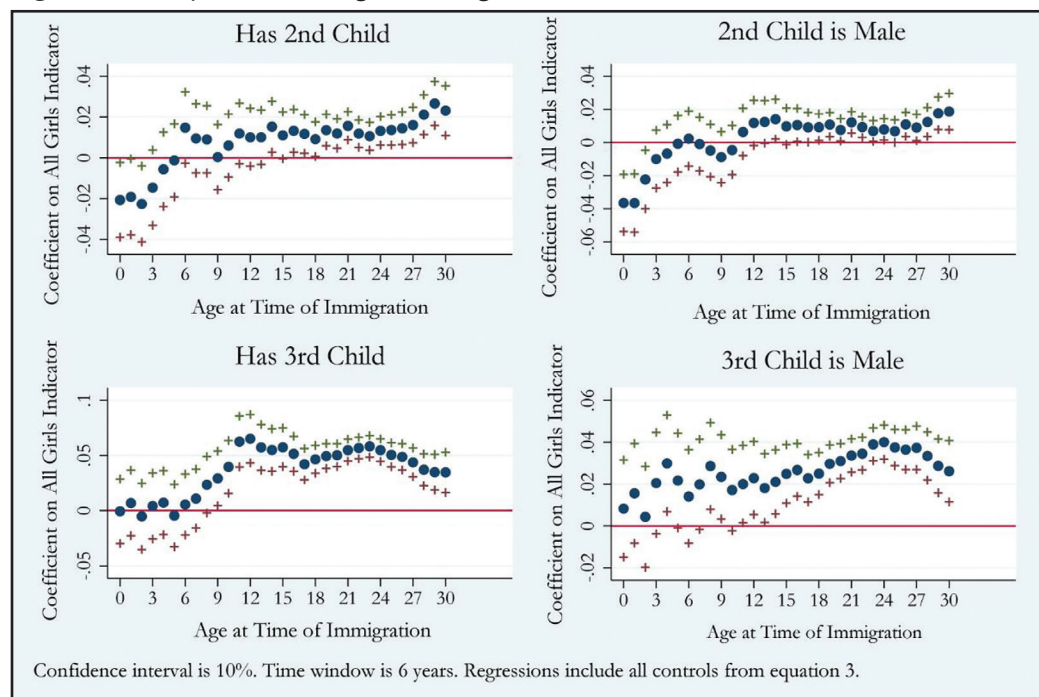
Source: Census and American Community Survey samples from 1980 to 2017.

migration within first-generation immigrants from SESE Asian countries.²² In these plots, having only daughters is not significantly associated with an increase in fertility for mothers who migrated at very young ages to the United States. However, starting around an age of migration of 8 or 9, the coefficients begin to increase and by age 10 there is a statistically significant increase in fertility among mothers whose first child or first two children are daughters.

These results are remarkably consistent with previous research on gender norm acquisition and justify the choice of the critical period in the regression analysis—the coefficient on the interaction of interest becomes positive and significant only among mothers who migrate at later stages of their life. These flexible plots suggest that ages between 7 and 11 are a critical period in life during which individuals acquire preferences regarding the gender of their offspring, consistent with the formation of gender norms of behavior found in previous work.

When we turn to male births as our measure of son preference in Column (2), the coefficient on the interaction term in families with at least one child is 0.027 and with two children is 0.28, both significant at 1%. As seen in Figure 2, the two right panels, we again see results

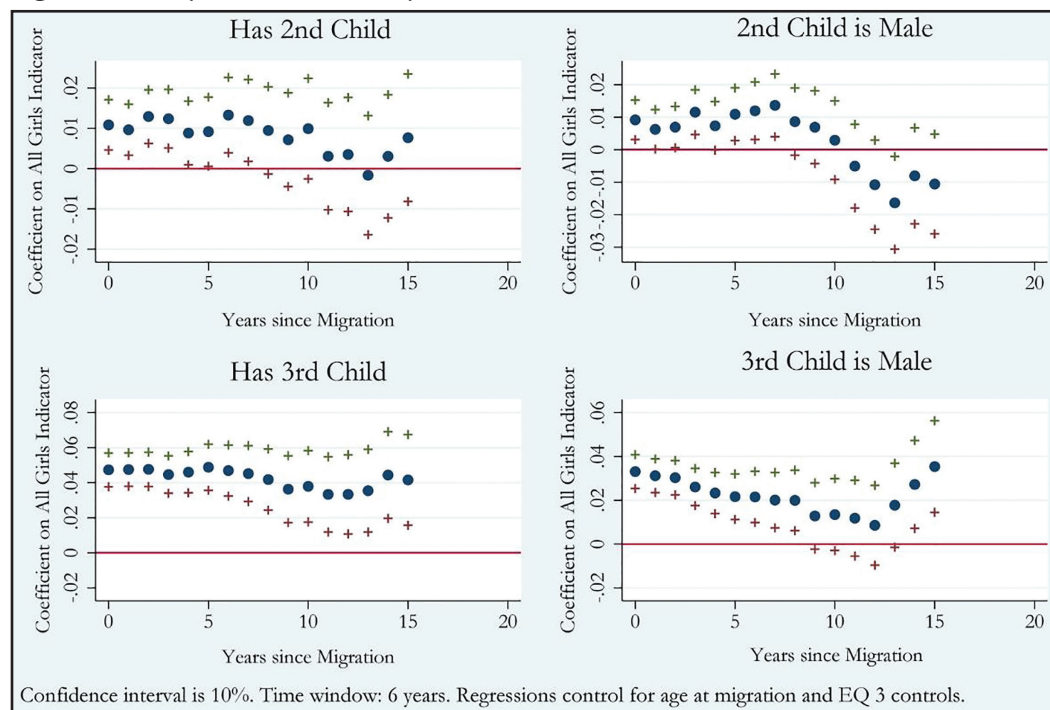
²² Figures 2 and 3 plot the coefficient of interest on the basis of individual age of migration in an effort to shed light on when son preference is formed and whether it is persistent. For each graph, we run a sequence of regressions using a moving window for a sample of migrants within 6 years (3 years on either side of each age). We then store the specified coefficients and SE from the model for each sample that are then plotted in the figures.

Figure 2 Son preference—age at immigration

consistent with there being a critical period in which individuals acquire son bias early in life for the gender of second children. When the first child is a girl, South East Asian mothers are significantly more likely to have male sons, but only if they migrated after age 10. When they arrived at their early ages, they would be more likely to have a second daughter.

We also observe a negative and significant coefficient (-0.018^{**}) on the indicator for all girls in Column 2 of Table 6, which provides suggestive evidence that there may be some degree of serial correlation in the gender of the second child. Impacts for the gender outcome of a third child, conditional on the first two being girls are, however, less precisely estimated. Noise in the estimates make it impossible to rigorously say whether younger age immigrants exhibit higher rates of male births for their third child, although it does appear that there is more robust evidence of a significant increase in the male share of births for SESE Asian migrants who arrive after age 9.

These results suggest that individuals form preferences for having a son early in life. A natural next question is whether son preference, once developed, is resilient in the face of exposure to a culture where son preference is not the norm, such as the United States. Figure 3 plots the coefficient on the indicator for all girl children as a function of the duration of time spent in the United States before the birth of the first child. The sample is the full set of mothers who have migrated from SESE Asia. In these specifications, we additionally control for age of migration as we have already shown that it matters for the formation of son preference. As can be seen from the figures, if longer duration of residence in the United States has any bearing on the degree of son preference exhibited in these households, it is a weak one. This suggests that either US cultural norms are not influential enough to shift migrants to US norms of child gender preferences. As a cultural trait, bias in favor of sons or daughters is persistent among individuals once they have developed it. Stated differently, the results suggest that those who have

Figure 3 The persistence of son preference

arrived earlier and thus spent more time in the United States exhibit less son preference. After the critical age, more time in the United States does not appear to diminish son preference.

4.2 The Intergenerational Transmission of Son Preference

A nice feature of the ACSs is that it provides information on an individual's language spoken in the home and their country of ancestry. Using these pieces of information, we run another set of analysis to examine fertility stopping and the sex ratio of births for higher-order generation immigrants who are from Southeast Asian countries. These results are presented in Table 7.

It is evidently apparent that there is no significant change in the probability of having a second child for families with a first child who is a girl in comparison to families with a first child who is a boy. When looking at larger size families and controlling, we observe an impact for several of the population groups—but this effect appears to be driven by a desire for gender-balancing in most cases. There is one exception that stands out starkly, families whose ancestors are from India are 6.2% and those from Korea are 5.9% points more likely to have a third child if the previous children are all girls than all boys. While the results for fertility stopping from China appear anomalous, we find no similar impact among second- and higher-order generation children from China when we use only recent ACS waves (Table A4 of Appendix). Those from other countries analyzed show no clear evidence of son preference.

At first blush, these results are quite surprising. Estimates of son preference for first-generation immigrants from China and Vietnam were even larger than those of India and Korea. Why do some of these populations assimilate more rapidly than others? Why are immigrants of Indian descent such an outlier? Indeed, when we look at only more recent immigrants, the effect for Korean migrants dissipates much as it has in previous analysis, but the impact for higher-order Indian migrant generations is even larger than that for first generations and

Table 7 The intergenerational persistence of son preference

Dep var.	Fertility			Male child		
	2nd child born (1)	3rd child born (2)	3rd child born (3)	2nd child male (4)	3rd child male (5)	3rd child male (6)
SE Asian						
All girls	-0.003 (0.007)	0.025*** (0.009)	-0.008 (0.011)	-0.002 (0.007)	0.017** (0.007)	-0.004 (0.009)
Mix			-0.052*** (0.009)			-0.032*** (0.007)
Chinese						
All girls	-0.012 (0.012)	-0.010 (0.016)	-0.044** (0.020)	-0.002 (0.011)	-0.002 (0.013)	-0.025 (0.016)
Mix			-0.053*** (0.017)			-0.035*** (0.013)
Japanese						
All girls	0.000 (0.011)	0.020 (0.015)	-0.028 (0.018)	0.013 (0.011)	0.023* (0.012)	0.008 (0.015)
Mix			-0.073*** (0.015)			-0.024** (0.012)
Korean						
All girls	-0.020 (0.020)	0.075*** (0.026)	0.059* (0.032)	-0.024 (0.018)	0.054** (0.021)	0.045* (0.025)
Mix			-0.025 (0.026)			-0.014 (0.020)
Philippine						
All girls	-0.004 (0.011)	0.042*** (0.016)	0.014 (0.019)	0.005 (0.010)	0.018 (0.012)	0.001 (0.015)
Mix			-0.042*** (0.015)			-0.027** (0.013)
Vietnamese						
All girls	0.024 (0.030)	0.034 (0.044)	-0.011 (0.053)	0.013 (0.027)	0.001 (0.037)	-0.027 (0.045)
Mix			-0.069* (0.041)			-0.042 (0.034)
Indian						
All girls	0.026 (0.019)	0.068*** (0.025)	0.062** (0.029)	-0.003 (0.018)	0.040** (0.019)	0.032 (0.022)
Mix			-0.010 (0.025)			-0.012 (0.018)

Notes: The samples contain families who are descendants of immigrants of those Asian countries. Left panel: The sample size for each group is 19,058; 6,338; 7,366; 7,932; 2,724; 1,168; 2,442, respectively. Right panel: The sample size for each group is 10,960; 3,579; 4,312; 1,398; 4,724; 632; 1,375, respectively. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Source: Census and American Community Survey samples from 1980 to 2017.

highly significant. Although we are limited to the pieces of information we can observe in the ACS, we posit two hypotheses for the case of Indian households as an outlier; however, there may be other explanations beyond the scope of our analysis.

First, because we cannot discern second generation from higher-generation immigrants—one possibility is that immigrants from India in our sample are more likely to be second-generation migrants than those from other South East Asian countries such as China or Vietnam, which showed son preference in the first generation. If migrants on average from China arrived further in the past, and son preference assimilates to US norms, then the results could be a quirk of the epoch of migration different populations around the world have faced. While we cannot observe these dates in the ACS for second- and higher-order generation migrants, we can observe the average year of migration for first-generation migrants. This value is 1995 for Vietnam, 1998 for Korea, 1999 for the Philippines, 2002 for China and Japan, and 2004 for India, which is not decisively supportive evidence of this explanation for the patterns we observe.

A second plausible explanation may be the higher proportion of homogamous marriages among Indian migrants. A high proportion of marriages among Indian immigrants could facilitate traditional social norms from an origin country, potentially reinforcing son preference in the home. As can be seen in Table A3 of Appendix, 92% of first-generation Indian immigrants marry other first-generation Indian immigrant fathers, significantly higher than for Chinese and Vietnamese mothers.²³ The share, at 26%, of second- or higher-generation migrants is also the highest for Indian migrants.

5 Conclusion

This paper studies the presence and malleability of son preference in the United States, looking both at native-born and immigrant populations. We confirm a number of established results in the literature and produce several new insights about the persistence and transmission of son preference. In order to do this, we first analyze how fertility timing and the gender of children change when households have children but no sons. We find that, consistent with existing research, there is no evidence of these forms of son preference among natives in the United States, but there is indirect evidence in the form of an effect of the gender of children on a mother's marital status both for natives and for immigrant groups.

Our research adds to a growing body of research examining son preference in immigrant populations, documenting a number of new stylized facts. When we focus on first-generation migrants arriving from countries with high levels of son preference, we observe son preference in fertility timing and in the gender of births for second and third births in the United States and document sizeable heterogeneity across immigrant populations, including documenting evidence of daughter preferences among Japanese migrants.

We then explore the formation and malleability of these preferences—studying assimilation of son preference among Asian immigrants through variation in the age of migration and the duration of residence in the United States, as well by contrasting the results for first-generation migrations with those for later generations to study intergenerational transmission.

²³ For first-generation immigrant Chinese and Vietnamese, the proportions are 72% and 75%, respectively.

For first-generation immigrants, son preference is only present for migrants who arrive after childhood, suggesting a need to have acquired gender norms in their origin country. These established effects do not appear to diminish with exposure to US culture, suggesting that once acquired, son preference, particularly in fertility timing, is persistent within individuals. Contrasting the results we obtain from the period 1980 onward against just recent years of ACS data, we find that even over this several decade period, son preference appears quite malleable. Specifically, daughter preference among Japanese households and son preference among Korean households have weakened.

Looking at the possibility of intergenerational transmission of son preference, we find that in most cases those whose ancestors migrated from a country in South East Asia with son preference exhibit weaker gender selection than first-generation migrants, consistent with relatively rapid assimilation to US norms. We also uncover an interesting degree of heterogeneity across immigrant populations in rates of assimilation. For example, second- and higher-order generation Chinese and Vietnamese immigrants conform rapidly to US norms, whereas, surprisingly, Indian immigrants exhibit even stronger son preference among higher-order generations.

Another novel feature of our analysis is that we take the case of assortative matching between immigrant parents into consideration. We find that couples where both parents are immigrants from the same country exhibit significantly stronger son preference outcomes (or daughter preference in the case of Japanese migrants). At the same time when we consider migrants who marry natives, we find no evidence of son preference among the households of female mother migrants, whereas at the same time we do see some evidence of child gender (both son and daughter) preference in the households formed between male migrants and natives. These results provide some of the first suggestive evidence that paternal preferences may matter just as much as maternal in determining son preference outcomes among these populations and suggest interesting avenues for future research.

Compliance with Ethical Standards

The authors declare that they have no conflict of interest.

Declarations

Availability of data and material

All data sufficient for replication and used in the analysis are freely available to other researchers from IPUMS—<https://usa.ipums.org/usa/>

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Competing interests

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Authors' contributions

HD cleaned and constructed the data and undertook the regression analysis. DH constructed the figures and tables. HD and DH wrote the manuscript. All authors read and approved the final manuscript.

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Appendix

Table A1 Summary statistics

Panel A: Demographics	Mean	SD
Household size	4.09	1.27
Family income	25,120	25,341
Mother in labor force	0.97	0.18
Mother's age at marriage	25.68	3.87
Mother's age of first birth	27.73	4.39
Mother's education high school and above	0.90	0.30
Mother's education bachelor's degree and above	0.54	0.50
Father in labor force	0.97	0.18
Father's education high school and above	0.91	0.29
Father's education bachelor's degree and above	0.57	0.49
Panel B: Country of Birth/Ancestry		
First-generation immigrants	0.74	0.44
Year of migration	1992	11.98
Immigrants from East, SE Asian countries and regions	0.70	0.46
Immigrants from China	0.13	0.34
Immigrants from Japan	0.04	0.19
Immigrants from Korea	0.09	0.29
Immigrants from the Philippines	0.14	0.34
Immigrants from Vietnam	0.09	0.28
Immigrants from India	0.20	0.40
Higher-order generation immigrants (SE Asian countries)	0.10	0.30
Panel C: Household Fertility		
Number of children	1.72	0.76
% of household with all girls	0.33	0.47
% of household with all boys	0.35	0.48
% of household with mix	0.32	0.47

Notes: The sample covers Asian immigrant families with married mothers between age 18 and 40, and with at least one child and the oldest one is 12 years old or younger in the United States. The unit of observations is the household, and there are 198,016 households in the sample.

Source: Census and American Community Survey samples from 1980 to 2017.

Table A2 Fertility change regressions in the United States with covariates shown

	Full sample	Natives	First-generation immigrants	Non-SE Asian immigrants	SE Asian immigrants
All girls	−0.002 (0.001)	−0.004*** (0.002)	0.006** (0.003)	−0.002 (0.004)	0.023*** (0.005)
Mother's education high school and above	−0.090*** (0.003)	−0.092*** (0.004)	−0.081*** (0.005)	−0.079*** (0.005)	−0.080*** (0.012)
Mother's education bachelor's degree and above	−0.053*** (0.002)	−0.046*** (0.002)	−0.087*** (0.004)	−0.056*** (0.005)	−0.094*** (0.007)
Mother's age at marriage	−0.015*** (0.001)	−0.017*** (0.001)	−0.009*** 0.000	−0.009*** 0.000	−0.009*** (0.001)
Family income	0.000*** (0.001)	0.000*** (0.001)	0.000*** 0.000	0.000*** 0.000	0.000*** (0.001)
Father's education high school and above	−0.007*** (0.003)	−0.002 (0.003)	−0.020*** (0.005)	−0.021*** (0.005)	0.016 (0.012)
Father's education bachelor's degree and above	0.011*** (0.002)	0.022*** (0.002)	−0.025*** (0.004)	0.015*** (0.005)	−0.043*** (0.007)
Male Household	0.011*** (0.001)	0.004** (0.002)	0.024*** (0.003)	0.014*** (0.004)	0.019*** (0.006)
Mother's age	0.023*** (0.001)	0.024*** (0.001)	0.019*** 0.000	0.015*** 0.000	0.030*** (0.001)
Constant	0.227*** (0.019)	0.396*** (0.018)	0.282*** (0.065)	0.399*** (0.075)	−0.03 (0.139)
Number of observations	480,360	383,683	101,310	66,718	34,592

Notes: See Notes for Table 1. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Source: American Community Survey from 2012 to 2016.

Table A3 Son preference among first-generation immigrants from Asia (recent ACS sample)

Dep var.	Fertility			Male child		
	2nd child born (1)	3rd child born (2)	3rd child born (3)	2nd child born (4)	3rd child born (5)	3rd child born (6)
China						
All girls	0.043*** (0.013)	0.079*** (0.017)	0.064*** (0.019)	0.009 (0.012)	0.065*** (0.014)	0.061*** (0.015)
Mix			-0.023 (0.015)			-0.006 (0.011)
Japan						
All girls	-0.036 (0.027)	0.002 (0.039)	-0.04 (0.045)	-0.024 (0.025)	0.003 (0.031)	-0.031 (0.037)
Mix			-0.068* (0.037)			-0.054* (0.030)
Korea						
All girls	0.016 -0.018	0.027 -0.025	-0.003 -0.03	0.012 -0.018	0.014 -0.018	0.012 -0.022
Mix			-0.046* (0.024)			-0.002 (0.018)
Philippines						
All girls	0.013 (0.014)	0.043** (0.020)	0.029 (0.024)	0 (0.013)	0.016 (0.016)	0.013 (0.019)
Mix			-0.021 (0.020)			-0.005 (0.016)
Vietnam						
All girls	0.034** (0.017)	0.094*** (0.023)	0.069** (0.027)	0 (0.017)	0.056*** (0.019)	0.042* (0.023)
Mix			-0.040* (0.022)			-0.022 (0.018)
India						
All girls	0.029*** (0.009)	0.037*** (0.008)	0.027*** (0.010)	0.011 (0.008)	0.029*** (0.007)	0.021** (0.008)
Mix			-0.016** (0.008)			-0.013** (0.006)

Notes: See Table 2 notes for definitions. The sample size for each group in Columns (1) and (4) is 5,126; 1,364; 2,671; 4,601; 3,099; 11,282 respectively. The sample size for each group in columns (2, 3, 5, and 6) is 2,620; 775; 1,549; 2,505; 5,655, respectively. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Source: American Community Survey from 2012 to 2016.

Table A4 The intergenerational transmission of son preference (recent ACS sample)

Dep var.	Fertility			Male child		
	2nd child born (1)	3rd child born (2)	3rd child born (3)	2nd child male (4)	3rd child male (5)	3rd child male (6)
SE Asian						
All girls	0.01 (0.010)	0.046*** (0.014)	0.018 (0.016)	-0.003 (0.009)	0.019* (0.011)	-0.007 (0.013)
Mix			-0.045*** (0.013)			-0.041*** (0.011)
China						
All girls	0.015 (0.021)	0.036 (0.029)	-0.007 (0.035)	0.007 (0.020)	0.028 (0.025)	0.002 (0.029)
Mix			-0.068** (0.029)			-0.041* (0.023)
Korea						
All girls	-0.002 (0.030)	0.105** (0.042)	0.046 (0.052)	-0.001 (0.028)	0.074** (0.033)	0.023 (0.041)
Mix			-0.090** (0.041)			-0.078** (0.033)
Philippines						
All girls	0.005 (0.019)	0.061** (0.027)	0.049 (0.032)	-0.003 (0.018)	0.009 (0.021)	-0.02 (0.025)
Mix			-0.018 (0.026)			-0.046** (0.021)
Vietnam						
All girls	0.018 (0.042)	0.073 (0.066)	0.005 (0.077)	0.051 (0.040)	-0.031 (0.051)	-0.071 (0.062)
Mix			-0.098* (0.057)			-0.057 (0.051)
India						
All girls	0.035 (0.027)	0.088** (0.035)	0.109*** (0.040)	-0.029 (0.025)	0.058** (0.027)	0.076*** (0.028)
Mix			0.032 (0.033)			0.028 (0.021)

Notes: The samples contain families who are descendants of immigrants of those Asian countries. The dependent variable, fertility, indicates having another child within 6 years of previous child's birth. "2nd child born" represents the sample of families with at least one child and may have additional children later. The unit of observations is the household, and the sample size for each group is 9,491; 2,067; 1,078; 2,724; 574; 1,238 respectively. The sample size for each group is 5,520; 1,154; 626; 1,609; 313; 720 respectively. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Source: American Community Survey from 2012 to 2016.

Table A5 Marriage patterns

Spouse's birthplace or ancestry	First-generation immigrants					
	China	Japan	Korea	Philippines	Vietnam	India
First-generation immigrants						
China	0.77	0.00	0.00	0.00	0.02	0.01
Japan	0.01	0.38	0.01	0.01	0.00	0.00
Korea	0.01	0.01	0.65	0.00	0.00	0.00
Philippines	0.00	0.00	0.00	0.61	0.00	0.00
Vietnam	0.02	0.00	0.00	0.00	0.82	0.00
India	0.00	0.00	0.00	0.00	0.00	0.92
Higher-order generation immigrants						
China	0.11	0.01	0.01	0.01	0.02	0.00
Japan	0.01	0.03	0.00	0.01	0.00	0.00
Korea	0.01	0.00	0.13	0.01	0.01	0.00
Philippines	0.00	0.00	0.00	0.12	0.00	0.00
Vietnam	0.01	0.00	0.01	0.01	0.24	0.00
India	0.00	0.00	0.00	0.00	0.00	0.33

Notes: The entry represents the proportion of the race of first-generation or higher-order generation immigrants' husband. For example, the first entry, 0.77, indicates that 77% of first-generation Chinese immigrants (mothers) get married with the first-generation immigrants from abroad of the United States.

Source: Census and American Community Survey samples from 1980 to 2017.