IS THERE STILL SON PREFERENCE IN THE UNITED STATES?*

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Abstract

In this paper, we use 2008-2013 American Community Survey data to update and further probe Dahl and Moretti's (2008) son preference results, which found evidence that having a female first child increased the probability of single female headship and raised fertility. In light of the substantial increase in immigration, we examine this question separately for immigrants and natives. Among the population in the aggregate, as well as among the native-born separately, consistent with Dahl and Moretti (2008), we find that having a female first child raises the likelihood that the mother is a single parent, although the impact is 40 percent lower for our pooled sample than that obtained by Dahl and Moretti. Moreover, in sharp contrast to Dahl and Moretti (2008), we find that having a female first child is actually associated with lower fertility. Thus, by the 2008-2013 period, any apparent son preference in fertility decisions appears to be outweighed by factors such as cost concerns in raising girls. This change may be plausible in light of the reversal of the gender gap in college attendance beginning in the 1980s (Goldin, Katz and Kuziemko 2006), potentially making girls more costly. The juxtaposition of these female headship and fertility findings casts doubt on son preference as the explanation for the female headship results during this period, at least for the population overall and for natives separately. In contrast, for immigrants, we find evidence that having a female first child has a positive effect on both female headship and fertility. At minimum, this suggests son preference in fertility among this group. This interpretation is further supported by evidence for both first and second generation immigrants (second generation immigrants were examined using the Current Population Surveys) that having a female first child has a more positive effect on fertility for those whose source countries have less gender equity as measured by the World Economic Forum's Global Gender Gap Index, or lower female labor force participation rates and higher sex (boy-to-girl) ratios among births. We also examine sex selection and find no evidence that sex selection has spread beyond the race groups identified in previous work (e.g., Almond and Edlund 2008), suggesting that it does not does not provide an alternative mechanism to account for the disappearance of a positive effect of female first child on fertility for natives.

I. Introduction

Economists have long been interested in the unequal treatment of women and men in families and have studied several possible manifestations of male preference. These include the impact of a child's sex on family structure and on further fertility, sex-selective abortion, and sex differences in parental time inputs, access to health care and nutrition.[1] Some of the strongest evidence of son preference comes from developing countries. Sen (1990), for example, inferred that there were millions of "missing women" in China and India, due largely to neglect in health care and nutrition and later pointing in addition to sex selective abortion (Sen 2003). Anderson and Ray (2010) note that unequal survival rates from specific diseases such as AIDS can also create sex imbalances in the population. Beyond the most basic difference in treatment of men and women—practices which lead to lower survival rates for women—the issue of unequal treatment also potentially affects gender inequality in the family and in society even where survival rates are the same.

Studies by sociologists and psychologists, but more recently by economists as well, have also found evidence of differences in the behavior of parents of sons and daughters even in developed countries. In a comprehensive review, Lundberg (2005) points to two fairly robust findings: sons increase family stability and, overall, fathers tend to spend more time with sons than daughters, although recent research by Baker and Milligan (2016) finds that parents of preschoolers invest more time in girls than boys in teaching activities (e.g., reading to children). While differences may be identified, as Lundberg (2005) notes it is unclear whether they reflect son preference or constraints, like differences in the productivity of fathers and mothers in

[1] See, for example, Dahl and Moretti (2008), Anderson and Ray (2010), Almond and Edlund (2008), Abrevaya (2009), Almond, Edlund and Milligan (2013), and Lundberg (2005).

parenting sons vs. daughters or differences in costs of boys vs. girls. In a landmark study for the United States, Dahl and Moretti (2008) found convincing evidence consistent with son preference as the explanation for the positive effect of a female first child on the probability of single female headship by showing that it also raised fertility.

In this paper, we revisit the question of son preference, adding to the literature in several ways. First, we use 2008-2013 American Community Survey (ACS) data to update and further probe Dahl and Moretti's (2008) son preference results. Updating is important because their analysis of family structure used data from 1960 through 2000, and, more significantly, their results for fertility were for the 1960-80 period. Further, in light of the increase in immigration and research showing that more recent immigrant waves tend to come from countries with a more traditional gender division of labor than in the United States (Blau, Kahn and Papps 2011), we analyze immigrants and natives separately. Among the population in the aggregate, as well as among the native-born separately, consistent with Dahl and Moretti (2008), we find that having a female first child raises the likelihood that the mother is a single parent, although the effect is now considerably smaller than in their data. However, in contrast to Dahl and Moretti (2008), we find that for the overall population, as well as among natives separately, having a female first child is actually associated with *lower* fertility. Thus, by the 2008-2013 period, any apparent son preference among natives in their fertility decisions appears to have been diminished, reversed, or outweighed by factors such as the cost of raising girls or increased female bargaining power. On disaggregation, we find one group of natives that continues to exhibit son preference in fertility: those with exactly a high school degree (17% of married natives); however, for the other education groups, we find no direct evidence of son preference as indicated by the impact of first-girl births on future fertility.

The aggregate change in fertility patterns may be plausible in light of the reversal of the gender gap in college attendance beginning in the 1980s (Goldin, Katz and Kuziemko 2006), making girls more costly.[2] We present further evidence on changes in the cost of raising girls from Kornrich and Furstenberg (2013), who found that, while in 1972-3 households spent more on boys than on girls, by 2006-7 this pattern had reversed and girls were more expensive to raise. Education expenses were the major source of these changes. While these trends are consistent with the cost argument, we note that the rising relative cost of raising girls may itself in part reflect a reduction in son preference in that families choose how much to spend on their children. In addition, since survey research has found that both men and women with higher education levels are less likely to have attitudes supporting traditional gender roles, rising education levels overall may also help explain the apparent decline in evidence of son preference.[3] Further, attitudinal data indicate that while men have a preference for boys over girls, women show no preference either way.[4] Thus, a move away from son preference in couples' fertility decisions could also reflect increased bargaining power of women within the family as might be expected based on rising female labor force participation rates and relative wages.[5]

Second, considering immigrants separately, we find some evidence that having a female first child contributes to female headship; the impact is statistically insignificant but has the same

[2] This assumes that the higher cost of investing in daughters' higher education outweighs the greater time spent by fathers with their sons.
[3] For evidence on the relationship between education and gender role attitudes, see Campbell and Horowitz (2016), Cunningham (2008), Kosteas (2013), Davis and Greenstein (2009) and Marks, Lam and McHale (2009).
[4] Specifically, in 2011, when asked about sex preference supposing that one could have only one child, men preferred a boy to a girl by a margin of 49 to 22 percent, whereas women were split roughly equally with 31 percent preferring a boy and 33 percent preferring a girl. (A higher proportion of women (36 percent) than men (28 percent) also said responded "Doesn't matter," "Not sure," or "No opinion." See Newport (2011).
[5] For a review of the bargaining literature, see, for example, Lundberg and Pollak (2008).

magnitude as the effects estimated for the aggregate population and for natives. However, in contrast to our findings for natives, we do find a positive overall fertility effect, suggesting son preference in fertility among immigrants. This interpretation is further supported by evidence that, for both first and second generation immigrants—immigrants and their native-born children—having a girl has a more positive effect on fertility for those from source countries with less gender equity, as measured by the World Economic Forum's (WEF) Global Gender Gap Index and other indicators. (The second generation was examined using the 1995-2014 Current Population Surveys, which have information on the birthplaces of respondents' parents.)

We also examine another indicator of son preference, sex selection, by estimating the impact of the sex composition of previous children on the probability that a given birth is a boy. We find no evidence that sex selection has spread beyond the race groups (Chinese, Asian Indian, and Korean) identified in previous work (e.g., Almond and Edlund 2008). This suggests that an increase in sex selection among natives (as an alternative manifestation of son preference) is not driving our fertility findings.

II. Literature Review and Our Contribution

As noted above, Dahl and Moretti (2008) made a major contribution in finding evidence of son preference in the United States. Specifically, using data for the 1960-2000 period, they found that first-born girls were less likely to be living with their father than first-born boys. That is, first-born daughters and their siblings are more likely to be living in single-parent, female-headed families than first-born sons and their siblings, with important consequences for family

income and poverty incidence.[6] While such a result is consistent with fathers' preference for sons, as Dahl and Moretti (2008) point out, there are other possible explanations. One is that raising girls is more expensive than raising boys, making fathers more reluctant to shoulder this burden. We note that this possibility is especially plausible in more recent decades given girls' greater propensity to attend college than boys' beginning in the 1980s (Goldin, Katz and Kuziemko 2006). As noted, we will present some direct evidence on the relative expense of raising girls that is consistent with the cost argument. Another possibility is that parents believe that the lack of a male role model is more harmful for boys than girls or that fathers have a comparative advantage in raising sons. This is consistent with recent empirical evidence suggesting that the negative effects of growing up with economic disadvantage, and particularly in a single-mother family, are more harmful for boys than girls. For example, Autor, Figlio, Karbownik, Roth, and Wasserman (forthcoming) find larger negative effects for boys than for girls on a number of education-related outcomes of being born to low-educated, unmarried mothers and raised in disadvantaged neighborhoods.[7] And, as another example, Bertrand and Pan (2013) find that being raised in a single-mother household has major negative consequences for boys' noncognitive development but much less so for that of girls.

In order to distinguish between a preference for sons vs. these other explanations for the effect of girls on family structure, Dahl and Moretti (2008) examine the impact of a female first child on a couple's subsequent fertility, developing a model to clarify these effects. They show

[6] As explained in greater detail below, Dahl and Moretti (2008) focus on the effect of having a first-born daughter because fertility is potentially endogenous to the sex of the first-born child and they find evidence to that effect.

[7] These outcomes include being kindergarten-ready, incidence of truancy and behavioral problems in elementary and middle school, performance on standardized tests, and high school graduation.

that son preference implies that the probability of having additional children should be *higher* for all girl than for all boy families. However, if one of the alternatives discussed above is correct, the probability of having an additional child for all girl families should be *equal to or lower* than for all boy families. The role model hypothesis has no implications for subsequent fertility, all else equal, or possibly a negative effect if the impact of having girls on family breakup is taken into account. If, alternatively, money and/or time costs are higher for girls or fathers have a comparative advantage in raising boys (making girls more expensive to raise) and children are a normal good, all-girl families are poorer than otherwise-similar all-boy families; this should decrease the probability of having another child due to the income effect. Taking into account the higher probability of family break-up with girls would strengthen this expectation.

Since this reasoning implies that fertility is endogenous, Dahl and Moretti (2008) focus empirically on the fertility consequences of having a first-born daughter. Using Census data for 1960-80, they find that the effect on fertility of having a female first child is positive, an outcome consistent with son preference but not with the notion that girls are more expensive to raise or that fathers are more important or more effective for sons. Of course, these other explanations could also be relevant, but Dahl and Moretti's (2008) fertility results imply that son preference outweighs any possible excess cost of raising girls in affecting future fertility.

In this paper, as noted in the introduction we add important new findings to the literature on son preference that cast doubt on its continued prevalence among the native born in the United States. In particular, our finding that there is no longer a positive effect on the future fertility of this group of a first child girl is significant because it raises a question about whether the female headship findings are due to son preference or one of the alternative interpretations discussed above.

We are able to substantially update Dahl and Moretti's (2008) analysis because our 2008-2013 ACS data contain crucial information on marital history that is needed for the fertility analysis and has been otherwise unavailable since the 1980 Census. Recall that Dahl and Moretti's (2008) analysis of fertility were for the 1960-80 period. They focused on this earlier period for fertility because, after 1980, the Census ceased collecting information on whether the respondent had been married more than once. They deemed this information crucial because marital status is endogenous to the sex of the first child. They argue that, among a group of currently married women, some may be previously divorced and, as they show, having a female first child increases this probability. Divorced women have lower fertility, potentially biasing the impact of a female first child on the fertility of currently married women downward. Using Census data for the earlier period Dahl and Moretti (2008) were able to confine their analysis of fertility to women who were in their first marriage, thus countering this bias. We take advantage of ACS data, which include information on whether the respondent has been married more than once, to update these results.

Given the growth in the immigrant share of the population and the tendency of immigrants to come from countries with a more traditional gender division of labor (Blau, Kahn and Papps 2011), we present results analyzing immigrants and natives separately. This investigation is motivated by recent research highlighting the role of culture in affecting gender-related outcomes such as fertility and labor supply.[8] (Recent findings on sex selection, discussed shortly, suggest an impact on son preference as well.) Specifically, we compare results for

[8] See, for example, Fernandez and Fogli (2006, 2009), Blau (1992), Antecol (2000), Blau, Kahn and Papps (2011), Blau, Kahn, Liu and Papps (2013), and Blau and Kahn (2015) for studies of the impact of culture on female labor supply and fertility behavior among first and second generation immigrants.

female headship and fertility among first or second generation immigrants whose source countries differ with respect to the WEF's Global Gender Gap Index or alternative indicators of female status including female labor force participation rates and (boy-to-girl) sex ratios among births. These comparisons in effect provide an estimate of the impact of different "doses" of son preference as indicated by measures of female status differences across source countries.

As we have seen, Dahl and Moretti (2008) make the insightful argument that alternative manifestations of son preference, like the impact of a female first birth on female headship and fertility of married couples, may be viewed as complementary pieces of information in establishing son preference. However, it is also possible that these and other avenues may to some extent be substitutes. For example, a strong response to a female first birth along the dimension of family structure might diminish the fertility response. Along that line, however, it is interesting that we find overall and for natives that the family structure response to a female first birth has *decreased* in our data compared to Dahl and Moretti's (2008) earlier period. This reduction in the family structure response and the lack of any positive fertility effect of having a female first child together suggest a reduction in son preference among natives compared to the earlier period Dahl and Moretti (2008) studied. Further, our examination of first and second generation immigrants yields a much less robust association between the response to a female first birth and source country characteristics for female headship than we found for fertility, although there are some findings consistent with such a relationship.

While Dahl and Moretti's (2008) study focused on the full U.S. population, another strand of research on son preference examines North Americans with heritage from countries which have been known to practice sex-selective abortion, an extreme form of son preference: China, Korea, and India. For example, Almond and Edlund (2008) used 2000 U.S. Census data

to study the gender composition of the children born to Chinese, Asian Indian, or Korean women (defined by the Census question on race). They found that, among the subset of such families who already had two girls, the third child was much more likely to be a boy than the third child born to families that already had at least one boy or Whites irrespective of the sex of elder siblings. Similar findings for Chinese and Asian Indian mothers have been found by Abrevaya (2009), who used California birth record data. And Almond, Edlund and Milligan (2013), using 2001 and 2006 Canadian census data, found a similar result for first and second generation South and East Asian immigrants to Canada. Moreover, Almond, Edlund and Milligan (2013) also found (among these ethnic groups) that having girls increased the likelihood of having more children. The finding of son preference in influencing family gender composition has been recently questioned by Persaud, Kalantry, Citro and Nandi (2015), using more recent U.S. data, who found some evidence in favor of a preference for diversity rather than for son preference among these groups.

In light of this research strand and in the interest of further pursuing the notion of substitution across alternative manifestations of son preference, we examine the impact of the sex composition of previous children on the probability that a given birth is a boy. As noted previously, we find no evidence that sex selection has spread beyond the groups identified in the previous literature. This rules out the possibility that an increase in sex selection among natives could account for our fertility findings for this group.

III. Data and Research Design

Our central goal is to study female headship and fertility in order to make inferences about son preference in the contemporary United States. Following Dahl and Moretti (2008), we

estimate the impact of having a first-born daughter on the probability that a woman is a female head and for her fertility. We use American Community Survey (ACS) data for 2008-2013 to study the behavior of the full population and of natives and immigrants separately. And, since information on parental birthplace is not available in the ACS, we use the March Current Population Survey (CPS) data for 1995-2014 to study the immigrant second generation (native-born individuals with at least one foreign born parent). We use a wider time window for the CPS to increase sample size.[9]

We begin by estimating equation (1):

(1) $y_{it} = bF_{it} + B'X_{it} + u_{it}$

where for each woman *i* in year *t*, y is an outcome variable including a binary for female headship and indicators of fertility (the number of children and, in some specifications, a binary for having n or more children, n = 2, 3, or 4); F is a binary equal to one if the firstborn child is female, X is a vector of controls and u is a disturbance term.

The vector X includes a cubic in respondents' age, year fixed effects, and dummies for region (based on 9 Census categories), respondents' education (based on < HS, HS only, Some College and College Degree), and race/ethnicity (based on non-Hispanic White, non-Hispanic Black, non-Hispanic Asian, non-Hispanic Other, and Hispanic). For analyses estimated on married samples, analogous spouse education, race/ethnicity and age variables are also included. Regressions are weighted by adjusting the ACS sampling weights so that each sample year of data contributes equally to the estimation.

[9] Information on parental birthplace became available in the CPS starting in 1994. We begin our analysis of the CPS with the March 1995 wave because the 1994 survey had insufficient detail on parents' birthplaces.

To further probe our findings from estimating equation (1) for immigrants in the ACS and for second generation respondents in the CPS, we explore the impact of source country characteristics on the response to a first child girl in the female headship and fertility regressions by estimating equation (2):

$$(2) \qquad y_{it} = bF_{it} + B'X_{it} + C'S_{it} + D'F_{it}S_{it} + E'Z_{it} + F'I_{it} + e_{it},$$

where, suppressing subscripts, the additional variables in (2) are S—an indicator or set of indicators of women's status in the source country, Z—a set of source country characteristics used as further controls, I—a set of variables referring to individual characteristics specific to immigrants when we analyze foreign-born respondents, and e—a disturbance term.

In terms of source country characteristics, we are particularly interested in testing whether characteristics indicating a lower status of women are associated with behavior consistent with son preference. To this end we examine the effect of alternative indicators of the status of women in the source country, S, including both main effects and interactions with first child female.[10] One indicator we employ is the WEF's Global Gender Gap Index (which we term the "Equity Index"). This is an annual index computed for each country that is based on the treatment of women on four dimensions: a) Economic Participation and Opportunity; b) Educational Attainment; c) Health and Survival; d) Political Empowerment. The index is calibrated so that higher values signify *more favorable* outcomes for women. We use the average of the 2006 and 2007 values of the Equity Index for each source country; the variable is

[10] For descriptions of and sources for the source country variables, see the Data Appendix.

therefore measured before the data we use from the ACS, which as noted covers the years 2008-13. (The Index is not available prior to 2006.)

While the Equity Index provides an overall indicator of the favorableness of a country's environment to women, it imposes a specific weighting on its components. To investigate the separate impact of some important gender-related source country characteristics, in additional specifications, we replace the Equity Index with either (1) the female labor force participation rate relative to that of men or (2) the relative labor force participation variable and the country's sex ratio at birth (boys/girls). Note that the measure of source country female labor supply we employ is women's labor force participation relative to men's (female LFP/male LFP). This relative measure is appropriate in that it captures the gender division of labor explicitly. A further advantage is that it implicitly adjusts for problems in measuring the labor force, particularly at different levels of economic development, at least to the extent that such problems affect men's and women's measured participation rates similarly. We follow the WEF in left-censoring the sex ratio at birth at 1.059 to identify son preference rather than natural biological variation. The labor force participation and sex ratio variables are averaged over the 2000-2007 period, thus measuring source country conditions for a reasonable period prior to our ACS data.

The regressions with source country variables also include controls for the main effects of basic influences on family formation and fertility, Z, including total fertility and the log of GDP per capita in the source country, which are also averaged for the 2000-7 period. By including a measure of total fertility in the source country, we are interpreting the impact of having a female first child, controlling for overall tastes for family size in the source country.

The immigrant-related variables I in equation (2) include the woman's years since migration and years since migration squared, and include an indicator for whether her spouse was an immigrant.

Finally, we examine sex selection. Our goals in doing so are two-fold. First, we seek to confirm that it is reasonable to view the sex of the first child as exogenous—given the fundamental importance of this issue for our research design, we turn to it shortly below. Second, we wish to examine the extent of sex selection for the broad population (beyond the subgroup of individuals of Chinese, Korean, and Indian origin who have been previously examined) to see whether sex selection now constitutes a significant complement to or substitute for son preference in female headship and fertility decisions for broad swaths of the population. In particular, sex selection could provide an alternate channel for influencing the sex composition of children and thus help to account for our failure to find evidence consistent with son preference in the fertility decisions of natives. We consider the latter exercise a robustness check and explore this question after our examination of female headship and fertility. We study whether sex ratios are outside what Anderson and Ray (2010) have identified as a normal biological range of 1.03 to 1.07 (boys to girls), as well as whether the sex composition of prior children influences the sex composition of subsequently born children.

The databases used in this and previous studies do not provide a fertility history for the woman who is the respondent. Rather, following the existing literature (e.g., Dahl and Moretti 2008; Almond and Edlund 2008), we infer birth order, number, and sex composition of children from the children present in the household. We thus impose some sample restrictions in order to increase the likelihood that we are observing all the children born to the respondent. Specifically, we restrict our sample to women age 18-40 (married women in indicated

specifications) with at least one child, the oldest of whom is at most 12 years old. These age restrictions on mothers and the oldest child present are made to reduce the probability that there was an older child who had left the household. In addition, we restrict the sample to women whose children were all born in the United States, and, in the ACS, we exclude women from households where adopted, step, or foster children of the household head are present.[11] In addition, we exclude same-sex couples, and women who were in group quarters or who had a multiple birth. Finally, given our focus on nativity, we exclude respondents who were born abroad to American parents because it is difficult to categorize such individuals as either natives or immigrants (foreign born). Results for the native/immigrant pooled sample were virtually identical when such individuals were included.

As discussed above, one issue in examining fertility is that marital status may be endogenous to the sex of the first born child. Thus, in additional specifications, we capitalize on the marital history information in the ACS to restrict the sample to women in their first marriage who are married to men also in their first marriage. While Dahl and Moretti (2008) only apply this restriction to the wife, it seems reasonable to apply it to the husband as well since a child or children born during a previous marriage could affect his preferences for the number and sex of children in the current marriage. Finally, since even a first marriage may be endogenous to the birth of a girl, we also estimate our fertility models on a sample of all women. As discussed above, this measure may be downward biased to the extent that a first girl birth is positively associated with female headship.

[11] Note, this information is only available in relation to the household head. In the CPS, we are only able to exclude households with foster children of the head.

These sample restrictions subsume the restrictions in Dahl and Moretti (2008) and Almond and Edlund (2008). Because we combine restrictions from both studies, we have a more restrictive sample than either one, enhancing our chances of accurately observing the sex and birth order of all the children in the household.[12] Importantly, however, our results were virtually identical when we used Dahl and Moretti's (2008) sample restrictions and specification.

For selected waves of the June CPS, we know the total number of children ever born to each female respondent for this period (2008, 2010 and 2012).[13] While these samples are of course much smaller than the ACS, they allow us to determine the degree to which the number of children living in the household (our measure of fertility) accords with the number of children actually born to the female respondent. The data suggest that our sample restrictions lead to a sample for which these numbers are well matched. This may be seen in Appendix Table A-1, which shows the extent to which the number of children we assign to each woman using our sample restrictions matches the number of children ever born to that woman (based on the June CPS). The first thing to note is that our other sample restrictions do substantially contribute to the accuracy of the match, above and beyond restrictions on the age of the woman. In our married sample we correctly match 92% of the cases for both immigrants and natives, while in the sample of all women, we match 91% of the cases for both immigrants and natives. Subgroups such as Asian immigrants, Hispanic immigrants, and second generation immigrants are also well-matched, with match rates ranging from 90 to 94%.

[12] Dahl and Moretti (2008) restricted their sample to women age 18-40 whose oldest child was at most 12 years old; Almond and Edlund (2008) restricted their sample to women whose oldest child was no older than 12 years old and to women whose children were all born in the United States; in addition, Almond and Edlund (2008) excluded households with step or adopted children in relation to the head.

[13] This information is also available for 1995, 1998, 2000, 2002, 2004, and 2006.

Recall that, because fertility is endogenous, we follow Dahl and Moretti (2008) in focusing on the sex of the first child, rather than the sex composition of all children present. Given that sex selective abortion is a feasible option, a question may be raised as to whether the sex of the first child is indeed exogenous.[14] This issue is examined in Appendix Table A-2, which presents the probability of a male first birth for natives and immigrants. Anderson and Ray (2010) emphasize that there is considerable natural variation in the sex ratio at birth, but, as previously noted, identify a range of 1.03 to 1.07 that they take as "normal." What do the sex ratios of first births look like in our data? We use three alternative samples. First, we focus on women who are married with spouse present (and with all of the other age- and children-related sample restrictions). Second, recognizing, as Dahl and Moretti (2008) argue, that having a girl can raise the probability of a marital breakup, we restrict the sample to those in their first marriage. Third, we use a sample of all women, since even a first marriage can be endogenous with respect to the sex of one's first child.

Appendix Table A-2 shows that for all three samples, the first child sex ratio (boys to girls) is well within the range suggested by Anderson and Ray (2010) as indicating a biologically-normal ratio. The table shows the boy-to-girl ratio, and the 95% confidence interval

[14] Although in principle, Assisted Reproductive Technologies (ART) can be used for nonmedical sex selection purposes, this potential method of sex selection is extremely rare. According to the Society for Assisted Reproductive Technology, a member organization that registers 95% of in vitro fertilization cycles in the United States (www.sart.org), 63,286 babies were born in the United States in 2013 using in vitro fertilization (http://www.sart.org/news/article.aspx?id=14570. In such cases, Pre-implantation Genetic Diagnosis (PGD)—the technology that in principle can be used for sex selection-- is used 4-6% of the time, and of these, 9% involved nonmedical sex selection in 2005 (Baruch, Kaufman and Hudson 2008). These percentages imply that an upper bound of (0.06)·(0.09)·(63286)=342 babies born in the United States using nonmedical sex selection. This represents a miniscule fraction (0.00009) of the 3,912,181 births registered in the United States in 2013 (Martin et al. 2015).

endpoints.[15] In particular, the sex ratio ranges from 1.043 (for immigrants among all women) to 1.057 (for natives among women in their first marriage). The ratio is slightly lower for all women than for the married samples, although the differences across samples are not statistically significant. Nonetheless, the slightly lower ratio of boys to girls among all women than among married women is consistent with Dahl and Moretti's (2008) finding that having a girl increases the probability of a single parent household. We examine the issue of single headship further below.

In results not shown but available upon request, we also computed the sex ratio of the first child separately by nativity-race/ethnic group status. The race/ethnicity breakdowns included non-Hispanic whites, non-Hispanic blacks, Hispanics, and, based on the race question, non-Hispanic women who were (i) Chinese, Korean, or Indian or (ii) other Asian (Asian but not Chinese, Korean or Indian). In almost every case, the sex ratios for these groups were not significantly different from the normal range reported by Anderson and Ray (2010), and the point estimates were usually in the range itself. There were two exceptions to this pattern. First, among native-born other Asians, sex ratios of the first child ranged from 1.127 to 1.178 (across the marital status groups shown in Appendix Table A-2), and these were statistically significantly greater than the upper limit of the normal range (1.07).[16] We note that this group comprises about 1% of natives and that immigrants who were of the same race/ethnicity (i.e., other Asian) had biologically normal sex ratios of their first children. Second, native black women had sex ratios that were lower than the minimum of the normal range, with estimates

[15] We calculate these endpoints based on the endpoints of the 95% confidence intervals for the means of the fraction of first children who are boys.
[16] Asian natives with heritage from countries other than China, Korea or India have a variety of national origins, with Japan, the Philippines, and Vietnam being the most common origin, comprising 60-63% of this group.

ranging from 1.012 to 1.014, and these were significantly less than 1.03 for one out of the three marital status groups. Anderson and Ray (2010) also note the low sex ratios among black children and suggest that it is due to biological factors. Overall, the breakdown of the sex ratios of the first children by nativity-ethnicity status confirms our conclusion based on the aggregate sex ratios for natives and immigrants: specifically, using the sex of the first child as an exogenous factor potentially influencing future family formation decisions appears to be justified.

IV. Aggregate Results for Female Headship and Fertility

We begin our data analysis of son preference by presenting regression results for the determinants of female headship and fertility at the aggregate level in order to characterize the United States as a whole, including both pooled results for the full population and for natives and immigrants separately.[17] In the next sections, we consider educational and race/ethnic differences in these outcomes for both natives and immigrants and cultural (source country) differences for immigrants and the second generation.

Table 1 shows results for the determinants of female headship, estimated for natives and immigrants separately and for both groups pooled. Similar to Dahl and Moretti (2008), we find that having a female first child significantly raises the probability of female headship both overall and for natives. For immigrants the effect is the same as for natives (0.003) but the point estimate is not significant. In all cases (natives, immigrants and both combined), the impact is about 1-2% of the mean, a modest but statistically significant effect for natives and for natives and immigrants aggregated. While these results are broadly consistent with those of Dahl and

[17] All results we report are for samples that meet the sample inclusion restrictions outlined above.

Moretti (2008), we note that the point estimate we obtain for our pooled sample is 40 percent lower than that obtained by Dahl and Moretti (.003 vs. .005) and the difference is significant.

Table 2 shows the impact of a female first child on total fertility among married women who have had at least one child, again for natives and immigrants separately and for both groups pooled. We estimated these models for four samples: Panel A-All Marriages; Panel B-First Marriages; Panel C-All Marriages, Spouses Same Immigrant Status; Panel D-First Marriages, Spouses Same Immigrant Status. As noted by Dahl and Moretti (2008) and discussed previously, if having a girl increases the likelihood of divorce or decreases the likelihood of marriage, then it may be important to restrict the sample to first marriages. Moreover, in Panels C and D, we use more homogeneous samples where both spouses are either natives or immigrants.

The results are very similar across all four samples and are not sensitive to the restriction to first marriages. First, among natives, having a female first child has a small but significantly negative effect on future fertility in each sample. The effects range from -0.007 to -0.009, or about -0.4 to -0.5 percent of the mean fertility level. This significant negative effect shows up for both the probability of having two or more and three or more children. We also find negative point estimates for immigrants and natives pooled, although the coefficient estimates are smaller in magnitude and are not statistically significant. These results strongly contrast with Dahl and Moretti's (2008) finding from the 1960-1980 Censuses that, among first marriages, having a female first child raises future fertility by 0.3% of the mean. While Dahl and Moretti (2008) pooled natives and immigrants, their sample is surely dominated by natives, an even larger share of the total population during the period covered by their data. They took their finding to imply son preference in fertility and to support their interpretation of the female headship results as

indicating son preference. We note that when they included all marriages (for the 1960-2000 period), the effect of having a female first child was much smaller (0.1% of the mean) and not statistically significant. In contrast, our finding for natives is negative, significant, and does not depend on the particular sample examined.

A key difference between our results for natives and for the full population in Table 2 and Dahl and Moretti's (2008) fertility results is that ours are estimated for the 2008-2013 ACS, in contrast to the 1960-80 sample they studied for first marriages. Evidently, as of 2008-13, on average, there is no longer son preference in the aggregate population or for natives overall, as expressed in the response of fertility to a female first child. While the significant negative effects for natives of having a female first child shown in Table 2 could reflect a preference for girls, they could also be a response to higher costs of raising girls or an increase in the bargaining power of married women. The findings in Dahl and Moretti (2008) suggest that preferences for boys outweighed such considerations (if any) during the 1960-80 period. Our findings imply either a reduction among natives in preferences for boys and/or an increase in the relative cost of raising girls and/or the bargaining power of wives. One factor that could contribute to costs is that, today, the majority of college students are female, in contrast to the higher male representation during the 1960-80 period (Goldin, Katz and Kuziemko 2006). Thus, it is possible that families who have girls today are more likely to anticipate higher college costs for their children than in the past. Further, while some data suggest aggregate preferences for the sex of a child have not changed, son preference appears to be a male phenomenon (Newport 2011). Thus, this outcome could also indicate that women have a greater say in this decision than previously, as might be expected given rising female labor force participation and relative wages. In any case, the sign change in the findings for native fertility removes a crucial piece of

supporting evidence that the positive effect of a first girl on female headship is due to son preference as opposed to the higher costs of raising girls or concerns over the larger negative effects of absent fathers on boys.[18]

Table 2 also shows that, in contrast to the findings for natives, there does appear to be a fertility effect consistent with son preference among immigrants. The impact of having a female first child among immigrants is very similar across samples. It ranges from 0.015 (0.8% of the mean) to 0.020 (1.1% of the mean) and is highly significant in each case. These effects are larger than those obtained for the full population by Dahl and Moretti (2008) for the earlier period. As in Dahl and Moretti's estimates, this effect does not show up until beyond the margin of having two or more children, probably because, as they note, having at least two children is so prevalent. To the extent that having a preference for boys characterizes values emphasizing traditional gender roles, the contrast between immigrants and natives shown in Table 2 suggests that, overall, immigrants have more traditional values than natives.[19] Below, we probe this possibility, explicitly examining the impact of source country characteristics on the effect of a

[18] We found that the disappearance of the positive effect of a female first child on future fertility can be seen in Dahl and Moretti's (2008) own data, which are available at: http://econweb.ucsd.edu/~gdahl/research.html , when we analyzed these data separately by subperiod. Specifically, if one uses all married women (not restricting to women in their first marriage) or all women (not restricting to married women), one can compare this effect for 1960-80 with 1990-2000. When we ran their model for all married women for 1960-80, the effect of a female first child on fertility was a highly significant 0.0042 (se 0.0015); and the impact for all women was a highly significant 0.0036 (se 0.0014). However, we found that the impact for these samples had evaporated by 1990-2000: for all married women it was -0.0018 (se 0.0032), and for all women it was -0.00002 (se 0.0029). Our results shown in Table 2 imply that this effect continued to get increasingly negative post-1990-2000.

[19] Blau, Kahn and Papps (2011) found that immigrants had a more traditional division labor in the home than natives, as indicated by women's labor supply behavior, reflecting the lower female- to-male labor supply ratios in immigrant source countries compared to the United States.

female first child on fertility and female headship among immigrant and second generation women.

In contrast to Dahl and Moretti's (2008) findings, the combination of results for natives in Tables 1 and 2 does not provide strong support for son preference. While son preference could still explain the results for female headship, as noted, they could also be explained by factors such as the cost of raising girls or the perceived benefit of having a father present for sons vs. daughters. And the fertility results, which indicate that having a female first child lowers fertility, provide no direct supporting evidence of son preference.[20] The fertility finding is interesting in itself and also because it raises a question about whether the female headship findings in our data are due to son preference or one of the alternative interpretations discussed above.

Appendix Table A-3 provides some direct evidence on one of the possible factors influencing headship and fertility, apart from son preference: the relative cost of raising girls and boys. Taken from Kornrich and Furstenberg (2013), it shows that, in 1972-3, households with all boys spent significantly more on their children than households with all girls; this gap was largely accounted for by educational expenses. However, by 2006-7, this pattern had reversed, with all girl households spending significantly more than all-boy households, particularly, again, on education. In their online appendix (available at: https://link.springer.com/article/10.1007%2Fs13524-012-0146-4), the authors show that the patterns in the data shown in Table A-3 are similar in a regression context and for mixed gender

[20] As we noted, even first marriages can be endogenous. When we re-estimated the basic fertility model on a sample of all women (not restricted to married women) who met the sample inclusion criteria, the results were very similar to those in Table 2: for natives, having a female first child lowered fertility by 0.008 (se 0.003), and for immigrants, a female first child raised fertility by 0.012 (se 0.006).

families. Specifically, Table A-4 (from Kornrich and Furstenberg 2013) shows differences in spending across three spending categories (education, child care, goods) for families with different gender composition of their children, controlling for parental education, wife's labor supply and earnings, age of youngest child, number of children, marital status, household income, and earnings decile. Again, educational costs and the reversal of the sign of the gender difference over the period are the most important factors. Adding the coefficients across spending categories, we find that in 1972-3, all else equal, all girl households spent $128.9 less and mixed gender households spent $57.6 less than all boy households; however, by 2006-7, all girl households spent $533.8 more, and mixed gender households spent $281.8 more than all boy households, all else equal.[21] Unfortunately, the authors did not provide enough information for us to calculate significance levels, but the point estimates are highly suggestive.

The results shown in Tables A-3 and A-4 indicate that girls have become relatively more expensive to raise between 1972-3 and 2006-7, with a particularly large portion of this change associated with education spending, and, moreover, by 2006-7 the cost of raising girls was absolutely higher than the cost of raising boys. The data for 1972-73 broadly support Dahl and Morreti's (2008) conclusion regarding son preference for earlier years. Specifically, since girls were actually less expensive than boys, costs cannot account for the positive effect of female first child on headship, although the lower costs of girls do provide an alternative interpretation to son preference for the positive effect they obtain for female first child on fertility.

The higher absolute cost of raising girls during the 2000s can explain our finding that a female first child both lowers fertility and raises single headship. Moreover, the increase in the

[21] Note that in 1972-3, spending on goods went in the opposite direction from spending on education; however, the education effects outweighed the goods effects. By 2006-7, spending on all categories was higher for the groups shown than for all boy families, all else equal.

cost of girls over the period is consistent with the reversal in sign of the effect of female first child on fertility between Dahl and Moretti's (2008) 1960-80 period and our 2008-13 period. However, despite these rising costs, the effect on female headship in our data compared to Dahl and Moretti's fell. This change could not have been driven by costs and thus suggests a decline in son preference over this time. Moreover, the spending data shown in Tables A-3 and A-4 could themselves reflect a reduction in son preference, since they indicate that families are now willing to spend more on girls, particularly their education. The increased expenditure on girls and the less positive effect of girls on fertility than in the past could also reflect an increase in bargaining power of wives as their labor force participation and relative wages have increased.

While son preference may have decreased since Dahl and Moretti (2008) examined the question, we are reluctant to interpret our finding of a positive effect of first female child as indicating a shift from son to daughter preference, although of course it might. This is because rising costs of girls provide another possible reason for this shift and also because we continue to find that a female first child raises single headship. While as we have noted there are other possible sources of this relationship, son preference does remain a possibility. In addition, as noted above, the 2011 survey evidence shows that men prefer sons and women on average equally prefer sons to daughters (Newport 2011).

What about the possibility that the impact of first child girl on single headship is not due to son preference? The higher costs of girls in the Kornrich and Furstenberg (2013) data, which provide an alternative explanation for the impact of first girl on headship, mean that this possibility remains on the table. In addition, as discussed further below, our examination of first and second generation immigrants yields a much less robust association between the response to a female first child and source country characteristics for female headship than we find for

fertility, although there are some findings consistent with such a relationship. Since we find strong evidence consistent with son preference for fertility among immigrants, the weaker headship results for source country characteristics call into question the interpretation of female headship as an indicator of son preference, at least for immigrants. Moreover, as we have seen, our results for natives also call into question this interpretation, since, although having a female first child raises single parenthood among natives, it does not raise fertility, a more direct indicator of son preference.

V. Female Headship and Fertility: Heterogeneity by Education and Race/Ethnicity

We now explore the degree to which the aggregate findings for female headship and fertility shown in Tables 1 and 2 hold within subgroups of the population. We first study heterogeneity across education groups and then explore differences in son preference across race/ethnic groups. In the next section, we probe the immigrant results further by analyzing the impact of source country characteristics on the responsiveness of immigrants to a female first child.

A. Differences by Education Group

Tables 3 and 4 show the results for the impact of a female first child on female headship (Table 3) and fertility (Table 4) disaggregated by education group. For natives, with the exception of high school graduates, results are broadly consistent with the aggregate results presented in Tables 1 and 2, although the magnitude and significance of the estimated coefficients varies. Except for those with exactly a high school degree (high school graduates), having a female first child is found to have a positive effect on the probability of female headship and a negative effect on fertility. The results for high school graduates, however, show

a pattern more consistent with son preference on both dimensions. The impact of a female first child on female headship is larger for high school graduates (0.007) than for the other education groups (0.002), although not significantly so, while the effect on fertility is large, positive and significant.[22]

For immigrants, the headship results are mixed. The effect of a female first child on female headship is positive for high school and below (0.008 and 0.014) and significant or larger than its standard error. However, the impact for those with more than high school is negative in both cases, although not significant. These mixed results by educational attainment contribute to the weaker results for the impact of first child female on headship for immigrants than natives in the aggregate, which were obtained in Table 1. For fertility, the impact of a female first child is more consistent with aggregate results being positive for each education group. Interestingly, the estimated effect is especially large (and significant) for those with a high school degree (0.037).

As we have seen, high school graduates are the one group of natives who seem to evince evidence of son preference in fertility. This group comprised a much larger portion of Dahl and Moretti's (2008) sample of women in first marriages for 1960- 80 (48%) than it does for our sample of natives and immigrants pooled (18% for all marriages and 17% for women in their first marriage), reflecting both the increase in education levels over time and the reduction in

[22] The headship findings for natives in Table 3 imply that a portion of the relatively high incidence of female headship in the population for high school graduates (41.1%) compared to college graduates (11.1%) could be due to different responses to female first births of the two groups. However, this does not appear to be a quantitatively important factor. Assuming about 49% of first births are female, a female first birth leads to an increase in the incidence of female headship of 0.0034 (0.007*0.49=0.0034) for native high school graduates and 0.00098 (0.002*0.49) for native college graduates. Therefore, the response to female first births can account for a difference in female headship between high school graduates and college graduates of only 0.0024, or 0.008% of the actual difference in incidence between the two groups.

relative and absolute marriage rates among the less educated since 1960-80.[23] Moreover, the group with the largest positive effect of a female first child on fertility during 1960-80, as found by Dahl and Moretti (2008), was women with less than a high school degree; and this group comprised 22% women in their 1960-80 sample compared to 8% of all married women and also 8% of women in their first marriage in 2008-13. We find an insignificantly negative effect of first child girl for fertility for this group (see "Both" in Table 4.) Nonetheless, it remains the case that the two education groups which Dahl and Moretti (2008) found had large positive fertility responses to a female first child for 1960-80 have fallen from a total of 70% of married women in their first marriage to 25% during our sample period, 2008-13.

The differing effects we have just discussed for education groups raise the possibility that the disappearance of evidence for son preference in fertility that we have found in the 2008-13 data compared to Dahl and Moretti's (2008) findings for 1960-80 reflects changes in the distribution of married women by education. This interpretation would also be supported by survey data we referred to earlier that showed that more educated individuals have more egalitarian gender role attitudes.[24] While it may be difficult to disentangle cause and effect between gender role attitudes and education, it is plausible that education could act to break down traditional attitudes even though the causality could also run in the reverse direction.

To assess the possibility that the changing distribution of educational attainment could account for our results, we re-estimated our basic models reweighting the data using the

[23] We computed the information about Dahl and Moretti's (2008) sample using their data, which are posted at: http://econweb.ucsd.edu/~gdahl/research.html . Their data do not distinguish between immigrants and natives.

[24] For example, Kosteas (2013), Campbell and Horowitz (2016), Davis and Greenstein (2009), and Marks, Lam and McHale (2009) all find such a pattern for men and women separately or combined. Cunningham (2008) also finds that higher education is associated with more egalitarian gender attitudes among a sample of white women.

incidence of educational attainment in Dahl and Moretti's (2008) sample. Since Dahl and Moretti's (2008) data did not distinguish between natives and immigrants, we pool natives and immigrants in our reweighted models. In this analysis, we used three education groups (less than high school, high school, and more than high school) in order to match Dahl and Moretti's (2008) educational breakdown.[25] We found, however, that, even using 1960-80 education weights the re-weighted regressions for 2008-13 did not replicate Dahl and Moretti's results for fertility; even with the 1960-80 education distribution, there is still no evidence that, in the aggregate, having a female first child raises fertility in our period.[26] Thus, there appears to have been some behavioral change with respect to son preference in fertility since the 1960-80 period that was the focus of the Dahl and Moretti (2008) analysis.[27]

B. Differences by Race/Ethnicity

In this subsection, we investigate whether the aggregate native and immigrant effects of having a female first child on female headship and fertility are heterogeneous by race/ethnic group. The results are shown in Tables 5 and 6. We include the standard categories controlled for in our previous regressions: non-Hispanic Whites (the omitted category), non-Hispanic Blacks, non-Hispanic Asians, non-Hispanic others, and Hispanics. Further, in light of the

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[25] We note that when we re-estimated the models used to produce the results in Tables 1 and 2 using three instead of four education categories, each first-girl coefficient and standard error was the same as in those two tables.

[26] The effect of having a female first child on fertility was -0.001 (se 0.003) for all marriages; and 0.0004 (se 0.0033) for first marriages.

[27] Evidence of this behavioral change can also be seen, using Dahl and Moretti's (2008) data for 1960-80 and 1990-2000. Specifically, we reestimated their model for fertility using either all married women or all women for the 1990-2000 sample (recall first marriage is not available) using educational weights for these groups taken from their 1960-80 samples. Even controlling for the changing distribution of education, by 1990-2000, the impact of a female first child on fertility was small and insignificant, in contrast to its larger and significantly positive effect for 1960-80. Specifically, the effects of a female first child on fertility were -0.0014 (se 0.0033) for married women and 0.0007 (se 0.0030) for all women.

literature on sex selection in China, Korea and India (CKI), we disaggregate the non-Hispanic Asian category into CKI and non-CKI subgroups.

For natives, Table 5's results for female headship show only one significant interaction with an indicator for having a female first child: natives with Chinese, Korean, or Indian (CKI) heritage have a significantly negative interaction effect of having a girl on female headship relative to white, non-Hispanic natives; this group represents less than one half of one percent of natives. For immigrants with Asian heritage other than Chinese, Korean or Indian, there is a significant negative interaction with having a female first child; this group comprises about 11% of immigrants and 2% of the total population. Finally, there is a positive interaction for immigrants of other race, a heterogeneous group that comprises about 1% of immigrants and 0.2% of the population. Thus, for most individuals in non-white subgroups, the effects of a female first child on female headship are not significantly different from those of whites.

Table 6 shows effects of a female first child on fertility by race/ethnicity group. For natives, there are positive interaction effects between being Black (nearly significant) or being Hispanic (significant) and having a female first child on subsequent fertility. Thus, there appears to be relatively more son preference along this dimension among Hispanic and, possibly, Black, native women than among white native women. These interaction effects largely hold for first marriages, for marriages with both spouses having the same ethnicity, and for first marriages with both spouses having the same ethnicity (results available on request). However, computing the effect of having a female first child for Black or Hispanic women (i.e., adding the First Child Girl main effect and Girl*Hispanic or Girl*Black interaction effects) only produced a significantly positive effect on fertility for Hispanic women, even though the point estimates were positive in all cases. Note that it is likely that many Hispanic natives are second generation

immigrants and thus that the positive effect on fertility for this group may be part of a broader second generation pattern reflecting source country values, which we examine in the next section. In supplemental analyses (results not shown) we use the CPS to confirm this. Specifically, we find that the positive Girl*Hispanic interaction effect on fertility for natives is entirely accounted for by its effect on second generation Hispanic women.

In contrast to natives, for immigrants, there were no significant Girl-interactions with the race/ethnicity dummy variables. However, in results presented below, we show that there is a lot of heterogeneity in apparent son preference in fertility among immigrants associated with characteristics in their countries of origin.

VI. Source Country Characteristics and First Child Girl Effects for Immigrants and the Second Generation

Overall, we do not find direct evidence of son preference for fertility for natives in the aggregate, although the female headship results are consistent with this phenomenon. However, immigrants, on average, do exhibit son preference in their fertility behavior which potentially provides supporting evidence for the (weaker) findings of female headship for them that might indicate son preference along this dimension. If the immigrant results for female headship and fertility reflect son preference, they would likely be tied to source country variables that measure the status of women in these countries. We thus examine these relationships for both immigrants and second generation natives—evidence of such an association provides further support for interpreting the estimated effects as indicators of son preference. We begin by first considering fertility, since results for this variable were stronger than for female headship. We then examine the headship findings. Since there are alternative explanations for the association between

female first child and the probability of female headship, it will be interesting to see whether the son preference explanation is supported by an association with source country characteristics.

Table 7 presents fertility results for immigrants and shows that the impact of a female first child on fertility is indeed affected in the expected direction by indicators of women's status in the immigrant's source country. We show results for all married couples as well as for women married to men who were immigrants from the same source country. In results not shown but available upon request, we also estimated models where immigrants were restricted to their first marriage and also where they were both married to immigrants from the same source country and in their first marriage. In all cases, the results were very similar.

The key results in Table 7 concern the interactions between first child girl and indicators of the status of women in the source country; as noted above, all regressions additionally control for total fertility and the log of GDP per capita in the source country. In Columns 1 and 4, we summarize women's status using an Equity Index (based on the World Economic Forum's Global Gender Gap Index). In additional specifications, we investigate the separate impact of some important gender-related source country characteristics by replacing the Equity Index with either (1) the female labor force participation rate relative to that of men (Columns 2 and 5) or (2) the female labor force participation ratio and the country's sex ratio at birth (boys/girls) (Columns 3 and 6).

The results of these alternative measures of women's status and gender roles in the source country are similar and strongly support a link between these source country characteristics and immigrant fertility behavior in the United States. Column 1 shows a significant negative interaction between first child girl and the Equity Index; Column 2 shows a significant negative interaction between first child girl and the female relative LFP rate; and Column 3 shows a

significant negative interaction between first child girl and the female relative LFP rate and a significant positive interaction between first child girl and the sex ratio at birth. In all cases, the apparent preference for boys is stronger among immigrants coming from societies with lower status for women—i.e., countries with lower Equity Indexes, lower female relative LFP rates, or higher sex ratios at birth. As Table 7 shows, the effects are less significant when we restrict the sample to women married to men from the same country, although the magnitudes are comparable. Because of the similarity in magnitudes across the two samples, we believe that the difference in significance levels is due to the smaller sample sizes when we restrict the sample to those married to men from the same country.

To assess the magnitudes of the differences in preference for boys across source countries, we used the coefficients in Table 7 and the sample distribution of the source country characteristics that are interacted with the first child girl variable. For example, the first column of Table 7 shows a significantly negative interaction effect between (First Child) Girl and the source country's Gender Equity Index, indicating weaker son preferences for immigrants coming from countries that score higher on the index. We contrast the effect of first child girl on the fertility of women migrating from a country at the 75th percentile of the Equity Index in our immigrant sample with that of women migrating from a country at the 25th percentile of the Equity Index; the 75th percentile of the Index is 0.6796 and the 25th percentile is 0.6459. These percentiles are implicitly weighted by the (weighted) frequency of immigrants from each source country. As examples, Thailand has an index near the 75th percentile, and Mexico's index is near the 25th percentile. In contrast, the 2006-7 average Equity Index for the United States is 0.7022, or above the 75th percentile for immigrants. The Equity Index thus provides some further

evidence that gender roles are more traditional on average in immigrant source countries than in the United States, as noted by Blau, Kahn and Papps (2011) in their study of labor supply.

Using the parameter values in Table 7 (all couples sample), we find that the impact of first child girl on fertility is relatively large and statistically significant for women coming from a country at the 25th percentile of the Equity Index (0.0186, se 0.0050) and smaller and not statistically significant for women coming from a country at the 75th percentile (0.0095, se 0.0077). When we replace the Equity Index with the female relative LFP rate (Column 2), the results are similar. The female relative LFP ratio at the 25th percentile is 0.4946, or about Mexico's level, and 0.7123, or about the value in Cyprus, at the 75th percentile. The effect of first child girl on fertility is larger and statistically significant at the 25th percentile (0.0229, se 0.0054) and smaller and not statistically significant for women coming from a country at the 75th percentile (0.0066, se 0.0089). Finally, when we include both the female relative LFP ratio and the sex ratio at birth (Column 3), the results are again similar. Specifically, we compare women coming from countries at the 25th percentile of the female relative LFP ratio with a relatively high sex ratio of 1.103, or the level in India (which corresponds to the 95th percentile of the distribution) with women coming from countries at the 75th percentile of female relative LFP ratio with a sex ratio of 1.059 (the minimum value for this variable as constructed). (Note that high values of the sex ratio above the normal biological range are relatively rare in the data.) Thus, the comparison is between two types of source countries: one with a high female LFP rate and biologically normal sex ratio (Senegal's values are close to these outcomes) and one with a low female LFP rate and India's high sex ratio (India has a relatively low female LFP rate as well as a high sex ratio). The effect of first child girl on fertility of women coming from the less "female friendly" country is relatively large and significant (0.0370, se 0.0058), while the effect

for women from a more female friendly is small and not statistically significant (0.0014, se 0.0093).

These simulations show that in all three specifications in Table 7, the impact of first child girl on fertility of women coming from a country where women have lower status is large and highly statistically significant. In contrast, for women coming from countries where women have higher status, it is small and not statistically significant.[28]

The results for immigrant fertility are consistent with son preference in the aggregate, as well as the importance of source country characteristics or culture in affecting the degree of son preference. In contrast, for natives overall, the fertility results do not suggest such preferences are dominant. An important question is whether immigrant preferences for sons and the cultural differences implied in the impact of source country characteristics persist into future generations. Tables 8 and 9 explore this issue by examining the impact of first child girl on the fertility of second generation women. As noted earlier, the information on parental birthplace of respondents in the CPS, in addition to, of course, where they themselves were born, allows us to study son preference separately among the foreign born (the 1st generation), among natives with foreign born parent(s) (the 2nd generation) and among natives with native-born parents (the 3rd+ generation).

Table 8 shows the overall effects of first child girl on fertility for each of these groups, using the March CPS from 1995 to 2014 (this wider time window is used to increase sample size). These results can give an indication of whether the CPS is yielding broadly similar overall results to the ACS before we consider finer distinctions among the 2nd generation based on

[28] The effects are quite similar but with larger standard errors for the (considerably smaller) sample with spouses having the same birthplace (Columns 4-6 of Table 7).

source country. In terms of the signs of the effects, the results are indeed similar. First, the effects for natives with native parents (3rd+ generation)—the majority of natives—are similar to those obtained for natives in Table 2: a female first child leads to lower fertility. (Recall that in the ACS, we cannot tell if natives had native-born or foreign-born parents). Second, the effect for immigrants (the 1st generation) is also similar to that in the ACS: having a female first child significantly raises fertility.

Table 8 also permits us to now look at second generation women separately. For this group overall (Panel C, "all"), first child girl raises fertility, although the effect just misses statistical significance at conventional levels. The effect becomes larger and statistically significant when we restrict the second generation sample to those with both parents foreign born. In fact, for this group, the effect of 0.054 is similar to the effect for immigrants (0.040). But the effects are smaller and insignificant when only one parent (mother or father) is foreign born. The larger effect for women of having both parents foreign born suggests a stronger "treatment" than when only one parent is foreign-born.[29]

Table 8 concerns the average second generation effect on fertility of having first child girl. As was the case for immigrants, there is considerable variation in source countries for the parents of second generation women, and in Table 9, we study whether this variation affects the relationship between fertility and first child girl for the second generation. The results are qualitatively quite similar to those for immigrants shown in Table 7. Specifically, among all

[29] Although results for immigrants and natives in the CPS are similar in sign to the results we obtained with the ACS (Table 2), the magnitudes of the estimated effects are larger in the CPS than in the ACS. This could be due to our wider time window in the CPS analysis (1995-2014). However, when we restricted the CPS analysis to the same years as the ACS—2008-2013, the effects for immigrants and 3rd+ generation natives remained larger than in the ACS. In this analysis, effects for the second generation became negative and usually insignificant.

second generation women (either parent foreign born), those whose parent(s) came from a country with a higher Equity Index exhibit significantly less son preference in fertility than those whose parent(s) came from a country with a lower Equity Index. Further, the interaction effect for Girl*LFP Ratio is significantly negative (Columns 2 and 3), while the interaction with Sex Ratio at Birth is positive, though not statistically significant (Column 3). The results are qualitatively similar but less significant when both parents were foreign born (Columns 4-6), possibly reflecting the smaller sample sizes.[30] Overall, the results suggest that cultural transmission of son preference in fertility from source country to immigrants continues into the second generation.

Turning to the effect of source country characteristics on first and second generation immigrant propensities to form single parent households, recall that our aggregate analysis of female headship showed a significantly positive effect of a female first child for natives and the same coefficient value, though insignificant, for immigrants. For immigrants, the combination of a positive effect of a first girl birth on fertility with a positive effect on headship is consistent with complementary evidence of son preference. Certainly, the impact of source country indicators of female status on immigrant and second generation fertility discussed above is supportive of this interpretation for the fertility results. Here we see if a similar investigation of the impact of source country characteristics on immigrant and second generation headship is also consistent with such an interpretation.

[30] As was the case with the overall effects for immigrants or natives, the interactions for second generation women shown in Table 9 are larger in magnitude for the Equity Index and LFP Ratio than for immigrants shown in Table 7; however, the effect for Girl*Sex Ratio at Birth is smaller for second generation women than for immigrants.

Table 10 studies source country effects on female headship among immigrants using the ACS by interacting the first child girl indicator with source country characteristics as was done for fertility in Table 7. It suggests that the effect of a female first child is weaker for women migrating from countries with higher Equity Index scores; the interaction effect is not significant but is larger than its standard error. However, we do not obtain significant results for the labor force participation ratio in either specification or for the sex ratio (the latter is also "wrong signed"); and all estimated effects are small relative to their standard errors. Thus, while the result for the Equity Index suggests the positive relationship between first child girl and female headship may be indicative of son preference, the findings for source country characteristics for headship are considerably weaker than the fertility results.

Finally, Tables 11 and 12 show CPS results for female headship distinguishing immigrant generation, with Table 11 giving aggregate results and Table 12 results for the effect of parents' source country characteristics on female headship for the second generation. Table 11 shows that the aggregate CPS results are broadly consistent with our findings from the ACS in Table 1, indicating a positive effect of first child girl on the probability of female headship, with the effect being positive for both the 3rd and 1st generations. As in the ACS, the results for immigrants (the 1st generation) are not statistically significant. The results for the second generation in the aggregate show that first child girl generally has a negative effect on female headship among second generation individuals, although this effect is usually not statistically significant. This stands in contrast to the positive effects for the 1st and 3rd generations.

Looking at the impact of source country variables, in Table 12, we find positive and significant interactions between first child girl and sex ratio at birth in the parental source country. While that is consistent with expectations, evaluating the main and interaction effects

indicates a positive effect of source country gender ratio on headship only at very high sex ratios--over 1.112 (column 3) or 1.183 (column 6). In our data, only three countries have sex ratios greater than 1.112: Armenia (1.1631), Azerbaijan (1.1547), and China (1.1533) and none have ratios over 1.183. Further, the Equity Index and Labor Force Participation Ratios interactions with First Child Girl are "wrong signed," and these are sometimes significant. Thus, the second generation results offer little evidence of an impact of source country characteristics on headship in the expected direction.

VII. Sex Selection

Our findings for fertility do not suggest son preference overall on the part of natives, while we do find some evidence for immigrants that having a girl raises future fertility, particularly for immigrants and second generation individuals from countries where women have a lower status. However, sex selection can serve as another, perhaps substitute option for exercising son preference, and, nearly a decade ago, Dahl and Moretti (2008) warned that the United States might see increases in such behavior due to technological advances in sex selection technology (p. 1087). We therefore have examined this issue by studying the impact of first child sex on the sex of the second child among those with at least two children, and the impact of the sex composition of the first two children on the sex of the third child among those with at least three children.

Table 13 shows these results. Overall for natives and for immigrants in the aggregate, there is no evidence of son preference through sex selection. For natives, the boy/girl ratios are all between 1.034 and 1.058, figures that are within the normal biological range suggested by Anderson and Ray (2010). What associations there are between the sex composition of past and future births for natives appear to be consistent with a biological tendency of future children to

be of the same sex as previous children.[31] For example, the second child is slightly less likely to be male if the first child was a girl than if the first child was a boy, and the difference is statistically significant for all married women and for all women. Similarly, the third child is more likely to be male if the first two were boys than if the first two were girls or were mixed, but the differences across the family types are not significant. Thus, at least as of 2008-2013, we find no evidence of sex selection among natives overall.

Among immigrants, the sex ratio of the second children given a male first child ranges from 1.045 to 1.054, or right at the normal level. However, the ratio falls to 1.006 to 1.011 if the first child was a girl. Moreover, the differences in the sex ratio given a male first birth vs. a female first birth for immigrants are statistically significant. These results for immigrants, like the ones for natives, do not suggest sex selection for the second child and are more consistent with a biological tendency for families with a female first child to have further female children. For third children, among immigrants, boy/girl sex ratios are lowest for those with two girls (again consistent with the biological argument), followed by those with two boys, and are relatively high for those with one boy and one girl. The differences between ratios for those with two girls vs. two boys are not significant, while the differences between ratios for those with two girls or two boys and those with one boy and one girl are significant in three of six cases. However, the pattern for the third child among immigrants does not suggest sex selection either for boys or for diversity.

Finally, in light of research highlighting sex selective abortion among those with Chinese, Korean, or Indian heritage (Almond and Edlund 2008; Abrevaya 2009; Almond, Edlund and

[31] Some researchers have found such a correlation between the sex composition of previous births and the sex of future children (Ben-Porath and Welch 1976; Gellatly 2009), although some find no such pattern (Rodgers and Doughty 2001; Jacobsen, Møller and Mouritsen 1999).

Milligan 2013), we also examined sex ratios of second and third children by nativity and race/ethnic group status (results available upon request). Similar to Persaud, Kalantry, Citro, and Nandi (2015), we found some evidence of a demand for diversity among immigrants with Chinese, Korean or Indian heritage for third children. (There was no evidence of son preference or demand for diversity for the second child.) Specifically, among married women in this race group, the sex ratio on the third child for those with two boys was 0.793, while for those with two girls, it was 1.168; among those with one boy and one girl, the sex ratio for third children was 1.070, at the right tail of the normal range. We note that these results are based on relatively small sample sizes of 320 (two boys), 401 (two girls), and 504 (mixed). Possibly because of small sample sizes, only the ratio for women with two sons was found to be significantly outside the normal range.[32]

For second children, there was only one case where the sex ratio was significantly outside the normal range: native women with Asian heritage other than Chinese, Korean and Indian. For this group, the sex ratio given a female first child was 1.16; however, the ratio for women with a male first child was also relatively high at 1.11, and these figures were not significantly different from each other. These high sex ratios are similar to those reported earlier on the first child. We note that among immigrants from the same countries, sex ratios were 1.07 (first child boy) and 1.08 (first child girl), respectively, and were not significantly different from each other or the normal range. Unfortunately, because of small sample sizes, we were unable to study the sex of the third child for natives with Asian heritage other than Chinese, Korean and Indian. However, because of the heterogeneity of this group with respect to source countries and its

[32] Results were similar for women in their first marriage and also for all women. We also found similar results when we defined CKI and Asian non-CKI for immigrants by birthplace rather than race.

relatively small size (recall that this group comprises about 1% of natives), we conclude that there is little evidence of sex selection among second children.

Overall, our examination of sex selection suggests that it has not become a feature of natives' demography or for the population more broadly, and, to the extent that it exists, it is confined to groups that previous research has found practice sex-selective abortion. Therefore, the reduction in the size of the effect of a first girl on female headship since Dahl and Moretti's (2008) data were collected and the reversal of the effect of a first girl on fertility that we found for natives likely indicate a general weakening of son preference in the United States rather than a shift to sex selective abortion as an alternative mechanism.

VIII. Conclusions

In this paper, we have used 2008-2013 ACS and 1995-2014 CPS data to generate new findings on the extent of son preference in the United States. In light of the large increase in immigration and the changes in immigrant source countries towards countries with a more traditional status for women than in the United States (Blau, Kahn, and Papps 2011), we introduce a new dimension into this literature by analyzing natives and immigrants separately. Perhaps most importantly, we find that, among native women, as well as among the aggregate population (immigrants and natives pooled), having a female first child reduces future fertility. This result stands in sharp contrast to earlier research by Dahl and Moretti (2008) which found for the 1960-80 period that having a girl led to higher fertility levels among the aggregate population. As in Dahl and Moretti (2008) who found that first child girl increased the likelihood of female headship for the aggregate population over the 1960-2000 period, we continue to find a positive relationship, although the estimated effects have decreased.

Upon disaggregation by education, we find that, for natives with a high school degree, having a female first child does raise fertility and also has a strong positive effect on female headship. Thus, some direct evidence of son preference in fertility decisions remains for this subgroup, which now comprises a relatively small share of the married population in particular. However, for other education groups, comprising about 83% of married natives, our findings for fertility and headship are more consistent with the hypothesis that girls are more expensive to raise, that boys especially benefit from having a father living with them than with the hypothesis of son preference. We presented data from Kornrich and Furstenberg (2013) that showed that, indeed, raising girls, which was cheaper in the 1970s than raising boys, had by the 2000s become more expensive than raising boys. Since our data come from a relatively recent period, another interpretation of our results in the context of Dahl and Moretti's (2008) findings for fertility is that, among natives, son preference has declined. Alternatively, some evidence suggests that women do not share men's preferences for sons (Newport 2011). Thus, the fertility changes may reflect an increase in women's bargaining power in the family, perhaps due to rising female labor force participation and relative wages. Another possibility is that the expense of raising girls has risen sufficiently to offset any son preference in fertility. This may be a plausible hypothesis given the rising relative education levels of girls.

For immigrants, we find a positive effect of a female first birth on female headship, which is not statistically significant but has the same magnitude to the effect estimated for natives. In contrast to natives, however, we find that, for immigrants, having a first child girl significantly raises future fertility, providing more direct evidence consistent with son preference for fertility for this group. Moreover, such fertility preferences are stronger for immigrants coming from countries with a lower status of women and also appear to carry over into the

second generation. We also found some weaker evidence (compared to our fertility results) that the impact of having a girl on female headship was stronger among first and second generation immigrants from source countries with a lower status of women. But this evidence was weak and, thus, in contrast to the fertility results, does not provide strong support that the relationship between first child girl and headship for immigrants is tied to son preference.

We also studied the issue of sex selection, a perhaps extreme manifestation of son preference. Overall, despite warnings that sex selection could spread among the wider population (Dahl and Moretti 2008), we found no evidence of such behavior for our relatively recent period of analysis (2008-13) outside small subgroups that had been identified in previous work (e.g., Almond and Edlund 2008), namely individuals of Chinese, Korean or Asian Indian origin. The findings for sex selection reinforce our overall conclusion that preference for sons appears to have diminished among US natives in that sex selection does not provide an alternative mechanism to account for the disappearance of a positive effect of first child girl on future fertility.

Data Appendix

Variable Definitions

Variables from the ACS and CPS

Race and Ethnicity

- We control for race and ethnicity using a set of indicator variables for five mutually-exclusive categories: White non-Hispanic, Black non-Hispanic, Hispanic, Asian non-Hispanic, and other non-Hispanic. In some instances, we disaggregate the Asian non-Hispanic category into Chinese, Korean, and Indian (CKI) and non-CKI subgroups
- Respondent is classified as Hispanic if the respondent reports being Hispanic or reports race as Spanish, Portuguese, Mexican, Puerto Rican, Latin American Indian, South American Indian, or Mexican American Indian.
- Respondent is classified as black non-Hispanic if the respondent reports being any detailed race that includes black (except for Black and Chinese, Black and Asian Indian, or Black and Korean) and is not classified as Hispanic.
- Respondent is classified as Asian non-Hispanic if the respondent is not classified as Hispanic or black non-Hispanic and reports race as Asian or any mixed race including Asian.
- Respondent is classified as white non-Hispanic if the respondent is not classified as Hispanic, black non-Hispanic, or Asian non-Hispanic and reports race as white.
- Respondent is classified as other non-Hispanic if none of the above classifications apply.

Chinese, Korean, or Indian

- We employ two different definitions for our indicator of "Chinese, Korean, or Indian (CKI)": Chinese, Korean, or Indian by birthplace; and Chinese, Korean, or Indian by race.
- Respondent is classified as Chinese, Korean, or Indian by birthplace if birthplace is China, Hong Kong, Taiwan, Korea, or India.
- Respondent is classified as Chinese, Korean, or Indian by race if respondent reports race as Chinese, Korean, Asian Indian, Taiwanese, or a mix of these.
- When we include separate indicators for Chinese, Korean, and Indian, respondents are classified as Chinese if they report their race as Chinese, Taiwanese, or a mix of these two. Respondents who report their race as a mix of Chinese, Korean, or Asian Indian are not included in these groupings.

Immigrant Status and Years Since Migration

- Respondents are classified as natives if their birthplace is one of the fifty states or the District of Columbia.
- For foreign-born persons and persons born in outlying U.S. areas, we define years since migration as the lesser of age or reported years in the United States.

First, Second, Third + Generation (CPS only)

- Respondents are classified as first generation if they report their birthplace as outside the fifty states or the District of Columbia.
- Respondents are classified as third generation or more if they report that both of their parents were born in the United States (not including outlying areas or territories).

- In our baseline specifications, respondents are classified as second generation if they were born in the fifty states or the District of Columbia and they report that either of their parents was born outside the United States. Where noted, second generation may alternatively be defined as born in the United States with mother's reported birthplace outside the US (regardless of father's birthplace); born in the United States with father's reported birthplace outside the US (regardless of mother's birthplace); or born in the United States with mother's *and* father's reported birthplaces outside the United States. Source country characteristics are allocated based on mother's birthplace, if she is foreign born, and father's birthplace otherwise.

Female Headship

- We classify a respondent as a female head if the respondent is female, unmarried (where married, spouse absent is considered married), listed as head of household, and has at least one child. Note that if the respondent has an unmarried partner, she can still be classified as a female head of household. Although the indicator we create for female headship limits our definition of female head to only include women whose youngest child is under 18 years of age, our sample restrictions (only including women whose oldest child is under 12 years of age) make this condition non-binding.

First Marriage

- Respondents are classified as being in a first marriage if both the respondent and her spouse report that their current marriage is their first marriage.

<u>Country Characteristics Variables</u>

Total Fertility

Total fertility data comes from the World Bank, available at http://data.worldbank.org/indicator/SP.DYN.TFRT.IN. In the regressions with country characteristics, we include 2000-2007 country averages of total fertility.

GDP Per Capita

Most GDP per capita data comes from the World Bank, available at http://data.worldbank.org/indicator/NY.GDP.PCAP.PP.KD. For Taiwan, data comes from the Chinese Statistical Yearbook 2013, available at http://ebook.dgbas.gov.tw/public/Data/3117141132EDNZ45LR.pdf. GDP for Argentina, Burma and Syria is constructed from UN Stats data on GDP by Type of Expenditure at current prices and at constant 2005 prices in national currency units, available at http://data.un.org/Data.aspx?d=SNAAMA&f=grID%3A101%3BcurrID%3ANCU%3BpcFlag%3A0 and http://data.un.org/Data.aspx?q=gdp&d=SNAAMA&f=grID%3a102%3bcurrID%3aNCU%3bpcFlag%3a0, respectively. PPP conversion rates come from http://icp.worldbank.org/icp/QueryResults.aspx?r=-1&ds=0&y=3&ws=1. We use the World Bank methodology to convert to GDP per capita, PPP. In the regressions with country characteristics, we include the natural log of 2000-2007 country averages of GDP per capita.

Ratio of Female to Male Labor Force Participation

Data on male and female labor force participation come from the International Labor Organization's Key Indicators of the Labor Market. We use labor force participation for the population 15 years of age and older. In the regressions with country characteristics, we include 2000-2007 country averages of the ratio of female to male labor force participation.

Sex Ratio at Birth

Sex ratio at birth comes from UN Data, available at http://data.un.org/Data.aspx?q=sex+ratio+at+birth&d=PopDiv&f=variableID%3a52. We follow the WEF in censoring the sex ratio at birth at 1.059 to identify son preference. In the regressions with country characteristics, we include 2000-2007 country averages of sex ratio at birth.

Equity Index

The equity index is based on the the World Economic Forum's Global Gender Gap Index from "The Global Gender Gap Report, 2012," available at http://www3.weforum.org/docs/WEF_GenderGap_Report_2012.pdf. In the regressions with country characteristics, we include 2006-2007 country averages of the Equity Index. (Note that the index first became available in 2006.)

Sample Selection

Unless otherwise noted, analyses with the American Community Survey (ACS) use data from the 2008-2013 waves and analyses with the Current Population Survey (CPS) use data from the 1995-2014 March CPS. Regressions are weighted by household weights that are normalized to provide equal weighting for each sample year.

For all analyses, our sample is limited to women between the ages of 18 and 64, inclusive, who are either the head of household or spouse of the head of household. We additionally exclude women who live in group quarters, are married to a female or have a female unmarried partner, or have ever had multiple births in the same quarter (e.g. twins). For the CPS sample, quarter of birth is not available, so the last restriction is imposed based on whether the woman has more than one child of the same age. We also exclude women who were born abroad of American parents.

In our main analyses, we make several additional sample restrictions. To try to assure that all of a woman's children are present in the household and therefore appear in the ACS or CPS, we further restrict our sample to women between the ages of 18 and 40, inclusive, whose oldest child is reported as no older than 12 years of age. We also exclude women who live in a household where the household head has any step, adopted, or foster children. In the CPS, we cannot identify if a child is adopted or a stepchild, so this restriction is only applied with respect to the presence of foster children in the household.

In analyses that include country characteristics, we exclude respondents who report being born in US territories or country aggregates. We also exclude respondents born in countries with low frequency and a high number of missing values in the data or countries with missing data on labor force participation. These countries include Antigua and Barbuda, Grenada, Bermuda, Micronesia, St. Kitts & Nevis, Marshall Islands, and Dominica. For CPS analyses, we also drop respondents born in countries not included in the 1995 list of countries. This restriction drops respondents born in Ivory Coast and Mongolia.

References

Abrevaya, Jason. 2009. "Are There Missing Girls in the United States? Evidence from Birth Data." *American Economic Journal: Applied Economics* 1, No. 2 (April): 1-34.

Almond, Douglas and Lena Edlund. 2008. "Son-Biased Sex Ratios in the 2000 United States Census." *Proceedings of the National Academy of Sciences* 105, No. 15: 5681-5682.

Almond, Douglas, Lena Edlund, and Kevin Milligan. 2013. "Son Preference and the Persistence of Culture: Evidence from South and East Asian Immigrants to Canada." *Population and Development Review* 39, No. 1 (March): 75-95.

Anderson, Siwan and Debraj Ray. 2010. "Missing Women: Age and Disease." Review of *Economic Studies* 77, No. 4 (October): 1262-1300.

Antecol, Heather. 2000. "An Examination of Cross-Country Differences in the Gender Gap in Labor Force Participation Rates," *Labour Economics* 7, No. 4 (July): 409-426

Autor, David, David Figlio, Krzysztof Karbownik, Jeffrey Roth, and Melanie Wasserman. Forthcoming. "Family Disadvantage and the Gender Gap in Behavioral and Educational Outcomes." *American Economic Journal: Applied Economics*.

Baker, Michael and Kevin Milligan. 2016. "Boy-Girl Differences in Parental Time Investments: Evidence from Three Countries." *Journal of Human Capital* 10, No. 4 (Winter): 399-441.

Baruch, Susannah, David Kaufman, and Kathy L. Hudson. 2008. "Genetic Testing of Embryos: Practices and Perspectives of US In Vitro Fertilization Clinics." *Fertility and Sterility* 89, No. 5 (May): 1053-1058.

Ben-Porath, Yoram and Finis Welch. 1976. "Do Sex Preferences Really Matter?" *Quarterly Journal of Economics* 90, No. 2 (May): 285-307.

Bertrand, Marianne and Jessica Pan. 2013. "The Trouble with Boys: Social Influences and the Gender Gap in Disruptive Behavior." *American Economic Journal: Applied Economics* 5, No. 1 (January): 32-64.

Blau, Francine D. 1992. "The Fertility of Immigrant Women: Evidence from High-Fertility Source Countries." In George J. Borjas and, Richard B. Freeman (eds) Immigration and the Work Force: Economic Consequences for the United States and Source Areas. University of Chicago Press, Chicago, pp 93–133.

Blau, Francine D. and Lawrence M. Kahn. 2015. "Substitution between Individual and Source Country Characteristics: Social Capital, Culture, and US Labor Market Outcomes among Immigrant Women." *Journal of Human Capital* 9, No. 4 (Winter): 439-482.

Blau, Francine D., Lawrence M. Kahn, and Kerry L. Papps. 2011. "Gender, Source Country Characteristics, and Labor Market Assimilation Among Immigrants." *Review of Economics and Statistics* 93, No. 1 (February): 43-58.

Blau, Francine D., Lawrence M. Kahn, Albert Yung-Hsu Liu, and Kerry L. Papps. 2013. "The Transmission of Women's Fertility, Human Capital and Work Orientation across Immigrant Generations." *Journal of Population Economics* 26, No. 2 (April): 405-435.

Campbell, Colin and Jonathan Horowitz. 2016. "Does College Influence Sociopolitical Attitudes?" *Sociology of Education* 89, No. 1 (January): 40-58.

Cunningham, Mick. 2008. "Changing Attitudes toward the Male Breadwinner, Female Homemaker Family Model: Influences of Women's Employment and Education over the Lifecourse." *Social Forces* 87, No. 1 (September): 299-323.

Dahl, Gordon B., and Enrico Moretti. 2008. "The Demand for Sons." *Review of Economic Studies* 75, No. 4 (October): 1085-1120.

Davis, Shannon N., and Theodore N. Greenstein. 2009. "Gender Ideology: Components, Predictors, and Consequences." *Annual Review of Sociology* 35: 87-105.

Fernández, Raquel, and Alessandra Fogli. 2006. "Fertility: The Role of Culture and Family Experience." *Journal of the European Economic Association* 4, Nos. 2/3 (April-May): 552-561.

Fernández, Raquel, and Alessandra Fogli. 2009. "Culture: An Empirical Investigation of Beliefs, Work, and Fertility." *American Economic Journal: Macroeconomics* 1, No. 1 (January): 146-177.

Gellatly, Corry. 2009. "Trends in Population Sex Ratios May be Explained by Changes in the Frequencies of Polymorphic Alleles of a Sex Ratio Gene." *Evolutionary Biology* 36, No. 2 (June): 190-200.

Goldin, Claudia, Lawrence F. Katz, and Ilyana Kuziemko. 2006. "The Homecoming of American College Women: The Reversal of the College Gender Gap." *Journal of Economic Perspectives* 20, No. 4 (Fall): 133-156.

Jacobsen, R., H. Møller, and A. Mouritsen. 1999. "Natural Variation in the Human Sex Ratio." *Human Reproduction* 14, No. 12 (December): 3120-3125.

Kornrich, Sabino and Frank Furstenberg. 2013. "Investing in Children: Changes in Parental Spending on Children, 1972-2007." *Demography* 50, No. 1 (February): 1-23.

Kosteas, Vasilios D. 2013. "Gender Role Attitudes, Labor Supply, and Human Capital Formation." *Industrial Relations* 52, No. 4 (October): 915-940.

Lundberg, Shelly. 2005. "Sons, Daughters, and Parental Behavior." *Oxford Review of Economic Policy* 21, No. 3 (Autumn): 340-356.

Lundberg, Shelly J. and Robert A. Pollak. 2008. "Family Decision Making." *New Palgrave Dictionary of Economics*, 2nd ed. In Steven N. Durlauf and Lawrence E. Blume. Palgrave/Macmillan, New York, pp. 254-260.

Marks, Jaime L., Chun Bun Lam, and Susan M. McHale. 2009. "Family Patterns of Gender Role Attitudes." *Sex Roles* 61, Nos. 3-4 (August): 221-234.

Martin, Joyce A., Brady E. Hamilton, Michelle J. K. Osterman, Sally C. Curtin, and T. J. Matthews. 2015. "Births: Final Data for 2013." *National Vital Statistics Reports* 64, No. 1 (January): 1-68. (U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System.)

Newport, Frank. 2011. "Americans Prefer Boys to Girls, Just as They Did in 1941." Gallup (June 23) available at: http://www.gallup.com/poll/148187/americans-prefer-boys-girls-1941.aspx .

Persaud, Alexander, Sital Kalantry, Brian Citro, and Arindam Nandi. 2015. "Do Asian Americans Practice Male-Biased Selection in the United States? New Evidence from the 2008-2012 American Community Survey and 2010 US Census." Unpublished Working Paper, Cornell University.

Rodgers, Joseph Lee, and Debby Doughty. "Does Having Boys or Girls Run in the Family?" *Chance* 14, No. 4: 8-13.

Sen, Amartya. 1990. "More Than 100 Million Women are Missing." *The New York Review of Books* 37, No. 20 (Dec 20) available at http://www.nybooks.com/articles/1990/12/20/more-than-100-million-women-are-missing/ .

Sen, Amartya. 2003. "Missing Women—revisited." *British Medical Journal* 327 (Dec 4) available at http://www.bmj.com/content/327/7427/1297 .

Table 1: Effects of a Female First Child on the Probability of Female Headship (Linear Probability Models)

	Native	Immigrant	Both
	(1)	(2)	(3)
First Child Girl	0.003**	0.003	0.003**
	(0.001)	(0.003)	(0.001)
N	553.836	112.304	666,140
Dep. Var. Mean	0.293	0.176	0.271

Notes: Sample from the ACS 2008-2013, includes women, ages 18-40, who are the household head or spouse of the household head, with 1 or more children, where the oldest child is twelve or younger, all children are born in the US and no children were adopted, step, or foster children of the household head. Same-sex couples, respondents living in group quarters, respondents born abroad to American parents, as well as mothers with multiple children born in the same year and quarter, are excluded. The dependent variable is a binary equal to one if the household is headed by an unmarried female with children under 12 present. Controls include a cubic in mothers' age as well as dummies for year, region (based on 9 Census categories), mothers' education (based on < HS, HS, Some College and College Degree), and race (based on White-nonHispanic, Black-nonHispanic, Hispanic, Asian-nonHispanic, and Other-nonHispanic). Regressions are weighted by normalized household weights that provide equal weighting for each sample year; robust standard errors are in parentheses. ***significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

Table 2: Effects of a Female First Child on Fertility

	Total # of Children			2 or more Children			3 or more Children			4 or more Children		
	Natives	Immigrants	Both	Natives	Immigrants	Both	Natives	Immigrants	Both	Natives	Immigrants	Both
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A: All Marriages												
First Child Girl	-0.007**	0.017***	-0.002	-0.005***	0.002	-0.004**	-0.003**	0.008***	-0.001	0.001	0.004***	0.002**
	(0.003)	(0.006)	(0.003)	(0.002)	(0.004)	(0.002)	(0.002)	(0.003)	(0.001)	(0.001)	(0.002)	(0.001)
N	410,109	93,068	503,177	410,109	93,068	503,177	410,109	93,068	503,177	410,109	93,068	503,177
Dep. Var. Mean	1.866	1.837	1.860	0.631	0.614	0.628	0.185	0.178	0.183	0.039	0.037	0.039
Panel B: First Marriages												
First Child Girl	-0.007*	0.015**	-0.002	-0.005***	0.001	-0.004**	-0.003*	0.007**	-0.001	0.001	0.004**	0.002**
	(0.004)	(0.007)	(0.003)	(0.002)	(0.004)	(0.002)	(0.002)	(0.003)	(0.001)	(0.001)	(0.002)	(0.001)
N	339,687	78,335	418,022	339,687	78,335	418,022	339,687	78,335	418,022	339,687	78,335	418,022
Dep. Var. Mean	1.882	1.851	1.875	0.641	0.624	0.637	0.189	0.181	0.188	0.041	0.038	0.040
Panel C: All Marriages, Spouses Same Immigrant Status												
First Child Girl	-0.009***	0.020***	-0.004	-0.006***	0.003	-0.004***	-0.004**	0.010***	-0.001	0.001	0.004**	0.001*
	(0.003)	(0.007)	(0.003)	(0.002)	(0.004)	(0.002)	(0.002)	(0.003)	(0.001)	(0.001)	(0.002)	(0.001)
N	384,162	70,854	455,016	384,162	70,854	455,016	384,162	70,854	455,016	384,162	70,854	455,016
Dep. Var. Mean	1.864	1.859	1.863	0.631	0.626	0.630	0.183	0.185	0.184	0.039	0.040	0.039
Panel D: First Marriages, Spouses Same Immigrant Status												
First Child Girl	-0.009**	0.017**	-0.004	-0.006***	0.001	-0.005***	-0.004**	0.009**	-0.001	0.001	0.004**	0.002**
	(0.004)	(0.008)	(0.003)	(0.002)	(0.004)	(0.002)	(0.002)	(0.004)	(0.002)	(0.001)	(0.002)	(0.001)
N	318,326	60,864	379,190	318,326	60,864	379,190	318,326	60,864	379,190	318,326	60,864	379,190
Dep. Var. Mean	1.880	1.867	1.877	0.641	0.632	0.639	0.188	0.187	0.188	0.040	0.040	0.040

Notes: Sample from the ACS 2008-2013, includes women, ages 18-40, who are married and who are the household head or spouse of the household head, with 1 or more children, where the oldest child is twelve or younger, all children are born in the US and no children were adopted, step, or foster children of the household head. Same-sex couples, respondents living in group quarters, respondents born abroad to American parents, as well as mothers with multiple children born in the same year and quarter, are excluded. Controls include a cubic in both parents' ages as well as dummies for year, region (based on 9 Census categories), both parents' education (based on < HS, HS, Some College and College Degree), and race (based on White-nonHispanic, Black-nonHispanic, Hispanic, Asian-nonHispanic, and Other-nonHispanic). Regressions are weighted by normalized household weights that provide equal weighting for each sample year; robust standard errors are in parentheses. ***significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

Table 3: Effects of a Female First Child on the Probability of Female Headship by Education Level (Linear Probability Models)

	Less than high school			High School			Some college			College +		
	Native	Immigrant	Both	Native	Immigrant	Both	Native	Immigrant	Both	Native	Immigrant	Both
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
First Child Girl	0.002	0.014**	0.005	0.007**	0.008	0.008**	0.002	-0.009	0.001	0.002	-0.001	0.002
	(0.006)	(0.007)	(0.005)	(0.004)	(0.007)	(0.003)	(0.003)	(0.006)	(0.002)	(0.002)	(0.003)	(0.002)
N	31,338	24,039	55,377	104,369	22,419	126,788	204,544	24,837	229,381	213,585	41,009	254,594
Dep. Var. Mean	0.566	0.242	0.418	0.411	0.219	0.372	0.353	0.215	0.337	0.111	0.074	0.104

Notes: Sample from the ACS 2008-2013, includes women, ages 18-40, who are the household head or spouse of the household head, with 1 or more children, where the oldest child is twelve or younger, all children are born in the US and no children were adopted, step, or foster children of the household head. Same-sex couples, respondents living in group quarters, respondents born abroad to American parents, as well as mothers with multiple children born in the same year and quarter, are excluded. The dependent variable is a binary equal to one if the household is headed by an unmarried female with children under 12 present. Controls include a cubic in mothers' age as well as dummies for year, region (based on 9 Census categories) and race (based on White-nonHispanic, Black-nonHispanic, Hispanic, Asian-nonHispanic, and Other-nonHispanic). Regressions are weighted by normalized household weights that provide equal weighting for each sample year; robust standard errors are in parentheses. ***significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

Table 4: Effects of a Female First Child on Fertility by Education Group

	Less Than High School			High School			Some College			College Degree		
	Native	Immigrant	Both	Native	Immigrant	Both	Native	Immigrant	Both	Native	Immigrant	Both
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
First Child Girl	-0.014	0.002	-0.007	0.020**	0.037**	0.025***	-0.004	0.016	-0.001	-0.020***	0.014	-0.014***
	(0.021)	(0.016)	(0.013)	(0.009)	(0.015)	(0.008)	(0.006)	(0.014)	(0.005)	(0.004)	(0.008)	(0.004)
N	14,306	18,205	32,511	64,550	17,482	82,032	139,058	19,481	158,539	192,195	37,900	230,095
Dep. Var. Mean	2.182	2.127	2.149	1.902	1.902	1.902	1.866	1.807	1.858	1.825	1.644	1.792

Notes: Sample from the ACS 2008-2013, includes women, ages 18-40, who are married and who are the household head or spouse of the household head, with 1 or more children, where the oldest child is twelve or younger, all children are born in the US and no children were adopted, step, or foster children of the household head. Same-sex couples, respondents living in group quarters, respondents born abroad to American parents, as well as mothers with multiple children born in the same year and quarter, are excluded. Controls include a cubic in both parents' ages as well as dummies for year, region (based on 9 Census categories) and race (based on White-nonHispanic, Black-nonHispanic, Hispanic, Asian-nonHispanic, and Other-nonHispanic). Regressions are weighted by normalized household weights that provide equal weighting for each sample year; robust standard errors are in parentheses. ***significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

Table 5: Effects of a Female First Child on the Probability of Female Headship by Race/Ethnicity (Linear Probability Models)

	Native	Immigrant
	(1)	(2)
Main Effects		
First Child Girl	0.004**	0.008
	(0.002)	(0.006)
Black	0.414***	0.215***
	(0.003)	(0.010)
Hispanic	0.099***	0.128***
	(0.004)	(0.005)
Asian (excl. CKI)	0.022**	0.020***
	(0.009)	(0.006)
Other	0.146***	0.016
	(0.009)	(0.017)
CKI	-0.036***	-0.031***
	(0.009)	(0.005)
Interactions		
Girl*Black	-0.002	-0.009
	(0.005)	(0.014)
Girl*Hispanic	-0.003	-0.005
	(0.005)	(0.007)
Girl*Asian (excl. CKI)	0.008	-0.016*
	(0.013)	(0.009)
Girl*Other	-0.006	0.069***
	(0.014)	(0.026)
Girl*CKI	-0.020*	-0.006
	(0.012)	(0.007)
N	553.836	112.304
Dep. Var. Mean	0.293	0.176

Notes: Sample from the ACS 2008-2013, includes women, ages 18-40, who are the household head or spouse of the household head, with 1 or more children, where the oldest child is twelve or younger, all children are born in the US and no children were adopted, step, or foster children of the household head. Same-sex couples, respondents living in group quarters, respondents born abroad to American parents, as well as mothers with multiple children born in the same year and quarter, are excluded. The dependent variable is a binary equal to one if the household is headed by an unmarried female with children under 12 present. Controls include a cubic in mothers' age as well as dummies for year, region (based on 9 Census categories) and mothers' education (based on < HS, HS, Some College and College Degree). Regressions are weighted by normalized household weights that provide equal weighting for each sample year; robust standard errors are in parentheses. ***significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

Table 6: Effects of a Female First Child on Fertility by Race/Ethnicity

	Native	Immigrant
	(1)	(2)
Main Effects		
First Child Girl	-0.013***	0.026*
	(0.003)	(0.016)
Black	0.026**	0.098***
	(0.011)	(0.024)
Hispanic	0.034***	0.080***
	(0.009)	(0.013)
Asian (excl. CKI)	-0.051**	-0.049***
	(0.020)	(0.016)
Other	0.048**	0.035
	(0.022)	(0.054)
CKI	-0.178***	-0.144***
	(0.025)	(0.013)
Interactions		
Girl*Black	0.026	0.019
	(0.017)	(0.036)
Girl*Hispanic	0.040***	-0.016
	(0.013)	(0.019)
Girl*Asian (excl. CKI)	0.025	-0.014
	(0.030)	(0.024)
Girl*Other	0.038	-0.090
	(0.032)	(0.072)
Girl*CKI	0.038	-0.090
	(0.032)	(0.072)
N	410.109	93.068
Dep. Var. Mean	1.866	1.837

Notes: Sample from the ACS 2008-2013, includes women, ages 18-40, who are married and who are the household head or spouse of the household head, with 1 or more children, where the oldest child is twelve or younger, all children are born in the US and no children were adopted, step, or foster children of the household head. Same-sex couples, respondents living in group quarters, respondents born abroad to American parents, as well as mothers with multiple children born in the same year and quarter, are excluded. Controls include a cubic in both parents' ages as well as dummies for year, region (based on 9 Census categories) and both parents' education (based on < HS, HS, Some College and College Degree). Regressions are weighted by normalized household weights that provide equal weighting for each sample year; robust standard errors are in parentheses. ***significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

Table 7: Effects of Source Country Characteristics on Fertility, Foreign Born Sample

	All Couples			Spouse Same Birthplace		
	(1)	(2)	(3)	(4)	(5)	(6)
Main Effects						
Total Fertility	0.097***	0.100***	0.102***	0.102***	0.117***	0.117***
	(0.024)	(0.025)	(0.028)	(0.025)	(0.029)	(0.031)
Log of GDP	0.113***	0.094***	0.096***	0.130***	0.120***	0.120***
	(0.026)	(0.022)	(0.025)	(0.035)	(0.029)	(0.031)
Labor Force Part.	---	-0.050	-0.045	---	-0.003	0.003
		(0.089)	(0.087)		(0.112)	(0.107)
Sex Ratio at Birth	---	---	-0.066	---	---	-0.306
			(0.557)			(0.657)
Equity Index	-0.458*	---	---	-0.459	---	---
	(0.232)			(0.293)		
First Child Girl	0.193*	0.060**	-0.367**	0.222*	0.050	-0.548**
	(0.100)	(0.024)	(0.145)	(0.121)	(0.030)	(0.228)
Interactions						
Girl*Labor Force Part.	---	-0.075*	-0.082**	---	-0.059	-0.071
		(0.043)	(0.040)		(0.059)	(0.052)
Girl*Sex Ratio at Birth	---	---	0.403***	---	---	0.564**
			(0.143)			(0.223)
Girl*Equity Index	-0.270*	---	---	-0.322*	---	---
	(0.156)			(0.190)		
N	85,601	91,416	91,416	55,113	58,329	58,329
Dep. Var. Mean	1.836	1.836	1.836	1.873	1.873	1.873

Notes: Sample from the ACS 2008-2013, includes women, ages 18-40, who are married and who are the household head or spouse of the household head, with 1 or more children, where the oldest child is twelve or younger, all children are born in the US and no children were adopted, step, or foster children of the household head. Same-sex couples, respondents living in group quarters, respondents born abroad to American parents, as well as mothers with multiple children born in the same year and quarter, are excluded. Controls include a cubic in both parents' ages as well as dummies for year, region (based on 9 Census categories), both parents' education (based on < HS, HS, Some College and College Degree), race (based on White-nonHispanic, Black-nonHispanic, Hispanic, Asian-nonHispanic, and Other-nonHispanic) and controls for years since migration and years since migration squared. Columns (1), (2), and (3) additionally include a binary variable for spouse immigrant. Country characteristics are based on 2000-2007 averages, with the exception of the gender equity index which is a 2006-2007 average. Regressions are weighted by normalized household weights that provide equal weighting for each sample year; robust standard errors are in parentheses. ***significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

Table 8: Effects of Female First Child on Fertility by Immigrant Generation

	Total # of Children	2 or more Children	3 or more Children	4 or more Children
	(1)	(2)	(3)	(4)
Panel A: 3rd+ Generation (Respondent and Both Parents Born in the US)				
First Child Girl	-0.019***	-0.011***	-0.007***	-0.001
	(0.006)	(0.003)	(0.003)	(0.001)
N	117,448	117,448	117,448	117,448
Dep. Var. Mean	1.892	0.649	0.193	0.041
Panel B: 1st Generation (Respondent Foreign Born)				
First Child Girl	0.041***	0.013*	0.020***	0.007***
	(0.011)	(0.007)	(0.005)	(0.003)
N	25,645	25,645	25,645	25,645
Dep. Var. Mean	1.842	0.610	0.186	0.039
Panel C: 2nd Generation (At Least One Parent Foreign Born)				
(i) All				
First Child Girl	0.028	0.006	0.018**	0.004
	(0.018)	(0.010)	(0.008)	(0.004)
N	10,954	10,954	10,954	10,954
Dep. Var. Mean	1.885	0.636	0.196	0.041
(ii) Both Parents Foreign Born				
First Child Girl	0.054**	0.018	0.028**	0.006
	(0.024)	(0.014)	(0.011)	(0.005)
N	5,658	5,658	5,658	5,658
Dep. Var. Mean	1.878	0.634	0.194	0.040
(iii) Mother Only Foreign Born				
First Child Girl	-0.009	-0.015	0.014	0.002
	(0.036)	(0.021)	(0.017)	(0.008)
N	2,769	2,769	2,769	2,769
Dep. Var. Mean	1.882	0.636	0.194	0.039
(iv) Father Only Foreign Born				
First Child Girl	0.016	0.003	0.007	0.004
	(0.039)	(0.022)	(0.017)	(0.009)
N	2,527	2,527	2,527	2,527
Dep. Var. Mean	1.903	0.643	0.202	0.045

Notes: Sample from March CPS 1995-2014, includes women, ages 18-40, who are married and who are the household head or spouse of the household head, with 1 or more children, where the oldest child is twelve or younger, all children are born in the US and no children were foster children of the household head. Same-sex couples, respondents living in group quarters, respondents born abroad to American parents, as well as mothers with multiple children born in the same year are excluded. Controls include a cubic in both parents' ages as well as dummies for year, region (based on 9 Census categories), both parents' education (based on < HS, HS, Some College and College Degree), and race (based on White-nonHispanic, Black-nonHispanic, Hispanic, Asian-nonHispanic, and Other-nonHispanic). Regressions are weighted by normalized household weights that provide equal weighting for each sample year; robust standard errors are in parentheses. ***significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

Table 9: Effects of Source Country Characteristics on Fertility, Second Generation Sample

	Either Parent Immigrant			Both Parents Immigrants		
	(1)	(2)	(3)	(4)	(5)	(6)
Main Effects						
Total Fertility	0.100**	0.094**	0.080*	0.061	0.050	0.025
	(0.041)	(0.041)	(0.046)	(0.046)	(0.048)	(0.054)
Log of GDP per capita	0.050	0.036	0.023	-0.002	-0.015	-0.038
	(0.036)	(0.032)	(0.037)	(0.045)	(0.036)	(0.041)
LF Part. Ratio (F/M)	---	0.245	0.251	---	0.097	0.102
		(0.165)	(0.167)		(0.246)	(0.255)
Sex Ratio at Birth	---	---	-1.448*	---	---	-2.048**
			(0.850)			(0.931)
Equity Index	0.535	---	---	0.030	---	---
	(0.342)			(0.607)		
First Child Girl	0.736**	0.219**	-0.063	0.780	0.253*	0.181
	(0.294)	(0.090)	(0.741)	(0.495)	(0.131)	(0.851)
Interactions						
Girl*LF Part. Ratio	---	-0.300*	-0.310*	---	-0.340	-0.360
		(0.159)	(0.168)		(0.228)	(0.248)
Girl*Sex Ratio at Birth	---	---	0.270	---	---	0.079
			(0.752)			(0.899)
Girl*Equity Index	-1.041**	---	---	-1.084	---	---
	(0.435)			(0.747)		
N	9,047	10,055	10,055	4,658	5,388	5,388
Dep. Var. Mean	1.862	1.862	1.862	1.878	1.878	1.878

Notes: Sample from the CPS 1995-2014, includes women, ages 18-40, who are married and who are the household head or spouse of the household head, with 1 or more children, where the oldest child is twelve or younger, all children are born in the US and no children were foster children of the household head. Same-sex couples, respondents living in group quarters, respondents born abroad to American parents, as well as mothers with multiple children born in the same year, are excluded. Controls include a cubic in both parents' ages as well as dummies for year, region (based on 9 Census categories), and both parents' education (based on < HS, HS, Some College and College Degree) and race (based on White-nonHispanic, Black-nonHispanic, Hispanic, Asian-nonHispanic. Country characteristics in Columns (1)-(3) are based on the woman's mother's birthplace (if immigrant) and the woman's father's birthplace otherwise. Country characteristics in Columns (4)-(6) are based on the woman's mother's birthplace. Country characteristics are 2000-2007 averages, with the exception of the gender equity index which is a 2006-2007 average. Regressions are weighted by normalized household weights that provide equal weighting for each sample year; robust standard errors are in parentheses. ***significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

Table 10: Effects of Source Country Characteristics on the Probability of Female Headship, Foreign Born Sample (Linear Probability Models)

	(1)	(2)	(3)
Main Effects			
Total Fertility	-0.005	-0.003	-0.007
	(0.007)	(0.009)	(0.008)
Log of GDP Per Capita	-0.013***	0.003	0.001
	(0.005)	(0.011)	(0.012)
LF Part. Ratio (F/M)		0.081**	0.075**
		(0.031)	(0.030)
Sex Ratio at Birth	---	---	-0.462**
			(0.209)
Equity Index	0.514***	---	---
	(0.080)		
First Child Girl	0.045	0.005	0.041
	(0.029)	(0.008)	(0.059)
Interactions			
Girl*LF Part. Ratio.		-0.003	-0.003
		(0.014)	(0.014)
Girl*Sex Ratio at Birth	---	---	-0.034
			(0.055)
Girl*Equity Index	-0.064	---	---
	(0.045)		
N	102,255	110,040	110,040
Dep. Var. Mean	0.176	0.176	0.176

Notes: Sample from the ACS 2008-2013, includes women, ages 18-40, who are the household head or spouse of the household head, with 1 or more children, where the oldest child is twelve or younger, all children are born in the US and no children were adopted, step, or foster children of the household head. Same-sex couples, respondents living in group quarters, respondents born abroad to American parents, as well as mothers with multiple children born in the same year and quarter, are excluded. Controls include a cubic in mothers' age as well as dummies for year, region (based on 9 Census categories), mothers' education (based on < HS, HS, Some College and College Degree), race (based on White-nonHispanic, Black-nonHispanic, Hispanic, Asian-nonHispanic, and Other-nonHispanic) and years since migration and years since migration squared. Country characteristics are 2000-2007 averages, with the exception of the gender equity index which is a 2006-2007 average. Regressions are weighted by normalized household weights that provide equal weighting for each sample year; robust standard errors are in parentheses. ***significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

Table 11: Effects of Female First Child on the Probability of Female Headship, Second Generation Sample (Linear Probability Models)

Panel A: 3rd+ Generation (Respondent and Both Parents Born in the US)	
First Child Girl	0.004*
	(0.002)
N	155,656
Dep. Var. Mean	0.239
Panel B: 1st Generation (Respondent Foreign Born)	
First Child Girl	0.006
	(0.005)
N	31,100
Dep. Var. Mean	0.162
Panel C: 2nd Generation (At Least One Parent Foreign Born)	
(i) All	
First Child Girl	-0.012
	(0.008)
N	14,711
Dep. Var. Mean	0.245
(ii) Both Parents Foreign Born	
First Child Girl	-0.014
	(0.011)
N	7,717
Dep. Var. Mean	0.255
(iii) Mother Only Foreign Born	
First Child Girl	-0.027*
	(0.016)
N	3,474
Dep. Var. Mean	0.195
(iv) Father Only Foreign Born	
First Child Girl	0.002
	(0.016)
N	3,520
Dep. Var. Mean	0.274

Notes: Sample from March CPS 1995-2014, includes women, ages 18-40, who are the household head or spouse of the household head, with 1 or more children, where the oldest child is twelve or younger, all children are born in the US and no children were foster children of the household head. Same-sex couples, respondents living in group quarters, respondents born abroad to American parents, as well as mothers with multiple children born in the same year are excluded. Controls include a cubic in mothers' age as well as dummies for year, region (based on 9 Census categories), mothers' education (based on < HS, HS, Some College and College Degree), and race (based on White-nonHispanic, Black-nonHispanic, Hispanic, Asian-nonHispanic, and Other-nonHispanic). Regressions are weighted by normalized household weights that provide equal weighting for each sample year; robust standard errors are in parentheses. ***significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

Table 12: Effects of Source Country Characteristics on the Probability of Female Headship, Second Generation Sample (Linear Probability Models)

	At Least One Parent Foreign Born			Both Parents Foreign Born		
	(1)	(2)	(3)	(4)	(5)	(6)
Main Effects						
Total Fertility	-0.003	0.012	0.006	-0.008	0.007	0.002
	(0.013)	(0.013)	(0.014)	(0.017)	(0.015)	(0.016)
Log of GDP per capita	-0.014*	0.010	0.007	-0.019*	0.013	0.010
	(0.007)	(0.011)	(0.012)	(0.010)	(0.009)	(0.010)
LF Part. Ratio (F/M)		0.157***	0.170***		0.165**	0.183**
		(0.049)	(0.047)		(0.071)	(0.072)
Sex Ratio at Birth	---	---	-1.247***	---	---	-0.978**
			(0.344)			(0.393)
Equity Index	0.289**	---	---	0.276	---	---
	(0.141)			(0.168)		
First Child Girl	-0.203	-0.046	-0.846***	-0.450**	-0.110*	-0.916**
	(0.146)	(0.048)	(0.268)	(0.200)	(0.055)	(0.366)
Interactions						
Girl*LF Part. Ratio	---	0.063	0.048	---	0.167*	0.140
		(0.075)	(0.075)		(0.088)	(0.088)
Girl*Sex Ratio at Birth	---	---	0.761***	---	---	0.774**
			(0.261)			(0.350)
Girl*Equity Index	0.287	---	---	0.662**	---	---
	(0.213)			(0.293)		
N	11,732	13,540	13,540	6,054	7,360	7,360
Dep. Var. Mean	0.245	0.245	0.245	0.251	0.251	0.251

Notes: Sample from the CPS 1995-2014, includes women, ages 18-40, who are the household head or spouse of the household head, with 1 or more children, where the oldest child is twelve or younger, all children are born in the US and no children were foster children of the household head. Same-sex couples, respondents living in group quarters, respondents born abroad to American parents, as well as mothers with multiple children born in the same year, are excluded. Controls include a cubic in mothers' ages as well as dummies for year, region (based on 9 Census categories), and mothers' education (based on < HS, HS, Some College and College Degree) and race (based on White-nonHispanic, Black-nonHispanic, Hispanic, Asian-nonHispanic. The country characteristics in Columns (1)-(3) are based on the woman's mother's birthplace (if immigrant) and the woman's father's birthplace otherwise. The country characteristics in Columns (4)-(6) country characteristics are based on the woman's mother's birthplace. Country characteristics are 2000-2007 averages, with the exception of the gender equity index which is a 2006-2007 average. Regressions are weighted by normalized household weights that provide equal weighting for each sample year; robust standard errors are in parentheses. ***significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

Table 13: Boy/Girl Ratio, Second and Third Children

	All Married Women		Women in First Marriage		All Women	
	Natives	Immigrants	Natives	Immigrants	Natives	Immigrants
	(1)	(2)	(3)	(4)	(5)	(6)
A. Second Child						
First Child Boy						
Sex Ratio	1.058	1.053	1.045	1.045	1.055	1.054
95% Conf. Int.	[1.046,1.069]	[1.029,1.078]	[1.019,1.071]	[1.019,1.071]	[1.045,1.065]	[1.032,1.076]
Sample Size	134,779	29,180	113,481	25,022	170,735	34,337
First Child Girl						
Sex Ratio	1.044	1.006	1.052	1.007	1.038	1.011
95% Conf. Int.	[1.033,1.056]	[0.982,1.029]	[1.039,1.065]	[0.981,1.033]	[1.028,1.048]	[0.989,1.032]
Sample Size	126,596	27,841	106,515	23,827	161,057	32,903
B. Third Child						
First Two Children Boys						
Sex Ratio	1.052	1.016	1.048	1.051	1.053	1.025
95% Conf. Int.	[1.024,1.080]	[0.955,1.077]	[1.018,1.078]	[0.983,1.118]	[1.028,1.077]	[0.970,1.081]
Sample Size	22,130	4,324	18,851	3,700	28,346	5,503
First Two Children Girls						
Sex Ratio	1.039	0.983	1.045	0.993	1.034	0.975
95% Conf. Int.	[1.010,1.068]	[0.924,1.041]	[1.014,1.077]	[0.929,1.057]	[1.009,1.060]	[0.922,1.028]
Sample Size	19,564	4,370	16,666	3,743	25,349	5,482
First Two Children Mix						
Sex Ratio	1.039	1.087	1.047	1.104	1.046	1.055
95% Conf. Int.	[1.017,1.061]	[1.036,1.137]	[1.023,1.071]	[1.049,1.159]	[1.026,1.065]	[1.011,1.100]
Sample Size	34,401	5,203	29,320	5,199	44,889	8,729

Notes: Sample from the ACS 2008-2013, includes women, ages 18-40, with 2 or more children (Panel A) or 3 or more children (Panel B), where the oldest child is twelve or younger, all children are born in the US and no children were adopted, step, or foster children of the household head. Same-sex couples, respondents living in group quarters, respondents born abroad to American parents, as well as mothers with multiple children born in the same year and quarter, are excluded. Means are weighted by normalized household weights that provide equal weighting for each sample year; 95% confidence intervals are in parentheses. Confidence intervals are based on the standard errors of the percentage of second (Panel A) or third (Panel B) children who are boys.

Table A1: Children in Sample Compared to Reported Live Births

	All Women, Ages 18-40		Women, Ages 18-40, With Sample Restrictions			
			Married		All	
	Number	Percent	Number	Percent	Number	Percent
A. All Groups						
Sample = Live	20271	84%	11824	92%	15749	91%
Sample Less Than Live	3064	13%	756	6%	1177	7%
Sample Greater Than Live	701	3%	295	2%	426	2%
B. Natives						
Sample = Live	16361	85%	9721	92%	13237	91%
Sample Less Than Live	2425	13%	615	6%	991	7%
Sample Greater Than Live	557	3%	242	2%	353	2%
C. Immigrants						
Sample = Live	3916	83%	2104	92%	2512	91%
Sample Less Than Live	634	14%	140	6%	185	7%
Sample Greater Than Live	143	3%	53	2%	72	3%
D. Asian Immigrants						
Sample = Live	893	90%	561	94%	597	94%
Sample Less Than Live	75	8%	24	4%	26	4%
Sample Greater Than Live	21	2%	12	2%	13	2%
E. Hispanic Immigrants						
Sample = Live	2111	80%	1027	91%	1303	90%
Sample Less Than Live	437	17%	79	7%	110	8%
Sample Greater Than Live	84	3%	26	2%	39	3%
F. Second Generation						
Sample = Live	1495	88%	904	94%	1241	94%
Sample Less Than Live	164	10%	44	5%	60	5%
Sample Greater Than Live	40	2%	16	2%	26	2%

Notes: Data are from the 2008, 2010, and 2012 June CPS. Number of live births is based on the variable frever (the number of live births the woman ever had). The unrestricted sample includes women, ages 18-40, who are the household head or spouse of the household head, with at least one child. The restricted sample is further limited to families where the oldest child is twelve or younger, all children are born in the US and no children were adopted, step, or foster children of the household head and, for married women, women who were married spouse present. Same-sex couples, respondents living in group quarters, as well as mothers with multiple children born in the same year, are excluded from both samples.

Table A2: Boy/Girl Ratio, First Child

	Natives	Immigrants
A. All Married Women		
Ratio	1.056	1.048
95% Confidence Interval	[1.049,1.062]	[1.034,1.061]
Sample Size	410,109	93,068
B. Married Women in First Marriage		
Ratio	1.057	1.049
95% Confidence Interval	[1.050,1.064]	[1.034,1.063]
Sample Size	339,687	78,335
C. All Women		
Ratio	1.047	1.043
95% Confidence Interval	[1.042,1.053]	[1.031,1.055]
Sample Size	553,836	112,304

Notes: Sample from the ACS 2008-2013, includes women, ages 18-40, with 1 or more children, where the oldest child is twelve or younger, all children are born in the US and no children were adopted, step, or foster children of the household head. Same-sex couples, respondents living in group quarters, as well as mothers with multiple children born in the same year and quarter, are excluded. Means are weighted by normalized household weights that provide equal weighting for each sample year; 95% confidence intervals are in parentheses. Confidence intervals are based on the standard errors of the percentage of first children who are boys.

Table A3 : Spending by Households With Only Female vs Only Male Children 1972-3 and 2006-7, 2000 dollars

	1972-3		2006-7	
Category	All Male Children	All Female Children	All Male Children	All Female Children
Children's Accessories	531.8	526.1	458.5	540.8
Day Care	30.2	22.9	440	510.9
Babysitting	201.4	194.3	107.5	166.4*
Education	896.1	636.6***	1239.6	1557.1*
Total	1659.5	1379.8***	2245.5	2775.1***

Source: Kornrich and Furstenberg (2013), p. 16. Children's ages restricted to 0-24 years old. Totals may not equal sum of category components due to rounding.

*p<.05; ***p<.001, based on two-tailed tests of differences between means for all male children vs. all female children assuming unequal variances.

Table A4: Regression-Adjusted Spending on Children by Household Gender Composition of Children, 1972-3 and 2006-7

	Spending Category		
	Education	Child Care	Goods
		1972-3	
All Girls	-228.5***	-3.8	103.4***
Mixed Gender	-124.5*	2.7	64.2**
		2006-7	
All Girls	393.9***	72.6	67.3***
Mixed Gender	160.9	69.9	51.0*

Source: Kornrich and Furstenberg (2013), Online Resource #2 (https://link.springer.com/article/10.1007%2Fs13524-012-0146-4).

Entries are regression coefficients for spending in 2000 dollars relative to All Boy households, the omitted category. Controls include age of youngest child, wife's labor supply and earnings, parental education, marital status, number of children, and household income and earnings decile.

*p<.05; **p<.01; ***p<.001