Ancestry culture and female employment - An analysis using second generation siblings

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Abstract

We study the importance of ancestry culture for female employment. To identify the separate importance of ancestry culture and institutions is difficult, as the factors are related to each other as well as to a host of potentially omitted factors. The epidemiological approach tries to separate culture and institutions by investigating outcomes of immigrants with different cultures living in the same institutional environment. We show that estimates from studies using this approach are likely to be biased upwards. Having access to very detailed registry data on the whole Norwegian population, we are able to rely on an extended epidemiological approach whereby we compare the outcomes of different sex, second generation immigrant siblings. We find a robust effect of ancestry culture on female employment, but it is smaller than in previous studies.

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1 Introduction

There is a clear relationship between macro-level factors such as family policies and welfare state regimes on the one hand, and gendered outcomes such as female employment and household work on the other (e.g. Hook (2006); Fuwa (2004)). But because societies differ along both institutional and cultural dimensions, and as these dimensions interact, we cannot infer causal relationships between e.g. welfare state regimes and female employment by simply comparing country level outcomes. To empirically identify the importance of one of the dimensions, we need to separate the influence of culture from that of institutions. One can do so by either examining people with different cultures facing the same institutions, or individuals with similar culture facing different institutions. We investigate the causal effects of culture on female employment using second generation immigrants in Norway.

Cultural beliefs on the appropriate role of women in society vary substantially across the globe (Inglehart and Norris 2003), and the intergenerational transmission of such gender values is potentially important for female employment (e.g. Moen et al. (1997); Vollebergh et al. (2001)). To identify the importance of culture for gendered outcomes, and how it is transmitted across generations, is notoriously difficult. In particular, it is not obvious how culture should be measured, or how it should be separated from other important factors, such as local labor markets or country-specific institutions. The epidemiological approach tries to separate culture and institutions by investigating outcomes of immigrants with different cultures living in the same institutional environment (see Röder and Mühlau (2014); Frank and Hou (2015); Dinesen (2013); Nannestad et al. (2014) for recent sociological applications and Fernández (2011) for a review of the use of the approach in economics).[1] Of particular relevance to the present study is the contribution of Polavieja (2015), who was the first outside of economics to analyze the effects of culture on female employment using an epidemiological approach. His study included a methodological extension by using imputed traits based on country origin as instruments

[1] More broadly, the question of the effects of cultural heritage has a long history in sociology with prominent contributions analyzing variation in violence (Gastil 1971; Nisbett and Cohen 1996) and more recently civic culture (Rice and Feldman 1997) in the US.

for cultural traits. The study sparked a debate on the crucial assumptions inherent in such an analysis (Chou 2017; Polavieja 2017). In particular, Chou (2017) questions whether the exclusion restriction in Polavieja (2015) is plausible in light of omitted variable bias, selection bias, and unobserved heterogeneity. Our study speaks directly to this debate, and shows that the assumptions of the epidemiological approach are more plausible when sibling fixed effects are included in the analysis.

We apply an extended version of the epidemiological approach to study the cultural impact on employment outcomes of female, second generation immigrants in Norway. More specifically, we follow previous work on this topic on US data (Fernández and Fogli 2009; Fernández 2007), and study the correlation between lagged female labor force participation rates (FLFPR) in the parents' country of ancestry and employment outcomes of second generation immigrants.[2] The second generation immigrants, as opposed to their parents, are all born and raised in Norway, and thus face the same labor market and the same institutions, but the cultural heritage from their parents is different. The FLFPR in the parents' country of ancestry, measured at the time of the second generation immigrants' year of birth, captures the cultural heritage. We label the cultural heritage brought from the parents' country of ancestry as "ancestry culture" and we estimate the effects of this on female employment in the host country. The strategy necessitates plausible controls for other factors, such as the parents' level of human capital and other characteristics of the source country. Our data and novel approach allow us to control for these factors.

We have access to rich administrative data covering the whole population of second generation immigrants, which implies that we have a substantively larger number of ancestry countries in our sample compared to in the previous literature. The high-quality register data we use are the basis for the calculation of citizens' taxes and welfare benefits, and we can link each second generation immigrant to her parents and siblings, and thus to the employment record of her close family. A particularly useful implication is that we

[2]Van Tubergen et al. (2004) also document a positive association between female employment in the country of origin and female employment in the country of destination, but only for first generation immigrants.

can compare employment of male-female sibling pairs in a sibling fixed effects model.

The sibling fixed effects model increases the plausibility that our estimates pick up the influence of attitudes related to gender roles. That is, by comparing siblings of different sex to each other, we are controlling for all factors that affect siblings equally, such as upbringing, parental networks, and parental resources, which are close to impossible to control for otherwise. The approach further controls for omitted characteristics correlated with ancestry female labor force participation and inherited outcomes, but uncorrelated with gender, such as work ethics and unobserved human capital through e.g. differences in school quality. In fact, the variation retained will by construction be the part of ancestry female labor force participation that affects daughters and sons differently. We show that the approach is important empirically, as ancestry female labor force participation is correlated also with second generation males' employment. Hence, without sibling fixed effects, the measure is correlated with factors other than beliefs about female employment, such as e.g. preferences for leisure, suggesting that previous estimates of the impact of ancestry gender beliefs, attitudes, and norms are biased upwards.

Fernández (2007) and Fernández and Fogli (2009) find robust and economically important relationships between the FLFPR in the parents' ancestry country and employment outcomes of second generation immigrant women in the US. Using the same method, our estimates of ancestry culture are smaller than what Fernández and Fogli (2009) find in the US. We find that a one standard deviation difference in the cultural proxy amounts to a 3 percentage point difference in the probability of being employed, while the corresponding US estimate is 4 percentage points. These estimates are likely biased upwards, however. Using our preferred sibling specification, we find that a one standard deviation difference in the cultural proxy amounts to a 2 percentage point difference in the probability of having earnings from employment and no effect on full-time employment. We discuss how the institutional particulars of Norway might shape the impact of culture on female employment across generations, and propose that the effect of culture is smaller due to a higher degree of social mobility, a different selection pattern of immigrants, and a strong link between labor market participation and access to welfare benefits.

2 Conceptualizing ancestry culture

There are many different definitions of culture and institutions, and there is no emerging consensus on which are the most appropriate ones (see Vaisey (2009); Polavieja (2015) for excellent overviews of different sociological conceptualizations of culture). We define ancestry culture as preferences and beliefs originating in the parental country of ancestry, transported to the host country, and reproduced within families via childhood socialization. Ancestry culture emerges in the country of origin of the parent of the second generation immigrant, and is brought to Norway and thereby separated from the institutions that caused it (such as local norms and labor markets). Transmission within the family (vertical socialization) will happen to the degree parents perceive that their children will get benefits from certain cultural traits and in so far they are willing to bear the costs associated with socialization, such as e.g. spend time and disciplining the child. The within-family socialization will, however, take place within a community which might limit or strengthen the cultural transmission (horizontal socialization). Our emphasis in this paper is on within-family socialization, however, we address horizontal socialization at the end of the paper.

We are particularly interested in preferences and beliefs regarding the role of women in society. We follow Fernández and Fogli (2009) and Fernández (2007), and restrict ourselves to study second generation immigrants, and proxy for ancestry culture by the lagged female labor force participation rates (FLFPR) in the parents' country of ancestry.

FLFPR differ across countries for many reasons, such as demand for labour, family policies, availability of childcare, the types of jobs that are available, the wage differentials between men and women, and other institutional differences. But differences also stem from differences in beliefs about women's role in society and other cultural factors. When an individual moves from her place of birth, she potentially brings with her parts of the culture, but she leaves the institutions behind. The culture she brings is then partly transmitted to her children via childhood socialization. Thereby, the approach separates ancestry institutions from ancestry culture.

The main problem with the approach is that parents also pass on other things, e.g. economic, human, and cultural capital, in addition to their beliefs and attitudes on the role of women. Furthermore, parents pass on other types of beliefs and attitudes, including for instance attitudes on work ethics or different preferences for leisure (Moriconi and Peri 2015). In addition, it is not random where people live, and immigrants from some countries may be more likely to live in areas with other immigrants, or in areas with different local labor markets. Finally, it may be that immigrants from some countries are discriminated against or face other institutional problems in the host countries. These issues loom large in the empirical literature on the effects of culture and, as will be explained in the empirical strategy, we solve them by including sibling fixed effects. By doing so, the only remaining variation is the one affecting brothers and sisters within the same families differently.

In interpreting the effects it is also important to consider the macro context. In the next section we discuss some factors of the Norwegian context that are likely to be important in our case.

2.1 Ancestry Culture and Employment in the Norwegian Context

Immigrants economic status likely depends on where they come from, the country they come to, and specific interactions between ancestry country and host country (Van Tubergen et al. 2004). Hence, the effect of ancestry culture is likely contingent on macro level factors in the host country. While economically important effects of cultural beliefs about female employment have been documented in the US (Fernández and Fogli 2009; Fernández 2007; Blau et al. 2013), there are a number of key aspects that might make the effects smaller in the Norwegian context.

Norway belongs to the social democratic welfare state model, with universalism and egalitarianism as guiding principles (Esping-Andersen 1990). Comparative welfare state researchers also highlight the gender aspects of the Nordic model, with a focus on dual earners and equality of outcomes between the sexes (Ellingsæter and Leira 2006). The

expectation that women should work is more prevalent in Norway, compared to in the United States,[3] but it is not obvious whether this difference will affect women from low or high FLFPR cultures the most. Intergenerational social mobility is greater in Norway than in the US (e.g. OECD 2010, chapter 5), which implies that parents' characteristics should matter less for children's outcomes. The gender pay gap is smaller in Norway as compared to in the US (OECD 2013, 262), which should make it more attractive for (married) women to work, thus making it more likely that economic considerations outweigh cultural considerations. Moreover, access to many important welfare benefits is tied to employment, which further strengthens the incentives to enter the labor market.

Apart from factors relating to norms and labor markets, the type of immigrants to the US and to Norway is likely to differ. More generally, the migrants in any host country are not a random sample from the population of the source country. If immigrants from low FLFPR countries have a particularly high disutility from working compared to the average disutility level in the country of ancestry, while immigrants from high FLFPR countries have a particularly low disutility from working compared to the level in their home country, then our estimates will be biased upwards (Fernández 2011). This is because our measure of ancestry culture captures average beliefs in the country of ancestry. Since Norway has a comparatively egalitarian wage distribution and low returns to education, we might in contrast expect negative selection of migrants on observed characteristics like wages and education (Borjas 1991). Furthermore, Belot and Hatton (2012) find that negative selection on skills is stronger from culturally proximate countries. If anything, these factors will induce a negative bias in the estimated impact of culture, which we consider as less serious than a positive bias, since it goes against concluding that there is an effect of culture. Nonetheless, in comparing the effects of ancestry culture across host countries it is important to note that differences in selection of immigrants are likely to affect the estimates.

[3]For instance, in the 2005-2009 round of the World Values Survey, 56 percent of Norwegians agree or agree strongly that "being a housewife is just as fulfilling as working for pay", compared to 78 percent in the US.

3 Data

We rely on data from merged administrative registers, encrypted to prevent identification of individuals, which are collected, administered, and made available for research by Statistics Norway. Our data include detailed information on labour market attachment as well as country of ancestry of second generation immigrants. The data cover the whole population, and we can link individuals to their parents and siblings. Compared to the previous literature on culture and female employment, we have higher quality data, we cover the whole population, and we have a larger number of ancestry countries in our sample.

We study the cohorts of female second generation immigrants born in the years 1965-1980, and observe their employment outcomes in the year they turn 30.[4] Since our empirical strategy is based on comparisons with male siblings (see below), we implicitly restrict our sample to females with male siblings.[5] In the main analysis we define a second generation immigrant as a person born in Norway with at least one foreign-born parent, and we do not distinguish between whether it is the mother or the father who is foreign-born. To examine to what degree the broad definition of a second generation immigrant bias our estimate of culture downwards, we also present results when we restrict the sample to those with both parents born abroad. Country of ancestry refers to the mother's country of birth if both parents are foreign-born. In the Appendix, we further examine the difference between having a foreign-born mother and a foreign-born father (see Table A4).

We derive our key independent variable, lagged female labour participation rates (FLFPR) in the parents' country of ancestry, from the International Labor Organization's (ILO) ILOSTAT Database (ILO 2014). It is not obvious how far back we should lag FLFPR to best capture the influence of culture. One might argue that FLFPR in the country of ancestry at the time parents immigrated to Norway best captures the culture

[4]The register data we have cover our outcomes for the years 1995-2010, which is why we study the 1965-1980 cohorts.

[5]In Appendix Table A1 we present the summary statistics for the entire sample and we note that the samples are very similar with respect to all variables.

the parents brought with them. Alternatively, one might argue that FLFPR in the ancestry country at the time of the second generation immigrants' year of birth best proxy the values transmitted from first to second generation. Data availability makes the former problematic, thus, we measure FLFPR in the year of birth.[6] As seen in Table 1, the mean FLFPR across the countries in our sibling sample for women is 31.4 (3.3 for Log FLFPR), with a standard deviation of 10.6 (.57). In the estimations, we take the natural log of FLFPR since it makes intuitive sense that a one percentage point difference in FLFPR will have a larger impact at low levels of FLFPR. We show in the Appendix that we get qualitatively the same conclusions if FLFPR is measured in levels.

[Table 1 about here.]

Our first outcome is a binary indicator of whether the individual is employed, defined as being registered with positive earnings in the administrative registers. This is a liberal definition of being employed, as it implies that only one hour of paid work during the year is sufficient to be defined as employed. We also use a variable representing whether the individual is employed full-time. This definition implies that the person has to be registered as working 37.5 hours a week. In addition, we employ the number of days the individual has been employed last year (according to his/her contract) as an indicator. As mentioned, all outcomes are measured in the year they turn 30.

We see in Table 1, that 72 percent of the sample of female, second generation immigrants in our sibling sample have earnings from employment, while 50 percent are full-time employed. The average across second generation immigrants is however less interesting than the huge variation across ancestry countries. We show a list of all ancestry countries and respective FLFPR in Table 2, which shows that the vast majority of second generation immigrants have a background from West-European countries. Pakistan is the non-western ancestry country with the highest number of second generation immigrants, with about 6 percent of the female sample. Among countries with at least 10 female, second generation immigrants in the sibling sample, 50 percent from Egypt ($n = 20$) are

[6]The ILO data base reports annual FLFPR, but with gaps in the time-series. These gaps vary across countries, but the majority of countries are observed in 1970 and in 1980. We interpolate between observations and use the interpolated value if the true value is missing.

registered with positive earnings, compared to 100 percent ($n = 14$) from Colombia.[7] We have a small number of observations from several of the ancestry countries, however, conclusions are robust to excluding e.g. countries with less than 40 observations.

[Table 2 about here.]

4 Empirical strategy

In estimating the effects of ancestry culture, a natural starting point is to follow the previous literature and estimate the correlations between our outcomes and FLFPR for the total population of second generation immigrants born 1965-1980. We show these for women in Table 3, Panel A, and for men in Panel B. The results in Table 3 show a significant correlation between FLFPR for females, but also for males, which tells us that the ancestry FLFPR picks up more than just beliefs about female employment. These results strongly suggest that previous estimates of the impact of gendered culture are biased upwards.

[Table 3 about here.]

We suggest a sibling comparison approach to improve the plausibility of FLFPR picking up attitudes specifically related to gender roles. That is, by comparing siblings of different sex, we are controlling for all factors affecting siblings equally, such as childhood environment, parental networks, time since immigration, and local labor markets, to the extent they affect siblings equally. These common factors are otherwise impossible to control for. In addition, the sibling fixed effects control for factors at the contextual level such as the share of immigrants in the area where the family lives and local labor market conditions. The approach further controls for characteristics correlated with FLFPR and inherited outcomes, but uncorrelated with gender, such as work ethics and ancestry level human capital.[8] In fact, the variation retained will by construction be the part of

[7] We exclude countries with less than 10 observations from the table for reasons of anonymity.

[8] A simpler correction of this last problem is to subtract the male coefficient from the female coefficient in Table 3. This produces results more in line with the sibling fixed effects model.

FLFPR that affects daughters and sons differently. The linear models we estimate are of the following form:[9]

$$\begin{aligned} Y_{i,s} =& \alpha_s + \beta_1 FLFPR_s \times FEMALE_{i,s} + \beta_2 FEMALE_{i,s} \\ &+ \beta_3 YEARBORN_{i,s} + \beta_4 YEARBORNSQ_{i,s} + \epsilon_{i,s} \end{aligned}$$

where i refers to individuals, s to sibling pairs, and α_s to sibling fixed effects. One individual can appear several times in the data set if s/he has multiple siblings. The inclusion of α_s implies that identification is from within-sibling pair variation. This approach is powerful since the sibling fixed effects effectively control for all the family- and country-level variation which affects brothers and sisters similarly. β_2 captures the average difference between the female and male sibling at the at a level of zero FLFPR, while β_1–our key estimate of interest–captures how the sibling differences vary depending on FLFPR in the country of ancestry. The inclusion of α_s makes the assumption that β_1 captures the effect of cultural beliefs more plausible, compared to the estimates in Table 3. Note that FLFPR does not vary within sibling-pair, thus it is perfectly collinear with the sibling fixed effects, and the "main effect" of FLFPR is absorbed by the sibling fixed effects. We consistently control for year of birth and its square term. We estimate robust standard errors adjusted for clustering at country of ancestry since FLFPR varies at this level.[10]

Sibling fixed effects may, however, introduce a new set of problems (Frisell et al. 2012). While the sibling fixed effects control for all factors that are time invariant within the families, a worry may be that there are some time-varying unobservable factor that affects our results. Since the siblings are born at different times, possible confounders could be changes in the parents' networks over time, upbringing practices, or improvements of living standards. Unless there is sex selective abortion, however, the birth order of siblings is

[9] In Appendix Table A2 we present fixed effects logit models of the two binary outcomes.

[10] The standard errors are similar if we cluster on sibling pair (see Table A3, Panel B in the Appendix).

random.[11] In addition we control for year of birth. Thereby the internal validity of the results is likely to be unaffected. Whether the effects are generalizable to other types of families is, however, not certain. One factor could be that gender is more salient in families with both sons and daughters. We find comfort in the fact that the results are qualitatively similar if we subtract the male coefficient from the female coefficient in the cross-sectional specification. Furthermore, as shown in Appendix Table A1, the sibling sample and the total sample are similar on observable characteristics but need not be so on unobservable characteristics.

5 Results

5.1 Main results

Table 4 reports the main results. We estimate the exact regression displayed in the equation above, but only display the output of the key coefficients. The results in the first column show that sisters have a lower probability of being employed than brothers. In brackets we show the results after we mean-center FLFPR so that the coefficient captures the average difference between the female and male sibling at the mean level of FLFPR. We see that, at average level of FLFPR, sisters are five percentage points less likely to be employed. The precisely estimated interaction term says that the sister-brother difference varies with FLFPR in the country of ancestry. In our sample, (mean-centered) Log FLFPR varies between -2.4 and .94, implying that the estimated sibling gap varies between -14.6 percentage points and -1.2 percentage points. A one standard deviation difference in the cultural proxy (0.57) amounts to a 2 percentage point difference in the probability of having earnings from employment. This is of course a non-negligible impact of ancestry culture, but smaller than estimates in e.g. Fernández and Fogli (2009).

If we move from examining the impact on the probability of being employed to ex-

[11] Recent research has used the epidemiological approach to investigate the cultural component of biased sex ratios, and find that immigrants from China, India, South Korea, and Taiwan display signs of sex selective abortion in the US and the UK (Abrevaya et al. 2009; Almond and Edlund 2008; Dubuc and Coleman 2007). Excluding second generation immigrants from these countries does not affect our results (see Table A5 in the Appendix).

amining fulltime employment, we find less clear results. We find a large gender gap in the probability of full time employment, but the full-time gender gap does not vary with ancestry FLFPR. There is also a correlation between ancestry culture and the probability of working full time, but this correlation is present for both sexes as seen in Table 3. However, if we examine contracted days of work (column 3), we again find a gender gap which varies according to ancestry culture. At the lowest observed FLFPR, the gap is estimated to 67 days, compared to 14 days at the highest observed FLFPR.

[Table 4 about here.]

In the Appendix we present a set of robustness checks of the main specification. If we measure FLFPR in levels (see Panel A in Table A3), we find that the estimated gender gap on any earnings from employment is between 5 and 13 percentage points[12] and between 15 and 57 on number of days employed. Results are very similar if we rely on alternative definitions of second generation immigrants, that is, if we define a second generation immigrant based on the mother's or the father's country of ancestry. This is potentially important as it could be that skills are more easily transferred from father to son and mother to daughter. If that is true, and if mothers worked less for institutional reasons in the source country, we may had attributed the effect to ancestry culture while it would have been lack of transferable skills for institutional reasons. The results are also similar if we restrict the sample to those who have two foreign-born parents (see Table A4).

Finally, in Table A6 we present results using the proportion agreeing that men should have more right to a job than women if jobs are scarce (from the World Values Survey) and FLFPR measured in the year 2000 as alternative proxies for culture. As seen in Figures A1 and A2 there is a very close relationship between these two measures and our main measure. Using FLFPR measured in the year 2000 produces almost identical results to those in Table 4; the coefficients are roughly twice as big, but since the SD on this variable is about half of the FLFPR used in the main results (.34 versis .57), a

[12]The FLFPR variables are first mean-centered and then divided by 100 for ease of presentation. The maximum/minimum on FLFPR X Female is .285/-.212 and the max on the square terms is 15.6/-10.9.

1 SD difference amounts to a similar difference in the outcomes. When we rely on the attitudinal proxy we get results that point in the same direction, however, the estimated effect is somewhat smaller (the SD for *jobs for men* is .19) and less precisely estimated (p=.11 in the employment-regression). Less precise estimates in this regression is to be expected since the number of ancestry countries is smaller using the attitudinal proxy, and because measurement error might be larger since this proxy is based on survey data.

It should be noted that the effect we identify is an average effect for many cultures and many time periods. This does not imply that we assume the effect of culture to be stable over time. Neither do we think that the effects are deterministic in the limited sense that all second generation women with ancestors from countries with lower FLFPR will have lower employment in Norway. There is obviously a large degree of heterogeneity at the individual level. Even at the ancestry country level there is a lot of heterogeneity in the effects. In Appendix Figures A3 to A5 we divide the sample into 22 equal sized bins and plot the average country-level gender difference from separate sibling fixed-effects regressions against the average log FLFPR by source country. We fit regression lines based on the underlying data and find that while the effects seem to be linear with respect to FLFPR for employment and days worked, they are by no means monotonic.[13]

5.2 Co-ethnic networks

Next we explore whether the relationship between ancestry culture and outcomes depends on co-ethnic networks in the county of upbringing. There are many reasons for why the number of co-ethnics in the community may affect the effect of culture. For instance, a large share of immigrants may affect the local labor market and the local schools. The share of immigrants has also been argued to affect the level of discrimination as larger groups may pose more of a threat or, conversely, larger groups may fare better if there is more hiring from co-ethnics (Van Tubergen et al. 2004). Relatedly, there may be gains from having a large share of co-ethnics in terms of "ethnic capital", especially if they are

[13]In Appendix Figures A6 to A10 we present the gender difference in employment from sibling fixed effects by ancestry country. Although many of the coefficients are negative, most are statistically insignificant.

highly educated (Borjas 1995). An important benefit of the sibling fixed effects approach is that such factors are controlled for to the extent that co-ethnic networks affect the siblings similarly.

However, it may be the case that co-ethnic networks affects the local community or the effects of culture in a gender specific way, and that such influences differ for immigrants with different ancestry culture. The effects of ancestry culture may be reinforced or inhibited as co-ethnic networks might make gender-specific issues more salient in the community and hence make parents treat boys and girls differently. We here conduct a complementary analysis where we explore whether the effect of ancestry culture differs in different type of areas depending on the share of immigrants in the community. Our analysis will be able to tell us whether the gender difference in the effects of culture is related to the share of co-ethnics in the community. As such, it speaks to the distinction between direct vertical and horizontal transmission of culture (Bisin and Verdier 2005, 2010), referring to socialization within and outside of the family.

To analyze the role of co-ethnics for the effects of culture, we construct a measure of whether the county of upbringing is one with relatively many co-ethnics. This is done by constructing a dummy that equals 1 if there were more than the median share of co-ethnics living in the county in 1992 and zero otherwise.[14]

In Table 5 we see that the differences are generally small between different areas depending on the number of co-ethnics living there in 1992, and none of the differences in the Log FLFPR X Female-coefficients between the two samples are statistically significant. We further show in Table A7 that the results are similar if we instead split on the number of co-ethnics in the municipality, or if we count the number of highly educated co-ethnics in the county (Table A8). Hence, it does not seem like co-ethnic networks affect the gendered effects of culture in a substantive manner. This may suggest that for gender and employment outcomes, vertical transmission is more important than horizontal transmission. It should be noted, however, that identification of the effects of co-ethnic networks is not as strong as the identification of the effects of ancestry culture, since

[14]Unfortunately, we do not have exact information on county of upbringing. However, we know where parents lived in 1992 and assume that this is the county of upbringing.

immigrants self select into areas of residence. Parents may choose where to live as part of their vertical socialization effort and there are many other factors that differ across areas.

[Table 5 about here.]

6 Concluding discussion

The striking cross national differences in women's employment across the world is likely a function of both differences in culture and differences in institutions. Measuring the impact of any of these dimensions is challenging, not least since their variation is correlated with differences in the other dimension. In an attempt to identify the causal effects of culture on a number of outcomes, recent research has employed the so called epidemiological approach (e.g. Fernández and Fogli (2009); Fernández (2007); Polavieja (2015)). By investigating outcomes for immigrants from different source countries in the same institutional environment, this approach can potentially separate culture from institutions. Immigrants are, however, already affected by the institutions in their home country, so, when possible, the previous literature circumvents this issue by studying behaviour of second generation immigrants, as they have not experienced ancestry institutions.

Even though focusing on second generation immigrants is better than investigating the migrants themselves, it is no panacea. Most importantly, it introduces the worry that we are picking up other factors that are transmitted through generations. That is, in addition to passing on their culture, parents also transmit social-, economic-, and human-capital to their children. Moreover, it is difficult to pinpoint what aspect of the ancestry culture that is transmitted. In addition to differences in gendered beliefs, the approach may pick up differences in e.g. work ethics and quality of schools.

We are interested in norms and beliefs about women's work, and we apply an extended version of the epidemiological approach to study the cultural impact on employment outcomes for female, second generation immigrants in Norway. Having access to very detailed registry data on the whole Norwegian population we are able to extend the epidemiological approach and exploit variation within cross-sex sibling pairs. That is, we can include sibling fixed effects in our estimation framework and thereby improve

the plausibility that our estimates pick up the influence of attitudes related to gender roles. The approach allows us to control for all factors that affect siblings equally, such as upbringing, parental networks, and parental resources, as well as characteristics correlated with ancestry FLFPR and inherited outcomes, but uncorrelated with gender, such as work ethics and school quality. Hence, the resulting measure will only capture differences in ancestry culture that are correlated with ancestry FLFPR, but that affects men and women differently in the host country.

We find that ancestry culture matters for female second generation employment but that previous estimates are likely biased upwards. We further find that ancestry culture has less persistent effects on female employment in Norway, than in comparable studies from the US (Fernández and Fogli 2009; Fernández 2007). The method we use can be applied to other sociological questions regarding the effects of culture on other outcomes, in particular we advice scholars interested in the gender dimensions of culture to always differentiate out the more general cultural aspects by taking the difference between men and women. We especially encourage future studies using the same approach in other settings. By having many empirically trustworthy measures from different contexts we will increase our understanding of factors for social change.

Separating the effects of culture on female employment by using the epidemiological approach only gives a partial answer on the role of culture, however. The approach, by construction, purges away any impact that institutions have as moderators for the effects. There are reasons to suspect that the impact of ancestry culture on female employment will vary across institutional settings. First, since institutions affect the rewards and benefits of cultural action and as institutions and policies affect the gendered division of labor (e.g. Kotsadam and Finseraas (2011, 2013)). Second, it is likely that the effects differ with respect to female employment, as the experiential perspective has been shown to be important for social trust (Dinesen 2013; Helliwell et al. 2014; Nannestad et al. 2014; Uslaner 2011), and as gender roles are particularly malleable to social relational contexts (Ridgeway and Correll 2004). We hope that future scholarship can investigate these interactions by combining the extended version of the epidemiological approach with

well identified effect estimates of institutional change.

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Tables

Table 1: Summary statistics for women and men in the sibling sample

	(1) Women		(2) Men	
	Mean	SD	Mean	SD
Employed	0.72	(0.45)	0.75	(0.44)
Full time	0.50	(0.50)	0.64	(0.48)
Days	222.88	(162.60)	243.21	(159.91)
Female LFPR	31.36	(10.61)	31.36	(10.61)
Log Female LFPR	3.34	(0.57)	3.34	(0.57)
N	9626		9626	

Table 2: Country summary statistics for women in the sibling sample

Country	Female LFPR	Observations	Employed	Employed full-time
Algeria	2.30	13	0.77	0.54
Argentine	19.92	33	0.67	0.52
Australia	28.73	46	0.65	0.46
Austria	30.95	99	0.73	0.51
Belgium	24.82	55	0.75	0.51
Brazil	20.31	15	0.67	0.47
Canada	29.77	81	0.72	0.53
Cape Verde	26.89	23	0.83	0.57
Chile	17.17	51	0.65	0.35
Colombia	14.38	14	1	0.86
Denmark	36.70	1878	0.73	0.51
Egypt	4.55	20	0.50	0.35
Faroe Islands	20.35	115	0.70	0.48
Finland	39.13	403	0.71	0.48
France	29.94	114	0.74	0.56
Germany	30.96	897	0.74	0.52
Great Britain	33.75	1157	0.73	0.51
Greece	21.23	32	0.72	0.59
Hong Kong	30.85	16	0.81	0.56
Hungary	38.06	146	0.74	0.53
Iceland	29.87	106	0.80	0.57
India	18.11	138	0.65	0.54
Indonesia	25.23	30	0.70	0.40
Ireland	20.28	33	0.67	0.52
Iran	7.69	14	0.57	0.57
Italy	21.46	103	0.76	0.45
Japan	36.83	48	0.81	0.60
Madagascar	46.90	29	0.83	0.79
Morocco	10.08	76	0.64	0.51
New Zealand	25.39	17	0.88	0.65
Nigeria	19.31	12	0.75	0.58
Pakistan	4.40	552	0.54	0.36
Poland	45.38	97	0.69	0.43
Portugal	27.99	18	0.67	0.39
Russia	45.49	26	0.77	0.50
Serbia	31.61	185	0.76	0.61
Singapore	25.09	11	0.64	0.55
South Africa	20.60	45	0.73	0.53
Spain	14.35	141	0.67	0.45
Sri Lanka	19.20	20	0.85	0.65
Sweden	37.53	1400	0.76	0.52
Switzerland	32.24	89	0.76	0.57
Thailand	40.24	12	0.58	0.42
The Czech Rep	43.51	74	0.70	0.55
The Netherlands	20.02	297	0.72	0.54
The Philippines	14.68	65	0.74	0.55
Trinidad and Tobago	17.13	23	0.61	0.43
Turkey	31.55	110	0.51	0.31
USA	44.39	495	0.72	0.49

Table 3: OLS regressions of our outcomes on ancestry FLFPR

	Employed	Full time	Days
Panel A: Women			
Log FLFPR	0.06***	0.05***	21.91***
	(0.02)	(0.02)	(5.74)
Observations	20,976	20,976	20,976
Panel B: Men			
Log FLFPR	0.04***	0.04***	14.66***
	(0.01)	(0.01)	(3.14)
Observations	22,276	22,276	22,276

Note: Robust standard errors adjusted for clustering on country of ancestry. All regressions include a constant and a control for year of birth. The samples are the total population of second generation immigrants born in the years 1965-1980. Outcomes are measured in the year they turn 30. *** p<0.01, ** p<0.05, * p<0.1

Table 4: Sibling fixed effects results

	Employed	Full time	Days
Log FLFPR X Female	0.04***	-0.00	16.01***
	(0.01)	(0.01)	(3.43)
Female	-0.17***	-0.14***	-76.79***
	[-0.05]	[-0.15]	[-28.78]
	(0.01)	(0.01)	(2.54)
Observations	19,252	19,252	19,252

Note: Robust standard errors adjusted for clustering on country of ancestry are presented in parentheses. All regressions include a constant and a control for year of birth and its square term. The brackets under the female coefficient shows the coefficient after a regression where we center the FLFPR variable at the mean. Outcomes are measured in the year they turn 30. *** p<0.01, ** p<0.05, * p<0.1

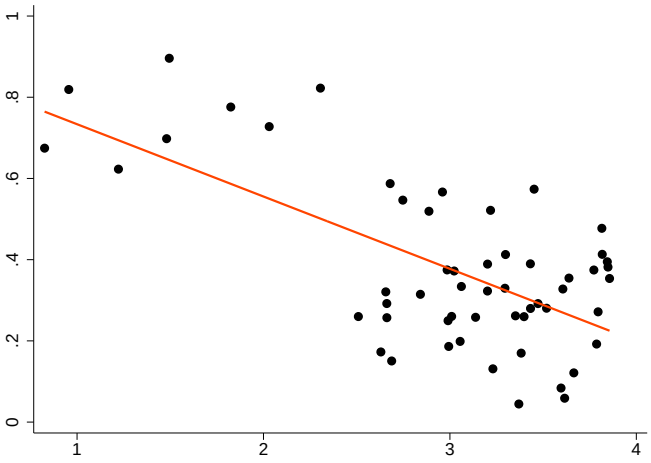
Table 5: Share of co-ethnic immigrants in the county in 1992

Co-ethnics:	High	Low	High	Low	High	Low
Dep. Variable:	Employed	Employed	Full time	Full time	Days	Days
Log FLFPR X Female	0.04***	0.04**	-0.02	0.01	15.61***	17.11**
	(0.01)	(0.02)	(0.01)	(0.02)	(2.08)	(6.62)
Female	-0.18***	-0.17***	-0.12***	-0.18***	-80.62***	-74.98***
	(0.02)	(0.06)	(0.04)	(0.05)	(7.48)	(22.07)
Observations	9,855	9,397	9,855	9,397	9,855	9,397

Note: Robust standard errors adjusted for clustering on country of ancestry are shown in parentheses. All regressions include a constant and a control for year of birth and its square term. Ancestry FLFPR is in log form. Outcomes are measured in the year they turn 30. *** p<0.01, ** p<0.05, * p<0.1

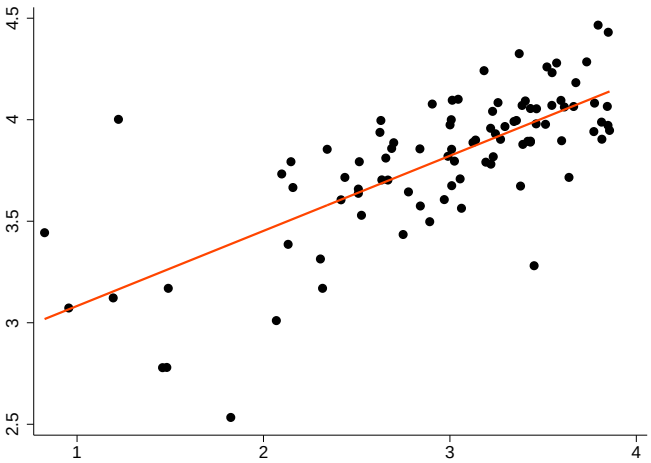
Appendix

Figure A1: Jobs to men when jobs are scarce (WVS) and Log FLFPR



Note: The Y-axis reports the proportion of survey respondents agreeing that "When jobs are scarce, men should have more right to a job than women" in the World Values Survey (various years, 1981-2000). The X-axis is the average by country of log FLFPR in the second generation immigrant's year of birth.

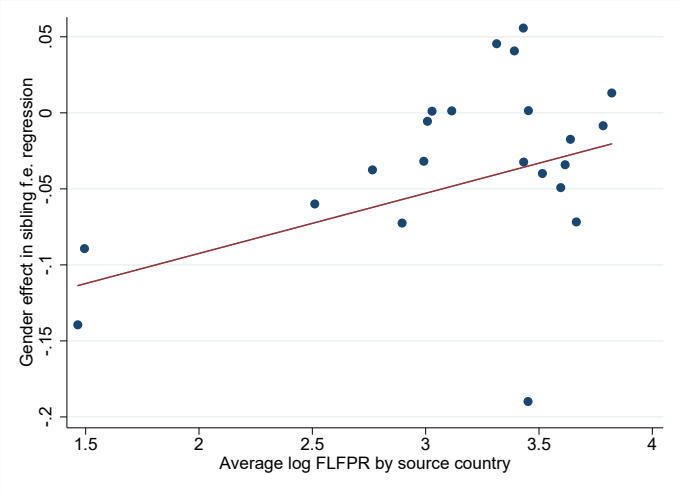
Figure A2: Log FLFPR in 2000 and lagged Log FLFPR



Note: The Y-axis reports Log FLFPR in the year 2000. The X-axis is the average by country of log FLFPR in the second generation immigrant's year of birth.

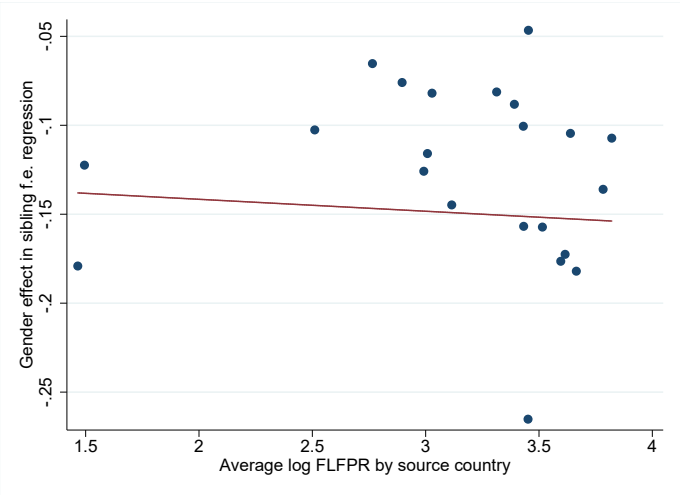
Heterogeneity

Figure A3: Average gender difference in employment and FLFPR



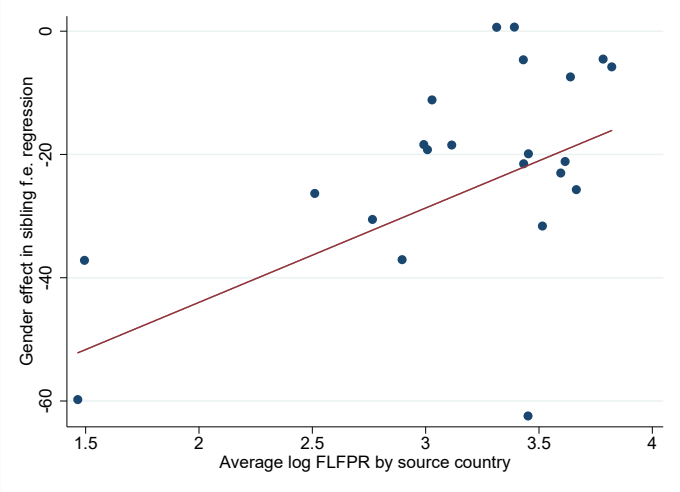
Note: The figure shows a binned scatterplot with 22 equal-sized bins. The gender effect is obtained from regressions (one for each ancestry country) including sibling fixed effects, a constant, a control for year of birth and its square term. Outcomes are measured in the year they turn 30.

Figure A4: Average gender difference in full-time employment and FLFPR



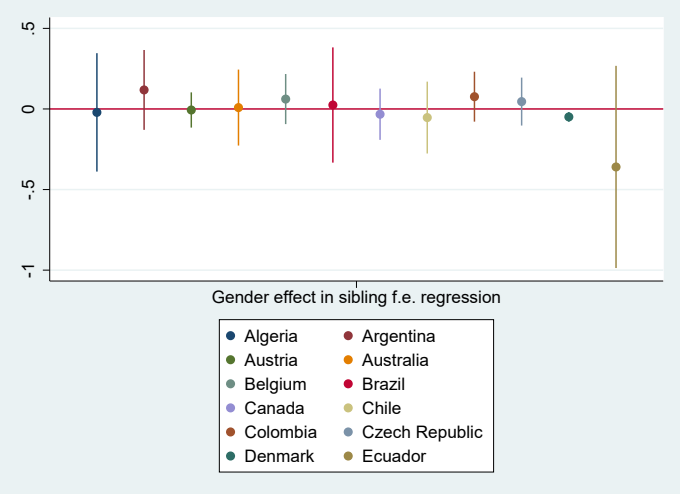
Note: The figure shows a binned scatterplot with 22 equal-sized bins. The gender effect is obtained from regressions (one for each ancestry country) including sibling fixed effects, a constant, a control for year of birth and its square term. Outcomes are measured in the year they turn 30.

Figure A5: Average gender difference in days worked and FLFPR



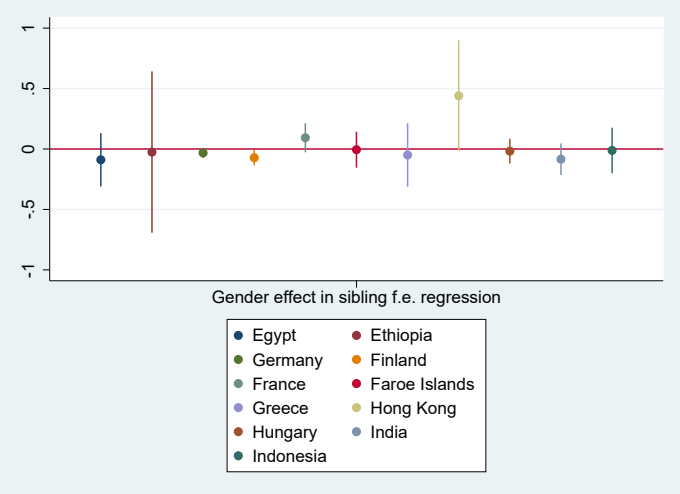
Note: The figure shows a binned scatterplot with 22 equal-sized bins. The gender effect is obtained from regressions (one for each ancestry country) including sibling fixed effects, a constant, a control for year of birth and its square term. Outcomes are measured in the year they turn 30.

Figure A6: Gender differences in employment across siblings by country 1/5



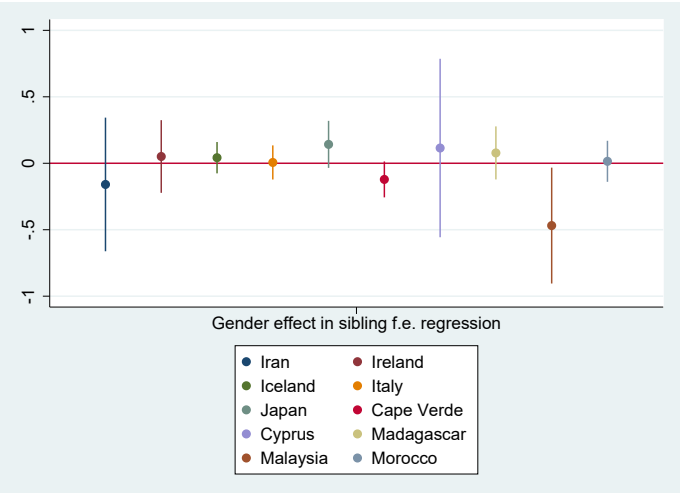
Note: The figure shows coefficients and 95 percent confidence intervals by country for the female coefficient. The gender effect is obtained from regressions including sibling fixed effects, a constant, a control for year of birth and its square term. Outcomes are measured in the year they turn 30 and standard errors are adjusted for clustering on country of ancestry.

Figure A7: Gender differences in employment across siblings by country 2/5



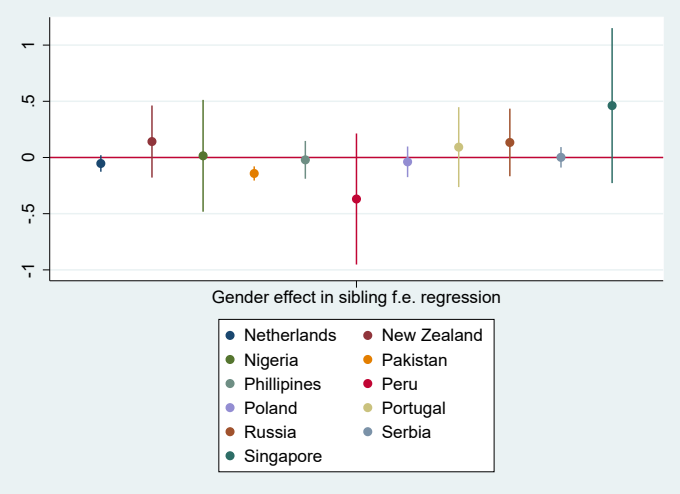
Note: The figure shows coefficients and 95 percent confidence intervals by country for the female coefficient. The gender effect is obtained from regressions including sibling fixed effects, a constant, a control for year of birth and its square term. Outcomes are measured in the year they turn 30 and standard errors are adjusted for clustering on country of ancestry.

Figure A8: Gender differences in employment across siblings by country 3/5



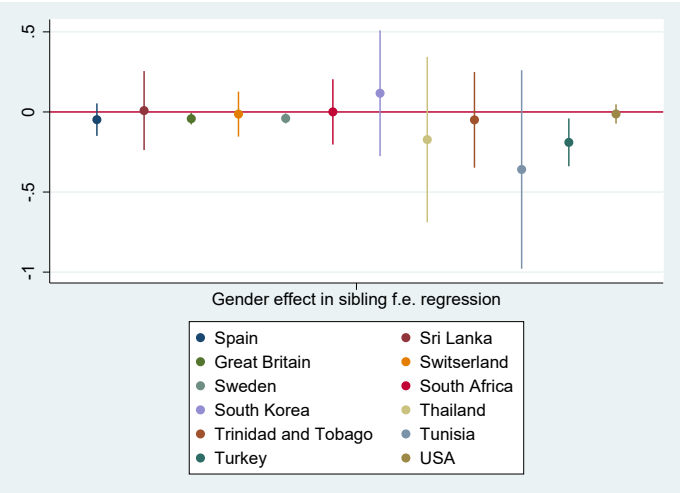
Note: The figure shows coefficients and 95 percent confidence intervals by country for the female coefficient. The gender effect is obtained from regressions including sibling fixed effects, a constant, a control for year of birth and its square term. Outcomes are measured in the year they turn 30 and standard errors are adjusted for clustering on country of ancestry.

Figure A9: Gender differences in employment across siblings by country 4/5



Note: The figure shows coefficients and 95 percent confidence intervals by country for the female coefficient. The gender effect is obtained from regressions including sibling fixed effects, a constant, a control for year of birth and its square term. Outcomes are measured in the year they turn 30 and standard errors are adjusted for clustering on country of ancestry.

Figure A10: Gender differences in employment across siblings by country 5/5



Note: The figure shows coefficients and 95 percent confidence intervals by country for the female coefficient. The gender effect is obtained from regressions including sibling fixed effects, a constant, a control for year of birth and its square term. Outcomes are measured in the year they turn 30 and standard errors are adjusted for clustering on country of ancestry.

Appendix tables

Table A1: Summary statistics for women and men in the total sample

	(1) Women		(2) Men	
	Mean	SD	Mean	SD
Employed	0.71	(0.46)	0.74	(0.44)
Full time	0.50	(0.50)	0.66	(0.47)
Days	219.09	(163.57)	245.81	(160.13)
Female LFPR	31.68	(10.29)	31.72	(10.30)
Log Female LFPR	3.36	(0.53)	3.36	(0.53)
N	21413		22783	

Note: The variables "Employed", "Full time" and "Days" are our dependent variables measured in the year the individuals turn 30. These variables are based on the Norwegian registry data. The variables "Female LFPR" and "Log Female LFPR" are the lagged ancestry "FLFPR" variables from the the ILOSTAT Database (ILO 2014).

Table A2: Sibling fixed effects results using a logit specification

	Employed	Full time
Log FLFPR X Female	0.18***	-0.05
	[1.19]	[0.95]
	(0.06)	(0.05)
Female	-0.74***	-0.42**
	[0.48]	[0.66]
	(0.20)	(0.19)
Observations	6,758	9,016

Note: Standard errors in parentheses. All regressions include a constant and a control for year of birth and its square term. Odds ratios in brackets. Outcomes are measured in the year they turn 30. *** p<0.01, ** p<0.05, * p<0.1

Table A3: Robustness checks

	Employed	Full time	Days
Panel A: Levels			
FLFPR X Female	0.59***	-0.53	191.65**
	(0.21)	(0.32)	(84.11)
FLFPR-sq X Female	-0.01**	0.01*	-2.27
	(0.00)	(0.01)	(1.41)
Female	-0.09***	-0.11***	-39.36***
	(0.02)	(0.03)	(7.07)
Observations	19,252	19,252	19,252
Panel B: Clustering on sibling pair			
Log FLFPR X Female	0.04***	-0.00	16.01***
	(0.01)	(0.01)	(4.02)
Female	-0.05***	-0.15***	-28.78***
	(0.01)	(0.01)	(2.81)
Observations	19,252	19,252	19,252

Note: Robust standard errors adjusted for clustering on country of ancestry (sibling pair) in Panel A (B). All regressions include a constant and a control for year of birth and its square term. In Panel A, FLFPR's theoretical range is between 0 and 1. Outcomes are measured in the year they turn 30. *** p<0.01, ** p<0.05, * p<0.1

Table A4: Alternative definitions of second generation immigrant

	Employed	Full time	Days
Panel B: Definition based on mother			
Log FLFPR X Female	0.04***	-0.01	16.89***
	(0.01)	(0.01)	(3.37)
Female	-0.05***	-0.13***	-28.86***
	(0.01)	(0.01)	(2.68)
Observations	12,034	12,034	12,034
Panel B: Definition based on father			
FLFPR X Female	0.05***	-0.00	17.84***
	(0.01)	(0.01)	(2.74)
Female	-0.20***	-0.15***	-83.73***
	(0.02)	(0.02)	(9.09)
Observations	10,340	10,340	10,340
Panel C: Both parents are foreign born			
FLFPR X Female	0.04***	0.02	16.64***
	(0.01)	(0.01)	(4.08)
Female	-0.19***	-0.16***	-82.96***
	(0.02)	(0.04)	(8.01)
Observations	3,124	3,124	3,124

Note: Robust standard errors adjusted for clustering on country of ancestry are presented in parentheses. All regressions include a constant and a control for year of birth and its square term. Outcomes are measured in the year they turn 30. *** p<0.01, ** p<0.05, * p<0.1

Table A5: Excluding respondents from countries with suspected sex selection

	Employed	Full time	Days
Log FLFPR X Female	0.04***	-0.00	16.29***
	(0.01)	(0.01)	(3.29)
Female	-0.17***	-0.15***	-77.74***
	(0.03)	(0.02)	(11.29)
Observations	18,976	18,976	18,976

Note: The sample excludes individuals with parents coming from China, India, South Korea, and Taiwan. Robust standard errors adjusted for clustering on country of ancestry. All regressions include a constant and a control for year of birth and its square term. Outcomes are measured in the year they turn 30. *** p<0.01, ** p<0.05, * p<0.1

Table A6: Alternative proxies for ancestry culture

	Employed	Full time	Days
Panel A: Jobs for men			
Jobs for men X Female	-0.08	0.06	-38.17**
	(0.05)	(0.04)	(18.43)
Female	-0.02*	-0.17***	-14.39***
	(0.01)	(0.01)	(4.33)
Observations	18,496	18,496	18,496
Panel B: FLFPR in 2000			
Log FLFPR 2000 X Female	0.07***	-0.01	29.77***
	(0.01)	(0.02)	(3.97)
Female	-0.33***	-0.11*	-139.97***
	(0.05)	(0.07)	(15.48)
Observations	19,030	19,030	19,030

Note: Robust standard errors adjusted for clustering on country of ancestry are presented in parentheses. All regressions include a constant and a control for year of birth and its square term. Outcomes are measured in the year they turn 30. *** p<0.01, ** p<0.05, * p<0.1

Table A7: Co-ethnics in the municipality 1992

Co-ethnics:	High	Low	High	Low	High	Low
Dep. Variable:	Employed	Employed	Full time	Full time	Days	Days
Log FLFPR X Female	0.04***	0.04**	-0.00	-0.01	17.02***	13.47**
	(0.01)	(0.02)	(0.01)	(0.01)	(2.79)	(5.22)
Female	-0.17***	-0.17***	-0.14***	-0.13***	-82.82***	-65.77***
	(0.03)	(0.05)	(0.04)	(0.04)	(9.23)	(17.45)
Observations	9,739	9,513	9,739	9,513	9,739	9,513

Note: Robust standard errors adjusted for clustering on country of ancestry are shown in parentheses. All regressions include a constant and a control for year of birth and its square term. Ancestry FLFPR is in log form. Outcomes are measured in the year they turn 30. *** p<0.01, ** p<0.05, * p<0.1

Table A8: Highly educated co-ethnics in the county in 1992

Highly edu co-ethnics:	High	Low	High	Low	High	Low
Dep. Variable:	Employed	Employed	Full time	Full time	Days	Days
Log FLFPR X Female	0.04***	0.04*	-0.00	-0.00	17.74***	15.22*
	(0.01)	(0.02)	(0.02)	(0.02)	(3.03)	(7.84)
Female	-0.19***	-0.16**	-0.16***	-0.13*	-87.46***	-69.44**
	(0.03)	(0.08)	(0.06)	(0.07)	(11.06)	(26.39)
Observations	9,958	9,294	9,958	9,294	9,958	9,294

Note: Robust standard errors adjusted for clustering on country of ancestry are shown in parentheses. All regressions include a constant and a control for year of birth and its square term. Ancestry FLFPR is in log form. Outcomes are measured in the year they turn 30. *** p<0.01, ** p<0.05, * p<0.1