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Cultural influences on the fertility behaviour of first- and second-generation immigrants in Germany

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Abstract

Using an epidemiological approach, we study the cultural influence on fertility outcomes of first- and second-generation female immigrants based on a 1% sample of the German population. We proxy for culture in the country of origin using total fertility rates from the year of migration, survey measures of fertility norms and cohort fertility rates from the year of birth. The last measure has not been used in the literature before. The large dataset allows us to focus on a relatively narrow range for age at migration and to estimate models that rely on within-country variation only, leading to more credible identification. We find a statistically significant, sizeable and robust impact of country-of-origin fertility rates on fertility outcomes. The impact works mainly through the intensive margin and less through the probability of having children. It is strongest in the first generation and becomes weaker for “generation 1.5” (migrants arriving as children) and the second generation. The cultural influence is strongest for women with low education.

JEL classification: J13; J16; J43

Keywords: Immigration; fertility; assimilation; intergenerational transmission; Germany

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1 Introduction

Fertility rates differ considerably both across countries and across time. Notable differences exist even between Western countries. While countries such as Germany, Italy or Spain currently exhibit total fertility rates (TFR) of about 1.4, fertility rates in France, Ireland, the UK and the US are close to the replacement rate of about 2.1 per woman. These differences in fertility rates have long-run consequences for both the size and the age structure of the population, with important and much-debated economic repercussions on the size and the average productivity of the workforce and on the pension system.

The differences in fertility rates are driven both by socio-economic and institutional factors (different opportunity costs resulting from differences in female human capital, access to child-care, or family policies) and by cultural differences with respect to gender roles and fertility norms. Empirically disentangling the influence of culture on the one hand and socio-economic and institutional factors on the other hand using cross-country variation in fertility rates is not straightforward, as both sets of variables likely influence each other. Likewise, while survey measures of gender norms and ideal family size are associated with fertility outcomes at both the individual and the aggregate level, identifying a causal effect of these cultural variables on fertility is difficult as causality runs in both directions.

While controlled experiments across different cultural settings (Henrich et al., 2001) can shed some light on the influence of culture on individual behaviour, this approach has obvious limitations for the study of fertility. Here, relatively clean identification of cultural effects can be achieved by using an “epidemiological approach” (for surveys, see Fernández, 2007; 2008; 2011; Guiso et al., 2006).¹ These studies relate fertility or labour market outcomes of immigrants or their descendants to the corresponding outcome measures (or, in some cases, to attitudinal data on gender norms) in the countries of origin or, for the second or higher gener-

¹An alternative strand of the literature employs a spatial regression discontinuity approach to study the effect of culture on behaviour. Eugster et al. (2011) use the relatively sharp language borders *within* Swiss cantons to identify the effect of culture on the demand for social insurance; Basten and Betz (2012) study the effect of religion. In yet unpublished work, Steinhauer (2012) uses the same spatial RDD approach to study childlessness and female labour supply.

ation, countries of ancestry. The hypothesis is that immigrants were socialized to the gender norms of their countries of origin before they migrated, and that these norms are then partly transmitted to their descendants. Since the different immigrant groups are now facing the same overall institutional setting in the host country, the influence of institutions on fertility outcomes can be controlled for and the impact of home country culture can be isolated.

This paper uses the epidemiological approach to study the cultural influence on the fertility behaviour of first- and second-generation immigrants in Germany.² As noted above, Germany currently has a very low total fertility rate of about 1.4. The cohort fertility rate is only slightly higher at 1.6 children per woman.³ Germany has been a country of large-scale immigration since the early 1960s, with most immigrants originating from southern and eastern Europe. According to 2011 figures, 10.7 million people living in Germany were born abroad (13% of the population), and an additional 5.3 million (7% percent) have at least one parent who was born abroad. The links between immigration and fertility are controversially discussed in Germany. While some see immigration as a remedy against the population decline resulting from below replacement fertility rates, others fear the political and cultural consequences of higher birth rates among immigrants and their descendants.

Despite the controversial discussion, there have been very few studies on the topic for Germany. In particular, little is known about the second generation of immigrants. This is mainly due to data limitations. While household surveys such as the Socio-Economic Panel (SOEP) do contain the necessary information on the country of birth of respondents and their parents,

²Fernández and Fogli (2006), Fernández and Fogli (2009) and Blau et al. (2008) use the epidemiological approach to study cultural influences on the fertility behaviour of second-generation immigrants in the United States. Cygan-Rehm (2011) applies the approach to first-generation immigrants in Germany. The approach has also been applied to other outcome variables. Blau et al. (2011) and Blau and Kahn (2011) investigate cultural influences on the labour supply of immigrants in the United States; Gevrek et al. (2011) and Kok et al. (2011) study the labour supply of second-generation female immigrants in Canada and female immigrants in the Netherlands, respectively. Luttmer and Singhal (2011) document the influence of home-country culture on the preferences for redistribution among immigrants in a number of European countries, and Furtado et al. (2011) apply the approach to divorce rates of European immigrants in the United States. Algan and Cahuc (2010) follow a related strategy and use variation across countries and cohorts in the inherited trust report by descendants of US immigrants to proxy for trust in their countries of ancestry.

³The cohort fertility rate is the average number of children per woman of an actual birth cohort. It is measured at the end of the women's fertile period, typically assumed to be at age 45 or 50. The value of 1.6 is for the birth cohort of 1961 (Statistisches Bundesamt 2012).

sample sizes are too small for a detailed analysis of the second and, for some aspects, even the first generation of immigrants. The German Mikrozensus, an annual 1% sample of the population, has a sufficiently large number of observations, but allows the identification of *naturalized* immigrants only in its waves since 2005. Moreover, the Mikrozensus has long been difficult to use for fertility studies as there was only information on the number of children currently living in the household and not on the total number of children born. The 2008 wave of the Mikrozensus is the only one that allows to identify both second-generation immigrants and the total number of births (more recent waves are again using the question about children in the household only).⁴

We merge data from the 2008 wave of the Mikrozensus with country information on total fertility rates since 1950 (compiled by the UN and the World Bank), completed fertility rates for selected birth cohorts (Myrskylä et al., 2012) and measures of gender roles from the 1990 wave of the World Values Survey. We estimate models for the total number of children and the probability of having children for women aged 40 or older who are either immigrants (1st generation) or who were born in Germany but have at least one parent who is an immigrant or who was born as a foreigner in Germany (2nd and higher generation).

Unlike some previous studies, we not only control for age at migration, but also restrict the sample to women who arrived before age 25. Including all women regardless of their age at arrival would invalidate the identification strategy as women who came at a later age will have spent most or even all of their fertile years in the country of origin, making it impossible to disentangle the effects of culture and institutions.

Concerns about age at arrival do not play a role for the second generation of immigrants. These women were born in Germany and have spent all of their fertile years in the same institutional setting. Moreover, disruptions due to migration do not matter for them, and the variation in language skills (which are unobserved in the Mikrozensus) is smaller than for the first generation.

⁴Recent studies on second generation immigrants in Germany using the Mikrozensus have focused on educational attainment Riphahn (2003; 2005); Luthra (2010a) and employment Luthra (2010b). Avitabile et al. (2012) and Sajons (2011a;b) use the Mikrozensus to study the effects of a reform in the German citizenship law on the return migration and integration decisions of first-generation immigrants.

At the same time, cultural influences from the country of origin will be weaker. Comparing results for the different generations of immigrants therefore provides suggestive evidence about the strength of cultural transmission versus assimilation to the common host country norms.

So far, most studies employing the epidemiological approach have relied on data for North America. The existing studies using European data by Luttmer and Singhal (2011), Kok et al. (2011) and Cygan-Rehm (2011) focus on the first generation.⁵ The paper that is most closely related to ours is by Cygan-Rehm (2011). She studies the effect of total fertility rates in the country of origin on completed fertility of immigrant women using pooled data from three waves of the SOEP. The present study extends the analysis to the second generation.

Another contribution of our study is the inclusion of country-of-origin fixed effects together with the cultural proxies, effectively using only the within variation from different years of arrival. Discarding the variation across countries is possible because of the large sample provided by the Mikrozensus. The approach mitigates concerns about (time-constant) omitted country-level variables that are correlated with the cultural proxies and that also exert an independent influence on fertility outcomes in Germany. One example would be the distance between Germany and the country of origin, which likely has an impact on fertility behaviour via the intensity of contacts with the country of origin.

Finally, we contribute to the literature by using the completed cohort fertility rate as a proxy for culture. Previous studies have used the more widely available total fertility rates. To our knowledge, there is currently no theory or consensus about which of the two is the better proxy for cultural influences on fertility. There are arguments for both. Using the total fertility rate in the year of emigration (or the year before) as a proxy assumes that the women were influenced by the fertility behaviour of women of all relevant ages in, say, Turkey in 1965. By contrast, the cohort fertility rate will be preferable as a proxy if the immigrants' reference group are those people of the same birth cohort in Turkey who did not migrate.

Our main results are as follows: The higher the total fertility rate in the country of origin in the

⁵Kok et al. (2011) include the second generation in a robustness check.

year of migration, the higher the number of children of the immigrant women in Germany. This also holds after controlling for observable differences between women of different origin countries and migration years, and also when only the temporal variation is used, thereby netting out time-constant factors at the country level. We find that if country-of-origin TFR in the year of migration is higher by one child per woman (this is about equal to one standard deviation), the completed fertility rate of immigrant women in Germany is higher by 0.24 children.

The relationship is highly statistically significant and survives in a large number of alternative specifications. Although the coefficient is smaller than the effect of, say, education, it is far from being negligible. The average completed fertility of immigrant women from the countries that we consider here is 2.3, and the latest figure for cohort fertility in the German population as a whole is currently about 1.6 children per woman. The influence from the country of origin appears to work mainly through the intensive margin and less through the probability of having children. The cultural effect is strongest in the first generation and becomes weaker for “generation 1.5” (migrants arriving as children) and the second generation. Moreover, we find that the influence of the cultural proxy is strongest for women with low education.

Concerning the relative importance of the different cultural proxies, we find a robust relationship for both total fertility rates in the year of migration and the completed cohort fertility of people that were born in the same year as the migrants but remained in the countries of origin. By contrast, when fertility norms from the 1990 wave of the World Values Survey are used as proxies instead, the relationship is instable and in most cases no longer statistically significant.

2 Data description

Our main data set is the Scientific Use File of the 2008 wave of the German Mikrozensus, an annual household-survey carried out by the German Statistical Office. The Mikrozensus is a representative 1% sample of German households.⁶ The sample size is much larger than in the

⁶Full censuses are rare in Germany. The 1987 Census was for West-Germany only and the data from the 2011 Census are not available yet.

Socio-Economic Panel (SOEP), which was used in the related study by Cygan-Rehm (2011).⁷ Another advantage is that people are legally obliged to answer the core set of questions in the Mikrozensus (including most of the variables used in our study, but unfortunately not the fertility question), so unit and item non-response is less of an issue than in other surveys. The drawback is that the set of possible covariates is smaller than in the SOEP or in specialized small-sample surveys with a focus on migration or family issues. Nevertheless, the advantages dominate since the large sample size makes it possible to study the first generation of immigrants in more detail and under weaker identification assumptions than in the study by Cygan-Rehm. More importantly, the Mikrozensus makes it possible to apply the epidemiological approach to the fertility behaviour of second-generation immigrant women for whom the sample size is too small in the SOEP.

The sample for the first generation comprises women who were born abroad, immigrated to Germany at age 15 or above and were residing in Germany in 2008. The related “generation 1.5” was also born abroad but immigrated before age 15. Distinguishing these two groups is common in the migration literature; the precise cut-off age is of course somewhat arbitrary. Our choice of age 15 follows Milewski (2007) and Cygan-Rehm (2011), but we checked that our results still go through when we use cut-offs of 6 or 12 years. Finally, the second generation is made up of people who were born in Germany but have at least one parent who immigrated or who was born as a foreigner in Germany.

The Mikrozensus allows clean identification of these groups only since 2005. In earlier waves, only respondents with foreign nationality were asked about their country of birth. As a result, naturalized immigrants could not be identified. Although naturalization rates for immigrants from the traditional “guest-worker” countries have long been low, this has changed considerably following a new Citizenship Law in 2000.⁸ Moreover, many of the so-called “Spätaussiedler” (people with German ancestry from Eastern Europe and the former Soviet Union) obtained a German passport on their arrival or shortly afterwards.

⁷By pooling the waves of 1991, 1999, and 2007, she arrives at a sample of 1163 immigrant women aged 45 or above. Our sample from the 2008 Mikrozensus contains 2276 women aged 40 or above.

⁸See, for instance, Avitabile et al. (2012) and Sajons (2011a;b).

While this first obstacle to a study of immigrant fertility has been lifted since 2005, the measurement of fertility poses a second challenge. In fact, the 2008 wave of the Mikrozensus is currently the only one that contains information on the total number of children a woman has given birth to. Both earlier and later waves instead asked about the children living in the household at the time of the survey. This measure would not be well-suited to our study of *completed* fertility where we focus on women aged 40 (or, in some specifications, aged 45) and above. At this age of the mother, some children will likely have moved out already and relying on the number of children in the household would therefore lead to a systematic underestimation of the completed fertility rate. The bias would be largest for mothers who had their children at a relatively young age.⁹

In our main specification, which focuses on completed fertility, we set the lower age limit to 40 years.¹⁰ In the alternative specification where we study the total number of births up to the present age, the lower age limit is 15 years, the earliest age for which fertility information is available in the Mikrozensus. Since our earliest country-level information is from 1950, we drop all women who were born before 1950 (second generation) or who migrated to Germany before that year (generations 1 and 1.5). We also drop observations with missing information on at least one of the variables used in our models. Since participation in the Mikrozensus is mandatory, this process of listwise deletion leads only to a small loss in terms of sample size. Finally, we keep only women from countries of origins for which—after imposing the other sample selection criteria—there were at least 100 (generation 1) or 15 (generation 2) observations. The lower limit of 15 observations for the second generation follows Fernández and Fogli (2009). Our final estimation sample consists of 6640 women from nine countries.

⁹With the new question, the data situation has improved but is still not ideal (for a survey on German fertility data, see Kreyenfeld et al., 2011). First, the children's year of birth was not surveyed in the Mikrozensus 2008. Moreover, the question about the total number of births was asked in the voluntary part of the Mikrozensus. In the questionnaire, this item was split from the mandatory questions about the people currently living in the household. Probably for this reason, item non-response was relatively high, and the German Statistical Office developed a procedure to impute answers whenever possible. After the imputation, information on the total number of children is missing for about 7% of the women in the Mikrozensus. Reassuringly, Pötzsch (2010) shows that the fertility data from the Mikrozensus 2008 are close to the figures from official birth statistics.

¹⁰Births at a later age are very rare among the groups of women that we consider. Still, we checked that the results are robust to using a lower age limit of 45 years.

Summary statistics by country of origin and generation are shown in the Appendix.

First generation Completed fertility in the first generation (Table A.1) varies between 1.5 (immigrant women from Austria) and 3.0 (Turkey) children per woman. Women from Greece and Italy have on average 2.3 children; women from the three former socialist countries (Poland, former Soviet Union, former Yugoslavia) have lower rates of between 1.7 and 2.0 children per woman.¹¹ A similar ranking arises when the share of women with children is considered. Only 3% of immigrant women from Turkey in our sample remained childless, while this share stands at 20% for immigrants from Austria. These are raw differences, unadjusted for compositional differences by country of origin.

There is evidence of an inverse U-shaped relationship with the decade of arrival: women who arrived in the 1970s tend to have more children than women who came in earlier or later decades. Immigrant women with German nationality have fewer children on average than those with foreign nationality. The most important variable that needs to be taken into account in the estimation is educational attainment. As the table shows, there is a strongly negative relationship between the level of education and completed fertility. While women with a tertiary degree have on average 1.5 children, the figure for the lowest educational group stands at 2.5. The difference in the share of childless women is equally large (5% versus almost 20%).

As Table A.2 shows, 58% of immigrant women fall into the lowest educational category, and only 5% possess a tertiary degree. There are considerable differences in educational attainment by country of origin that need to be controlled for in the estimation. While at most 3% of immigrant women from the traditional “guest worker” countries in the sample (Greece, Italy, Turkey, former Yugoslavia) have a tertiary degree, the share is twice or even three times as high for women from Austria, Poland, or the former Soviet Union. The share of women who are married varies between slightly more than 70% (Austria, former Yugoslavia) and about 85% (Italy, Turkey). Finally, the country of origin is also correlated with differences in citizenship.

¹¹The broad ranking and the overall mean are similar to Cygan-Rehm (2011, Table 2). Some of the individual values do differ. They are not directly comparable, however, as Cygan-Rehm pools information from 1991, 1999 and 2007 and relies on a smaller sample.

While more than 80% of women from Poland or the former Soviet Union possess German citizenship (either exclusively or, in some cases, together with their nationality of origin), only about a quarter of women from Turkey or the former Yugoslavia do so. The share is even lower for women from Greece or Italy. Women from these countries have relatively less to gain from German citizenship since in many domains EU nationals have the same rights as Germans.

The ranking with respect to the share of women with German citizenship is the opposite of the ranking in terms of arrival year (Table A.3 and Figure A.1). Italy, Greece and the former Yugoslavia were among the first “guest worker” countries. Typically the men arrived first and, if they decided to stay, their women joined them a few years later. In our sample, women from these early “guest worker” countries have lived in Germany for about 35 years. Women from Turkey mainly arrived in the 1970s, and women from Eastern Europe mostly came in the late 1980s and early 1990s.

Recall that the sample includes only women aged 40 or above and who arrived before the age of 25. The variable “years since migration” therefore has a minimum of 15, and 1993 is the most recent year of arrival. These age restrictions are necessary for the identification of the cultural effect, as the women have to spend their fertile years under the common (German) institutional context. Importantly for our empirical strategy, there is considerable variation in the time of arrival even within countries of origin. For each country, there are some women who came in the 1950s and others who arrived only in the early 1990s.

The mean age at migration within our age span of 15 to 25 is about 21 years. Women from “guest worker” countries came at a slightly younger age than women from Austria, Poland, and the former Soviet Union. For completeness, the final column of Table A.3 shows the age of the women at the time of the Mikrozensus wave of 2008. For each woman, there is a linear relationship between age in 2008, age at migration and years since migration, which means that at most two of these variables can be included in the estimation.

Generations 1.5 and 2 For a study of completed fertility with a lower age limit of 40 years, the sample size becomes rather small in the second generation. For none of the origin countries there are more than 100 observations in this case. Even with a limit of 15 observations per country for inclusion in our sample, Poland and Russia drop out of the list of countries of origin. We therefore consider two alternative samples: the first one is for the second generation only, but with a lower age limit of 15 instead of 40 years. In the second alternative sample we keep the age limit of 40 but combine the second generation and generation 1.5. That is, we estimate models of completed fertility for women who either immigrated below the age of 15 or who were born in Germany and have at least one parent who immigrated or was born as a foreigner in Germany.

Tables A.4 to A.7 in the Appendix show summary statistics for the second generation.¹² Because we require only 15 observations per country for the second generation, two additional countries (Portugal and Spain) are included when the lower age limit is 15. With a lower limit of 40 years, Spain is still represented but Poland, Portugal and the former Soviet Union are no longer included.

In the sample including immigrants aged 15 and above, the information on the number of children has to be interpreted carefully as the average age differs considerably by country of origin. The mean age ranges from about 20 years (women of Polish origin) to 30 years (Austrian or Spanish origin). Women of Turkish origin, by far the largest group, are on average 24 years old. This mainly reflects the arrival pattern of the first generation documented above. The differences in the number of children in Table A.4 are clearly confounded by the age differences, which suggests that controlling for age will be more important in the younger sample than in a model for completed fertility estimated on a sample of women aged 40 and above. For this older sample (Table A.6), the fertility differences by country of origin are reduced compared with the first generation. Women of Turkish origin still have fertility rates that are larger than those for the other countries (with the exception of Spain), but the mean number of children

¹²The summary statistics for the sample in which we combine generations 1.5 and 2 (both with age limit 40) are available from the authors upon request.

is only 1.8, well below the value of 3.0 in the first generation. For all countries, the average completed fertility rates are below the replacement rate of about 2.1 children per woman. Note, however, that the figures for the completed fertility rates are based on a small sample with between 15 and 47 women per country of origin.

The patterns with respect to marriage, education and citizenship also persist in the second generation, but there is again both a trend towards the German average and a reduction in the variance across countries of origin. For instance, about 60% of women of Turkish origin aged 40 and above fall into the lowest educational category. This is more than for the other groups, but much less than the 88% in the first generation. Finally, note the high share of women with foreign nationality even in the second generation, although these women were born in Germany. Due to the German citizenship law which favours the “right of the blood” (*ius sanguinis*) over the “right of the soil” (*ius soli*), 51% of the women in our second generation sample do not possess German citizenship.

Country-level data We merge the individual- and household-level data from the Mikrozensus with information at the country level from several data sources. Total fertility rates are available on an annual basis from the World Bank’s data base of World Development Indicators (World Bank, 2012). The earliest TFR values are for 1960. We extend the data back by using the values for 1950-1955 and for 1955-1960 from the United Nations Population Division (United Nations Population Division, 2011). Figure A.2 shows how fertility has evolved since 1950 for the countries of origin included in our estimations. There is considerable variation both across countries and, important for our within-country strategy, across time. A majority of countries in most years exhibited higher total fertility rates than Germany. Turkey stands out for experiencing both by far the highest levels of TFR in the period considered and the largest absolute reduction, from about 6 children per woman in the 1950s and early 1960s down to about 3 children in the early 1990s. The reduction has continued since, but with an age limit of 40 in 2008 and a maximum age at arrival of 25, 1993 is the latest year that we consider in the estimation. Two other countries in our sample that have registered large declines in fertility

over a relatively short period of time are Spain after the mid-1970s and Russia after the late 1980s.

As an additional cultural proxy for fertility norms, we use cohort fertility rates compiled by Myrskylä et al. (2012). Table A.8 in the Appendix shows the cohort fertility rates for the countries in our sample. The table shows completed fertility rates in the year 2009 (hence very close to our survey year 2008) for six birth cohorts.¹³ Unfortunately, Turkey, the most important country of origin, is not part of the compilation by Myrskylä et al. (2012). We construct cohort fertility rates for 1950 and 1960 based on the reports for the Turkey Demographic and Health Surveys of 1998 and 2008 (Hacettepe University Institute of Population Studies, 1999; 2009). Each survey report has a table with information on “Children ever born and children surviving” by age group (Tables 3.5 and 4.6 in the reports for 1998 and 2008, respectively). We use the value for women aged 45–49, which corresponds to the birth years 1949–1953 and 1959–1963, respectively. In Table A.8, these values are assigned to the years 1950 and 1960.

Finally, we use direct evidence on fertility norms from four questions in the 1990 wave of the European Values Survey (EVS) and the World Values Survey (WVS).¹⁴ This is the earliest year that we can use, as only two of our origin countries (Italy and Spain) participated in the first wave of 1981. The questions ask about the ideal number of children (between “none” and “10 or more”), the importance of children for a successful marriage¹⁵ and for personal fulfillment¹⁶ and about whether “women really want a home and children”¹⁷. We recode the variables so that higher values stand for a greater importance attached to children. The four variables are highly

¹³For the younger cohorts, the values compiled by Myrskylä et al. are partly based on projections for the remaining fertile years.

¹⁴The 1990 survey of the WVS is a replication of the original EVS survey for the same year. See <http://www.worldvaluessurvey.org> for further information. The values for “Yugoslavia” are from a 1992 survey in Slovenia.

¹⁵The precise wording is the following: “Here is a list of things which some people think make for a successful marriage. Please tell me, for each one, whether you think it is very important, rather important or not very important for a successful marriage.” “Children” is one of 13 items. There are three answer categories: “very important”, “rather important”, “not very important”.

¹⁶“Do you think that a woman has to have children in order to be fulfilled or is this not necessary?”. We keep the two answer categories “needs children” and “not necessary” and recode “don’t know” as missing.

¹⁷“People talk about the changing roles of men and women today. For each of the following statements I read out, can you tell me how much you agree with each. Please use the responses on this card.”. There are six statements, one of which reads “A job is alright but what most women really want is a home and children”. The four answer categories are “strongly agree”, “agree”, “disagree” and “strongly disagree”.

correlated (see Table A.9 in the Appendix). Figure A.3 shows the weighted country averages that will be used in the estimation.¹⁸ Poland and Russia are the two countries that have the most traditional views about fertility norms, Austria has the least traditional views. In Turkey, a relatively high percentage of respondents declare that “a women has to have children to be fulfilled” (this is the variable with the largest variation in percentage terms), but, surprisingly perhaps, the ideal number of children is the lowest among the countries considered here. As Figure A.4 shows, there is a positive relationship between fertility norms as reported in the 1990 WVS and the total fertility rate in the same year, although Turkey appears to be an outlier in the question on the “ideal number of children”.

3 Empirical Strategy

As can be seen in these data, countries differ widely in their fertility rates. The differences are associated with differences in both institutions and culture. Following Fernández and Fogli (2009, 147), we define culture as “systematic differences in preferences and beliefs across either socially or geographically differentiated groups”. Using data at the country level makes it difficult to disentangle the causal influences as institutions and culture influence each other; there is also reverse causality from a country’s fertility rate to its institutions and culture. A more promising strategy for identifying the causal effect of culture is to use variation between groups within a given institutional setting. The idea of the epidemiological approach is to compare fertility outcomes between immigrants of different countries of origin in the same host country. Figure 1 illustrates this empirical strategy. Immigrants from, say, Turkey and Italy were influenced by both the institutions and the fertility norms in their respective country before migrating. Once in Germany, the overall institutional setting is the same for them. If they make different fertility choices while in Germany (after adjustment for other observable differences), the difference will be attributed to the fertility norms to which they were socialized

¹⁸Greece did not take part in the 1990 wave of the EVS/WVS and is therefore missing from the figure. In the Turkish survey, only two of the four questions were asked.

prior to migration. These norms will still play a role in the second- or higher generations to the extent that intergenerational transmission occurs.

Our outcome of interest is completed fertility, the number of children at the end of the fertile period. Assuming a model that is linear in parameters, we arrive at the following estimation equation:

$$Children_{icsa} = \beta_0 + \beta_1' \mathbf{x}_i + \beta_2 Culture_{ca} + f_c + f_s + \varepsilon_{icsa} \quad (1)$$

where $Children_{ica}$ is the number of children of woman i from country of origin c who arrived in Germany in year a and currently lives in federal state s . $Culture_{ca}$ is a proxy for the culture of the country of origin and is our regressor of main interest. The proxy varies both by country and by year of arrival. f_c is a country indicator that captures unobserved influences at the level of the origin country that are constant across years of arrival. f_s is an indicator for the federal state which attempts to control for the considerable regional differences in access to childcare.¹⁹ x_i is a vector of control variables measured at the individual level. ε_{icsa} captures measurement error in the covariates as well as unobserved influences on the fertility outcome. We assume that the ε_{icsa} 's are potentially correlated within cells formed by country of origin and year of arrival and uncorrelated otherwise. The model is estimated using Ordinary Least Squares. As part of the robustness checks, we alternatively estimate count data and Tobit models for completed fertility, and probit models for the probability of having at least one child.

The parameter β_2 measures the causal effect of country-of-origin culture on completed fertility if $E(\varepsilon_{icsa} | x_i, Culture_{ca}, f_c, f_s) = 0$, that is, if the expected value of the unobserved influences is the same across individuals conditional on x_i , $Culture_{ca}$, f_c and f_s . One contribution of the present paper is to include f_c in the conditioning set, which allows an identification of the causal effect under weaker assumptions. In our model with country fixed effects, the identifying variation comes from women from the same country of origin arriving in different years. Potential country-level confounders which are constant over time are therefore controlled for.

¹⁹There are 16 federal states (*Bundesländer*) in Germany. A finer distinction at the municipal level would have been desirable. Unfortunately, the Scientific Use File of the Mikrozensus does not contain this detailed regional information.

One example would be the distance between the country of origin and Germany.

While the large data set makes it possible to base estimation on this within-country variation only, the set of available conditioning variables x_i is unfortunately limited. As seen in Section 2, the educational level is an important confounder that needs to be controlled for. By contrast, we do not control for marital status in our main specification since we are interested in the total effect of culture on fertility, part of which passes through the marriage decision.

The relatively large number of observations in the Mikrozensus makes it possible to restrict the analysis for the first generation to women who migrated between the age of 15 and 25. Including women who arrived at a younger age (“generation 1.5”) would arguably underestimate the cultural effect as these women had been exposed to the culture of the source country only for a short period of time. In contrast, including all immigrant women aged 40 or over regardless of their age at arrival would not be consistent with the empirical strategy. Some of these women arrived in their 40s and a few even in their 50s or later. Consequently, these women spent most or all of their fertile years outside Germany and were exposed to both the culture and the institutions of their countries of origin, making it difficult to convincingly disentangle the two influences. Setting the upper limit for age at migration to 25 mitigates these concerns.²⁰ In addition, we control for age at migration to adjust for the fact that even with a relatively narrow age-at-arrival span of 15 to 25, the women spent different fractions of their reproductive years in Germany.²¹ A threat to validity arises in our specification if women from the same country of origin who migrated at exactly the same age and who have the same educational level differ in the number of children they had prior to arriving in Germany, and if these differences are systematically related to the fertility rate in the country of origin at the time of migration.

Since this constellation cannot be entirely ruled out, we also estimate models for the second generation of immigrants. The concerns about age of arrival and number of children in the

²⁰Adsera and Ferrer (2011) choose the same upper limit.

²¹We do not observe how many years the women *actually* spent in Germany between the year of their (first) arrival and the interview year in 2008. We assume that the length of time spent back in the country of origin or elsewhere is independent of country of origin and year of arrival (the level at which we measure our cultural proxies).

origin country do not play a role for the second generation of immigrants.²² These women were born in Germany and have spent all of their fertile years in the same institutional setting. Moreover, disruptions due to migration do not matter for them, and the variation in language skills (which are unobserved in the Mikrozensus) is smaller than for the first generation. At the same time, cultural influences from the country of origin will be weaker. Comparing results for the different generations of immigrants therefore provides suggestive evidence about the strength of cultural transmission versus assimilation to the common host country norms.

The main drawback of estimating the model for the second generation is the smaller sample size. This has two consequences for the identification strategy. First, when estimating the model on the sample of second-generation women aged 40 and above, the number of observations per country becomes so small that using only the within-country variation leads to highly imprecise estimates. Conceptually, defining the appropriate dimension of within-country variation is also less straightforward than for the first generation where year of arrival is a natural choice. For the second generation, it is arguably the culture of their parents' generation that is relevant, as cultural transmission mainly operates through this channel. Unfortunately, information on the parents' year of arrival is not available in the Mikrozensus. We use information from the year of birth of second-generation women instead. We also tried specifications with proxies from fixed years in the past as in Fernández and Fogli (2009), effectively using cross-sectional variation only.

The second consequence of the smaller sample size in the second generation concerns the dependent variable. As one way to increase the sample size, we include all women aged 15 and above in our model for the number of children. In this case, we can only estimate the effect of culture on the current number of children, and have to be careful to control for the considerable age differences by country of origin (cf. Section 2). However, controlling for age still does not allow to draw inference about the effect of culture on *completed* fertility, as the timing of births likely differs between the groups.

²²For the women in generation 1.5, that is, those women who immigrated before the age of 15, the issue of children in the country of origin cannot be ruled out, but seems to play only a negligible role. In our sample, there is not a single woman who already has children at age 15.

A final point about the interpretation of results concerns the issue of selection. The epidemiological approach neither allows nor attempts to draw inference about culture in the countries of origin from the behavior of immigrants in Germany. Both the initial migration and the return migration decisions are selective, and the group of immigrants and their descendants that we observe in Germany in 2008 is therefore neither a random sample of people in the origin countries in 2008 nor of the immigrants that originally came to Germany.

4 Results

4.1 First generation

As a first step towards the estimation of the model, we study the bivariate relationship between the total fertility rate in the country of origin in the year of migration and the completed fertility rates of immigrant women in Germany. Both measures are positively correlated ($r=0.36$). As Figure 2 shows, the positive relationship is also apparent *within* most countries of origin.²³ From the figure it appears that the relationship between the two variables can be modelled by a second-order polynomial; within the different countries of origin, a linear relationship probably suffices. A final lesson from the figure is that completed fertility rates generally increase less than one-by-one with the total fertility rate in the country of origin. This is most readily apparent in the case of Turkey, where total fertility rates of up to 6 children per woman translate into completed fertility rates among Turkish immigrant women in Germany that are about half as large. That is, the relationship between the two variables is almost flat for women of Turkish origin. Note, however, that the figure does not yet correct for the compositional differences highlighted in Section 2.

Table 1 presents results for the estimation of equation (1) on the sample of first-generation immigrant women. The first column shows the regression coefficients for the bivariate model. The

²³The figure shows averages by decade of arrival since the number of observations is small for some of the cells if combinations of country of origin and year of arrival are considered. In the estimation, we use the yearly information.

higher the TFR in the country of origin in the year of arrival, the higher the average completed fertility of immigrant women. A difference of one child in country-of-origin TFP translates into a difference of about 0.4 children per woman in Germany.

The influence of home country culture on fertility outcomes survives when compositional differences with respect to age, age at migration and education are controlled for (column 2). The specification also contains dummies for the federal state, which capture differences in the access to childcare. As expected, the coefficient for the cultural influence becomes smaller after these adjustments. The coefficients on education have the expected sign: women with higher education tend to have fewer children. Age at migration is positively related to the number of children. One more year spent in the country of origin is associated with a completed fertility that is higher by 0.03. This is in line with the “socialization hypothesis”, according to which the more time the women spend in the country of origin, the more strongly they are influenced by the cultural norms there. Unlike Mayer and Riphahn (2000) and Cygan-Rehm (2011), we only estimate this effect on the age range 15 to 25. Including women who arrived later and who spent most of their fertile years in the country of origin would not be consistent with our identification strategy that relies on separating cultural effects from the institutional setting.

Our preferred specification for the first generation is the one in which we only exploit the variation within countries, which becomes feasible with the large sample of the Mikrozensus. The coefficient on the TFR in the country of origin is further reduced in the model with country fixed effects. This suggests that immigrants from countries with high total fertility rates tend to have more children for other, unobserved reasons as well. Previous estimates that did not control for these differences are therefore likely to be upward biased. Interestingly, the coefficients on the education variables are also reduced in absolute size. This suggests that, despite the efforts by the data producer and the use of the international ISCED classification, the educational levels are not entirely comparable across countries of origin.

Immigrant women in Germany have on average 2.3 children (cf. Table A.1). The total fertility rate by country of origin and year of arrival varies between 1.25 and 6.10, with a standard

deviation of about 1. According to the point estimate from the within-country model, a change in the TFR of one standard deviation is associated with a change in completed fertility by 0.24 children per immigrant woman in Germany, which is about 10% of the mean. This points to a sizeable impact of home country culture. Note, however, that the large standard deviation in TFR is mainly driven by Turkey. Moreover, the point estimate of 0.24 associated with country-of-origin TFR is still smaller than for the education variables. For instance, immigrant women with a tertiary degree have on average 0.70 children less than women from ISCED categories 1 and 2 (no degree of the equivalent of the German Hauptschule). Finally, the coefficient—although highly statistically significant—is rather imprecisely estimated in the within-country model. The 95% confidence interval attached to this coefficient ranges from 0.06 to 0.41.

4.2 Generations 1.5 and 2

Table 2 summarizes the estimation results for generations 1.5 and 2. The positive effect of culture on fertility is confirmed in the estimations for the second generation.²⁴ However, in the strictest specification in which we consider completed fertility of women aged 40 or above, the sample size becomes fairly small for the second generation, and the coefficient on TFR, while still positive, is estimated only imprecisely (column 1).

In column 2 we include all women of the second generation aged 15 and above, the earliest age for which information on the number of children is available in the Mikrozensus. Consequently, we no longer model the influence of culture on completed fertility, but on fertility up to the present age. Although this approach does not allow to isolate the effect of culture on total number of births from pure timing effects, it is quite common in the literature and was used by, among others, Blau et al. (2008) and Fernández and Fogli (2006; 2009). Like them, we condition on age and age squared to take into account that, other things equal, the number of children

²⁴As the within-country models yield only imprecise results for the second generation, we focus on the specifications that also exploit the variation across countries. In fact, the earlier studies by Fernández and Fogli (2006; 2009) and Gevrek et al. (2011) only use this cross-country variation, without any temporal component. We document the within-country results in the Appendix. The sign of the coefficients is the same in the within-country and the pooled models.

increases with age, but in a non-linear fashion. We again find a positive and statistically significant effect of country-of-origin TFR on the number of children of second-generation women in Germany. A TFR that is higher by one child per woman in the country of ancestry translates into an increase in the conditional mean of 0.06 children per woman in Germany. Interestingly, the coefficient is almost identical to the model for completed fertility in the sample of women aged 40 and above (column 1).

In the third column of Table 2, we return to the lower age limit of 40 (and hence to a model of completed fertility), but we include those women who immigrated before the age of 15. These women make up “generation 1.5” and, although born abroad, were excluded from the models for the first generation. When including them with the second generation, the coefficient on TFR is 0.15 and highly statistically significant.

Taken together, the results for the different samples—1st generation, 2nd generation and generation 1.5, 2nd generation only—show that the cultural effect is strongest for the first generation. The association with home country culture persists for the subsequent generations, but becomes weaker. Thus, cultural transmission does occur but is far from complete.

4.3 Alternative specifications

The finding of a positive coefficient on home country TFR is robust to the functional form of the estimation model—Tobit and Poisson models yield the same qualitative results.²⁵ This holds both for the first generation and for all three samples for the second generation. The Poisson model for the first generation allows a direct comparison with the study by Cygan-Rehm (2011, 31). She finds a coefficient of 0.08 (std. error: 0.03), while our estimate is 0.14 (std. error: 0.01); the difference between the two estimates is not statistically significant at the 5% level. When we use only the within variation (which Cygan-Rehm does not do), the point estimate in the Poisson model becomes 0.10 (std. error: 0.04), closer to and again not significantly

²⁵Only selected results of the following robustness checks are documented in the Appendix. Full results are available from the authors upon request.

different from her estimate. However, the comparison is at best suggestive since neither the set of conditioning variables nor the population of women considered are exactly the same.

Our results are robust to using age 45 instead of 40 as the lower limit for completed fertility.²⁶ The coefficient in the within-model increases to 0.28, but is less precisely estimated due to the smaller sample size.

As an additional robustness check we reduced the upper limit for age at migration from 25 to 20.²⁷ The sample size is considerably reduced in this case. Only three countries (Poland, Turkey, former Yugoslavia) have more than 100 observations for women aged 40 and above and who arrived between the ages of 15 and 20. The qualitative results are unchanged, however. The coefficient on country-of-origin TFR is 0.34 in the pooled model (significant at the 1% level) and 0.31 in the fixed-effects model (p-value 0.13).

As noted in Section 2, we tried different cut-off ages for distinguishing generations 1 and 1.5. When we reduce the cut-off age from 15 to 12, the coefficients for the first generation are reduced to 0.33 (pooled model) and 0.23 (within-country model). With an even lower cut-off age of 6 years (the typical school entry age in Germany), the cultural effect is further reduced to 0.31 (pooled) and 0.17 (within). This is in line with the “socialization hypothesis” already mentioned: the more time the immigrants spent in their countries of origin, the stronger the cultural effect.

Yearly information on TFR is available for all countries only from 1960 onwards. For the 1950s, we use data from another source that only reports averages over the periods 1950-1955 and 1956-1960. To make sure that this interpolation is not driving the results, we restrict the sample to women who arrived in 1960 or later. The results change little since, in any case, only relatively few women already came in the 1950s.

When we exclude women from Turkey, the most important country of origin and the country with the largest level and the largest variation in TFR, the coefficient for the first generation

²⁶This test was carried out only for the first generation. As noted above, in the second generation the sample size is already very small with an age limit of 40.

²⁷This robustness check is relevant only for the first generation.

becomes smaller in the pooled model (0.20 instead of 0.35 in the main specification that includes Turkey) and larger for the within-country specification (0.7 instead of 0.24). Due to the smaller sample size, the results are less precisely estimated, but are significantly different from zero. In the within-country model, the coefficients in the overall model and the model without Turkey are also different from each other. The larger coefficient when Turkey is left out is the multivariate confirmation of the graphical analysis in Figure 2 where Turkish immigrants already stood out for having a high and only slightly decreasing completed fertility of 3 children per woman regardless of the decade of arrival, despite a large reduction in TFR in Turkey.²⁸

When we decompose the fertility outcome into an extensive and intensive margin, we find that, in the first generation, home country TFR is strongly associated with the number of children in the subsample of women who gave birth to at least one child. On the extensive margin, the results are less clear-cut. When using the entire variation across countries and across time, we find that home country TFR is positively related to the probability of having at least one child. However, the coefficient becomes smaller and statistically insignificant when only the within-country variation is used. We tentatively conclude from these results that home country TFR exerts a stronger effect on the intensive margin where the variation over time and across countries is greater. The weaker effect on the extensive margin is plausible as the percentage of women with children is high among immigrant women from the countries considered here and varies less across time than the average number of children. Based on data from the SOEP, Milewski (2007, 887) similarly finds that “[t]he country of origin does not explain much of the first-birth behavior of immigrants in West Germany. However, since a first child can be seen as the norm in the countries of origin of the women analyzed in this paper and country differences occur mainly in higher parities, further research should study the transition to subsequent births as well”. Interestingly, we find that in the second generation, for which the share of childless women is higher, the cultural effect works more strongly on the extensive margin

²⁸In the largest sample for the second generation (age 15 and above), the coefficient increases slightly in the pooled model when Turkey is omitted, and remains also unchanged in the within model. In the two smaller samples for the second generation, the coefficient on TFR becomes insignificant in both the pooled model and the within model in this case.

than in the first generation.

As another step towards an analysis of the mechanisms behind the positive relationship, we interact the coefficient on the total fertility rate with the education level of the woman (see Tables A.13–A.16 in the Appendix). We find that the relationship is strongest for women with low levels of education, and that it is no longer statistically significant for women with a tertiary education. This holds in both the pooled model and the within-country model. The heterogeneity in the effect with respect to education is even more pronounced in the second generation. To our knowledge, this interaction effect is a novel finding in the epidemiological literature. A related result was obtained by Adsera and Ferrer (2011), who study the effect of age at migration on fertility assimilation in Canada but do not directly proxy for fertility norms in the country of origin.

Our main specification contains only a small set of conditioning variables. This is mainly due to the nature of the data set. Participation in the Mikrozensus is mandatory, but the number of questions is relatively limited. A second reason for not including more variables is the issue of over-controlling. We consider that marital status, labour force participation, foreign nationality and household income all lie on the causal pathway from country-of-origin culture to fertility outcomes. Since we are interested in the total effect of culture, we choose not to condition on them. When we do include them, we find that in the pooled model the coefficient on total fertility rate hardly changes (see Table A.17 in the Appendix). The results for the additional covariates show a plausible pattern. Women who are married tend to have more children; the same is true for women with foreign nationality. Female employment is associated with fewer children, a higher household net income with more children.²⁹

When controlling for GDP per capita (in constant 2000 US dollars), the coefficient on the fertility rate is reduced to 0.23, but remains highly statistically significant. The coefficient on GDP per capita is negative: women who migrated from countries with a higher GDP per capita in the year of migration tend to have fewer children, other things equal. The sample size is

²⁹The answer to the question about household income is voluntary. Item non-response is therefore higher and the sample size is slightly reduced.

considerably reduced, as comparable GDP data (we use the World Bank’s World Development Indicators) are only available from 1960s and, in the case of Poland, Russia, and Yugoslavia, from 1989/1990 onwards.

Including dummies for the decade of arrival to capture the general downward trend in total fertility rates leaves the coefficient on TFR almost unchanged in the pooled model (here, we return to the full sample by omitting GDP per capita again).

In the models with country-of-origin fixed effects (Table A.18), controlling for marital status and foreign nationality leaves the coefficient on total fertility rate virtually unaltered. In the specifications that control for employment status and income or that include dummies for the decade of arrival, the coefficient increases from 0.24 to 0.31. When these dummies are made country-specific, the coefficient further increases to 0.44, reinforcing the evidence in favour of a cultural effect on fertility outcomes. Note, however, that these results, although significantly different from zero, are statistically indistinguishable from each another.

Controlling for GDP per capita in the within-model reduces the coefficient on TFR to 0.13, which is no longer statistically significantly different from zero. As noted, the loss in statistical power is partly due to the much smaller sample size. Moreover, the correlation between TFR and GDP per capita is very high (up to $r=0.98$) within countries. In most cases, the two variables are negatively correlated. The two exceptions are Russia and Yugoslavia, which exhibit a high positive correlation as both the fertility rate and GDP per capita went down in the early 1990s and then picked up again.

In our three samples for the second generation, including additional control variables (Tables A.19–A.21 in the Appendix) leaves the coefficient on total fertility rate in the same range as in the main specification of Table 2.³⁰

³⁰For these three samples, we do not include controls for the decade of arrival as, with the exception of generation 1.5, all women were born in Germany. Moreover, since our main specification for the second generation focuses on the pooled model, we do not show the tables for the within models with additional controls here—as noted above, there is little temporal variation in the second generation. In these within models with additional controls, the coefficient on TFR is statistically insignificant for the samples “Second generation, age 40 and above” and “Generations 1.5 and 2, age 40 and above”. In the larger sample “Second generation, age 15 and above” the coefficient on TFR remains positive and statistically significant.

4.4 Other proxies for culture

For comparison with earlier studies which use cross-sectional variation only (e.g., Fernández and Fogli, 2006; 2009; Gevrek et al., 2011), we estimated the model using as cultural proxy the TFR in 1950, 1960, 1970, 1980, 1990 and in 2008, the year of the Mikrozensus survey (see Tables A.22–A.25 in the Appendix). In the models for the first generation, the coefficient on TFR is in a similar range as in the main specification based on TFR from the year of arrival when single TFR values from 1950, 1960, 1970 or 1980 are used. By contrast, when the values of 1990 or 2008 are used, by contrast, the coefficient increases considerably. This is because the relatively small TFR differences across countries in the later years are then used to “explain” fertility differences among immigrant groups that arrived much earlier, at a time when fertility differences were much greater. Similar, though less extreme, dependence on the year chosen for the cross-sectional measure arises in the models for the three samples of the second generation. This sensitivity analysis suggests that choosing the year of measurement for the cultural proxy is far from innocuous.

When the country averages for fertility norms from the 1990 wave of the World Values Survey are used as a cultural proxy (in separate models), the coefficients on all four variables that measure these norms are statistically insignificant (Tables A.26–A.29 in the Appendix).³¹ Admittedly, we do not have a full explanation for this result. After all, these variables from the WVS are arguably a more direct measure of culture than either the total fertility rates or cohort fertility rates. We suspect that the instable relationships found for the WVS variables are partly due to their measurement in 1990, years after most of the immigrant women (with the exception of women from Poland and Russia) arrived in Germany and years after the women of the second generation that we consider in the estimation were born.³² As already noted in Section 2, fertility norms in Turkey, the country where most of the women came from, were quite low in 1990 and probably reflected the rapid decline in fertility rather than the high level of these

³¹As noted above, Greece did not participate in the 1990 wave of the WVS. In Turkey, only two of the four questions were part of the survey. The sample size is therefore smaller than in the main specification.

³²The only exception is the sample in which we lower the age limit to 15. In this case, some women were born as late as 1993.

rates that prevailed at the time when many of the immigrant women left Turkey for Germany. However, it seems unlikely that it is only the measurement in a single, late and somewhat arbitrary year that explains the insignificant coefficients—after all, when we used the total fertility rate from 1990 as a proxy for culture, the coefficient remained positive and highly significant. Another explanation could therefore be that it is indeed observed fertility behaviour and not fertility norms as reported in a survey such as the WVS that influences people’s own fertility decisions.

Finally, we replaced total fertility rates in the year of migration by the completed cohort fertility rates for people with the same year of birth but who stayed in the country of origin.³³ The cohort fertility rates are positively related with completed fertility of immigrants in Germany (Table A.30). In the pooled model, the relationship is stronger than for the total fertility rate, which is consistent with people born in the same year but living in the country of origin constituting a reference group for immigrants in Germany. These results for completed fertility rates are novel: the literature so far has only used the more widely available total fertility rates. Note, however, that the coefficient becomes weaker and statistically insignificant in the model that uses only variation within countries (column 3). This is because the estimation relies on only three data points (1950, 1960, 1970) and only two data points (1950, 1960) in the case of Turkey. In the three samples for the second generation, the coefficients on cohort fertility rates also tend to have a positive sign, but are sometimes statistically insignificant even in the pooled model.

5 Conclusion

In this paper we have studied the fertility outcomes of first- and second-generation immigrants in Germany using data from the 2008 of the Mikrozensus, a representative 1% sample of the

³³We assign the values from Table A.8 in the Appendix as a function of the woman’s year of birth: [1950; 1954] \mapsto 1950; [1955; 1959] \mapsto 1960; [1960; 1968] \mapsto 1970. For Turkey there are only two data points (1950 and 1960). We use the 1960 value for all Turkish immigrants born between 1955 and 1968. For the sample of the second generation in which we include all women aged 15 and above, we additionally use the following assignment: [1971; 1975] \mapsto 1975; [1976; 1978] \mapsto 1978; [1979; ∞] \mapsto 1979.

German population. We show that total fertility rates and completed fertility rates in the country of origin have a sizeable impact on completed fertility rates in Germany. The findings for completed fertility rates are novel: previous studies have only used the more widely available total fertility rates. The results are robust to a control for compositional differences between women from different countries and cohorts. Moreover, the coefficient on origin culture remains positive (but decreases slightly) when country of origin fixed effects are allowed for in the model, mitigating concerns about omitted variables.

Since the women all live under roughly the same institutional framework in Germany, our results suggest that country-of-origin culture matters for fertility outcomes. We find that the influence is strongest for the immigrant generation itself, that is, for women who were born and socialized in the country of origin. The influence of country-of-origin fertility rates persists into but becomes smaller in the second generation, which suggests that parents vertically transmit the culture of their country of origin, but that horizontal and oblique influences in the host country play a role as well (see the survey by Bisin and Verdier, 2011).

In future research, the precise workings of the cultural influence and of the transmission mechanisms should be studied in greater detail. The literature has already established that in the US, the number of own siblings (Fernández and Fogli, 2006) and own labour market experience prior to migration (Blau and Kahn, 2011) can explain part but not all of the association between country-of-origin culture and own fertility or labour market outcomes. For first-generation immigrants in Germany, Cygan-Rehm (2011) confirms the influence of the number of own siblings but shows that the cultural effect is still present after controlling for this variable. For second-generation immigrants in Germany, these questions have not yet been investigated. The difficulty is that social science surveys such as SOEP include the necessary questions but have a relatively limited number of observations for the second generation, while the Mikrozensus is a large sample with a smaller set of covariates.

Nevertheless, the Mikrozensus-based analysis in the present paper already allows to establish some first results concerning the mechanisms behind the cultural influence on fertility. We find

that the cultural influence is stronger on the intensive margin than on the decision to have at least one child. Moreover, we show that the cultural influence is strongest for women with low levels of education and almost disappears for women with a tertiary education. In the literature that directly focuses on the fertility effects of country-of-origin culture, this is a novel finding. A similar interaction effect with education was found by Adsera and Ferrer (2011), who study the effects on age at migration on fertility assimilation in Canada. We also find that there is no robust relationship between completed fertility of immigrants in Germany and direct measures of fertility norms from the World Values Survey 1990, hence years after most immigrant women in our sample left their country. This suggests that the socialization up to the year of migration and one's own birth cohort exert a stronger influence than the later evolution in one's country of origin. The result may also suggest that observed fertility outcomes are a stronger reference point for one's own behaviour than norms and attitudes (even assuming that the self-reported attitudes from the World Values Survey accurately reflect "true" attitudes).

The problem of the small sample size for the second generation in social science surveys is most severe for the study of completed fertility. With other outcome variables, the number of observations becomes larger. Milewski (2007; 2010) uses the SOEP to study transitions to first, second and third births. She also increases the sample size by grouping together generations 1.5 and 2. Casey and Dustmann (2010) use the SOEP for a study of cultural transmission with respect to labour-market behaviour. They exploit the fact that in the SOEP children who leave the household remain part of the survey. A promising project for future research would be to use the same dataset and to combine Casey and Dustmann's focus on transmission with the focus of the epidemiological literature on country-of-origin variables.

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Tables

Table 1: First generation - Main results

	(1)		(2)		(3)	
Total fertility rate	0.38***	(0.03)	0.35***	(0.03)	0.24***	(0.09)
Age			-0.02***	(0.00)	-0.01**	(0.01)
Age at migration			0.03***	(0.01)	0.03***	(0.01)
Medium education			-0.48***	(0.06)	-0.33***	(0.07)
High education			-0.91***	(0.11)	-0.75***	(0.13)
Intercept	1.13***	(0.08)	1.47***	(0.33)	1.18***	(0.34)
Bundesland Fixed Effects	No		Yes		Yes	
Country of Origin Fixed Effects	No		No		Yes	
R ²	0.13		0.18		0.20	
Observations	2276		2276		2276	

Note: Mikrozensus 2008. The dependent variable is the number of children. The models are estimated using Ordinary Least Squares. Standard errors clustered at the country-migration year level. Medium education: upper secondary degree or some professional training; High education: tertiary education; omitted reference category: no degree or the equivalent of the German Hauptschule and Realschule. *p<0.1, **p<0.05, ***p<0.01

Table 2: Second generation - Main results

	Generation 2		Generations 1.5 and 2			
	Age 40+	Age 15+	Age 40+	Age 40+		
Total fertility rate	0.06	(0.07)	0.06***	(0.02)	0.15***	(0.02)
Age	0.02	(0.02)	0.14***	(0.02)	-0.00	(0.01)
Medium education	-0.53*	(0.30)	-0.37***	(0.05)	-0.57***	(0.08)
High education	-1.50***	(0.42)	-1.02***	(0.09)	-1.39***	(0.17)
Age ²			-0.00***	(0.00)		
Intercept	0.67	(1.15)	-2.30***	(0.24)	1.95***	(0.46)
Bundesland Fixed Effects	Yes		Yes		Yes	
R ²	0.21		0.44		0.18	
Observations	153		3261		950	

Note: Mikrozensus 2008. The dependent variable is the number of children. The models are estimated using Ordinary Least Squares. Standard errors clustered at the country-year of birth level. Medium education: upper secondary degree or some professional training; High education: tertiary education; omitted reference category: no degree or the equivalent of the German Hauptschule and Realschule. *p<0.1, **p<0.05, ***p<0.01

Figures

Figure 1: Illustration of the empirical strategy

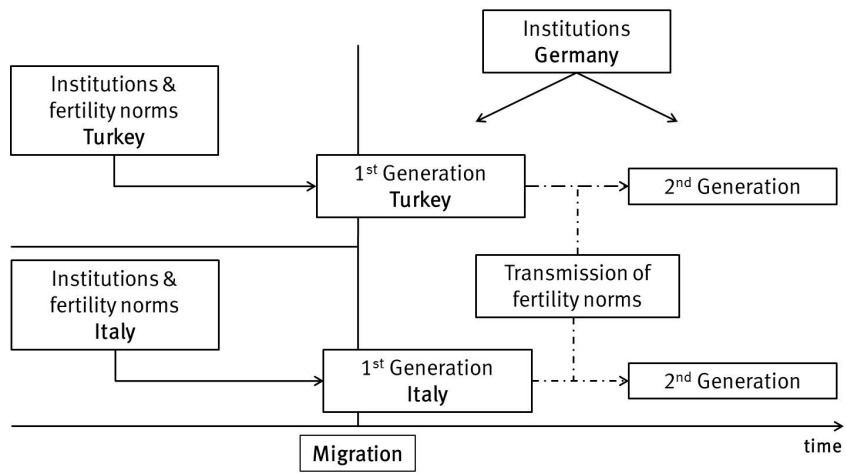
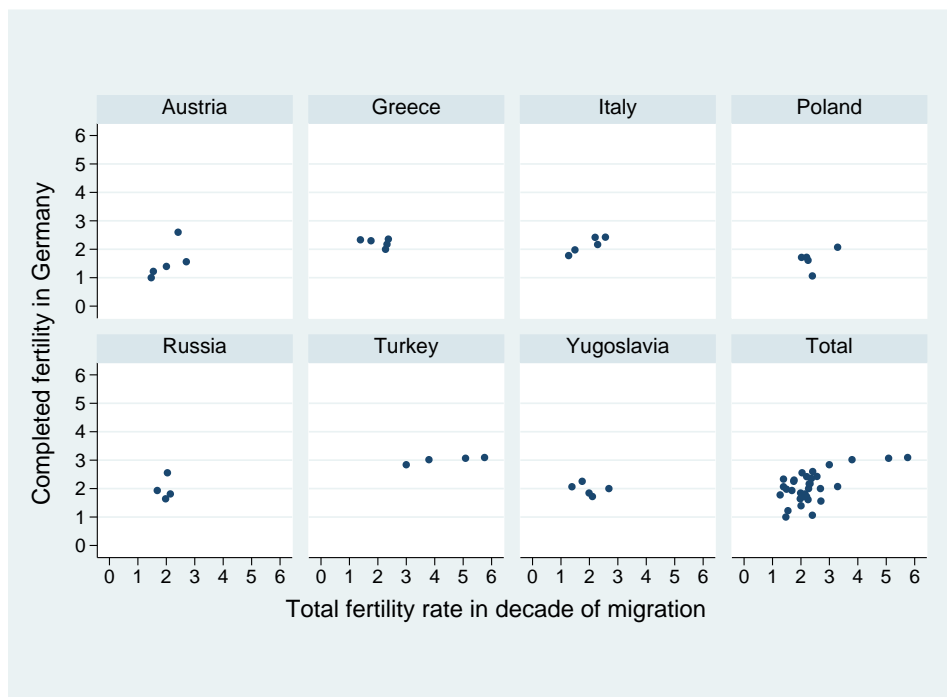


Figure 2: Fertility rates in the country of origin and among immigrants in Germany



A Appendix

A.1 Summary statistics

A.1.1 First generation

Table A.1: First generation, age 40 and above - Number of children

	N	Avg. nb. of Children	Share of women with children	Avg. nb. of children (women with children only)
Country of origin				
Austria	177	1.5	0.80	1.9
Greece	120	2.3	0.97	2.4
Italy	186	2.3	0.94	2.4
Poland	387	1.7	0.88	1.9
Russia	160	2.0	0.89	2.3
Turkey	780	3.0	0.97	3.1
Yugoslavia	466	1.9	0.90	2.1
Total	2276	2.3	0.92	2.5
Education				
Low	1329	2.6	0.95	2.8
Medium	837	1.8	0.89	2.0
High	110	1.5	0.82	1.8
Total	2276	2.3	0.92	2.5
Decade of arrival				
1950s	51	2.2	0.90	2.5
1960s	437	2.1	0.91	2.3
1970s	950	2.4	0.93	2.6
1980s	658	2.3	0.91	2.5
1990s	180	2.0	0.92	2.2
Total	2276	2.3	0.92	2.5
Citizenship				
German	802	2.1	0.90	2.3
German and foreign	93	2.0	0.95	2.1
Foreign	1381	2.4	0.93	2.6
Total	2276	2.3	0.92	2.5

Source: Mikrozensus 2008. 10 Jan 2013 12:07:37

Table A.2: First generation, age 40 and above - Socio-economic characteristics

	N	Married	Education			Nationality		
			Low	Medium	High	German	Both	Foreign
Austria	177	0.71	0.29	0.63	0.07	0.28	0.02	0.71
Greece	120	0.73	0.69	0.29	0.02	0.05	0.07	0.88
Italy	186	0.85	0.77	0.20	0.03	0.09	0.01	0.91
Poland	387	0.78	0.16	0.73	0.11	0.74	0.14	0.12
Russia	160	0.79	0.27	0.61	0.12	0.84	0.03	0.13
Turkey	780	0.86	0.88	0.10	0.02	0.23	0.02	0.75
Yugoslavia	466	0.72	0.55	0.42	0.03	0.27	0.01	0.71
Total	2276	0.79	0.58	0.37	0.05	0.35	0.04	0.61

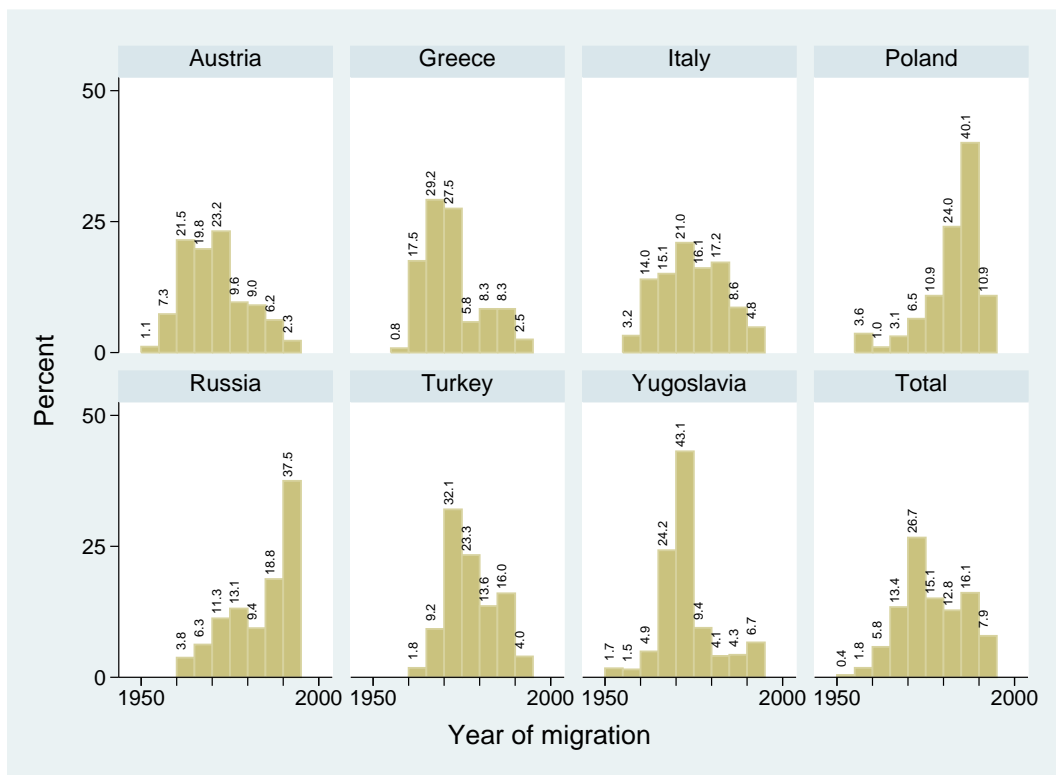
Source: Mikrozensus 2008. 10 Jan 2013 12:07:37

Table A.3: First generation, age 40 and above - Arrival history

	N	Years since migration			Age at migration			Age		
		Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Austria	177	37.9	16	58	20.9	15	25	58.8	40	76
Greece	120	36.6	16	49	20.4	15	25	57.0	40	72
Italy	186	33.9	15	51	20.5	15	25	54.4	40	74
Poland	387	25.5	15	52	21.8	15	25	47.2	40	74
Russia	160	24.9	15	46	22.0	15	25	46.9	40	70
Turkey	780	30.9	15	47	20.2	15	25	51.0	40	68
Yugoslavia	466	35.4	15	56	20.5	15	25	55.9	40	74
Total	2276	31.5	15	58	20.7	15	25	52.3	40	76

Source: Mikrozensus 2008. 10 Jan 2013 12:07:37

Figure A.1: First generation, age 40 and above - Year of migration



A.1.2 Second generation

Table A.4: Second generation, age 15 and above - Number of children

	N	Avg. nb. of Children	Share of women with children	Avg. nb. of children (women with children only)
Country of origin				
Austria	117	0.5	0.26	1.9
Greece	181	0.6	0.32	1.8
Italy	459	0.6	0.34	1.8
Poland	294	0.1	0.04	1.7
Portugal	61	0.3	0.20	1.7
Russia	151	0.2	0.15	1.3
Spain	92	0.8	0.43	1.9
Turkey	1564	0.5	0.27	1.8
Yugoslavia	342	0.5	0.31	1.8
Total	3261	0.5	0.27	1.8
Education				
Low	1827	0.3	0.17	2.0
Medium	1306	0.7	0.40	1.7
High	128	0.3	0.23	1.4
Total	3261	0.5	0.27	1.8
Citizenship				
German	1435	0.3	0.18	1.7
German and foreign	159	0.2	0.13	1.5
Foreign	1667	0.7	0.36	1.8
Total	3261	0.5	0.27	1.8

Source: Mikrozensus 2008. 10 Jan 2013 12:08:03

Table A.5: Second generation, age 15 and above - Control variables

	N	Age			Married	Education			Nationality		
		Mean	Min	Max		Low	Medium	High	German	Both	Foreign
Austria	117	29.6	15	56	0.22	0.31	0.60	0.09	0.52	0.09	0.38
Greece	181	27.7	15	51	0.30	0.41	0.50	0.09	0.17	0.07	0.76
Italy	459	27.3	15	57	0.32	0.51	0.45	0.05	0.20	0.10	0.70
Poland	294	19.8	15	56	0.03	0.72	0.27	0.01	0.90	0.04	0.05
Portugal	61	24.5	15	51	0.20	0.51	0.49	0.00	0.21	0.11	0.67
Russia	151	21.5	15	56	0.13	0.76	0.21	0.03	0.87	0.02	0.11
Spain	92	30.4	15	54	0.36	0.35	0.59	0.07	0.25	0.07	0.68
Turkey	1564	24.0	15	56	0.32	0.61	0.36	0.03	0.44	0.03	0.53
Yugoslavia	342	26.4	15	57	0.27	0.40	0.55	0.06	0.40	0.04	0.56
Total	3261	24.8	15	57	0.28	0.56	0.40	0.04	0.44	0.05	0.51

Source: Mikrozensus 2008. 10 Jan 2013 12:08:03

Table A.6: Second generation, age 40 and above - Number of children

	N	Avg. nb. of Children	Share of women with children	Avg. nb. of children (women with children only)
Country of origin				
Austria	28	1.5	0.68	2.2
Greece	19	1.6	0.79	2.1
Italy	47	1.7	0.72	2.3
Spain	20	2.0	0.95	2.1
Turkey	24	1.8	0.75	2.4
Yugoslavia	15	1.4	0.60	2.3
Total	153	1.7	0.75	2.2
Education				
Low	43	2.2	0.93	2.4
Medium	93	1.6	0.74	2.1
High	17	0.6	0.29	2.0
Total	153	1.7	0.75	2.2
Citizenship				
German	40	1.2	0.57	2.1
German and foreign	2	0.0	0.00	
Foreign	111	1.9	0.82	2.3
Total	153	1.7	0.75	2.2

Source: Mikrozensus 2008. 10 Jan 2013 12:08:13

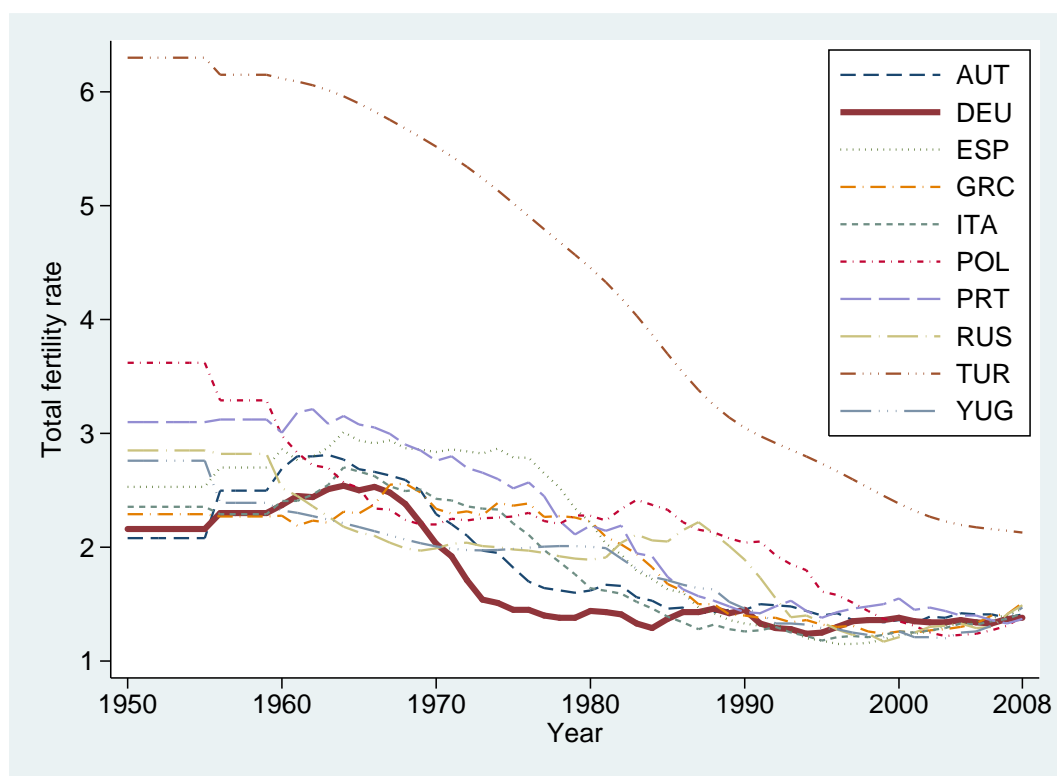
Table A.7: Second generation, age 40 and above - Control variables

	N	Age			Married	Education			Nationality		
		Mean	Min	Max		Low	Medium	High	German	Both	Foreign
Austria	28	47.1	40	56	0.61	0.04	0.86	0.11	0.21	0.04	0.75
Greece	19	42.8	40	51	0.68	0.26	0.63	0.11	0.05	0.05	0.89
Italy	47	44.5	40	57	0.66	0.30	0.55	0.15	0.26	0.00	0.74
Spain	20	44.0	40	54	0.80	0.15	0.80	0.05	0.20	0.00	0.80
Turkey	24	44.7	40	56	0.58	0.58	0.33	0.08	0.46	0.00	0.54
Yugoslavia	15	47.9	40	57	0.40	0.40	0.47	0.13	0.40	0.00	0.60
Total	153	45.1	40	57	0.63	0.28	0.61	0.11	0.26	0.01	0.73

Source: Mikrozensus 2008. 10 Jan 2013 12:08:13

A.2 Country-level variables

Figure A.2: Total fertility rates (TFR)



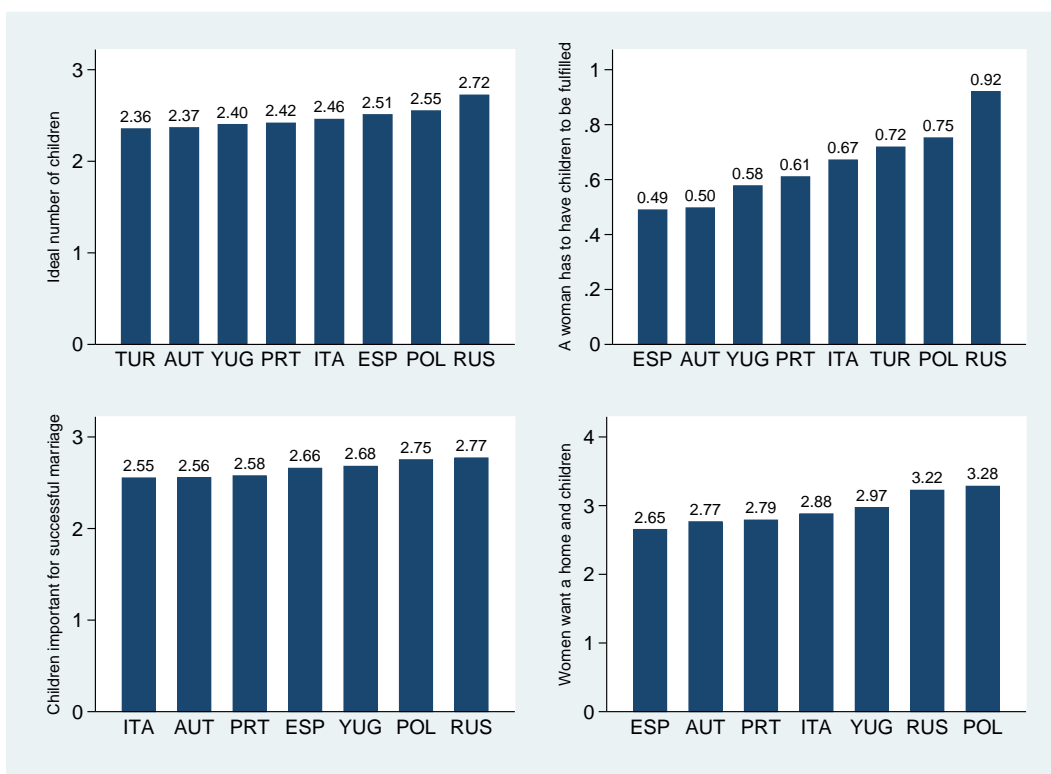
Source: World Bank (2012); UN Population Division (2011)

Table A.8: Completed cohort fertility rates

Country	Year of birth						Total
	1950	1960	1970	1975	1978	1979	
Austria	1.89	1.70	1.61	1.64	1.59	1.59	1.67
Germany East	1.77	1.81	1.51	1.53	1.54	1.57	1.62
Germany West	1.71	1.61	1.52	1.57	1.55	1.57	1.59
Greece	2.00	1.97	1.64	1.61	1.62	1.64	1.75
Italy	1.86	1.69	1.48	1.45	1.46	1.47	1.57
Poland	2.06	2.05	1.85	1.63	1.58	1.57	1.79
Portugal	2.11	1.94	1.69	1.57	1.50	1.47	1.71
Russia	1.84	1.86	1.61	1.61	1.65	1.67	1.71
Spain	2.20	1.80	1.50	1.40	1.40	1.40	1.62
Turkey	4.54	3.51					4.03
Yugoslavia	1.89	1.80	1.69	1.70	1.68	1.72	1.75
Total	2.17	1.98	1.61	1.57	1.56	1.57	1.75

Source: Own calculations based on Hacettepe University Institute of Population Studies (1999; 2009) for Turkey; Myrskylä et al. (2012) for the remaining countries. 10 Jan 2013 12:07:20

Figure A.3: Fertility norms - country averages

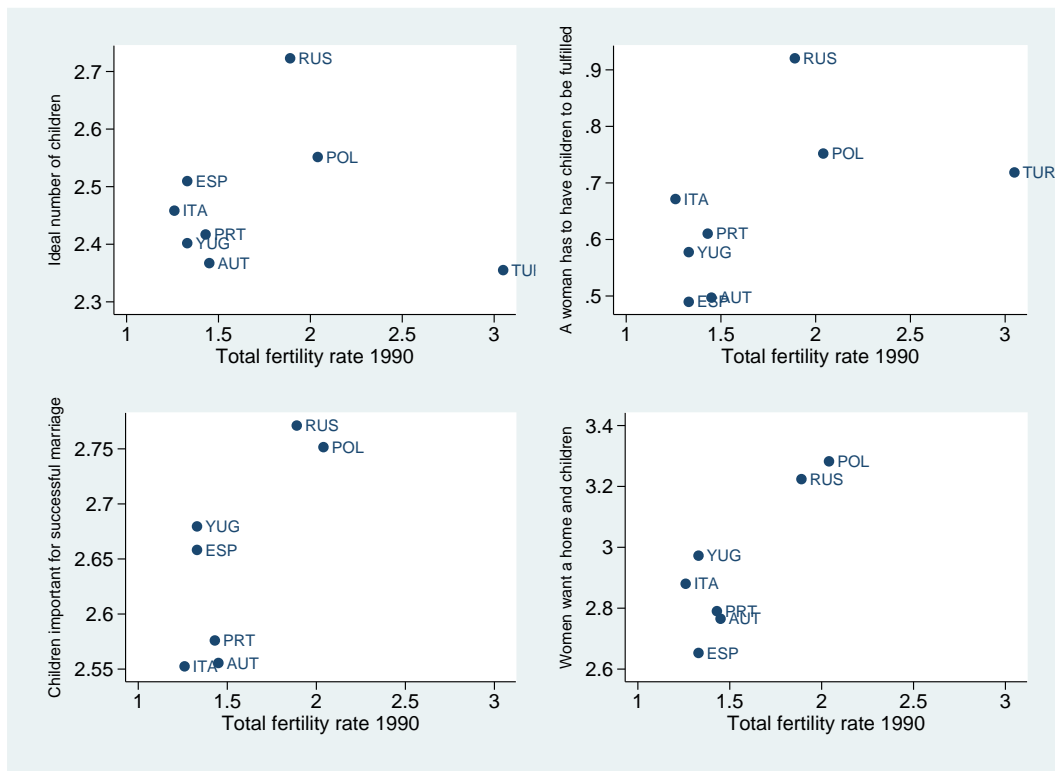


Source: World Values Survey (1990)

Table A.9: Fertility norms - piecewise correlations

Variables	(1)	(2)	(3)	(4)
(1) Ideal number of children	1.00			
(2) A woman has to have children to be fulfilled	0.38	1.00		
(3) Children important for successful marriage	0.66	0.74	1.00	
(4) Women want a home and children	0.77	0.87	0.84	1.00

Figure A.4: TFR and fertility norms in 1990



Source: World Bank (2012); UN Population Division (2011); World Values Survey (1990)

A.3 Additional results for the main specification

Table A.10: Second generation, age 40 and above - Main results

	(1)		(2)		(3)	
Total fertility rate	0.09	(0.07)	0.06	(0.07)	0.89	(0.62)
Age			0.02	(0.02)	0.03	(0.02)
Medium education			-0.53*	(0.30)	-0.55*	(0.32)
High education			-1.50***	(0.42)	-1.46***	(0.44)
Intercept	1.38***	(0.26)	0.67	(1.15)	-2.01	(1.83)
Bundesland Fixed Effects	No		Yes		Yes	
Country of Origin Fixed Effects	No		No		Yes	
R ²	0.01		0.21		0.24	
Observations	153		153		153	

Note: Mikrozensus 2008. The dependent variable is the number of children. The models are estimated using Ordinary Least Squares. Standard errors clustered at the country-year of birth level. Medium education: upper secondary degree or some professional training; High education: tertiary education; omitted reference category: no degree or the equivalent of the German Hauptschule and Realschule. *p<0.1, **p<0.05, ***p<0.01

Table A.11: Second generation, age 15 and above - Main results

	(1)		(2)		(3)	
Total fertility rate	0.25***	(0.03)	0.06***	(0.02)	0.31***	(0.06)
Age			0.14***	(0.02)	0.10***	(0.02)
Age ²			-0.00***	(0.00)	-0.00**	(0.00)
Medium education			-0.37***	(0.05)	-0.35***	(0.05)
High education			-1.02***	(0.09)	-1.01***	(0.09)
Intercept	-0.23***	(0.08)	-2.30***	(0.24)	-1.90***	(0.25)
Bundesland Fixed Effects	No		Yes		Yes	
Country of Origin Fixed Effects	No		No		Yes	
R ²	0.11		0.44		0.45	
Observations	3261		3261		3261	

Note: Mikrozensus 2008. The dependent variable is the number of children. The models are estimated using Ordinary Least Squares. Standard errors clustered at the country-year of birth level. Medium education: upper secondary degree or some professional training; High education: tertiary education; omitted reference category: no degree or the equivalent of the German Hauptschule and Realschule. *p<0.1, **p<0.05, ***p<0.01

Table A.12: Generations 1.5 and 2, age 40 and above - Main results

	(1)		(2)		(3)	
Total fertility rate	0.20***	(0.02)	0.15***	(0.02)	0.04	(0.15)
Age			-0.00	(0.01)	0.00	(0.01)
Medium education			-0.57***	(0.08)	-0.54***	(0.08)
High education			-1.39***	(0.17)	-1.39***	(0.18)
Intercept	1.14***	(0.09)	1.95***	(0.46)	2.20***	(0.49)
Bundesland Fixed Effects	No		Yes		Yes	
Country of Origin Fixed Effects	No		No		Yes	
R ²	0.07		0.18		0.19	
Observations	950		950		950	

Note: Mikrozensus 2008. The dependent variable is the number of children. The models are estimated using Ordinary Least Squares. Standard errors clustered at the country-year of birth level. Medium education: upper secondary degree or some professional training; High education: tertiary education; omitted reference category: no degree or the equivalent of the German Hauptschule and Realschule. *p<0.1, **p<0.05, ***p<0.01

A.4 Interaction of TFR and education level

Table A.13: First generation - Interaction with education level

	(1)		(2)		(3)		(4)	
Total fertility rate (TFR)	0.39***	(0.03)	0.37***	(0.03)	0.25***	(0.09)	0.25***	(0.09)
TFR * Medium education	-0.17***	(0.02)	-0.10*	(0.05)	-0.12***	(0.02)	-0.14**	(0.05)
TFR * High education	-0.33***	(0.04)	-0.21***	(0.08)	-0.28***	(0.04)	-0.25***	(0.08)
Age	-0.02***	(0.00)	-0.02***	(0.00)	-0.01*	(0.01)	-0.01*	(0.01)
Age at migration	0.03***	(0.01)	0.03***	(0.01)	0.03***	(0.01)	0.03***	(0.01)
Medium education			-0.22	(0.15)			0.05	(0.15)
High education			-0.37	(0.23)			-0.09	(0.25)
Intercept	1.28***	(0.33)	1.37***	(0.34)	1.04***	(0.34)	1.03***	(0.36)
Bundesland Fixed Effects	Yes		Yes		Yes		Yes	
Country of Origin Fixed Effects	No		No		Yes		Yes	
R ²	0.18		0.18		0.20		0.20	
Observations	2276		2276		2276		2276	

Note: Mikrozensus 2008. The dependent variable is the number of children. The models are estimated using Ordinary Least Squares. Standard errors clustered at the country-migration year level. Medium education: upper secondary degree or some professional training; High education: tertiary education; omitted reference category: no degree or the equivalent of the German Hauptschule and Realschule. *p<0.1, **p<0.05, ***p<0.01

Table A.14: Second generation, age 40 and above - Interaction with education level

	(1)		(2)		(3)		(4)	
Total fertility rate (TFR)	0.15**	(0.06)	0.07	(0.10)	0.96	(0.63)	0.89	(0.63)
TFR * Medium education	-0.14*	(0.07)	-0.03	(0.18)	-0.13*	(0.08)	0.03	(0.20)
TFR * High education	-0.44***	(0.12)	-0.01	(0.18)	-0.42***	(0.13)	0.01	(0.19)
Age	0.02	(0.02)	0.02	(0.02)	0.03*	(0.02)	0.03	(0.02)
Medium education			-0.43	(0.76)			-0.65	(0.80)
High education			-1.48*	(0.86)			-1.48*	(0.87)
Intercept	0.32	(1.11)	0.68	(1.15)	-2.43	(1.90)	-2.06	(1.91)
Bundesland Fixed Effects	Yes		Yes		Yes		Yes	
Country of Origin Fixed Effects	No		No		Yes		Yes	
R ²	0.20		0.21		0.23		0.24	
Observations	153		153		153		153	

Note: Mikrozensus 2008. The dependent variable is the number of children. The models are estimated using Ordinary Least Squares. Standard errors clustered at the country-year of birth level. Medium education: upper secondary degree or some professional training; High education: tertiary education; omitted reference category: no degree or the equivalent of the German Hauptschule and Realschule. *p<0.1, **p<0.05, ***p<0.01

Table A.15: Second generation, age 15 and above - Interaction with education level

	(1)		(2)		(3)		(4)	
Total fertility rate (TFR)	0.13***	(0.02)	0.08***	(0.03)	0.47***	(0.06)	0.42***	(0.08)
TFR * Medium education	-0.10***	(0.01)	-0.02	(0.03)	-0.11***	(0.01)	-0.08***	(0.03)
TFR * High education	-0.28***	(0.03)	-0.08	(0.05)	-0.29***	(0.03)	-0.17***	(0.06)
Age	0.12***	(0.02)	0.14***	(0.02)	0.06***	(0.02)	0.08***	(0.02)
Age ²	-0.00***	(0.00)	-0.00***	(0.00)	-0.00	(0.00)	-0.00	(0.00)
Medium education			-0.30***	(0.08)			-0.09	(0.09)
High education			-0.76***	(0.18)			-0.47**	(0.19)
Intercept	-2.19***	(0.23)	-2.30***	(0.24)	-1.75***	(0.24)	-1.83***	(0.26)
Bundesland Fixed Effects	Yes		Yes		Yes		Yes	
Country of Origin Fixed Effects	No		No		Yes		Yes	
R ²	0.44		0.44		0.45		0.45	
Observations	3261		3261		3261		3261	

Note: Mikrozensus 2008. The dependent variable is the number of children. The models are estimated using Ordinary Least Squares. Standard errors clustered at the country-year of birth level. Medium education: upper secondary degree or some professional training; High education: tertiary education; omitted reference category: no degree or the equivalent of the German Hauptschule and Realschule. *p<0.1, **p<0.05, ***p<0.01

Table A.16: Generations 1.5 and 2, age 40 and above - Interaction with education level

	(1)		(2)		(3)		(4)	
Total fertility rate (TFR)	0.22***	(0.02)	0.17***	(0.03)	0.09	(0.16)	0.07	(0.16)
TFR * Medium education	-0.13***	(0.02)	-0.04	(0.05)	-0.12***	(0.02)	-0.05	(0.05)
TFR * High education	-0.35***	(0.04)	-0.21**	(0.09)	-0.35***	(0.04)	-0.21**	(0.09)
Age	0.00	(0.01)	-0.00	(0.01)	0.00	(0.01)	0.00	(0.01)
Medium education			-0.40*	(0.21)			-0.33	(0.20)
High education			-0.65*	(0.36)			-0.62*	(0.37)
Intercept	1.51***	(0.46)	1.80***	(0.49)	1.68***	(0.50)	1.98***	(0.54)
Bundesland Fixed Effects	Yes		Yes		Yes		Yes	
Country of Origin Fixed Effects	No		No		Yes		Yes	
R ²	0.18		0.19		0.19		0.19	
Observations	950		950		950		950	

Note: Mikrozensus 2008. The dependent variable is the number of children. The models are estimated using Ordinary Least Squares. Standard errors clustered at the country-year of birth level. Medium education: upper secondary degree or some professional training; High education: tertiary education; omitted reference category: no degree or the equivalent of the German Hauptschule and Realschule. *p<0.1, **p<0.05, ***p<0.01

A.5 Additional control variables

Table A.17: First generation - Additional control variables

	(1)	(2)	(3)	(4)	(5)
Total fertility rate	0.33*** (0.03)	0.34*** (0.03)	0.23*** (0.05)	0.35*** (0.03)	0.33*** (0.03)
Age	-0.01*** (0.00)	-0.02*** (0.00)	-0.01** (0.01)	-0.03*** (0.01)	-0.04*** (0.01)
Age at migration	0.04*** (0.01)	0.03*** (0.01)	0.03** (0.01)	0.05*** (0.01)	0.05*** (0.01)
Medium education	-0.47*** (0.06)	-0.43*** (0.06)	-0.39*** (0.09)	-0.48*** (0.06)	-0.40*** (0.06)
High education	-0.86*** (0.12)	-0.97*** (0.12)	-0.95*** (0.18)	-0.91*** (0.11)	-0.87*** (0.13)
Married	0.47*** (0.07)		0.43*** (0.11)		0.38*** (0.07)
Only foreign nationality	0.06 (0.06)		0.12 (0.10)		0.12* (0.07)
Employed		-0.34*** (0.07)	-0.46*** (0.09)		-0.31*** (0.08)
Household net income		0.10*** (0.03)	0.13*** (0.04)		0.08*** (0.02)
GDP per capita			-0.04*** (0.01)		
Intercept	0.85*** (0.31)	1.69*** (0.36)	1.43*** (0.49)	2.49*** (0.67)	2.45*** (0.70)
Dummies for decade of arrival	No	No	No	Yes	Yes
Bundesland Fixed Effects	Yes	Yes	Yes	Yes	Yes
R ²	0.20	0.20	0.21	0.18	0.21
Observations	2276	2117	1275	2276	2117

Note: Mikrozensus 2008. The dependent variable is the number of children. The models are estimated using Ordinary Least Squares. Standard errors clustered at the country-migration year level. Medium education: upper secondary degree or some professional training; High education: tertiary education; omitted reference category: no degree or the equivalent of the German Hauptschule and Realschule. Income in 1000 euros; measured in the month before the interview. Omitted reference category for "only foreign nationality": German nationality or both German and foreign nationality; GDP per capita in constant US dollars, base year 2000. Unit of measurement: 1000 dollars/year. *p<0.1, **p<0.05, ***p<0.01

Table A.18: First generation - Additional control variables - Within-country variation only

	(1)	(2)	(3)	(4)	(5)	(6)
Total fertility rate	0.25*** (0.09)	0.31*** (0.09)	0.13 (0.19)	0.31*** (0.09)	0.44*** (0.17)	0.44** (0.18)
Age	-0.01* (0.01)	-0.02*** (0.01)	-0.00 (0.02)	-0.03*** (0.01)	-0.04*** (0.01)	-0.04*** (0.01)
Age at migration	0.04*** (0.01)	0.03*** (0.01)	0.02 (0.03)	0.06*** (0.01)	0.06*** (0.02)	0.06*** (0.02)
Medium education	-0.34*** (0.07)	-0.29*** (0.07)	-0.23** (0.10)	-0.31*** (0.07)	-0.30*** (0.07)	-0.28*** (0.06)
High education	-0.75*** (0.12)	-0.84*** (0.14)	-0.78*** (0.21)	-0.73*** (0.12)	-0.71*** (0.13)	-0.75*** (0.13)
Married	0.45*** (0.07)		0.42*** (0.11)			0.36*** (0.07)
Only foreign nationality	-0.04 (0.08)		0.04 (0.11)			0.05 (0.08)
Employed		-0.34*** (0.07)	-0.47*** (0.09)			-0.31*** (0.08)
Household net income		0.11*** (0.03)	0.13*** (0.04)			0.08*** (0.03)
GDP per capita			-0.00 (0.05)			
Intercept	0.66** (0.33)	1.31*** (0.38)	0.27 (1.14)	2.44*** (0.65)	3.03*** (0.71)	2.87*** (0.74)
Dummies for decade of arrival	No	No	No	Yes	Yes	Yes
Dummies for decade of arrival (country-specific)	No	No	No	No	Yes	Yes
Bundesland Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country of Origin Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R ²	0.21	0.21	0.22	0.20	0.21	0.23
Observations	2276	2117	1275	2276	2276	2117

Note: Mikrozensus 2008. The dependent variable is the number of children. The models are estimated using Ordinary Least Squares. Standard errors clustered at the country-migration year level. Medium education: upper secondary degree or some professional training; High education: tertiary education; omitted reference category: no degree or the equivalent of the German Hauptschule and Realschule. Income in 1000 euros, measured in the month before the interview. Omitted reference category for 'only foreign nationality': German nationality or both German and foreign nationality. GDP per capita in constant US dollars, base year 2000. Unit of measurement: 1000 dollars/year. *p<0.1, **p<0.05, ***p<0.01

Table A.19: Second generation, age 40 and above - Additional control variables

	(1)		(2)		(3)	
Total fertility rate	0.08	(0.07)	0.05	(0.07)	0.10	(0.16)
Age	0.02	(0.02)	0.02	(0.02)	0.02	(0.05)
Medium education	-0.49	(0.31)	-0.57*	(0.31)	-0.28	(0.28)
High education	-1.23**	(0.48)	-1.67***	(0.42)	-1.16**	(0.55)
Married	0.73***	(0.25)			0.49	(0.34)
Only foreign nationality	0.39	(0.23)			0.24	(0.32)
Employed			-0.33	(0.29)	-0.42	(0.33)
Household net income			0.08	(0.06)	0.04	(0.10)
GDP per capita					0.04	(0.08)
Intercept	0.17	(1.18)	0.79	(1.25)	0.35	(2.57)
Bundesland Fixed Effects	Yes		Yes		Yes	
R ²	0.30		0.25		0.33	
Observations	153		145		109	

Note: Mikrozensus 2008. The dependent variable is the number of children. The models are estimated using Ordinary Least Squares. Standard errors clustered at the country-year of birth level. Medium education: upper secondary degree or some professional training; High education: tertiary education; omitted reference category: no degree or the equivalent of the German Hauptschule and Realschule. Income in 1000 euros; measured in the month before the interview. Omitted reference category for 'only foreign nationality': German nationality or both German and foreign nationality. GDP per capita in constant US dollars, base year 2000. Unit of measurement: 1000 dollars/year. *p<0.1, **p<0.05, ***p<0.01

Table A.20: Second generation, age 15 and above - Additional control variables

	(1)		(2)		(3)	
Total fertility rate	0.00	(0.02)	0.05***	(0.02)	0.03*	(0.02)
Age	0.07***	(0.01)	0.18***	(0.02)	0.06***	(0.02)
Age ²	-0.00	(0.00)	-0.00***	(0.00)	0.00	(0.00)
Medium education	-0.30***	(0.04)	-0.36***	(0.04)	-0.27***	(0.04)
High education	-0.79***	(0.08)	-0.98***	(0.09)	-0.77***	(0.09)
Married	0.91***	(0.05)			0.86***	(0.06)
Only foreign nationality	0.04	(0.02)			-0.00	(0.02)
Employed			-0.32***	(0.04)	-0.28***	(0.04)
Household net income			0.02*	(0.01)	0.01	(0.01)
GDP per capita					0.01***	(0.00)
Intercept	-1.12***	(0.21)	-2.72***	(0.25)	-1.03***	(0.24)
Bundesland Fixed Effects	Yes		Yes		Yes	
R ²	0.56		0.47		0.59	
Observations	3261		2989		2552	

Note: Mikrozensus 2008. The dependent variable is the number of children. The models are estimated using Ordinary Least Squares. Standard errors clustered at the country-year of birth level. Medium education: upper secondary degree or some professional training; High education: tertiary education; omitted reference category: no degree or the equivalent of the German Hauptschule and Realschule. Income in 1000 euros; measured in the month before the interview. Omitted reference category for 'only foreign nationality': German nationality or both German and foreign nationality. GDP per capita in constant US dollars, base year 2000. Unit of measurement: 1000 dollars/year. *p<0.1, **p<0.05, ***p<0.01

Table A.21: Generations 1.5 and 2, age 40 and above - Additional control variables

	(1)		(2)		(3)	
Total fertility rate	0.13***	(0.02)	0.13***	(0.02)	0.19***	(0.05)
Age	-0.00	(0.01)	-0.00	(0.01)	0.02	(0.01)
Medium education	-0.49***	(0.08)	-0.57***	(0.08)	-0.49***	(0.10)
High education	-1.14***	(0.15)	-1.50***	(0.17)	-1.39***	(0.22)
Married	0.70***	(0.10)			0.63***	(0.17)
Only foreign nationality	0.14**	(0.07)			0.01	(0.10)
Employed			-0.38***	(0.10)	-0.42***	(0.11)
Household net income			0.14***	(0.04)	0.06	(0.06)
GDP per capita					0.06	(0.03)
Intercept	1.43***	(0.42)	1.90***	(0.49)	0.17	(0.73)
Bundesland Fixed Effects	Yes		Yes		Yes	
R ²	0.25		0.22		0.31	
Observations	950		899		520	

Note: Mikrozensus 2008. The dependent variable is the number of children. The models are estimated using Ordinary Least Squares. Standard errors clustered at the country-year of birth level. Medium education: upper secondary degree or some professional training; High education: tertiary education; omitted reference category: no degree or the equivalent of the German Hauptschule and Realschule. Income in 1000 euros; measured in the month before the interview. Omitted reference category for "only foreign nationality": German nationality or both German and foreign nationality. GDP per capita in constant US dollars, base year 2000. Unit of measurement: 1000 dollars/year. *p<0.1, **p<0.05, ***p<0.01

A.6 TFR from single years

Table A.22: First generation - Results with TFR from single years

	1950	1960	1970	1980	1990	2008
Total fertility rate	0.26*** (0.03)	0.27*** (0.02)	0.30*** (0.02)	0.39*** (0.04)	0.60*** (0.08)	1.48*** (0.12)
Age	0.00 (0.01)	-0.00 (0.01)	-0.00 (0.01)	0.00 (0.01)	0.00 (0.01)	-0.00 (0.01)
Age at migration	0.02 (0.01)	0.02 (0.01)	0.02 (0.01)	0.02 (0.01)	0.02 (0.01)	0.02 (0.01)
Medium education	-0.49*** (0.06)	-0.46*** (0.06)	-0.40*** (0.08)	-0.44*** (0.07)	-0.54*** (0.06)	-0.38*** (0.09)
High education	-0.90*** (0.17)	-0.87*** (0.15)	-0.81*** (0.17)	-0.84*** (0.17)	-0.97*** (0.16)	-0.79*** (0.18)
Intercept	0.77 (0.51)	0.88 (0.50)	0.91 (0.48)	0.75 (0.51)	0.59 (0.55)	-0.58 (0.47)
Bundesland Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R ²	0.18	0.18	0.18	0.18	0.17	0.19
Observations	2276	2276	2276	2276	2276	2276

Note: Mikrozensus 2008. The dependent variable is the number of children. The models are estimated using Ordinary Least Squares. Standard errors clustered at the country level. Medium education: upper secondary degree or some professional training; High education: tertiary education; omitted reference category: no degree or the equivalent of the German Hauptschule and Realschule. *p<0.1, **p<0.05, ***p<0.01

Table A.23: Second generation, age 40 and above - Results with TFR from single years

	1950	1960	1970	1980	1990	2008
Total fertility rate	0.01 (0.01)	0.03 (0.03)	0.05 (0.05)	0.03 (0.03)	0.02 (0.03)	0.07 (0.08)
Age	0.02 (0.01)	0.02 (0.01)	0.02 (0.01)	0.02 (0.01)	0.02 (0.01)	0.02 (0.01)
Medium education	-0.57** (0.21)	-0.55** (0.21)	-0.54* (0.21)	-0.56** (0.21)	-0.57** (0.20)	-0.57** (0.21)
High education	-1.54* (0.65)	-1.52* (0.65)	-1.51* (0.65)	-1.53* (0.65)	-1.54* (0.65)	-1.53* (0.65)
Intercept	0.86 (0.58)	0.77 (0.62)	0.68 (0.68)	0.81 (0.62)	0.86 (0.58)	0.77 (0.63)
Bundesland Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R ²	0.20	0.21	0.21	0.21	0.20	0.20
Observations	153	153	153	153	153	153

Note: Mikrozensus 2008. The dependent variable is the number of children. The models are estimated using Ordinary Least Squares. Standard errors clustered at the country level. Medium education: upper secondary degree or some professional training; High education: tertiary education; omitted reference category: no degree or the equivalent of the German Hauptschule and Realschule. *p<0.1, **p<0.05, ***p<0.01

Table A.24: Second generation, age 15 and above - Results with TFR from single years

	1950	1960	1970	1980	1990	2008
Total fertility rate	0.02*** (0.00)	0.02*** (0.00)	0.02*** (0.01)	0.03*** (0.01)	0.05*** (0.01)	0.12*** (0.02)
Age	0.16*** (0.01)	0.16*** (0.01)	0.16*** (0.01)	0.16*** (0.01)	0.16*** (0.01)	0.16*** (0.01)
Age ²	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)
Medium education	-0.38*** (0.04)	-0.38*** (0.04)	-0.38*** (0.04)	-0.38*** (0.04)	-0.38*** (0.04)	-0.38*** (0.04)
High education	-1.04*** (0.09)	-1.04*** (0.09)	-1.04*** (0.09)	-1.04*** (0.09)	-1.04*** (0.09)	-1.04*** (0.09)
Intercept	-2.44*** (0.16)	-2.43*** (0.17)	-2.42*** (0.17)	-2.44*** (0.16)	-2.47*** (0.16)	-2.54*** (0.17)
Bundesland Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R ²	0.44	0.44	0.44	0.44	0.44	0.44
Observations	3261	3261	3261	3261	3261	3261

Note: Mikrozensus 2008. The dependent variable is the number of children. The models are estimated using Ordinary Least Squares. Standard errors clustered at the country level. Medium education: upper secondary degree or some professional training; High education: tertiary education; omitted reference category: no degree or the equivalent of the German Hauptschule and Realschule. *p<0.1, **p<0.05, ***p<0.01

Table A.25: Generations 1.5 and 2, age 40 and above - Results with TFR from single years

	1950	1960	1970	1980	1990	2008
Total fertility rate	0.13*** (0.01)	0.14*** (0.01)	0.16*** (0.02)	0.20*** (0.02)	0.27*** (0.02)	0.72*** (0.07)
Age	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)	-0.00 (0.01)	0.00 (0.01)
Medium education	-0.59*** (0.06)	-0.57*** (0.06)	-0.55*** (0.06)	-0.57*** (0.06)	-0.61*** (0.06)	-0.56*** (0.06)
High education	-1.40*** (0.22)	-1.39*** (0.23)	-1.37*** (0.24)	-1.39*** (0.23)	-1.42*** (0.21)	-1.39*** (0.24)
Intercept	1.91*** (0.46)	1.79*** (0.47)	1.69*** (0.51)	1.78*** (0.44)	1.92*** (0.42)	1.10* (0.51)
Bundesland Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R ²	0.18	0.18	0.18	0.18	0.18	0.18
Observations	950	950	950	950	950	950

Note: Mikrozensus 2008. The dependent variable is the number of children. The models are estimated using Ordinary Least Squares. Standard errors clustered at the country level. Medium education: upper secondary degree or some professional training; High education: tertiary education; omitted reference category: no degree or the equivalent of the German Hauptschule and Realschule. *p<0.1, **p<0.05, ***p<0.01

A.7 Fertility norms from the WVS 1990

Table A.26: First generation - Results with WVS fertility norms

	(1)		(2)		(3)		(4)	
Age	-0.02*	(0.01)	-0.00	(0.01)	-0.01	(0.01)	-0.01	(0.01)
Age at migration	0.02	(0.01)	0.01	(0.01)	0.02	(0.02)	0.02	(0.02)
Medium education	-0.74**	(0.19)	-0.89***	(0.22)	-0.32**	(0.09)	-0.35**	(0.08)
High education	-1.06***	(0.22)	-1.28***	(0.29)	-0.62***	(0.11)	-0.65***	(0.09)
Ideal number of children	-1.72	(1.17)						
A woman has to have ch. to be fulfilled			1.81	(1.18)				
Ch. important for successful marriage					-0.61	(0.54)		
Women want a home and children							-0.10	(0.51)
Intercept	7.02*	(2.85)	1.22	(0.89)	3.62*	(1.57)	2.28	(1.97)
Bundesland Fixed Effects	Yes		Yes		Yes		Yes	
R ²	0.12		0.12		0.05		0.05	
Observations	2156		2156		1376		1376	

Note: Mikrozensus 2008. The dependent variable is the number of children. The models are estimated using Ordinary Least Squares. Standard errors clustered at the country level. Medium education: upper secondary degree or some professional training; High education: tertiary education; omitted reference category: no degree or the equivalent of the German Hauptschule and Realschule. *p<0.1, **p<0.05, ***p<0.01

Table A.27: Second generation, age 40 and above - Results with WVS fertility norms

	(1)		(2)		(3)		(4)	
Age	0.02	(0.02)	0.02	(0.01)	0.02	(0.02)	0.02	(0.03)
Medium education	-0.67**	(0.17)	-0.68**	(0.20)	-0.55	(0.30)	-0.69*	(0.25)
High education	-1.91**	(0.47)	-1.94**	(0.45)	-1.92*	(0.64)	-1.95**	(0.58)
Ideal number of children	1.57	(1.56)						
A woman has to have ch. to be fulfilled			-0.74	(0.73)				
Ch. important for successful marriage					-0.73	(1.43)		
Women want a home and children							-2.04*	(0.78)
Intercept	-2.86	(3.99)	1.27	(0.72)	2.66	(2.64)	6.72***	(1.14)
Bundesland Fixed Effects	Yes		Yes		Yes		Yes	
R ²	0.28		0.28		0.24		0.26	
Observations	134		134		110		110	

Note: Mikrozensus 2008. The dependent variable is the number of children. The models are estimated using Ordinary Least Squares. Standard errors clustered at the country level. Medium education: upper secondary degree or some professional training; High education: tertiary education; omitted reference category: no degree or the equivalent of the German Hauptschule and Realschule. *p<0.1, **p<0.05, ***p<0.01

Table A.28: Second generation, age 15 and above - Results with WVS fertility norms

	(1)		(2)		(3)		(4)	
Age	0.16***	(0.01)	0.16***	(0.01)	0.14***	(0.01)	0.14***	(0.01)
Age ²	-0.00***	(0.00)	-0.00***	(0.00)	-0.00***	(0.00)	-0.00***	(0.00)
Medium education	-0.40***	(0.04)	-0.40***	(0.04)	-0.32***	(0.04)	-0.32***	(0.04)
High education	-1.09***	(0.08)	-1.08***	(0.08)	-0.98***	(0.16)	-0.98***	(0.16)
Ideal number of children	-0.14	(0.10)						
A woman has to have ch. to be fulfilled			0.24	(0.19)				
Ch. important for successful marriage					-0.03	(0.10)		
Women want a home and children							-0.04	(0.11)
Intercept	-2.04***	(0.31)	-2.58***	(0.23)	-1.98***	(0.51)	-1.93**	(0.58)
Bundesland Fixed Effects	Yes		Yes		Yes		Yes	
R ²	0.44		0.44		0.45		0.45	
Observations	3080		3080		1516		1516	

Note: Mikrozensus 2008. The dependent variable is the number of children. The models are estimated using Ordinary Least Squares. Standard errors clustered at the country level. Medium education: upper secondary degree or some professional training; High education: tertiary education; omitted reference category: no degree or the equivalent of the German Hauptschule and Realschule. *p<0.1, **p<0.05, ***p<0.01

Table A.29: Generations 1.5 and 2, age 40 and above - Results with WVS fertility norms

	(1)		(2)		(3)		(4)	
Age	-0.01	(0.01)	-0.01	(0.01)	0.01	(0.01)	0.01	(0.01)
Medium education	-0.65***	(0.06)	-0.74***	(0.09)	-0.42***	(0.08)	-0.44***	(0.08)
High education	-1.56***	(0.25)	-1.61***	(0.21)	-1.18***	(0.28)	-1.19***	(0.28)
Ideal number of children	-1.44**	(0.44)						
A woman has to have ch. to be fulfilled			0.35	(0.81)				
Ch. important for successful marriage					-0.63	(0.33)		
Women want a home and children							-0.40	(0.24)
Intercept	6.40***	(1.53)	2.88***	(0.78)	3.48**	(1.18)	3.04***	(0.76)
Bundesland Fixed Effects	Yes		Yes		Yes		Yes	
R ²	0.17		0.16		0.12		0.12	
Observations	883		883		524		524	

Note: Mikrozensus 2008. The dependent variable is the number of children. The models are estimated using Ordinary Least Squares. Standard errors clustered at the country level. Medium education: upper secondary degree or some professional training; High education: tertiary education; omitted reference category: no degree or the equivalent of the German Hauptschule and Realschule. *p<0.1, **p<0.05, ***p<0.01

A.8 Cohort fertility rates

Table A.30: First generation - Results with cohort fertility rates

	(1)		(2)		(3)	
Completed cohort fertility	0.50***	(0.04)	0.42***	(0.04)	0.14	(0.14)
Age			-0.01***	(0.00)	-0.00	(0.01)
Age at migration			0.01*	(0.01)	0.02**	(0.01)
Medium education			-0.46***	(0.06)	-0.32***	(0.07)
High education			-0.87***	(0.11)	-0.74***	(0.12)
Intercept	1.01***	(0.09)	1.51***	(0.34)	1.18***	(0.36)
Bundesland Fixed Effects	No		Yes		Yes	
Country of Origin Fixed Effects	No		No		Yes	
R ²	0.14		0.18		0.19	
Observations	2276		2276		2276	

Note: Mikrozensus 2008. The dependent variable is the number of children. The models are estimated using Ordinary Least Squares. Standard errors clustered at the country-birthyear level. Medium education: upper secondary degree or some professional training; High education: tertiary education; omitted reference category: no degree or the equivalent of the German Hauptschule and Realschule. *p<0.1, **p<0.05, ***p<0.01

Table A.31: Second generation, age 40 and above - Results with cohort fertility rates

	(1)		(2)		(3)	
Completed cohort fertility	0.14	(0.12)	0.03	(0.10)	0.47	(0.68)
Age			0.02	(0.02)	0.02	(0.03)
Medium education			-0.57*	(0.30)	-0.63*	(0.32)
High education			-1.53***	(0.42)	-1.51***	(0.44)
Intercept	1.39***	(0.27)	0.86	(1.12)	0.18	(1.23)
Bundesland Fixed Effects	No		Yes		Yes	
Country of Origin Fixed Effects	No		No		Yes	
R ²	0.01		0.21		0.23	
Observations	153		153		153	

Note: Mikrozensus 2008. The dependent variable is the number of children. The models are estimated using Ordinary Least Squares. Standard errors clustered at the country-birthyear level. Medium education: upper secondary degree or some professional training; High education: tertiary education; omitted reference category: no degree or the equivalent of the German Hauptschule and Realschule. *p<0.1, **p<0.05, ***p<0.01

Table A.32: Second generation, age 15 and above - Results with cohort fertility rates

	(1)		(2)		(3)	
Completed cohort fertility	0.59***	(0.07)	0.08	(0.06)	-0.04	(0.65)
Age			0.14***	(0.02)	0.13***	(0.02)
Age ²			-0.00***	(0.00)	-0.00***	(0.00)
Medium education			-0.35***	(0.05)	-0.34***	(0.05)
High education			-0.99***	(0.10)	-0.98***	(0.10)
Intercept	-0.48***	(0.14)	-2.27***	(0.29)	-2.06*	(1.21)
Bundesland Fixed Effects	No		Yes		Yes	
Country of Origin Fixed Effects	No		No		Yes	
R ²	0.05		0.46		0.46	
Observations	1745		1745		1745	

Note: Mikrozensus 2008. The dependent variable is the number of children. The models are estimated using Ordinary Least Squares. Standard errors clustered at the country-birthyear level. Medium education: upper secondary degree or some professional training; High education: tertiary education; omitted reference category: no degree or the equivalent of the German Hauptschule and Realschule. *p<0.1, **p<0.05, ***p<0.01

Table A.33: Generations 1.5 and 2, age 40 and above - Results with cohort fertility rates

	(1)		(2)		(3)	
Completed cohort fertility	0.37***	(0.04)	0.26***	(0.04)	-0.05	(0.40)
Age			-0.00	(0.01)	0.00	(0.01)
Medium education			-0.57***	(0.08)	-0.54***	(0.08)
High education			-1.39***	(0.17)	-1.39***	(0.18)
Intercept	1.02***	(0.11)	1.98***	(0.46)	2.29***	(0.62)
Bundesland Fixed Effects	No		Yes		Yes	
Country of Origin Fixed Effects	No		No		Yes	
R ²	0.07		0.18		0.19	
Observations	950		950		950	

Note: Mikrozensus 2008. The dependent variable is the number of children. The models are estimated using Ordinary Least Squares. Standard errors clustered at the country-birthyear level. Medium education: upper secondary degree or some professional training; High education: tertiary education; omitted reference category: no degree or the equivalent of the German Hauptschule and Realschule. *p<0.1, **p<0.05, ***p<0.01