DO THE MORE-EDUCATED PREFER SMALLER FAMILIES?

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Abstract

This study investigates the relationship between education and desired family size in Western Europe. Using rich individual-level data from the 1988 and 1994/95 wave of the DJI Familiensurvey we find that more-educated West German men and women are significantly *more* likely to desire three or more children and less likely to favor childlessness or the one child family compared to individuals with less schooling and training. The results are robust to multivariate analysis and replication with multinational data suggests that this relationship holds more broadly in Western Europe. Given that higher education is generally associated with lower realized fertility, the findings suggest that there is a particularly large gap between desired and actual fertility among the more-educated. We argue in favor of policies that facilitate the compatibility between family and career as they may allow more career-oriented individuals to have the family of two or more children that many of them still desire.

Keywords: Fertility Preferences, Desired Family Size, Education, West Germany, Western Europe

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1 INTRODUCTION

In most developed countries and particularly in Western Europe, total period fertility rates have fallen below replacement level and total cohort fertility rates have confirmed that the average number of children per woman is declining across cohorts (Frejka and Calot 2001). Consistent with the dramatic decline of fertility in Western Europe, recent survey data on fertility preferences suggest that the desired number of children may be falling across cohorts (Goldstein et al. 2003). Overall, desired family size has, however, remained close to the two-child ideal in most European countries (Lutz 1996, Goldstein et al. 2003) implying a significant, persistent and possibly widening gap between desired and actual number of children. For example, completed cohort fertility has fallen from 2.2 to 1.6 between the 1935 and the 1956 birth cohorts while the desired number of children is estimated to have declined from 2.5 to 2.2 across the same cohorts among West German women (see Figure 1). The gap between desired and realized number of children is interpreted by some as unmet demand for children (Chesnais 1996, 2000). Following this view, a better understanding of the characteristics of individuals who desire large families but find themselves unable to realize them is important since fertility behavior of these individuals is more likely to be responsive to policy interventions that remove obstacles to achieving desired family size targets.

While one dimension of the gap, observed fertility, has received a lot of attention in the literature, much less research exists on the determinants of desired family size in Western Europe. Specifically, fertility research has identified increases in educational attainment resulting from rising returns to human capital, improved access to the labor market and more effective contraception as a leading cause of fertility postponement and ultimately lower fertility, in particular among women (e.g., Kohler et al. 2002, Kreyenfeld 2002 for West Germany).[1] Whether a similar negative relationship exists between

[1] As illustrated in Figure 1, the share of West German women who attend college has increased across cohorts while

educational attainment and desired fertility, however, is not known. Understanding the extent to which education shapes family size preferences is important for the prospects of higher fertility in Europe. It addresses the question whether the downward trend in desired family size may be led by the growth in the share of the more-educated men and women. It also helps to understand whether low fertility among the more-educated is primarily the result of life course contingencies and structural constraints or whether it may simple be a reflection of the desire to have fewer children.

In this study, we analyze the relationship between educational attainment and family size preferences. We present evidence from two large individual-level surveys, one from West Germany in 1988 and 1994, and the other covering the EU 15 nations in 2001. In addition to descriptive findings regarding the association between education and family size desire, we examine the effect of education on desired family size in detail using a multivariate approach that controls for other possible determinants of desired fertility. The results reject the idea that the more-educated desire smaller families in West Germany and other parts of Europe. We find evidence that the more-educated prefer larger families compared to individuals with less education and training. The pattern is found across gender and age groups and the positive effect of education on the likelihood of desiring three or more children is robust to multivariate analysis in Western Europe. In light of a negative relation between education and actual fertility, our novel findings suggest that the expanding population of well-educated Western Europeans face particularly severe obstacles in achieving their reproductive goals. We discuss the implications for developing effective policy interventions.

completed as well as desired number of children has declined.

2 BACKGROUND

2.1 Measuring Fertility Preferences

The literature on fertility preferences in developed countries is broad and has its longest tradition in the United States due to data availability.[2] Depending on the scope of the study 'fertility preferences' are measured either using an instrument of (i) fertility/birth intention (e.g., "Do you plan to have a(nother) child?"), or on (ii) fertility desire or ideal (e.g., "What is your ideal number of children?"). The key conceptual difference between 'intentions' and 'desires' is that family size desires/ideals measure a person's preferred family size whereas intentions capture an individual's expected or planned fertility choice. Since (planned) fertility choices reflect the individual's ranking of possible family sizes *and* any constraints that may prevent the person from achieving the highest-ranking family size, 'fertility intentions' can differ substantially from 'fertility desires' in the presence of socio-economic or biological constraints. In other words, instruments that measure 'desired fertility' are most suitable to study 'fertility preferences' itself whereas instruments on 'intentions' are more useful to predict fertility behavior. A concern with family size desires/ideals instruments is that they may reflect societal norms rather than the individual's own preference (cf. Livi Bacci 2001).

The relationship between fertility preferences and fertility behavior has been an area of active research as documented below and preferences continue to play an important role in explanations of the fertility decline (Lesthaeghe and Surkyn 1988, Van de Kaa 2001). In our study, we investigate the role of educational attainment on a person's desired or ideal family size. The instruments for preference in the data-sets from West Germany and the EU 15 countries measure personal desired and personal ideal family size and hence are well-suited for our study of the individual's own family size preferences.

[2] For a survey of the literature on fertility preferences in developing countries see Pritchett 1994.

2.2 What Shapes Family Size Preferences?

Early theories of fertility have taken a static view of family size preferences (Becker 1960, Willis 1973). According to this view individual's fertility preferences are shaped early in life and remain constant throughout the reproductive career. More general theories of fertility preferences adopt a dynamic perspective (Modell, Furstenberg and Hershberg 1976, Hogan 1978, Elder 1985) and emphasize the importance of life course events and constraints (Nambodiri 1983, Westoff and Ryder 1977, Westoff 1981) as well as the role of social interactions (Kohler 2001) in the formation of fertility preferences. While family background factors and early influences of family norms can still play a role in the dynamic view, they may be mediated by major life course events and experiences. In particular, childbearing events have been found to strongly influence fertility preferences (Monnier 1987, Miller and Pasta 1995).

As discussed in more detail in the next section, existing research on the education-preference relationship is limited. Why would we expect desired family size to differ by educational attainment? Since higher educational attainment has been associated with low fertility one might expect that more-educated men and women have 'balanced' their preferences for different family-size types with their ambitions and possibilities in the workplace. In that case, we expect that the more-educated prefer smaller families. On the other hand, more education may translate into a greater willingness to have a larger family as a result of increased skill and confidence. In this case, the more-educated may state a greater desire to have a large family compared to their less-educated counterparts.

In this study, we employ multivariate analysis to test for an effect of education on preferences using three sets of additional possible determinants of preferences: (1) individual background characteristics such as gender, age, religion, attitudinal measures; (2) family background influences such as parents' educational attainment and the presence of siblings in the family; (3) life course and contemporaneous experiences including marital status and partnership history, actual number of children, health status,

household income, labor force status, and residency.[3] Following the static view, we would expect that life course experiences including schooling and training contribute little to preference formation compared to social and family background factors.

2.3 Previous Evidence

Most research on fertility 'intentions' and 'desires' has focused on the determinants of the difference between fertility preferences and realizations in different populations (fertility intentions/expectations: Schoen et al. 1999, Joyce et al. 2002, Quesnel-Vallée and Morgan 2003 (all US), Symeonidou 2000 (Greece), Menniti 2001 (Italy), Noack and Østby 2002 (Norway); desired/ideal family size: Coombs 1979, Thomson et al. 1990 (all US), Löhr 1991, Heiland and Prskawetz 2003 (all West Germany), Van Peer 2002 (9 European countries); fertility intentions and family size desires/ideal: Freedman et al. 1980, Hendershot and Placek 1981 (collective volume), Thornton et al. 1984, Thomson 1997 (all US)).[4] Multivariate studies of the gap between stated and realized fertility typically include measures of educational attainment. The interpretation of education effects obtained in this way is complicated by the fact that it is unclear whether the estimated effect is the result of correlations that exist between education and preference, between education and the constraints, or both.[5]

Few studies have looked at the effect of education on fertility preferences directly. In an early study, Hirsch et al. (1981) find a positive relationship between educational attainment of the parents or raisers and the desired family size of teenage women in the US. The prospect of below replacement fertility in Europe has increased the interest in fertility preferences here. Using fertility intentions data from

[3] We note that due to limitations in the data used here the respondent's partner's or spouse's desired family size cannot be controlled for. There is evidence that spousal preferences have an effect on fertility preferences and actual fertility (e.g., Bumpass and Westoff 1970, Morgan 1985, Thomson et al. 1990, Thomson 1997, Van Peer 2002).

[4] Several authors have raised methodological concerns. The predictive value of preference data has been frequently critiqued (Blake 1966, Ryder 1973, Westoff and Ryder 1977, Ryder 1980, Lee 1980, Ryder 1981, Westoff 1981, Joyce et al. 2002, Walker 2003). Others have investigated the validity and comparability of measures (Morgan 1981, Morgan 1982, Bongaarts 1990, Van Hoorn and Keilman 1997).

[5] It is not surprising then that Van Peer 2002, for example, does not find a consistent pattern of the effect of education on the gap between desired and achieved fertility in FFS data from nine European countries (Austria, Belgium (Flanders), Finland, France, Hungary, Italy, Poland, Spain and Sweden).

Bulgaria and Hungary, Philipov et al. (2004) find no effect of educational attainment on the intention of ever having a first child for those without children but a positive effect on ever having a second child for those with one child. Engelhardt (2004) finds a positive but not statistically significant relationship between having the highest postsecondary degree ('Matura') and the total desired number of children among women in Austria. Individual-level evidence from Germany is mostly missing. Using 20 to 29 year old West German men and women from the 1988 wave of the DJI Familiensurvey, Löhr (1991) presents descriptive evidence of a polarization of preferences by the quality of the secondary degree. Among the group of individuals with the more advanced college preparatory high school degree stronger desire for more than two children as well as a greater desire for childlessness or the one-child family was found, compared to those with only a basic high school degree.[6]

To summarize, the existing empirical evidence is very limited but suggests that there may not be a negative relation between education and fertility intentions and desires. In light of the lack of systematic evidence, Huinink (2001), a prominent observer of the fertility trends of more-educated women in Germany, has emphasized that "...- we need much more research on the intention issues - they [more-educated women] show a fairly high level of fertility intentions and with only a small percentage of women expecting to stay childless over time". We extend previous research by examining the effect of education on fertility desires using data from West Germany in 1988 and 1994 and the EU 15 countries in 2001. We present descriptive as well as multivariate evidence using the rich German data and we replicate the multivariate analysis in the weaker but more recent multinational data.

3 DATA AND METHODS

The data for this study were taken from the 1988 and the 1994/95 wave of the West German Familiensurvey of the German Youth Institute (DJI Familiensurvey 1988, 1994/95) and the 2001 Euro-

[6]Using data from East and West German 1961-1972 birth cohorts from the 1992 Family and Fertility Survey, Kreyenfeld (2001) finds that East Germans are more certain to want children and they want to have their first child earlier in life, they are less likely to want a large family compared to West Germans.

barometer (EUROSTAT 2001).[7] The West German data are rich in terms of measures and sample size while the Eurobarometer data are more current and enable us to replicate the analysis for West Germany within the EU 15 countries.

3.1 West German Data

The first wave of the DJI Familiensurvey gathered data on 10,043 individuals from a random sample of German citizens of age 18 to 55 in 1988 who resided in West German households. The sample obtained during the 1994/95 wave contains 6,999 German citizens of ages 18 to 61 who resided in West Germany. 4,997 of the respondents in the second wave are individuals who were also interviewed in the first wave while the remaining 2,002 respondents were randomly sampled from the West German 18 to 30 year old residence population. A comparison to German census data has shown that men are slightly under-represented in both surveys. In the first survey singles are under-represented whereas they are slightly over-represented among the newly sampled 18 to 30 year-olds. Among individuals interviewed for the second time in 1994/95, women and married individuals continue to be over-represented.[8] The over-representation of women is not a major concern since we conduct our analysis separately for men and women. The sample used in the multivariate analysis below pools the samples from the two waves. To account for potential systematic variation due to attrition of individuals who are part of the longitudinal study, we include a binary indicator to control for individuals who are in both survey waves in addition to an indicator for survey year.[9]

To obtain a sample of individuals with a more homogenous parental background we only included individuals who grew up with at least one parent (excludes 511 initial respondents or 3%).[10] In addition

[7] Unfortunately data from the most recent survey round (DJI Familiensurvey 2000) cannot be used in this study since the question on desired number of children does not compare to the earlier waves.

[8] The details on the sample construction and the comparisons to census data are documented in Bender et al. (1996).

[9] In the multivariate results the standard errors are corrected for clustering to account for repeated observations for individuals who are interviewed in both waves. In additional analyzes using (a) only one occurrence for panel members and (b) only the members of the panel we found qualitatively similar results to those reported here based on the full sample. These results are available from the authors on request.

[10] We also conducted the analysis with the full sample and find qualitatively similar results. These results are available

the sample excludes cases with missing values for desired children (809 initial respondents or 4.7%), educational attainment or training (18), health status (30), labor force status (116), actual number of children (2), and traditional values (112). The final sample consists of 8,616 women and 6,913 men. Table 2 presents the definitions of the variables and the corresponding summary statistics in the sample of all women and all men and for the subsamples of women in their prime reproductive ages (age 18-35; column 3) and in the 1994 wave (column 4). The measures used in the analysis are discussed in detail in the following sections.

Measure of Family Size Preference

In both waves of the survey the total number of desired children can be computed for every respondent. In the 1994/95 wave all respondents were asked: *Q20(1994/95). If it was entirely up to you, how many children in total would you like to have or liked to have had?* The answers are coded on a scale with a minimum of zero and a maximum of four or more children.[11] In the 1988 wave of the survey the same question was only given to respondents who either had children at the time of the interview (”yes” on Q8(1988)) or those without children who answered ”yes” or ”depends” to the following question: *Q9(1988). Would you like to have children or would you have liked to have children?*. Based on the answers to this set of questions in 1988 and question *Q20(1994/95)* in 1994/95, we generated the variable ’Desired’ (cf. Table 2) with scale ”none”, ”one”, ”two”, ”three” and ”four or more”. For the 1988 round we classified individuals who answered ”no” in *Q9(1988)* as ”none”.[12]

The dependent variable measures the individual’s own preference for family size and is based on a question that explicitly invites individuals to answer for themselves (”*if it was entirely up to you*”).[13]

from the authors on request.

[11]Comparison with a similar measure in the 2001 Eurobarometer indicates that this data limitation of a cut-off point at four children is marginal since only 1% of the respondents reported personal ideal family size above four. The maximum family size reported in the Eurobarometer for West Germany is seven children.

[12]Morgan 1981, 1982 suggests that respondents who answer ”don’t know” to questions relating to fertility intentions are an important group that should not be discarded. Unfortunately, in the DJI Familiensurvey a distinction between ”don’t know” and missing for other reasons in *Q19(1988)/20(1994/95)* cannot be made. Hence, we do not include this group in our analysis.

[13]As stated above respondents without children answered the question *Q9(1988)* which does not make that qualification.

Other surveys such as the 2001 Eurobarometer (EUROSTAT 2001) provide a similar measure of personal desired family size based on the instrument: "*personal ideal number of children*". We will attempt to partly replicate the analysis of fertility preferences in West Germany using the Eurobarometer data below.

As shown in Table 2 the two child family is the most common desired family size. In our sample the average desired number of children is 2.2 for women and 2 for men. Only between 5 and 7% of the respondents state childlessness as their ideal, and only 10% desire a one child family. More than half of the respondents prefer the two child family, about 20% desire three children and between 6 and 11% desire four or more children. Table 2 illustrates the decline in desired fertility. The average number of children for 18-35 year old women is 2.12 compared to 2.21 among all women (age 18-61). A decomposition by desired parity shows that this is the result of a slight increase in preference for being childless and having two children at the expense of a three child (or more) family. There is no evidence of systematic differences in fertility preference between the two survey waves. The desired number of children and its distribution for the women in 1994 differ only marginally from the overall averages.

Educational Attainment and Other Explanatory Factors

We constructed six binary indicators to measure different levels of completed education at the time of the interview: (1) no high school degree, (2) lowest or middle track high school degree ('Volks-/Hauptschule' or 'Realschule'), (3) lowest or middle track high school degree with job training/apprenticeship ('Lehre', 'Berufsfachschule', 'Volontariat', 'Laufbahnprüfung', or equivalent), (4) college preparatory (college track) high school degree ('Fachhochschulreife' or 'Hochschulreife'), (5) college preparatory high school degree with training, (6) and college degree or higher ('Fachhochschule', 'Universität' or equivalent). The ranking is based on the level of *general* schooling (basic

We do not expect that this lead-in question causes measurement error in our dependent variable since respondents affected by the qualification would likely be in the "depends" category and hence also answer *Q19(1988)*. In any case, measurement error of this type would be accounted for by the survey year dummy in the analysis below.

secondary=ISCED2A, upper secondary=ISCED3A, tertiary/college=ISCED5A/5B/6) differentiated by additional vocational or job training programs.[14] For individuals who were still participating in a program at the time of the interview (about 14% of women in 18-35 age group) we code the highest completed attainment at the time and control for non-completion via the labor force status indicator 'In School'.

The most common educational attainment in the data is the combination of basic high school degree and a job training program. The share of women in this category is 57% compared to 60% among men. On average men have a slightly higher educational attainment than women. We see that 20% of the women stopped acquiring education after receiving a basic high school diploma compared to only 9% of the men. About 2% of the respondents report that they have no high school degree at all.[15] 15% of men graduated from college compared to 9% of women. For more recent cohorts the fraction receiving higher educational attainment is rising and the educational gap between men and women is narrowing (Table 2, column 1 vs. column 4).

To distinguish the effect of education of the respondent from influences that are transmitted through the parents, we account for the educational attainment of the respondent's parents in the multivariate analysis. The measures of parents' attainment are constructed similar to the measures for the respondent and are described in Table 2.

To account for realized parity at the time of the interview, we use a measure of the number of children of a respondent that reflects biological and non-biological (step, adopted and foster) children.[16] The fraction of non-biological children of all children in the sample is about 4% (3% step, 0.5% adopted, 0.5% foster). We replicated the analysis for the measure using biological children only

[14]The ISCED codes stand for the education attained according to the International Standard Classification of Education. For a helpful summary of the German education system see: http://www.ed.gov/pubs/GermanCaseStudy/chapter1a.html.

[15]This is consistent with the German Mikrozensus where 2.2% of respondents 15 and older who are not currently enrolled report that they did not obtain a high school degree in 1996.

[16]Actual family size at the time of the interview was measured in the survey based on the lead-in question, *Q8(1988)/Q8(1994/95). Do you or did you have children? I am interested in your own, step, foster and adopted children as well as the children of your partner, those who live with you*, and the follow-up question: *Q10(1988)/Q9(1994/95). How many children do you have? Please also include in your count children that no longer live in your household or are no longer alive*.

and did not find noteworthy differences.[17]

We find that 28% of the women are childless and 23% have one child. One in three women has two children and 16% have more than two. Women who are in their prime reproductive ages have not yet completed their fertility, hence the distribution is shifted towards lower parity. In the estimation we investigate the sensitivity of the effect of actual on desired family size by controlling for respondents' age and by estimating the relationships for different age groups separately. The descriptives also show that women have more children than men, which is expected since the average age of men and women is similar in the survey while the mean age at childbirth is lower for women than men (e.g., Bytheway 1981).

In the multivariate analysis below, we also control for independent effects of respondents' age. It may be a proxy for otherwise uncontrolled-for life course experiences that are correlated with age and absorbs potential cohort effects.[18] We also include a binary indicator for whether or not the respondent was interviewed in the first survey year ('Surv 88'). It accounts for systematic variation between the survey waves such as potential differences in survey procedures or period effects that might otherwise be captured by the age measures. Additional factors that may exercise independent effect on preferences considered in the multivariate analysis are the number of siblings, broken home experience, income, labor force status, marital and relationship status and history, religion, health status, scales for materialistic (Inglehart scale) and traditional views. Explanations of these variables and sample descriptives are given in Table 2.

[17] The estimated effects of education on desired fertility reported were almost identical. The results are available from the authors upon request.

[18] For example older respondents may report higher desired number of children than younger ones since they are now more aware of the potential benefits of having children. One would need data on the same age group(s) over time to clearly identify cohort effects independently of life cycle or age effects. This difficulty in identifying cohort effects is common to all preference studies using a single cross-section but one finds that it is rarely acknowledged.

3.2 EU 15 Country Data

To examine if the relationship between education and desired family size also holds more broadly in Western Europe, we also present multivariate evidence from the 2001 Eurobarometer (EUROSTAT 2001). This data-set contains individual-level information on a representative sample of approximately 1,000 respondents for each of the countries[19] of the EU 15 (West Germany, East Germany, Austria, Finland, Denmark, Belgium, Luxembourg, France, Greece, Italy, Spain, Ireland, UK, Netherlands, Portugal, Sweden). The survey allows us to conduct a comparative analysis of fertility preferences in the EU-15 countries since all respondents are asked the same set of background questions and a question about their personal ideal number of children that is closest to the one we use above: *Q61. And for you personally, what would be the ideal number of children you would like to have or would like to have had?*[20]

The drawbacks of these data are that only a few explanatory factors are available and the measure of education varies from the data set analyzed above. Unlike in the DJI Familiensurvey information on family background factors (parent's education, siblings, broken home), attitudes, belief, unemployment, is not available in the Eurobarometer. Moreover, the survey asks for the respondent's age when full-time education stopped instead of his or her completed educational programs.

Nevertheless the data enable a partial replication and extension of the analysis for West Germany. We construct the categories of educational attainment 'no high school completion', 'completion of high school', '(some) first stage tertiary education completed', or 'second stage tertiary education (advanced research qualification) completed' by relating the survey information on the age when full-time education stopped to each country's typical entry age for upper secondary programs (ISCED3A) and second stage tertiary programs (ISCED6) from the 1997 International Standard Classification of Education (ISCED-1997) report. In the analysis below, we also control for country/region effects and a similar but less detailed set of socio-economic measures as available in the West German data.

[19] The populations of East and West Germany are sampled separately.

[20] A detailed discussion of the data can be found in Goldstein et al. 2003.

3.3 Methods

We present descriptive and multivariate results from the West German data and replicate the multivariate results using data from the EU 15 nations.

In the multivariate analysis, we models individual's desired family size as the outcome of a Multinomial Logit (MNL) discrete choice problem (Theil 1969, 1970, McFadden 1974). This modelling strategy is motivated by the idea that family size preferences correspond to distinct family type categories (or life styles). The advantage of the MNL model is that it allows the effect of the covariates on the desired number of children to vary by family type. In particular, using this approach we allow for the possibility that education may have a positive effect on both the probability of desiring childlessness, and on the probability of desiring three or more children relative to desiring two children.[21] We consider a model with four desired family size outcomes (d): no children (d=0), one child (d=1), two children (d=2), or three or more children (d=3).[22]

We will present the empirical results using the complementary odds-ratio and the total probability form of the MNL model. Following standard procedure, we use the most frequent category, i.e. the two child family (d=2), as reference or base category for the odds-ratios. The probability that family size type j ($j\varepsilon\{0,1,3\}$) is chosen takes the following form

$$P(d=j|x,\beta) = exp(x\beta_j) / \left[1 + \sum_{h\,\varepsilon\{0,1,3\}} exp(x\beta_h)\right], \quad j=0,1,3 \tag{1}$$

where x is a set of explanatory variables and β_j is the coefficient vector associated with preference type j. Since the response probabilities must sum to unity, for identification the probability of the base

[21] For example, the distribution of actual fertility by parity shows more clustering at childlessness for more-educated women in several European populations including West Germany (Huinink 2001, Dorbritz 2003). Descriptive evidence has suggested that fertility preferences of West German women also shows a pattern of polarization by education (Löhr 1991). Any estimation strategy that uses desired family size as a continuous or ordinal measure would impose an undesirable structure in the presence of such non-linear effects of education on preferences.

[22] We also conducted the analysis using five family size types: 0=childless, 1=one child, 2=two children, 3=three children, 4=four or more children. Since this more general specification did not appear to shed much additional light on the determinants on the upper desired parities but makes the exposition more difficult, we decided to report the specification based on four family types only. However, the results are available from the authors on request.

category ($j = 2$) is normalized to

$$P(d = 2|x, \beta) = 1/\left[1 + \sum_{h\,\varepsilon\{0,1,3\}} exp(x\beta_h)\right]. \tag{2}$$

To interpret the effect of a change in any covariate, x_k, on desired family size, we first note that the log-odds-ratio is defined by

$$\ln \frac{P(d = j|x, \beta)}{P(d = 2|x, \beta)} = x\beta_j, \quad j = 0, 1, 3. \tag{3}$$

From expression (3) it is easy to see that the change in the log-probability ratio due to a one unit change in the explanatory variable x_k is $\beta_{j,k}$. Hence, a *positive* estimate $\beta_{j,k}$ implies an increasing relationship between x_k and the log-odds of having family size ideal $d = j$ relative to the base category of the two-child family ideal. Also, this effect is greater the larger the coefficient. The odds-ratios are used to indicate the dynamics among the different family type preferences.

We note that in the MNL model the magnitude and even the direction of a change in a covariate can depend on the remaining covariates. To illustrate the magnitude of the effects of educational attainment on desired family size we present the predicted distributions of desired family size assuming that all individuals have the same educational attainment and using the individual data for all other covariates.

A key property of the MNL model is that the outcome categories satisfy Independence of Irrelevant Alternatives (IIA). IIA requires that the exclusion of alternative categories does not change the effect that a covariate has on the odds-ratio of a category. In our context, it means, for example, that we assume that the effect of educational attainment on the chances of favoring the one child over the two child family is the same regardless of whether or not desiring childlessness or the three-or-more child family is included in the model (cf. expression (3)). Based on Hausman tests (cf. Hausman and McFadden 1984) we found no evidence that the IIA assumption is violated in our data.[23]

[23]For example, we investigated the validity of the IIA assumption in the West German data by testing for equality of the effects on the risk of favoring the one child family over the two child family using estimates from the full model and a model that excludes the childless and three-or-more categories. In the pooled sample of women the χ^2 distributed test statistic was 42.8 which falls short of the critical value of 82.53 that corresponds to the 5% significance level (given 63 degrees of freedoms). As a result the null hypothesis of equality (validity of IIA) could not be rejected. Additional results

A difficulty in estimation arises if desired fertility affects realized family size directly. The estimated effect of having children on desired family size would overstate any independent positive effect that childbearing and rearing might have. In that case realized fertility should be a good predictor of desired family size and hence strongly influence the estimated effects of the other covariates. In other words the effects of other variables may not be robust to specifications with and without accounting for realized number of children. To investigate this aspect, we report estimated effects for specifications with and without controls for realized family size. We note that these differences are expected to be particularly strong for respondents who have completed their fertility. Hence we only present estimates by age groups.[24]

4 RESULTS

4.1 Descriptive Results

Table 1 displays the average desired number of children by educational attainment. The averages suggest that better-educated men and women often desire more children on average than the less-educated. For example, the desired family size for college-educated women of age 36 to 45 is 2.27 compared to 2.16 for women with only a high school degree and training. For older cohorts the effect is even stronger. Figure 2 shows that about 40% of all college-educated women would like to have a family of three or more children compared to only 30% of women whose highest education is a high school degree or a high school degree with training. Among men this difference is almost 12 percentage

are available from the authors on request.

[24]Identification of the effect of having children on desired family size is a different issue. If actual fertility is determined by desired fertility or the same (unobserved) characteristics as desired fertility then it is potentially statistically endogeneous and its coefficient needs to be interpreted with caution. For example, women with above-average, but unobserved, preferences for large families are likely to have higher completed fertility as a result. In that case the estimated (positive) effect of realized family size on the odds of desiring a large family overstates any true underlying causal effect that experiencing a(nother) child may exercise on family size preferences. However, the controls for family background and attitudes such as education of the parents, number of siblings, religious orientation, gender role and political attitudes proxy for family-related preferences and tastes thereby helping to purge the coefficients of potentially endogeneous variables such as the existing number of children of omitted variable bias (cf. McCallum 1972).

points.

4.2 Multivariate Results

4.2.1 West Germany

Table 3 reports the estimated MNL education effects for women by age groups on the log-odds ratios of desired family size. The results are reported not controlling for actual number of children (columns 1-3) and controlling for it (columns 4-6) to assess the robustness of the effects to the specification. The reported standard errors are robust using a Huber-White variance estimator that accounts for clustering due to individuals who are in both survey waves. The comparable specifications for men are presented in Table 5.[25]

As discussed above the reference category for the choice probabilities is the two-child family size ideal, and the coefficients are the effects of unit changes on the log-odds of favoring a family of 0 or 1 child over the two child family (columns titled '0' or 1') and on the odds of favoring a family of more than two children over the two child family (columns titled '$3, 4+$'). The reference categories are individuals with strong post-materialistic views ('PPM'), basic high school diploma with job training ('HS+Training'), currently employed, a monthly household-level income between 2,000 and 4,000 Deutschmarks, one actual child (where applicable), married and living together ('Marriedt'), mother and father with a high school diploma and job training, and no siblings.[26]

To illustrate the magnitude of the education categories, the effect of unit changes on the predicted probability of each desired family size are presented in Table 4 for women and in Table 6 for men. The predictions are based on the estimates from models with control variables.[27]

[25] We only report the estimates of the education effects. Detailed tables are presented in a working paper version of this manuscript made available by the authors on request.

[26] We control for missing cases for income, Inglehart scale, parents' education, and siblings. We also account for potential survey year effects and for systematic attrition by including a binary indicator for individuals who are member of the panel and did not attrite. In both cases we do not find strong evidence of such effects.

[27] We conducted further sensitivity analysis to determine the robustness of the education pattern. We obtained estimates from the sample for the first wave and the second wave of the survey separately. The magnitude of the effects of higher education on desired fertility was essentially unchanged. We also checked the sensitivity of the results to the definition

The models fit the data moderately well with (pseudo) coefficients of determinations, R^2, ranging from 0.06 to 0.27. The best fits are obtained in models that control for actual number of children by order. In the latter case most effects of the remaining covariates are not dramatically changed suggesting that these factors have strong underlying effects on preferences. Overall, we find that both background and contemporaneous factors play a role in shaping fertility preferences supporting the idea that preferences are responsive to life course events.

Women's Desire for three or more Children

The results show that on average women with higher educational attainment prefer the three-or-more-child-family over the two child family. For example, a college educated women in the 36-45 age group is about 60%[28] more likely to favor three or more children over two children compared to a women with the reference education of basic high school degree and job training (Table 3, columns 3 and 6). The effect of college degree on this odds ratio is of even larger for younger as well as older women. The estimates are statistically significant different from zero across age groups and for specifications with and without controls for actual number of children. Women with college preparatory degree and training are also more likely to favor the large family over the two-child family than women with less schooling but the coefficients are not individually significant except for women younger than 36.

The magnitude of the effect of education on the desire for large families is best illustrated by looking at predicted probabilities. Columns 4 and 8 in Table 4 report the predicted fraction of women in the respective age and educational group that desire three or more children. The predictions are obtained

of the age groups and the results did not display dramatic changes as the cut-off points varied. As mentioned above, we replicated the analysis using the biological children only and did not find noteworthy differences. Moreover, we investigated how the effect changes when certain control variables were dropped from the equation. Most importantly, we estimated the relationship without the respondent's parents' educational attainment and found that the education effects became slightly stronger.

[28]This change in the odds-ratio is obtained from exponentiating the reported log-odds coefficients and subtracting unity: $e^{0.456} - 1 = 0.58$ or 58%. In general we are computing $\frac{P(d=j|x_k=1,\beta)}{P(d=2|x_k=1,\beta)} - \frac{P(d=j|x_k=0,\beta)}{P(d=2|x_k=0,\beta)} = e^{1\cdot\beta_{j,k}} - e^{0\cdot\beta_{j,k}} = e^{\beta_{j,k}} - 1$ using Expression (3) to determine the change in the odds-ratio j over 2 due to x_k.

from the fitted model using the actual characteristics of each individual for all variables except from educational attainment. The resulting partial effects of education show a strong positive relationship between final degree/training and the desire to have at least three children. If all women had a basic high school degree and job training (the most frequent attainment in the sample) about 25% of the 18 to 35 year old would desire three or more children. If all women in that age group had a college degree then holding everything else constant almost 37% would desire such large families.

For the most part the effects are monotone within each age group so that the predicted differences between not having any high school degree and being a college graduate are found to be substantial. The ranges are somewhat smaller if we do not control for the actual number of children. It is interesting to note that with up to 20 percentage points difference (controlling for children), the differences between the extremes is largest among the oldest women (46 to 61), a group that must have completed fertility already. The results suggest that while the effect of education on the desire to have a large family is strong within each age group it may become smaller across cohorts.

Women's Desire for Childlessness and One-Child Family

We now turn to the desire for family types with fewer children than the two-child family, i.e. childlessness and the one-child family. About 10% of the women in the sample desire the one-child family arrangement and 5% wish to remain childless. Comparing the one-child family to the two-child family we find that the odds of favoring the one-child family over the two-child family is smaller for women with more education. While the individual coefficients are only statistically significant for the youngest women the direction of the effects is consistent with a positive association between education and family size. The predicted probability distribution confirms this interpretation: the fraction of women who desire the one-child family tends to be higher for lower-educated women. For example, if all women in the 46 to 61 age group were college-educated 5% would desire only one child compared to 10% if all women had only a basic high school degree.

The estimated effect of education on the preference for childlessness over the two-child-family

mostly shows the expected pattern: for attainments below (above) the reference education category the effects on the log-odds ratios are positive (negative) indicating that the desire for childlessness is more (less) common among less (more) educated women then more (less) educated women. However, some noteworthy exceptions exist among women who just completed or are about to complete their fertility (36-45 group). The estimates for college preparatory school with training and for college are positive (Table 3, columns 1 and 4). While the estimates are not statistically different from zero, which may be due to noisy data, the sign suggests that the desire for childlessness is higher for women with high educational attainment compared to women with a basic high school degree and training. The predicted family size distribution confirms that for the youngest and the oldest cohorts in the sample education and childlessness are negatively associated but for the intermediate age group the relationship appears to be u-shaped. Apart from the effect on childlessness for this age group there is no evidence of a polarization among better-educated women. The polarization towards the end of the reproductive span is likely the result of increased heterogeneity within educational groups as women with career jobs try to cope with increasingly demanding trade-offs between family life and career.

Men's Family Size Preferences

Interestingly, we find the same striking pattern of the educational attainment effect on family size preference among men that we saw for women. For the discussion we recall that the distribution of desired number of children is different for men. Specifically, the 'average' male respondent is more likely to desire no, one or two children—at the expense of three or more children—than the average woman in the sample (e.g., Table 6, row 1).

Men who obtained a college degree or graduated from a college preparatory high school with or without training are less likely to favor childlessness and more likely to favor three or more children than those with lower attainments. As for women, the effect on larger family size among college-educated men is particularly visible: predictions show that these men are around 10 percentage points more likely to favor three or more children than men with a basic high school degree and training (the

reference group). The pattern is less visible for the effects on the preference for a large family for men between age 36 and 45. However, it is found also for this group if one only considers categories two children or more versus less than two.

4.2.2 Countries of the EU-15

Table 7 shows the multinomial logit coefficients of the effect of educational attainment on the personal ideal number of children for 5,949 women in different age groups from the EU-15. The reference category for the education effects in Table 7 is the lowest attainment, no completion of upper secondary education. The reference category is also the most common attainment in the sample (column 1). Within the data limitations in the Eurobarometer we attempted to make the specification comparable to Table 3. The many positive and statistically significant coefficients of higher educational attainments (ISCED3A or higher) on the odds of favoring three or more children over the two-child family suggest that on average better-educated women in the EU-15 are more likely to consider a large family as personal ideal than those without upper secondary education. Also consistent with a positive effect of education on family size ideal is that the EU-15 women with higher educational attainment are more likely to favor the two-child ideal over the one-child ideal. However, this effect is only statistically significant for older women. Finally, for age groups 18 to 35 and 36 to 45 we find mostly positive effects of higher education on the odds of considering childlessness ideal relative to two children. While the estimates are small and not statistically significant they may indicate some polarization of fertility preferences among higher educated women.[29]

[29]To check the robustness of the pattern in Table 7 we also looked at models with a measure of the years of full-time schooling. Using this continuous variable and its square we found the same positive association between education and a family size ideal of three or more children. The models for the men of the EU-15 show a similar pattern. These additional results are available from the authors upon request.

5 DISCUSSION

Since more schooling and training helps to attain career opportunities and financial independence, one might expect that more-educated men and women have substituted traditional preferences of a family-oriented life style with other ideals such as a professional career. This study of desired family size in Western Europe documents that this is not the case. Descriptive findings from West Germany reject the notion that education has a negative association with desired number of children. We find that higher educational attainment is associated with an elevated desire to have a large family in West Germany. Controlling for various background and contemporaneous factors including the realized number of children, we find the effect of education on desired family size to be remarkably consistent. It is found for men and women alike and across age groups but may have weakened among more recent cohorts in West Germany. In particular we document a substantially greater desire for the three-or-more-child-family among graduates from college preparatory high schools and college graduates compared to those with lower educational attainment.

Evidence from a recent survey in the EU 15 nations also rejects the idea that the more-educated prefer smaller families. While the multinational results are not readily comparable to those obtained from the rich West German data due to data limitations, our findings suggests that the positive relationship between educational attainment and family size preferences found in West Germany may hold more broadly in Western Europe. The documentation of a positive effect of education on desired family size is novel and our interpretation remains tentative. More formal education may lead to a greater willingness to have a larger family as a result of skills and confidence gained through the educational experience.

The existence of a positive relation between education and desired number of children has important implications in light of rising educational attainment and labor force participation (especially among women) in developed countries and evidence that the more-educated realize smaller families on average. The fact that the better-educated desire large families but realize small ones suggests that they face

particularly difficult family choices. They may be subjected to constraints that make the realization of the kind of family life that they desire impossible. For example, in West Germany, the magnitude of the gap between desired and realized fertility can be substantial as illustrated in Table 1 for age groups that are about to complete or have completed fertility. More than half of the college-educated women in the age group 46 to 61 desire more children than they realized, compared to 24% (36%) among women with a basic high school degree (high school degree and job training).

At a time when many industrialized societies, and Germany in particular, are beginning to face the social and economic consequences of sustained below replacement fertility, this study identifies a key demographic group that may (still) have high 'unmet demand' for children. Since the better-educated have on average more career opportunities and are hence more likely to spend time in the labor market, policy interventions that ease the incompatibilities between jobs and children may help narrow the gap between desired and realized family size. For example, public policies in West Germany have favored the traditional family type of breadwinning husband and homemaker wife (e.g., Brewster and Rindfuss 2000). Given the positive trend in female tertiary enrollment (cf. Figure 1) and the resulting increase in female labor force participation, these policies may be increasingly ineffective in addressing the concerns of the population.

Many of the interventions that have been discussed in the low fertility literature seem particularly important in light of our findings (e.g., Kohler et al. 2002, Rindfuss et al. 2003, DiPrete et al. 2003, Kreyenfeld 2004). Policies that facilitate the reentry into the labor market after childbearing, allow for more flexible work schedules, and that provide wider access to affordable childcare appear most likely to allow the more career-oriented individuals to have the family of two or more children that many of them still desire.

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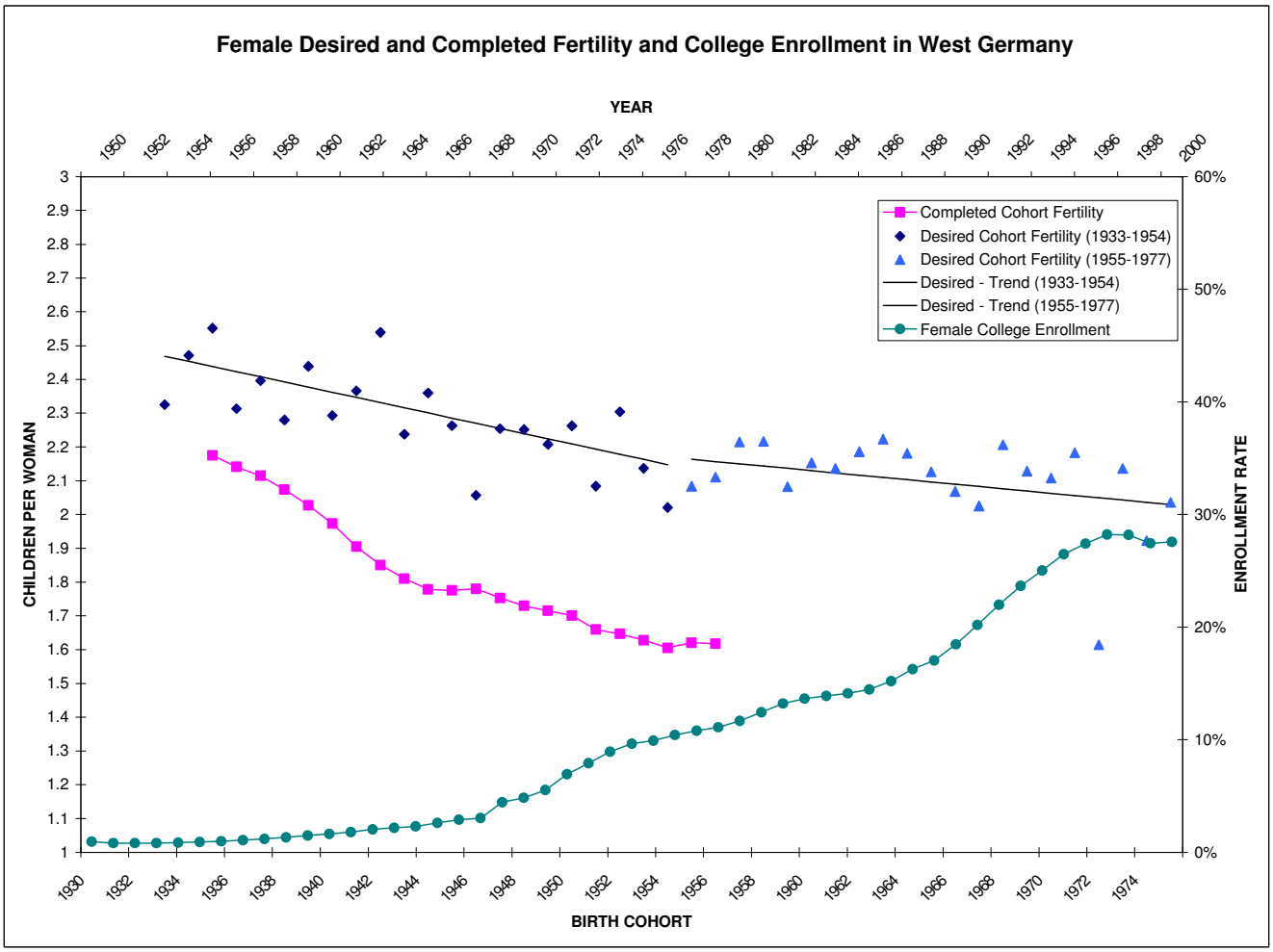

Figure 1: Desired and Actual Number of Children of Selected West German Female Cohorts, and Female College Enrollment Rates. (Sources: DJI Familiensurvey 1988 and 1994/95; Statistisches Jahrbuch der Bundesrepublik Deutschland various years)

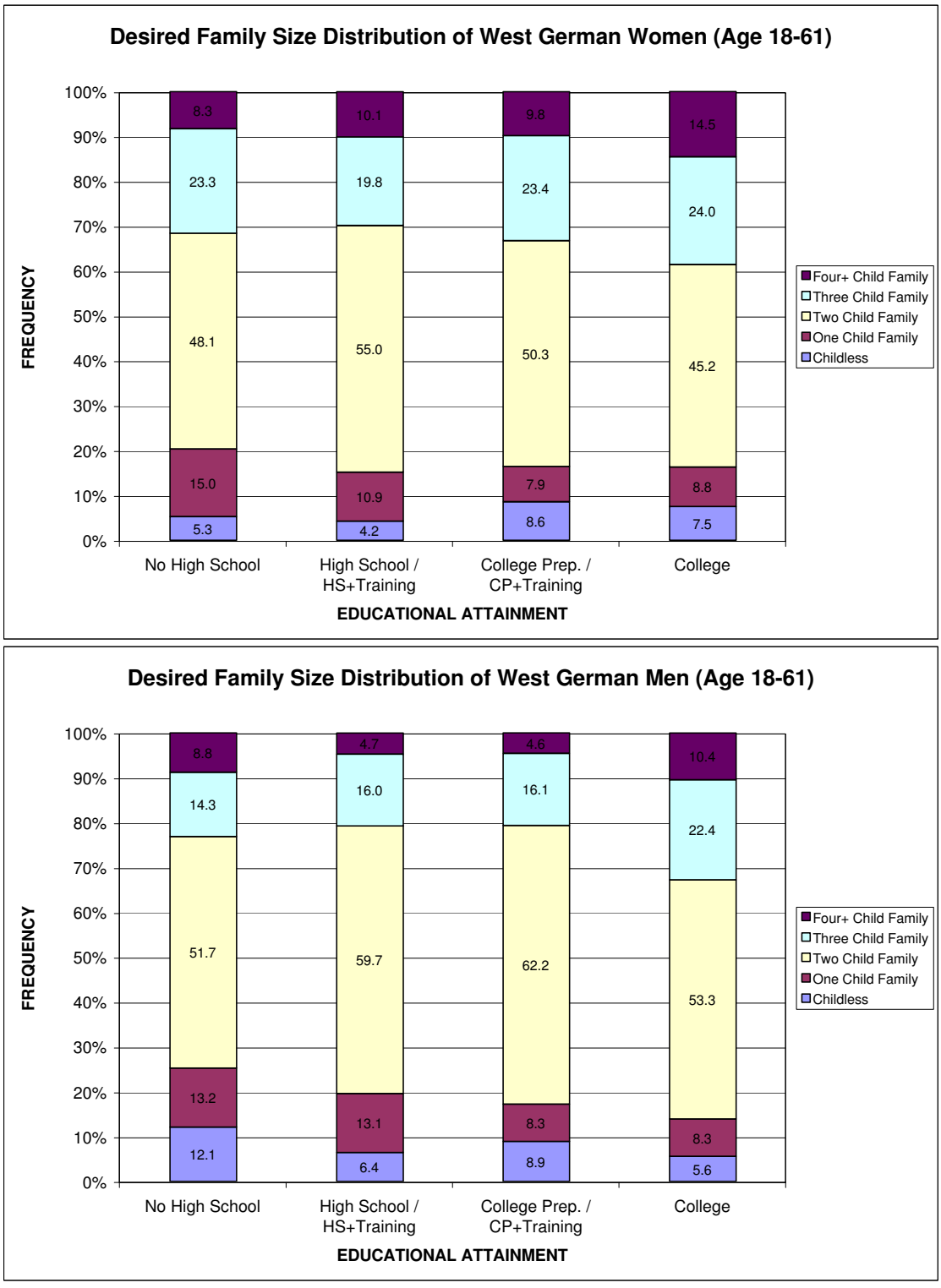

Figure 2: Distribution of Desired Family Size of West German Men and Women by Educational Attainment (Source: DJI Familiensurvey 1988 and 1994/95)

Table 1: Desired vs. Realized[a] Number of Children in West Germany by Education, Gender and Age

Group	Average	No HS	HS	HS+Training	CP/CP+Training	College
			Women: 36-45 Year Old			
Desired	2.20	1.96	2.28	2.16	2.25	2.27
Realized	1.78	1.71	2.02	1.76	1.66	1.66
Gap	0.42	0.25	0.26	0.4	0.59	0.61
Mean Absolute Difference	0.67	0.61	0.69	0.64	0.75	0.76
% Desired > Realized	**37.8**	**28.6**	**34.1**	**36.5**	**44.6**	**46.7**
% Desired < Realized	**9.2**	**7.1**	**14.6**	**8.8**	**5.4**	**5.9**
(N)	(2,261)	(28)	(378)	(1,437)	(112)	(306)
			Women: 46-61 Year Old			
Desired	2.38	2.15	2.37	2.37	2.52	2.55
Realized	2.07	2.32	2.32	1.97	1.87	1.71
Gap	0.31	-0.17	0.05	0.4	0.65	0.84
Mean Absolute Difference	0.71	0.94	0.61	0.71	0.80	0.96
% Desired > Realized	**33.8**	**27.7**	**24.4**	**36.3**	**44.7**	**51.1**
% Desired < Realized	**14.0**	**29.8**	**20.2**	**11.6**	**6.4**	**4.9**
(N)	(2,205)	(47)	(672)	(1,251)	(94)	(141)
			Men: 36-45 Year Old			
Desired	2.02	1.95	2.08	2.00	1.91	2.13
Realized	1.58	1.74	1.44	1.66	1.25	1.52
Gap	0.44	0.21	0.62	0.34	0.66	0.61
Mean Absolute Difference	0.66	0.63	0.81	0.60	0.85	0.73
% Desired > Realized	**37.1**	**26.3**	**50.0**	**33.6**	**44.5**	**42.2**
% Desired < Realized	**8.7**	**21.1**	**6.0**	**10.0**	**7.0**	**5.3**
(N)	(1,580)	(19)	(84)	(1,010)	(128)	(339)
			Men: 46-61 Year Old			
Desired	2.15	2.16	2.16	2.08	2.25	2.40
Realized	1.85	1.79	1.79	1.85	1.87	1.87
Gap	0.30	0.37	0.37	0.23	0.38	0.53
Mean Absolute Difference	0.64	0.79	0.63	0.62	0.67	0.73
% Desired > Realized	**31.1**	**42.1**	**30.5**	**29.4**	**32.1**	**37.0**
% Desired < Realized	**13.1**	**21.1**	**10.6**	**14.7**	**11.9**	**7.7**
(N)	(1,843)	(19)	(151)	(1,265)	(84)	(324)

Notes: [a]Due to data limitations 'Desired Number of Children' is measured on a scale from zero to 'four or more'. For consistency the scale for 'Actual Number of Children' is chosen accordingly.

Table 2: Means of Variables (West Germany)

Variable Name	Definition	Sample Mean[a] Women	Men	Women 18-35	Women 1994
Children					
Desired	total desired number of children	2.21	2.03	2.12	2.21
None Desired	desired no children	0.05	0.07	0.06	0.05
One Desired	desired one child	0.10	0.12	0.10	0.10
Two Desired	desired two children	0.53	0.59	0.57	0.54
Three Desired	desired three children	0.21	0.17	0.19	0.20
Four+ Desired	desired four or more children	0.10	0.06	0.08	0.11
Actual	total actual number of children	1.43	1.09	0.90	1.44
No Child	has/had no child at time of interview	0.28	0.43	0.48	0.28
One Child	has/had one child at time of interview	0.23	0.19	0.23	0.22
Two Children	has/had two children at time of interview	0.33	0.26	0.23	0.34
Three Children	has/had three children at time of interview	0.11	0.09	0.05	0.11
Four+ Children	has/had four+ children at time of interview	0.05	0.03	0.01	0.05
Characteristics					
Catholic	respondent's religious affiliation is Catholic	0.42	0.42	0.44	0.42
Both Parents	grew up with both parents	0.88	0.88	0.91	0.88
Traditional	'women should work less in labor market than men'	0.10	0.14	0.07	0.08
Ingle Type[b] PPM	strong post-materialistic views on Inglehart Scale	0.30	0.35	0.35	0.29
Ingle Type PMP	intermediate post-materialistic views on Inglehart Scale	0.16	0.17	0.17	0.17
Ingle Type PMM	weak post-materialistic views on Inglehart Scale	0.10	0.09	0.10	0.11
Ingle Type MPP	weak materialistic views on Inglehart Scale	0.20	0.20	0.19	0.19
Ingle Type MPM	intermediate materialistic views on Inglehart Scale	0.12	0.10	0.10	0.12
Ingle Type MMP	strong materialistic views on Inglehart Scale	0.11	0.08	0.08	0.10
Ingle Missing	Inglehart missing	0.01	0.01	0.01	0.01
Health Status	self-reported health scale (1-5; 1=very good, 5=poor)	2.18	2.09	1.95	2.18
Education [c]					
No HS	has no high school diploma	0.02	0.01	0.01	0.01
HS	has only high school diploma	0.20	0.09	0.17	0.17
HS+Training	received high school diploma and training	0.57	0.60	0.54	0.58
CP	received only college preparatory diploma	0.05	0.07	0.09	0.05
CP+Training	received college preparatory diploma and training	0.07	0.08	0.11	0.09
College	graduated from university or technical college	0.09	0.15	0.08	0.10
Labor Force Status					
Employed	in labor force and employed	0.53	0.80	0.53	0.59
Unemployed	in labor force and unemployed	0.03	0.03	0.03	0.03
In Household	not in labor force and at home	0.32	0.00	0.26	0.26
In School	not in labor force and in school	0.07	0.11	0.14	0.08
Other Status	not in labor force and other activity (incl. retired)	0.04	0.05	0.04	0.04
Income [d]					
Income 0-2	household monthly real disposable income is 0-2000	0.18	0.14	0.24	0.16
Income 2-4	household monthly real disposable income is 2000-4000	0.61	0.62	0.61	0.50
Income 4+	household monthly real disposable income is 4000+	0.21	0.24	0.15	0.34
Inc Missing	household disposable income info missing	0.11	0.10	0.12	0.12
Survey 88	respondent is in 1988 wave of the survey	0.59	0.59	0.60	0.00
Panel	respondent is in both waves of the survey	0.61	0.58	0.49	0.74
Sample Size		8,616	6,913	4,150	3,558

Notes: [a]Mean is computed for individuals with complete information only. Information relates to the time of the interview. [b]Ranking of two post-materialistic (P) versus two materialistic (M) objectives: first letter expresses highest priority and last letter expresses lowest. [c]Highest Education/Training completed. [d]Categorization based on 1988 Deutschmarks. 1988 and 1994 are made comparable using the CPI (Preisindex für die Lebenshaltung—Alle Privaten Haushalte') for West Germany.

Table 2 (continued): Means of Variables (West Germany)

Variable Name	Definition	Mean[a] Women	Men	Women 18-35	Women 1994
Age					
Age at Int.	age at interview in years	37.0	36.6	27.4	37.6
Age20	age group 20 ($18 < \text{age} \leq 20$)	0.05	0.06	0.10	0.05
Age25	age group 25 ($21 < \text{age} \leq 25$)	0.12	0.13	0.25	0.10
Age30	age group 30 ($25 < \text{age} \leq 30$)	0.17	0.19	0.36	0.20
Age35	age group 35 ($30 < \text{age} \leq 35$)	0.14	0.13	0.29	0.12
Age40	age group 40 ($35 < \text{age} \leq 40$)	0.15	0.12		0.14
Age45	age group 45 ($40 < \text{age} \leq 45$)	0.12	0.11		0.12
Age50	age group 50 ($45 < \text{age} \leq 50$)	0.11	0.11		0.08
Age60	age group 60 ($50 < \text{age} \leq 60$)	0.15	0.15		0.19
Rural	residential category (0-9; 0='>0.5 mill.', 9='< 2,000.')	3.37	3.47	3.33	3.49
Partnership					
Married	married at time of interview	0.69	0.59	0.54	0.68
Marriedt	married and living together	0.67	0.58	0.52	0.66
Marrieds	married and separated	0.02	0.01	0.02	0.02
Divorced	divorced at time of interview	0.06	0.05	0.04	0.06
Divorcep	divorced and living with a partner	0.03	0.03	0.02	0.03
Divorcenp	divorced and living without a partner	0.03	0.02	0.02	0.03
Widowed	widowed at time of interview	0.03	0.01	0.00	0.03
Single	single at time of interview	0.22	0.35	0.41	0.23
Singlep	single and living with a partner	0.13	0.17	0.26	0.14
Singlenp	single and living without a partner	0.09	0.18	0.16	0.09
Parents' Education[b]					
No HSF	father has no high school diploma	0.08	0.07	0.06	0.07
HSF	father has only high school diploma	0.13	0.12	0.11	0.12
HSF+Training	father received high school diploma and training	0.66	0.68	0.68	0.67
College PrepF	father received college preparatory diploma	0.02	0.03	0.02	0.03
CollegeF	father graduated from college	0.11	0.10	0.12	0.11
EDUF Missing	father's educational attainment info missing	0.10	0.08	0.10	0.11
No HSM	mother has no high school diploma	0.08	0.07	0.07	0.07
HSM	mother has only high school diploma	0.44	0.45	0.35	0.41
HSM+Training	mother received high school diploma and training	0.43	0.41	0.51	0.45
College PrepM	mother received college preparatory diploma	0.05	0.04	0.05	0.08
CollegeM	mother graduated from college	0.02	0.03	0.03	0.03
EDUM Missing	mother's educational attainment info missing	0.11	0.10	0.11	0.11
Siblings					
Num. Siblings	number of siblings	1.85	1.77	1.75	1.93
No Siblings	has/had no siblings	0.13	0.15	0.15	0.19
One Sibling	has/had one sibling	0.31	0.32	0.31	0.27
Two Siblings	has/had two siblings	0.24	0.23	0.25	0.24
Three+ Siblings	has/had three siblings	0.32	0.30	0.29	0.30
Sib. Missing	sibling info missing	0.09	0.10	0.18	0.19
Sample Size		8,616	6,913	4,150	3,558

Notes: [a]Mean is computed for individuals with complete information only. Information relates to the time of the interview.[b]Highest Education and Training completed.

Table 3: Estimated Effect of Education on Desired Fertility in West Germany: Women by Age

	Not Controlling for Children			Controlling for Children		
Variable Name	0	1	3,4+	0	1	3,4+
			18-35 Year Old (N=4,150)			
No HS	**0.200**	**0.192**	**0.243**	**0.621**	**0.135**	**0.122**
	(0.822)	(0.515)	(0.330)	(0.800)	(0.523)	(0.336)
HS (no training)	**0.058**	**0.205**	**0.060**	**0.174**	**0.202**	**-0.126**
	(0.268)	(0.162)	(0.121)	(0.291)	(0.170)	(0.130)
HS+Training (Ref.)						
CP	**-0.079**	**-0.144**	**0.373****	**-0.153**	**-0.130**	**0.309***
	(0.285)	(0.279)	(0.168)	(0.291)	(0.287)	(0.173)
CP+Training	**0.003**	**-0.358***	**0.384*****	**-0.162**	**-0.435****	**0.468*****
	(0.235)	(0.216)	(0.139)	(0.244)	(0.215)	(0.141)
College	**-0.249**	**-0.218**	**0.446*****	**-0.274**	**-0.344**	**0.592*****
	(0.276)	(0.235)	(0.150)	(0.283)	(0.240)	(0.155)
R^2		0.084			0.158	
			36-45 Year Old (N=2,261)			
No HS	**0.087**	**1.283****	**0.138**	**0.689**	**0.904**	**-0.060**
	(0.987)	(0.576)	(0.503)	(0.993)	(0.622)	(0.480)
HS (no training)	**-0.235**	**-0.138**	**0.093**	**-0.108**	**-0.221**	**-0.065**
	(0.355)	(0.203)	(0.144)	(0.392)	(0.219)	(0.167)
HS+Training (Ref.)						
CP	**0.194**	**0.631**	**0.364**	**-0.364**	**0.528**	**-0.175**
	(1.181)	(0.566)	(0.425)	(1.263)	(0.706)	(0.400)
CP+Training	**0.239**	**-0.639**	**0.067**	**0.521**	**-0.721**	**0.185**
	(0.595)	(0.436)	(0.280)	(0.690)	(0.462)	(0.275)
College	**0.303**	**-0.109**	**0.455*****	**0.340**	**-0.019**	**0.456****
	(0.385)	(0.273)	(0.173)	(0.432)	(0.288)	(0.188)
R^2		0.075			0.230	
			46-61 Year Old (N=2,205)			
No HS	**1.734****	**0.650**	**0.069**	**2.898*****	**0.406**	**-0.399**
	(0.702)	(0.494)	(0.369)	(0.698)	(0.592)	(0.410)
HS (no training)	**0.050**	**0.180**	**-0.188**	**0.481**	**0.140**	**-0.453*****
	(0.375)	(0.204)	(0.129)	(0.442)	(0.220)	(0.144)
HS+Training (Ref.)						
CP/CP+Training	**-0.426**	**0.163**	**0.359**	**-0.660**	**0.050**	**0.466**
	(0.861)	(0.460)	(0.262)	(0.899)	(0.448)	(0.303)
College	**0.295**	**-0.281**	**0.479****	**0.075**	**-0.402**	**0.536****
	(0.560)	(0.441)	(0.227)	(0.582)	(0.497)	(0.247)
R^2		0.087			0.241	

Notes: Table reports estimated effects on log-odds ratios. All models also include controls for the 10 states and missing data on post-materialism, income, siblings, and parents' education. Robust standard errors that correct for clustering of individuals who interviewed in both survey rounds are in parentheses. *Statistically significant at the .10 level; **at the .05 level (two-tailed test); ***at the .01 level (two-tailed test).

Table 4: Predicted[a] Desired Fertility in West Germany: Women by Age and Education

	Not Controlling for Children				Controlling for Children			
Variable Name	0	1	2	3,4+	0	1	2	3,4+
				18-35 Year Old (N=4,150)				
Within Sample	*0.062*	*0.102*	*0.566*	*0.270*	*0.062*	*0.102*	*0.566*	*0.270*
No HS	0.072	0.118	0.529	0.281	0.101	0.113	0.529	0.257
HS	0.066	0.126	0.558	0.250	0.076	0.128	0.572	0.224
HS+Training	0.066	0.107	0.582	0.245	0.066	0.108	0.576	0.249
College Prep.	0.057	0.087	0.536	0.320	0.056	0.093	0.546	0.305
CP+Training	0.062	0.072	0.540	0.326	0.055	0.070	0.535	0.341
College	0.049	0.081	0.531	0.339	0.049	0.073	0.514	0.365
				36-45 Year Old (N=2,261)				
Within Sample	*0.047*	*0.126*	*0.517*	*0.310*	*0.047*	*0.126*	*0.517*	*0.310*
No HS	0.036	0.325	0.388	0.250	0.062	0.232	0.450	0.257
HS	0.038	0.116	0.529	0.317	0.044	0.113	0.547	0.296
HS+Training	0.047	0.132	0.530	0.292	0.046	0.131	0.524	0.300
College Prep.	0.045	0.194	0.425	0.335	0.034	0.195	0.512	0.259
CP+Training	0.060	0.073	0.547	0.320	0.064	0.070	0.523	0.343
College	0.054	0.103	0.455	0.388	0.053	0.115	0.456	0.377
				46-61 Year Old (N=2,205)				
Within Sample	*0.034*	*0.087*	*0.492*	*0.388*	*0.034*	*0.087*	*0.492*	*0.388*
No HS	0.118	0.124	0.407	0.351	0.176	0.103	0.432	0.289
HS	0.035	0.101	0.517	0.347	0.045	0.100	0.532	0.323
HS+Training	0.032	0.081	0.493	0.394	0.030	0.082	0.482	0.406
College Prep./ CP+Training	0.020	0.083	0.425	0.473	0.017	0.075	0.414	0.494
College	0.035	0.052	0.408	0.505	0.028	0.051	0.409	0.511

Notes: [a]The predictions by educational attainment are obtained by assuming that all individuals in the sample have the same educational attainment while using the individual data for all other covariates.

Table 5: Estimated Effect of Education on Desired Fertility in West Germany: Men by Age

	Not Controlling for Children			Controlling for Children		
Variable Name	0	1	3,4+	0	1	3,4+
			18-35 Year Old (N=3,490)			
No HS	**0.200**	**0.192**	**0.243**	**0.621**	**0.135**	**0.122**
	(0.822)	(0.515)	(0.330)	(0.800)	(0.523)	(0.336)
HS (no training)	**0.058**	**0.205**	**0.060**	**0.174**	**0.202**	**-0.126**
	(0.268)	(0.162)	(0.121)	(0.291)	(0.170)	(0.130)
HS+Training (Ref.)						
CP	**-0.079**	**-0.144**	**0.373****	**-0.153**	**-0.130**	**0.309***
	(0.285)	(0.279)	(0.168)	(0.291)	(0.287)	(0.173)
CP+Training	**0.003**	**-0.358***	**0.384*****	**-0.162**	**-0.435****	**0.468*****
	(0.235)	(0.216)	(0.139)	(0.244)	(0.215)	(0.141)
College	**-0.249**	**-0.218**	**0.446*****	**-0.274**	**-0.344**	**0.592*****
	(0.276)	(0.235)	(0.150)	(0.283)	(0.240)	(0.155)
R^2		0.081			0.124	
			36-45 Year Old (N=1,580)			
No HS	**0.087**	**1.283****	**0.138**	**0.689**	**0.904**	**-0.060**
	(0.987)	(0.576)	(0.503)	(0.993)	(0.622)	(0.480)
HS (no training)	**-0.235**	**-0.138**	**0.093**	**-0.108**	**-0.221**	**-0.065**
	(0.355)	(0.203)	(0.144)	(0.392)	(0.219)	(0.167)
HS+Training (Ref.)						
CP	**0.194**	**0.631**	**0.364**	**-0.364**	**0.528**	**-0.175**
	(1.181)	(0.566)	(0.425)	(1.263)	(0.706)	(0.400)
CP+Training	**0.239**	**-0.639**	**0.067**	**0.521**	**-0.721**	**0.185**
	(0.595)	(0.436)	(0.280)	(0.690)	(0.462)	(0.275)
College	**0.303**	**-0.109**	**0.455*****	**0.340**	**-0.019**	**0.456****
	(0.385)	(0.273)	(0.173)	(0.432)	(0.288)	(0.188)
R^2		0.110			0.270	
			46-61 Year Old (N=1,843)			
No HS	**0.303**	**-1.004**	**-0.641**	**0.034**	**-1.258**	**-0.646**
	(1.341)	(1.089)	(0.633)	(1.766)	(1.161)	(0.753)
HS (no training)	**0.649***	**0.588***	**0.524****	**0.634***	**0.358**	**0.551****
	(0.394)	(0.307)	(0.238)	(0.368)	(0.355)	(0.274)
HS+Training (Ref.)						
CP/CP+Training	**0.000**	**-0.835***	**0.263**	**-0.492**	**-0.763**	**0.297**
	(0.520)	(0.476)	(0.276)	(0.706)	(0.531)	(0.288)
College	**-0.247**	**-0.685****	**0.750*****	**-0.435**	**-0.614***	**0.923*****
	(0.386)	(0.288)	(0.182)	(0.378)	(0.334)	(0.209)
R^2		0.095			0.276	

Notes: Table reports estimated effects on log-odds ratios. All models also include binary controls for the 10 states and missing data on post-materialism, income, siblings, and parents' education. Robust standard errors that correct for clustering of individuals who interviewed in both survey rounds are in parentheses. *Statistically significant at the .10 level; **at the .05 level (two-tailed test); ***at the .01 level (two-tailed test).

Table 6: Predicted[a] Desired Fertility in West Germany: Men by Age and Education

	Not Controlling for Children				Controlling for Children			
Variable Name	0	1	2	3,4+	0	1	2	3,4+
				18-35 Year Old (N=3,490)				
Within Sample	*0.082*	*0.104*	*0.620*	*0.194*	*0.082*	*0.104*	*0.620*	*0.194*
No HS	0.158	0.141	0.504	0.197	0.171	0.170	0.488	0.171
HS	0.094	0.130	0.600	0.176	0.100	0.126	0.612	0.161
HS+Training	0.086	0.115	0.628	0.171	0.086	0.114	0.627	0.173
College Prep.	0.089	0.070	0.636	0.206	0.089	0.073	0.637	0.202
CP+Training	0.070	0.093	0.623	0.214	0.066	0.097	0.625	0.212
College	0.055	0.068	0.592	0.285	0.052	0.066	0.583	0.299
				36-45 Year Old (N=1,580)				
Within Sample	*0.053*	*0.145*	*0.583*	*0.220*	*0.053*	*0.145*	*0.583*	*0.220*
No HS	0.141	0.139	0.403	0.318	0.177	0.116	0.463	0.243
HS	0.056	0.138	0.558	0.248	0.058	0.130	0.559	0.254
HS+Training	0.055	0.158	0.589	0.198	0.064	0.150	0.587	0.199
College Prep.	0.069	0.234	0.436	0.261	0.066	0.208	0.390	0.335
CP+Training	0.033	0.104	0.673	0.190	0.027	0.121	0.668	0.184
College	0.047	0.114	0.558	0.281	0.038	0.129	0.557	0.277
				46-61 Year Old (N=1,843)				
Within Sample	*0.053*	*0.118*	*0.539*	*0.291*	*0.053*	*0.118*	*0.539*	*0.291*
No HS	0.083	0.062	0.688	0.166	0.067	0.055	0.687	0.190
HS	0.073	0.179	0.429	0.319	0.075	0.144	0.460	0.321
HS+Training	0.054	0.134	0.561	0.251	0.056	0.130	0.559	0.256
College Prep./ CP+Training	0.055	0.061	0.562	0.322	0.041	0.073	0.572	0.314
College	0.039	0.059	0.473	0.429	0.037	0.070	0.477	0.416

Notes: [a]The predictions by educational attainment are obtained by assuming that all individuals in the sample have the same educational attainment while using the individual data for all other covariates.

Table 7: Estimated Effect of Education on Desired Fertility in EU 15: Women by Age

		Not Controlling for Children			Controlling for Children		
Variable Name	**Fraction**	0	1	3,4+	0	1	3,4+
		<u>18-35 Year Old</u> (N=2,669)					
No Upper Second. (Ref.)	**35.1**						
Upper Secondary	**29.4**	**0.404**	**-0.034**	**-0.167**	**0.295**	**-0.033**	**-0.096**
		(0.285)	(0.169)	(0.135)	(0.292)	(0.178)	(0.141)
1st Stage Tertiary	**31.7**	**0.434**	**-0.162**	**0.190**	**0.245**	**-0.237**	**0.283****
		(0.293)	(0.194)	(0.136)	(0.294)	(0.201)	(0.143)
2nd Stage Tertiary	**3.8**	**0.409**	**-0.913***	**0.030**	**0.223**	**-0.739***	**0.115**
		(0.561)	(0.493)	(0.274)	(0.548)	(0.434)	(0.300)
R^2			0.097			0.153	
		<u>36-45 Year Old</u> (N=1,366)					
No Upper Second. (Ref.)	**42.1**						
Upper Secondary	**23.8**	**0.143**	**0.397***	**0.355****	**0.217**	**0.400**	**0.479****
		(0.419)	(0.234)	(0.171)	(0.478)	(0.261)	(0.195)
1st Stage Tertiary	**26.4**	**0.822****	**0.076**	**0.167**	**0.392**	**-0.178**	**0.334***
		(0.390)	(0.258)	(0.173)	(0.434)	(0.268)	(0.193)
2nd Stage Tertiary	**7.6**	**0.449**	**-0.201**	**0.084**	**-0.191**	**-0.441**	**0.331**
		(0.619)	(0.423)	(0.272)	(0.675)	(0.440)	(0.286)
R^2			0.103			0.279	
		<u>46-61 Year Old</u> (N=1,914)					
No Upper Second. (Ref.)	**56.9**						
Upper Secondary	**18.8**	**-0.660***	**-0.551****	**-0.037**	**-0.622***	**-0.494***	**0.162**
		(0.356)	(0.252)	(0.149)	(0.356)	(0.273)	(0.167)
1st Stage Tertiary	**18.9**	**-0.965****	**-0.150**	**0.366****	**-1.322*****	**-0.545****	**0.589*****
		(0.445)	(0.236)	(0.151)	(0.498)	(0.260)	(0.167)
2nd Stage Tertiary	**5.3**	**-1.215***	**-0.495**	**0.605****	**-1.182**	**-0.538**	**0.966*****
		(0.707)	(0.408)	(0.252)	(0.749)	(0.439)	(0.294)
R^2			0.117			0.280	

Notes: See the explanation in the text for details on the construction of the education variables. All models also include controls for the EU 15 countries/regions (West Germany, East Germany, Austria, Finland, Denmark, Belgium, Luxembourg, France, Greece, Italy, Spain, Ireland, UK, Netherlands, Portugal, Sweden), political orientation scale, in school, age and partnership measures comparable to the ones used in the analysis for West Germany, labor force status indicators (self employed, employed, not working), location (village or rural, small town, large town or city), a four category adjusted household income scale and controls for 'don't know' (political scale and income) and refusal (political scale and partnership). Robust standard errors are presented in parentheses. *Statistically significant at the .10 level; **at the .05 level (two-tailed test); ***at the .01 level (two-tailed test).