Educational Fields and Fertility in Western Germany – An Analysis of Women born 1955-59 with the Mikrozensus 2008

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In recent years, research on education and fertility has been enriched by studies that take the educational field into account in addition the educational level. The aim of the present paper is to add Western Germany, a country with outstandingly high levels of childlessness, to the list of countries on which comparable research has been carried out. Using data from the German Mikrozensus 2008 the association between educational attainment, childlessness, and ultimate fertility among Western German women born between 1955 and 1959 is examined.

The overall finding of the present analysis is that, despite the strong impact of the level of education, there is also a relationship between the educational field and childlessness in Western Germany. Consistent with previous findings from other countries, women educated in teaching and health-care are the group with the lowest rates of childlessness at each educational level, while those educated in administration, economics or social science are the groups with the highest levels of childlessness. Educational field and level account equally for variation in ultimate fertility. In further analysis the differences between Eastern and Western Germany with regard to childlessness is confirmed. At the same time similarities are observed in comparison with other European countries.

Keywords: Fertility, Childlessness, Germany, Education, Educational Field

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1. Introduction

In recent years, research on education and fertility has been enriched by studies that take the educational field into account in addition to the educational level (Lappegård and Rønsen 2005; Hoem et al. 2006a; Hoem et al. 2006b; Martín-García and Baizán 2006; Neyer and Hoem 2008; Rønsen and Skrede 2010; Van Bavel 2010; Begall and Mills 2012; Michelmore and Musick 2013). All of these studies find an effect of the field that is independent of the level. The findings differ with regard to the question of whether or not the level or the field of education is a better indicator for fertility. Institutional aspects of the educational system, like flexibility or its gendered structure, as well as measures of family policy are assumed to be of importance for these differences.

The operationalization of educational attainment varies considerably between these studies, especially with regard to the number of educational categories used in the analysis. Nevertheless three studies analyzing childlessness in three different countries, namely Sweden, Austria and Greece, apply a comparable set-up (Hoem et al. 2006a; Neyer and Hoem 2008; Bagavos 2010). Each study uses national register or census data to examine childlessness of women born between 1955 and 1959. The operationalization is very similar; each uses about sixty categories of educational attainment (about fifty in the case of Greece). These categories are built out of combinations of educational levels and fields. For Sweden, a companion paper also looks at ultimate fertility (i.e., the average number of children) (Hoem et al. 2006b).

The aim of the present paper is to add Western Germany to the list of countries this approach is applied to. Data from the German Mikrozensus 2008[2] on educational attainment and childlessness are treated in a comparable manner to previous studies. Additionally, ultimate

[2] For the analysis, the full sample of the Mikrozensus 2008 was used. This was possible via an On-Site access for guest researchers. The author is very grateful for the kind support of the team at the Forschungsdatenzentrum in Berlin-Mitte.

fertility is examined in accordance with the study of Hoem et al (2006b). A further aim of this paper is to provide reference data for researchers examining the relationship between education and fertility in the German context.

Germany is a low-fertility country with one of the highest rates of childlessness worldwide (Dorbritz 2008). Due to the emphasis of German family policy on monetary support and structures that support the male-breadwinner model, like the taxation law or the lack of (full-time) daycare coverage, compatibility is considered to be rather low in Western Germany. Women of childbearing age seem to face the choice between career and children. A bifurcation between childless women and mothers with two or more children is often observed (e.g. Dorbritz 2008). Despite the fact that a lot of research has examined the relationship between the educational level and fertility in Western Germany, a possible impact of the field has so far been given little attention. Using data from the German Socio-Economic Panel study, it has been shown that educational field matters for the transition to parenthood for women in Western Germany, but not men (Oppermann 2012). The present analysis contributes to existing knowledge by applying a comparable approach to the data of the German Mikrozensus 2008. This overview is enabled by the large number of cases in the Mikrozensus. In addition, the relationship between educational fields and ultimate fertility is explored for the first time in Western Germany.

In the next section the main arguments why the educational field should matter for fertility behavior are summarized. In the subsequent section important features of the Western German educational system and family policy are discussed along with selected research findings. The data for the analysis come from the German Mikrozensus 2008. The data and how they are treated is described in the data section. Analysis is focused on Western German women born between 1955 and 1959. The main findings are presented. The findings on Western Germany are discussed with regard to results from Eastern Germany and previous

findings from other countries. The paper concludes with a reflection of the findings also with regard to implications for research on Germany.

2. A brief argument: Why the field matters

The idea behind including the educational field into the analysis of the relationship between education and fertility is discussed in most detail by Hoem et al. (2006a). At this point only the main arguments are highlighted: A tight bond between education and labor market opportunities is assumed. Educational fields differ with regard to labor market opportunities that make compatibility of family and an employment career easier or more difficult. Flexible working hours and part-time work and a high workplace security (maybe due to employment in the public sector) are assumed to positively impact on compatibility. It is further assumed that educational fields differ with regard to skill depreciation: this term refers to the loss of knowledge due to a temporary break, for example for parental leave (Martín-García & Baizán 2006). This risk might be high especially in technical fields when important developments are missed during a break (Hoem et al. 2006a). Occupational specificity differs between educational fields; some fields lead more clearly to a certain occupations than others. For example, education in arts, humanities or social sciences usually does not prepare one for specific occupations (ibid.). Preferences regarding the future lifestyle, especially towards work content and family, as well as the anticipation of working conditions and compatibility of employment and parenthood, impact on the selection of a field of education. Especially for women educated in care-related fields like teaching and health care, it is assumed that preferences and personality traits simultaneously impact on the choice of an educational field and fertility behavior (ibid.). The selection of an educational field also influences the social environment during the years in education and later in adult life, which also shape a person's preferences with regard to childbearing (Martín-García & Baizán 2006; Van Bavel 2010).

The association between educational attainment, level and field of education, and fertility has been shown in many European countries. It is assumed that the association is shaped by country specific institutional settings.

3. The German Setting

Structure and organization of an educational system influence fertility outcomes (Hoem et al. 2006a). Three aspects of the German educational system are highlighted and a detailed overview is provided in the Appendix.

A main characteristic of the German educational system is early tracking (Jacob & Tieben 2009; Shavit & Müller 2000) after four years of elementary school. In general, the flexibility of the educational system is rather low (Kerckhoff 2001).

While the share of women participating in secondary and tertiary education increases, choices of educational fields are still strongly gender segregated (BMBF 1997, 2007; Charles & Bradley 2009; Wirth & Dümmler 2004). For example, women are overrepresented in health care and men in engineering (Charles & Bradley 2009).

The bond between educational system and labor market opportunities is tight (Schneider 2008; Shavit & Müller 2000). It is very common in Germany to earn a qualification, often closely related to an occupation, and to stick to this occupation throughout working life (Kerckhoff 2001). Numerous occupations are tied to formal educational qualification (Buchmann & Charles 1995, p. 85).

Next to the educational system, measures of family policy as well as dominant value orientations within a country impact on fertility behavior (Blossfeld & Huinink 1991; Brewster & Rindfuss 2000; Dorbritz 2008; Gauthier 2007; Henz 2008; Hoem et al. 2006a, 2006b; Kravdal & Rindfuss 2008; Kreyenfeld 2002). Very recent developments are not

discussed here as they, like for example the introduction of the Elterngeld in 2007, occurred after women born between 1955 and 1959 reached the end of their fertile years.

Western Germany is a country with prevailing traditional family attitudes and gender roles (Pfau-Effinger & Smidt 2011; Pfau-Effinger 2012). Marriage and childbearing are strongly tied. In 1990 only 10.05% of children were born to mothers who were not married in Western Germany (Dorbritz 2008, p. 573). A pregnancy is an occasion for marriage (Blossfeld & Rohwer 1995; Dorbritz 2008, p. 573 and 579; Federkeil 1997; Sobotka 2008). Women's participation in education has increased, leading to more opportunities in the labor market. At the same time, being a housewife and mother, is a widely accepted lifestyle choice.

A traditional division of labor is supported by many features of German family policy. The tax system supports marriages, with or without children. Due to the so-called "Ehegattensplitting" (Daly 2000, p. 91; Federkeil 1997, p. 87; Steiner & Wroblich 2006), marriages with one main earner (usually the male-breadwinner) benefiting the most. The lack of full time day-care hinders compatibility of family and employment, which only recently became a political goal. A long parental leave on the other hand is supported financially and with a guaranteed return to the previous job after up to three years[3] of a childs life. Traditionally daycare is mainly provided by the Kindergarten, which is for children between age 3 and 6, usually for 4 hours per day (Daly 2000, p. 81; Dustmann & Schönberg 2012; Federkeil 1997, p. 90; Henz 2008, p. 1456). Daycare for children under the age of 3 or schoolchildren is scarce[4] (Federkeil 1997, p. 90), the cohort under examination did not benefit from developments within the last years.

[3] Parental Leave with job protection was expanded from 2 month to 6 month in 1979. This protected period was increased to 10 month in 1986, to 18 month in 1990 and, to 36 month in 1992 (Dustmann & Schönberg 2012).

[4] School in Germany usually is in the morning and only occasionally in the afternoon. Additionally, school start and ending times are not the same at every day of the week.

Fertility rates in Germany are beneath replacement rate since the end of the "Golden Age of Marriage" in the 1960s (Dorbritz 2008, p. 562; Federkeil 1997, p. 82). A polarization between childless women and women who opt to have more than one child can be observed. Women seem to choose between these two lifestyles as compatibility is low (Dorbritz 2008, p. 560).

The strong impact of education on fertility, especially the timing of childbirth but also on childlessness or ultimate fertility has drawn much attention in the context of low fertility in Germany. Among the common findings is that childbirth is postponed until after graduation (e.g. Blossfeld & Huinink 1991; Kreyenfeld & Konietzka 2008; Kreyenfeld 2010). While highly educated women (for whom the opportunity costs of children are especially high) more often remain childless than less well educated women; highly educated women who do become mothers, despite the opportunity costs, tend to also have a second child. This is partly caused by self-selection of especially family prone women into motherhood (Kreyenfeld 2002).

4. Hypotheses

Based on the description of the Western German context and previous findings from Sweden, Austria and Greece I expect to find the following with regard to the relationship between educational level, educational field and childlessness:

I expect the level of education to be strongly associated with childlessness. Additionally I expect the field of education to matter for childlessness. Very much in line with other countries, I furthermore expect care-related fields (teaching and health care) and women-dominated fields to have low childlessness. Fields with high skill depreciation (technology) or with uncertain occupational perspectives (humanities, social sciences) as well as fields with long educational enrollment should have high proportions of childlessness. Finally a high share of people who have never married in a field should result in high childlessness.

With regard to the relationship between educational level, educational field and ultimate fertility, I expect that mothers in fields with high childlessness have similar high or even higher numbers of children compared to mothers in fields with less childlessness (bifurcation).

5. Data and Data Management

The data for this analysis come from the German Mikrozensus 2008. The Mikrozensus consists of 1% of households in Germany[5]. Usually respondents are not asked about children and one can only infer from the household composition the existence of children. In the wave of 2008, female respondents between age 15 and 75 were asked (voluntarily) about having given birth to a child and the number of children. The Mikrozensus includes information on the highest level of education of a respondent as well as about 90 categories of educational fields. The aim of this analysis is to provide figures that are comparable to previous findings. The studies of Hoem et al (2006a and 2006b) were the first to use such a detailed differentiation of educational categories. The data management of the Swedish data by Hoem et al. is used as guide for the data management of the Mikrozensus data. The information on the ISCED level of the highest educational degree and the information on the field of education are used to build categories as similar as possible to the categories used by Hoem et al. (2006a and 2006b).

[Figure 1 about here]

Figure 1 shows how the German educational system fits into ISCED and how the ISCED levels were combined to match the levels used in the analysis of Hoem et al. 2006a and 2006b. These are used for the analysis. Due to the structures of the German educational

[5] While the previous studies on Sweden, Austria and Greece use register or census-data, and therefore information on the whole cohort of women born between 1955 and 1959, such data are not available for Germany. The census carried out in 2011 does not include the information needed for this analysis.

system, some groups are not completely identical. For example teachers in Germany have a university degree (level 6) while some teachers (like pre-school teachers) in Sweden have level 5. Also the information on the field of education does not allow some of the differentiations made by Hoem et al. For example a midwife and a nurse cannot be differentiated and are labeled health-care specialists. How the educational categories used in the present analysis correspond to those used in Hoem et al. (2006a) is displayed in Table 1. For the present analysis 50 categories of educational attainment are used.

[Table 1 about here]

The analysis is conducted for women born between 1955 and 1959, the same cohort used in the studies on Sweden, Austria and Greece. The sample is restricted to women who live in Western Germany in the year 2008 – the year of the survey. Women in Eastern and Western Germany differ with regard to their fertility behavior (Dorbritz 2008; Henz 2008; Kreyenfeld 2004). Ideally the sample would have been restricted by residence prior to the German reunification in 1990. Unfortunately no information is available in the Mikrozensus that allows identifying residence prior to 1990. Using the current residence is the next best thing and has been used in studies of Germany before (e.g., Huinink et al. 2012; Wirth 2007). The analysis sample consists of 19,879 women. Table 1a in the appendix displays the main findings.

6. Childlessness in Western Germany

The presentation of the main findings is structured as follows: First the relationship between childlessness and educational attainment of Western German women born between 1955 and 1959 is explored. In a second step, childlessness of this cohort is compared to childlessness of the neighboring cohorts of 1950-1954 and 1960-1964. It is further compared to childlessness of women in Eastern Germany. The findings from Germany are discussed in comparison to

the previous findings from Sweden, Austria and Greece. Finally, ultimate fertility and its relationship with educational attainment is explored.

The following figures and discussions are mainly based on Table 1a in the appendix. As described before, the level of childlessness is high in Western Germany - it varies between 9% (child-care worker) and 45% (Ph.D. in Social Science or Humanities). The overall childlessness in the sample is 17.8%.

[Figure 2 about here]

Figure 2 contains the main findings on the relationship between educational level, educational field and childlessness for Western German women born 1955-59[6]. Figure 2 clearly shows a relationship between the field of education and childlessness. It also shows a clear effect of the level; the trend lines are rather steep. The margin between the group with the highest and those with the lowest childlessness at each educational level increases with an increasing level of education. Women educated in teaching and health care are the group with the lowest rates of childlessness at each educational level, while those educated in administration, economics or social science are the groups with the highest levels of childlessness. Social workers seem to be an exception within this group. Their low level of childlessness fits more into the group of women educated in teaching and health care. The results for women educated in the arts or humanities do not show a clear pattern. Childlessness of women with a Ph.D. in medicine is about 26%, while those of women with a Ph.D. in natural or technical science is about 34%. Women with a Ph.D. in social science or humanities are the group with the highest level of childlessness within the analysis sample. As can be seen in Figure 3, those women also have the highest mean age at completion of education.

[6] In order to make comparison easier, the layout of Figure 2 resembles those of Hoem et al. (2006a and 2006b) using similar markers and colors. In Figure 2, all markers are labeled while in some of the following graphs only selected markers are labeled.

A two way analysis of variance shows that the level of education accounts for more variation in childlessness than the field of education. Table 2a in the appendix shows the association between educational level and childlessness in the analysis sample.

6.1 Childlessness and mean age at completion of education

[Figure 3 about here]

Figure 3 shows a strong relationship between the duration of education and permanent childlessness. As described above, it is very common in Germany to postpone the birth of a first child until after graduation. Nevertheless, Figure 3 also shows an effect of the field of education. Again, women educated in teaching and health-care are among those with the lowest levels of childlessness. While the mean age of completion for women educated as teachers for children with special needs and psychologists is about the same (30.5 and 30.7) their rates of childlessness differ considerably. While the former group has about 19% childlessness, childlessness among psychologists is 38%. A higher age at completion does therefore not necessarily lead to higher levels of childlessness in Western Germany. Some educational fields might be more compatible with childbearing during educational enrollment than others. Some of the women educated as teachers for children with special needs might have had their first child prior to graduation while this is not feasible with training as a psychologist. While the Mikrozensus does contain the information in which year the highest educational degree was received, it does not include the age or year of the birth of the first child. Given the German educational system described above and the high tendency of women to postpone childbirth until after graduation, I would not expect to find many women having their first child prior to graduation in Western Germany, but this cannot be examined using these data. It cannot be ruled out that educational lines differ with regard to compatibility with having children while in educational enrollment, as findings from Norway and Sweden imply (Hoem et al. 2006a; Lappegård & Rønsen 2005).

6.2 Groups with high levels of childlessness

In Western Germany, no effect of the field of education can be observed among the groups with more than a quarter childless. Given the overall high levels of childlessness in Western Germany, quite many educational lines have childlessness above 25%. Even within the group of teaching and health care, there are three sub-groups that have childlessness above 25% (Ph.D. (Med): 26%; high-school teacher: 27%; health care, university degree: 28%). Each of them has an educational level of 6 or above. It has to be noted that no group with a general or unspecified educational field or field in personal services has childlessness above 25%. Administration, economics and social science are fields with high fractions of childlessness. Childlessness of women educated in business administration varies between 26% and 29%, childlessness of psychologists and lawyers is about 38% and 45% of women with a Ph.D. in social science or humanities remain childless. High childlessness is also observed among women educated in arts, humanist or religious fields, varying from 28% of women educated in the humanities at university-level, to 41% of those educated in the arts at university-degree level. Among the natural sciences, engineers have 28% childlessness and women with a research degree 34%. The majority of the groups with more than 25% childlessness have an educational level of 6 (university degree) or above.

6.3 Groups that never marry

[Figure 4 about here]

Childbearing within marriage is the common pattern in Western Germany. Therefore it is not surprising that Figure 4 shows very low percentages of never married among groups with low levels of childlessness. No field effect can be observed in this figure. The upper right half of Figure 4 shows a few educational lines with high childlessness, all of those educational lines have a high educational level (level 6 or 7).

6.4 Is there change over time?

In order to examine whether the described relationship between educational level, educational field and childlessness is persistent over time, the two neighboring cohorts (1950-1954 and 1960-1964) are examined[7]. The overall level of childlessness has risen from cohort to cohort. 16.3% of the women born between 1950 and 1954 remained childless, 17.8% of those born between 1955-1959, and about 20% of those born between 1960-1964. Educational level and childlessness are strongly related in each cohort. With regard to childlessness within educational lines, changes between cohorts are mainly observed among fields that do not contain many observations. The only eye-catching change is the rise in childlessness among women educated in industry, crafts, engineering and natural sciences. In the cohort 1950-1954, childlessness within this field is close to childlessness among women educated in teaching and health care. Childlessness within this field is higher in the cohort 1955-59 as described above. The pattern of the relationship between educational attainment (level and field) is remarkably similar between the two cohorts 1955-1959 and 1960-1964. Only the level of childlessness is higher in the latter cohort.

The association between childlessness and average age at education is less pronounced in the cohort 1950-54 than in the following two cohorts. The pattern does not change over time. The association between the share of women in an educational line who were never married and childlessness does not show any clear change.

7. Childlessness in Eastern Germany

During the years of separation the observed fertility behavior developed quite differently in Eastern and Western Germany. On average, women in the German Democratic Republic (GDR) had their children at an earlier age, were more often unmarried at the time of the first

[7] The tables on the cohorts 1950-1954 and 1960-1964 are available from the author upon request.

birth and the overall childlessness was lower than in Western Germany (Dorbritz 2008; Kreyenfeld 2004).

The development in the GDR is often explained with the pronatalist family policy since the 1970s that provided child allowances and maternal leave. Having a child improved the chances of getting a home while daycare was available and affordable (Dorbritz 2008, p. 563). According to the political goals of the GDR, women should participate in the labor marked as well as become mothers (Henz 2008; Kreyenfeld 2004). Institutional settings were very different during the fertile years of the cohort under examination. As Dobritz puts it, the choice for children was easier in the GDR due to the combination between limited life-choices and a higher amount of social security (Dorbritz 2008, p. 563).

The number of cases in the Mikrozensus 2008 for Eastern German women born between 1955 and 1959 are too small for a comparison of the full range of educational lines. Table 2 therefore consists of a comparison of childlessness in Eastern and Western Germany between those educational lines for which data on at least 50 women in Eastern Germany are available.

[Table 2 about here]

The overall childlessness is 7.4% in Eastern Germany; there is no real relationship between the level of education and childlessness. Childlessness is on an average level at each educational level. Higher childlessness is only observed among women who only completed primary school or those who hold a Ph.D., but both groups only consist of very few women (37 and 29).

Both within Eastern and Western Germany, lower than average childlessness is observed among women educated in teaching and child-care. Childlessness is low among women educated in health care only among those with a low educational level in Western Germany, while there is no clear pattern in Eastern Germany. Women educated in personal services (e.g.

hotel or restaurant worker or beautician, hairdresser - all educational level 3) have lower than average childlessness in both parts of Germany. Contrary to Western Germany, childlessness among women educated in administration or social sciences is not clearly above average in Eastern Germany. The high childlessness among Western German women is assumed to be caused by the low occupational specificity of these educational lines and the insecurities that derive from this. Seemingly, these insecurities were minimized in Eastern Germany.

8. The Findings in an international context

The findings of this analysis add to a set of comparable studies on Sweden, Austria and Greece (Hoem, et al. 2006; Neyer and Hoem 2008; Bagavos 2010). All of them are industrialized countries but differ with regard to welfare state and family policy regime. Sweden is known for its social-democratic welfare state, generous family policy and strong emphasis on gender equality (Gauthier 2002). Greece belongs to the group with a southern European family policy, with low benefits and numerous private and public incentive schemes (ibid.). The geographical neighbors, Western Germany and Austria, are both known for their conservative family policies oriented towards a traditional division of labor between men and women (ibid.). Both are also quite similar with regard to their educational systems, especially the early tracking of students and the "dual system of vocational training" (Schneider 2008; Neyer and Hoem 2008). The findings from Western Germany should therefore be more similar to Austria than to Sweden or Greece.

But there also relevant differences between Western Germany and Austria. While Western Germany is more urbanized, the agricultural sector is more important in Austria than in Western Germany (STATISTICS AUSTRIA 2013; United Nations 2013). Tourism and related occupations are also of higher importance in Austria (STATISTICS AUSTRIA 2013). The gender-segregation among educational fields is higher in Germany than in Austria (Charles & Bradley 2009).

Overall childlessness is about 15.7% among women born between 1955-1959 in both Sweden and Austria. 12.3% of the women of this cohort are childless in Greece. Western Germany's 17.8% is the highest overall childlessness among the four countries.

A strong relationship between educational level and childlessness is observed in Western Germany, Austria and Greece. In Austria and Western Germany, the level of education accounts for more variance in childlessness than the field of education. In Greece both are equally important and in Sweden the field is even more important than the level.

Comparing the patterns of childlessness, the most eye catching are – despite the different levels of childlessness – the similarities. A relationship between the field of education and childlessness is found in all countries. In all countries, childlessness is low in the fields of teaching and child care. High rates of childlessness are found among women educated in administration and social sciences. While women educated in health care have low rates of childlessness in Sweden and Western Germany, the opposite is observed in Austria and Greece. A clear pattern of high childlessness among women educated in engineering and natural science was only found in Greece but neither in Sweden, Austria, nor Western Germany.

Furthermore, high childlessness was expected in arts, humanist and religious fields of education. The results do not show a clear pattern. Childlessness among this group varies between 14% (humanities, specialists) and 41% (arts, university-level degree). The latter finding is in line with findings from Sweden, but the generally high childlessness among this group observed in Sweden as well as in Austria is not observed in Western Germany. Uncertain career perspectives are assumed to cause the high rates of childlessness in this group in Sweden. In Germany, dropping out of the labor market and becoming a mother and housewife might have been an attractive option for women in this field. They might have opted for the latter to avoid the difficulties of the former. Women educated in the field of

administration, economy, or social science have medium to high rates of childlessness in all analyzed countries.

Childlessness among women educated for a service job in a hotel or restaurant is low in Austria and Western Germany but high in Sweden. While the Swedish finding is explained by working conditions, such as unusual working hours, that are difficult to combine with family life, those working conditions could have prompted German women to leave the labor market and become a mother and housewife. Another possibility is the explanation given for the Austrian finding: Women educated for jobs in hotels or restaurants might be working within family businesses offering enough flexibility to combine parenthood and employment. Childlessness among women educated in agriculture is also low in Austria, while Sweden and Western Germany are more alike. As described above both sectors are more important in Austria than in Western Germany and therefore contribute to the overall childlessness to a greater extent.

The pattern of the relationship between educational attainment and childlessness observed in Western Germany is most similar to the Swedish pattern, but with a stronger impact of the level of education and a higher overall level of childlessness in Western Germany. Differences in the patterns of childlessness between Austria and Western Germany are probably mainly based on the stronger impact of tourism and agriculture in Austria. Greece is unique in many ways, but the high childlessness among women holding a Ph.D is very similar to Western Germany.

9. Ultimate Fertility in Western Germany

[Figure 5 about here]

Figure 5 shows the relationship between educational level, educational field and ultimate fertility for Western German women born 1955-59[8]. The most eye catching is the high ultimate fertility of women with a low educational level (primary school, level 2). On average women educated only with a primary school have about 2.5 children, 71% have two or more children and among those who do become mothers, the average number of children is 2.9. Childlessness of this group is low (14%) but does not stick out; many groups at higher levels of education have lower fractions of childlessness. No other group has an ultimate fertility that is even close to this group. Education at this level contains little or no specific labor market qualifications. It might be that the low labor market potential of these women encouraged them to practice a traditional division of labor and specialize in housework and childcare while their partners contributed financially to the household as male breadwinner.

Figure 5 shows, as one would expect, that ultimate fertility declines with an increasing level of education. It also shows an effect of the field of education in the expected order, but the effect seems less pronounced than with regard to childlessness. Again, social workers stick out in their group and are more comparable to the group of teaching and healthcare. Even though the group of teaching and health care is the group with the highest ultimate fertility, with the exception of educational level 2, ultimate fertility of other educational lines are also at their level. Ultimate fertility of teaching and heath care does not stick out as prominently as one might have expected given the low childlessness of this group in Western Germany. In Sweden this group sticks out with highest ultimate fertility at each level of education. Ultimate fertility in the group of arts and humanities does not display a clear pattern. They have rather high levels of childlessness but especially women educated in theology are among

[8] The association between educational attainment and ultimate fertility does not change between the three cohorts: 1950-54, 1955-59, and 1960-64.

those with the highest ultimate fertility at educational level 6. A two-way analysis of variance shows that educational level and educational field account equally for variation in ultimate fertility.

[Figure 6 about here]

Comparing childlessness and ultimate fertility does show how strongly those two are related. Figure 6 confirms the two outliers described above. The first group is again those women with only primary school education. These women stick out for their low childlessness and especially an outstandingly high level of ultimate fertility. The second group are the women educated in theology. Given their rather high rates of childlessness, their rather high level of ultimate fertility comes as a surprise. This becomes even more obvious when comparing ultimate fertility and the number of children born to those women who do become mothers.

[Figure 7 about here]

The average number of children born to women educated in theology is 1.8, but the number of children born to mothers is 2.6 (while childlessness is about 31%). This findings resembles the finding of bifurcation between childlessness and rather high numbers of children for those women who do become mothers found in Sweden. Contrary to expectations this is the only group in which such a polarization was found. It was expected that a low compatibility of childbearing and rearing within an educational line would lead to high childlessness among women educated in these lines. It was also expected that women who do opt to become mothers despite low compatibility are especially family prone (as Kreyenfeld, 2002 puts it). This family proneness should also increase the probability for these women to have a second child. The findings of the present analysis imply that family proneness and choice of educational field are closely related.

10. Discussion and Conclusion

The overall finding of this analysis is that despite the strong relationship between educational level and childlessness in Western Germany, the educational field matters as well. Educational field and level account equally for variation in ultimate fertility. The strong impact of the educational level on childlessness was expected, but the strength of the field is more pronounced than expected.

The present analysis shows, at each educational level, outstandingly low rates of childlessness among women educated in teaching and child care in Western Germany. Low childlessness among these women has also been found in Sweden, Austria and Greece. This implies that (in this group) the choice of an educational field is an expression of preferences or even personality traits that are independent from the institutional context. This is further supported by similar findings from Eastern Germany.

High childlessness was expected among graduates in industry crafts, engineering and natural sciences according to the argument of Hoem et al. (2006a), due to high risks of skill depreciation resulting from breaks in employment. This cannot be confirmed as childlessness is rather at a medium level and it was also not observed in Sweden or Austria, and only in Greece. High childlessness was expected among women educated in humanities or social sciences. While the first group does not show a clear pattern, the latter indeed has a high share of childless women. This finding on women educated in social sciences is consistent with Sweden, Austria, and Greece.

As expected, a higher mean age at completion of education is associated with higher rates of childlessness. Very interestingly, a field effect is also observed: A higher age at completion does not necessarily lead to higher levels of childlessness in Western Germany. The possible causes for this finding can only be speculated about as the data do not allow close

examination. It might be that childbearing and childcare are more compatible during educational enrollment in some educational fields than in other. It might also be that women educated in fields like teaching and health care (the field with the weakest association between mean age at completion and childlessness) catch-up with childbirth soon after graduation. If this is the case, differences in the school-to-work transition and aspects of employment security may play an important role.

The share of women never being married is strongly associated with the level of childlessness among the graduates of an educational line. No effect of the field on this association can be observed. The overall level of women who were never married is low in the analysis sample (9.6%).

The association between educational level, educational field, and ultimate fertility resembles those with childlessness. The number of children declines with an increasing level, but differences between fields are also observed. The number of children among women educated in teaching or health care is highest but this group does not stick out as strongly as one would have expected due to their low levels of childlessness.

The only educational line in which bifurcation between childlessness and number of children born to mothers can be observed is theology (university degree). It was expected that women who are educated in educational lines with high rates of childlessness who opt for motherhood are a group of very family prone women. This family proneness should positively impact on the probability to have further children. But, this is not found in the present analysis. For Western Germany it has repeatedly been shown that women with a high educational level have lower probability of motherhood than less well-educated women. Highly educated women who opt for motherhood on the other hand have a higher tendency to expand their family (Blossfeld & Huinink 1991; Kreyenfeld 2002). This is partly caused by the previously-discussed family proneness of these women (Kreyenfeld 2002). The findings of the present

analysis imply that the educational field also plays an important role in the relationship between educational attainment and fertility behavior. The choice of an educational field, like teaching and health care, might be an expression of family proneness. Therefore including the educational field into the analysis of the relationship between education and fertility should increase our understanding.

The overall finding of the present analysis is that there is a relationship between the field of educational attainment and fertility in Western Germany. Common patterns are observed across countries as well as differences. The differences are attributed to differences in institutional settings and match these settings. Given the differences in the institutional settings similarities between the countries are much more remarkable.

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The author is grateful for comments from Karsten Hank

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Table 1: Educational Fields in Sweden and Germany

SWEDEN (HOEM et al. 2006a)		GERMANY		
FIELD	LEVEL	LEVEL	FIELD	CODE
General education, non specific				
primary school	2	2	primary school	101
brief secondary school, general	3	3	brief secondary school, general	102
long secondary school, general	4	4	long secondary school or higher, general	103
arts, humanist, religious				
religious education, brief	5	6	theology, university degree	201
theology, university degree	6			
arts, brief	5	3	arts, brief	202
arts, university-level degree	6	6	arts, university-level degree	203
humanities, universitiy degree (not teacher)	6	3	humanities, brief	204
		4	humanities, long	205
		5	humanities, specialist	206
		6	humanities, universitiy degree (not teacher)	207
librarian	6			
personal service etc				
hotel & restaurant worker	3	3	hotel & restaurant worker	301
home maker	3	3	service worker, unspecified	302
cleaner	3			
food processing	3			
policewoman	5			
service worker, unspecified	3			
grand-household administrator	5	5	service specialist	303
beautician, hairdresser	3	3	beautician, hairdresser	304
mail carrier	3	3	mail office worker	305
mail office worker	3			
		4	mail and transports	306
admin. Econom. Social science				
administration, brief secondary	3	3	administration, brief secondary	401
		3	trade and storage	406
business administration, brief secondary	4	4	business administration, long secondary	402
business administration, long secondary	5	5	business administration specialist	403
business administration, university degree	6	6	business administration, university degree	404
journalist	6			
medical secretary	4	3	medical secretary	405
social worker	6	5	social worker	407
psychologist	6	6	psychologist	408
lawyer	6	6	lawyer	409
social science, university degree	6	6	social science, university degree	410
industry, crafts, engineering, natural sience				
mechanic etc, brief secondary	3	3	mechanic etc, brief secondary	501
pharmacy technician	3			
engineer advanced vocational training	5	4	engineer, long	502
		5	engineer specialist	503
pharmacy receptionist	5			
laboratory assistant	5			
textile worker	3	3	textile worker	504
natural science & engineering, university degree	6	6	natural science & engineering, university degree	505
pharmacist	6			
mapmaker	3	3	architecture, brief	506
architect	6	6	architect	507

Table 1: Continued

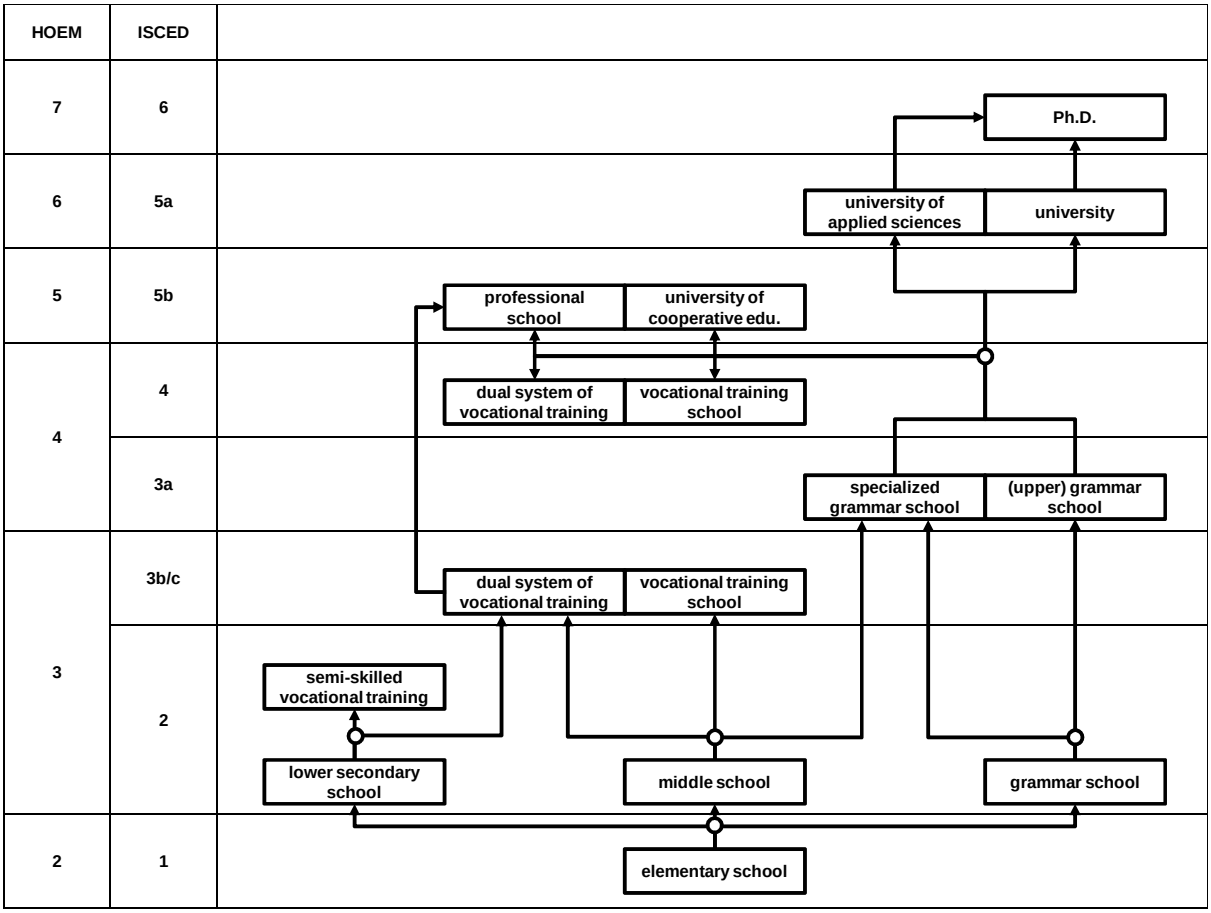
SWEDEN (HOEM et al. 2006a)		GERMANY		
FIELD	LEVEL	LEVEL	FIELD	CODE
agriculture				
farm worker, brief secondary	3	3	farm worker, brief secondary	601
agronomist, veterinarian	6	6	agronomist, veterinarian	602
health professions				
health-care worker	3	3	health-care worker, brief secondary	701
dental nurse etc	4	4	health-care worker, long secondary	702
nurse	5	5	health-care specialist	703
midwife	5			
physician	6	6	health care, university degree	704
child-care worker	4	3	child-care worker, brief secondary	705
		4	child-care worker, long secondary	706
		5	child-care specialist	707
Ph.D. (Med)	7	7	Ph.D. (Med)	708
dentist	6			
teaching				
youth worker	5	3	youth worker	801
primary-school teacher	6	6	primary-school teacher	802
teacher of children with special needs	6	6	teacher of children with special needs	803
high-school teacher	6	6	high-school teacher	804
pre-school teacher	5	6	other teacher	805
physical education, teacher	5			
music or arts teacher	5			
home-economics teacher	6			
non-medical research				
Ph.D. (Social Science or Humanities)	7	7	Ph.D. (Social Science or Humanities)	901
Ph.D. (Natural or Technical Science)	7	7	Ph.D. (Natural or Technical Science)	902

Table 2: Educational attainment and childlessness in Western and Eastern Germany, women born in 1955-59

		Western Germany (FRG)		Eastern Germany (GDR)	
field of education	level	N	% childless	N	% childless
general education, non specific					
brief secondary school, general	3	3,105	13.4%	176	9.0%
art, humanist, religious					
arts, brief	3	276	17,2%	66	10.3%
humanities, brief	3	56	20.6%	50	14.3%
personal service etc.					
hotel & restaurant worker	3	232	12.0%	157	5.8%
service worker, unspecified	3	426	12.2%	87	4.7%
beautician, hairdresser	3	588	13.6%	58	3.6%
mail office worker	3	112	16.4%	93	5.0%
administration, economy, social sciences					
administration, brief secondary	3	2,583	18.8%	402	6.5%
business administration specialist	5	179	29.1%	123	6.0%
business administration, university	6	273	28.0%	124	8.1%
medical secretary	3	730	22.4%	143	5.8%
trade and storage	3	2,523	16.4%	377	7.6%
social science, university degree	6	457	31.9%	70	8.8%
industry, crafts, engineering, natural sciences					
mechanic etc, brief secondary	3	406	17.1%	434	8.3%
engineer specialist	5	85	20.3%	74	7.2%
textile worker	3	496	11.1%	325	6.5%
natural science & engineering, university	6	312	20.0%	149	9.4%
agriculture					
farm worker, brief secondary	3	98	23.0%	174	6.1%
health professions					
health-care worker, brief secondary	3	1,889	14.6%	187	8.1%
health-care specialist	5	410	23.9%	266	6.7%
health care, university degree	6	192	27.5%	56	3.0%
child-care specialist	5	141	9.5%	179	6.3%
teaching					
other teacher	6	301	15.3%	78	1.3%
total		19,879	17.8%	4,276	7.4%

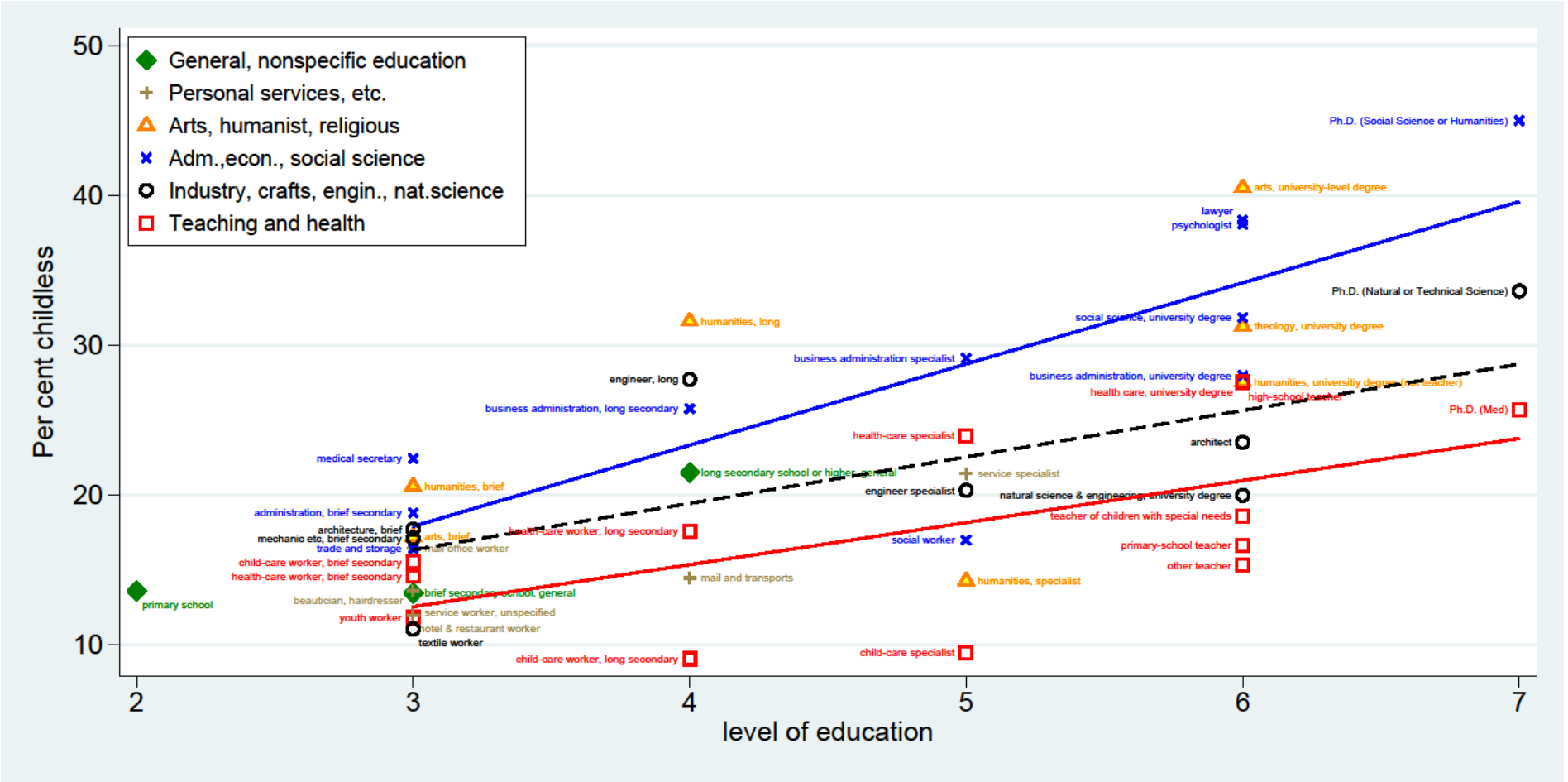
Source: FDZ der Statistischen Ämter des Bundes und der Länder, Mikrozensus 2008, own calculations
Selected educational lines with at least 50 observations in Eastern Germany

Figure 1: German educational system



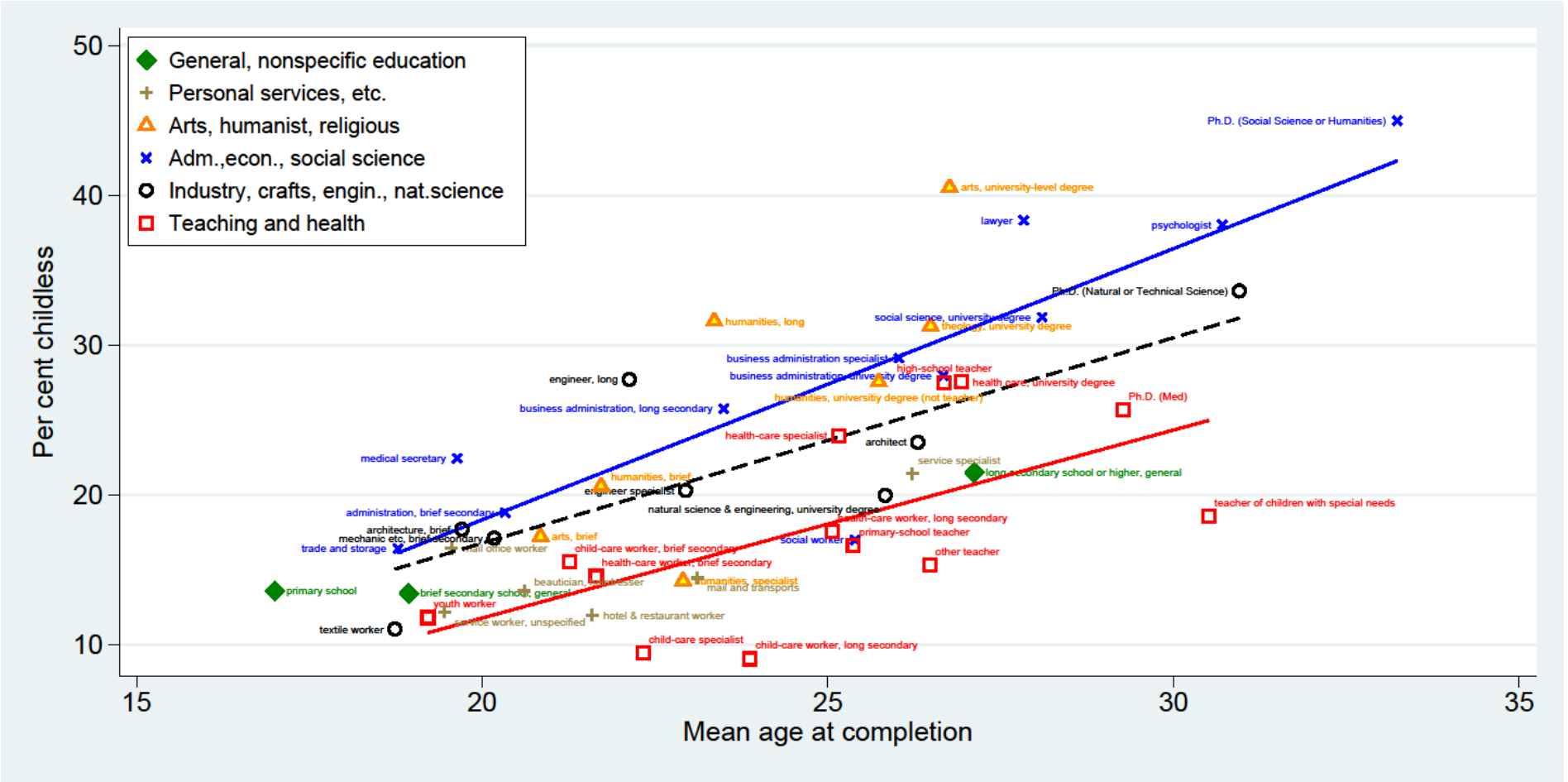
Source: own representation

Figure 2: Per cent permanently childless, by education group; Western German women born in 1955-1959



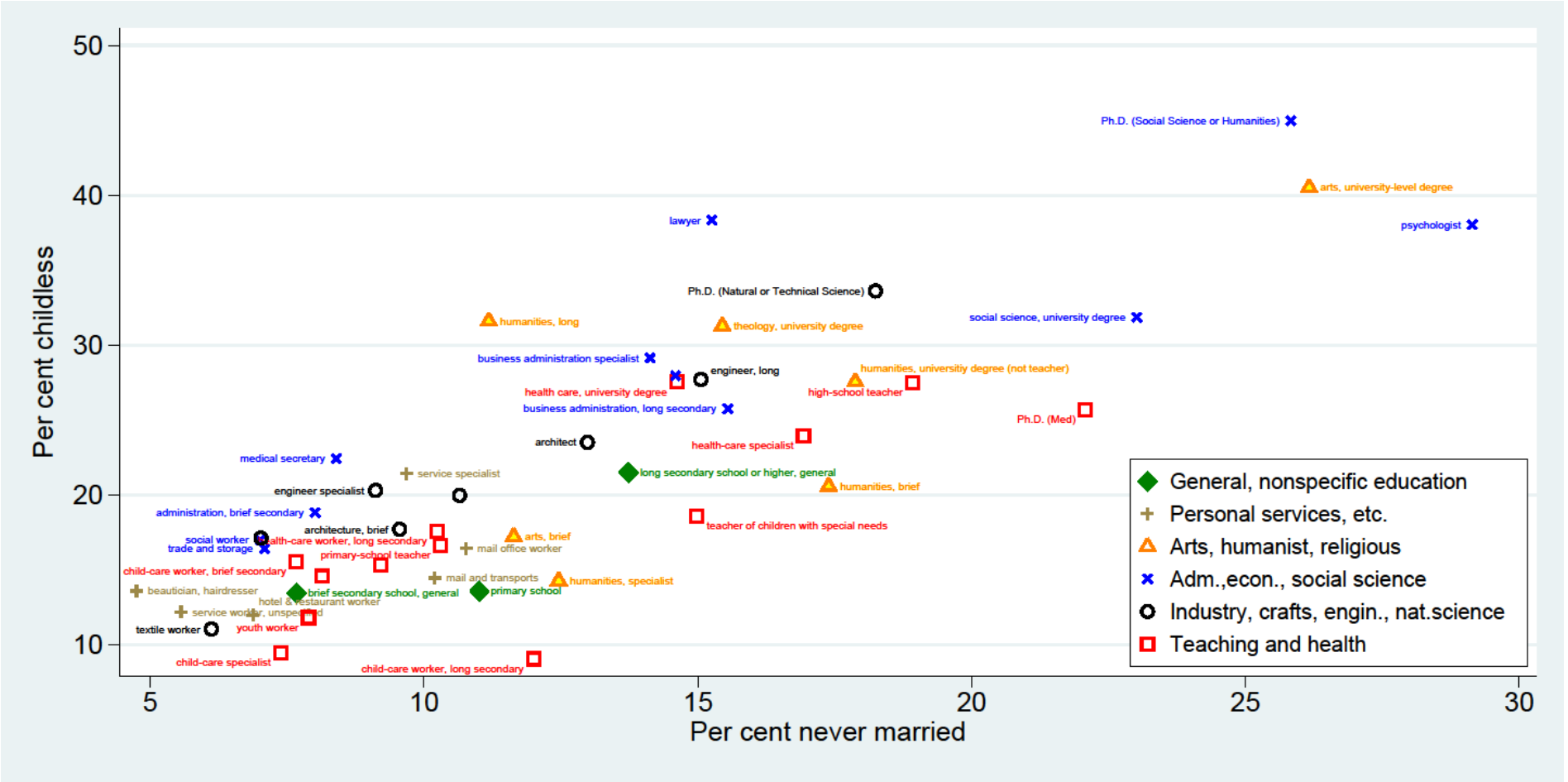
Source: FDZ der Statistischen Ämter des Bundes und der Länder, Mikrozensus 2008, own calculations

Figure 3: Per cent permanently childless, by mean age at completion of education; Western German women born 1955-1959



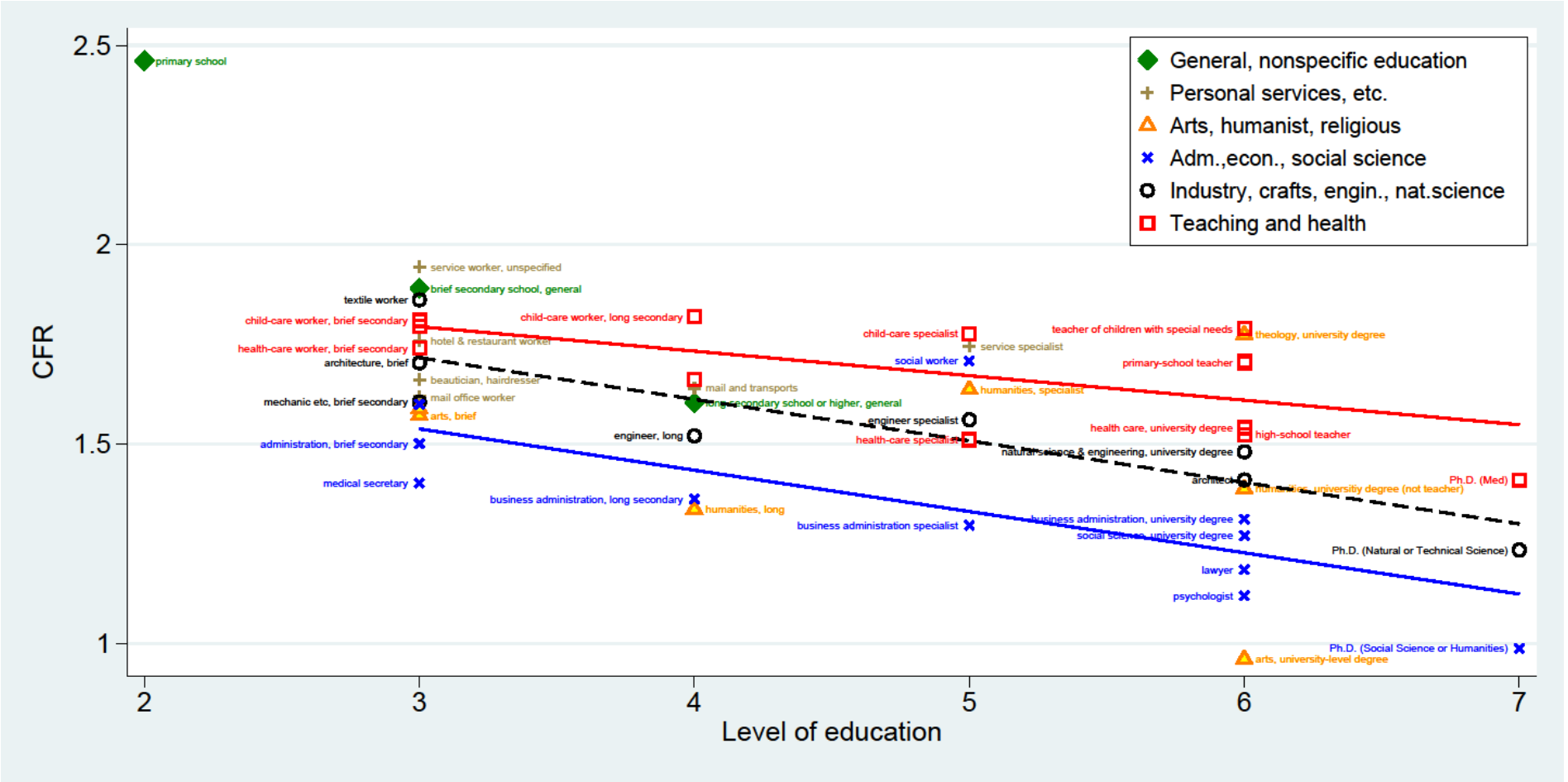
Source: FDZ der Statistischen Ämter des Bundes und der Länder, Mikrozensus 2008, own calculations

Figure 4: Per cent permanently childless vs. never married; Western German women born 1955-59



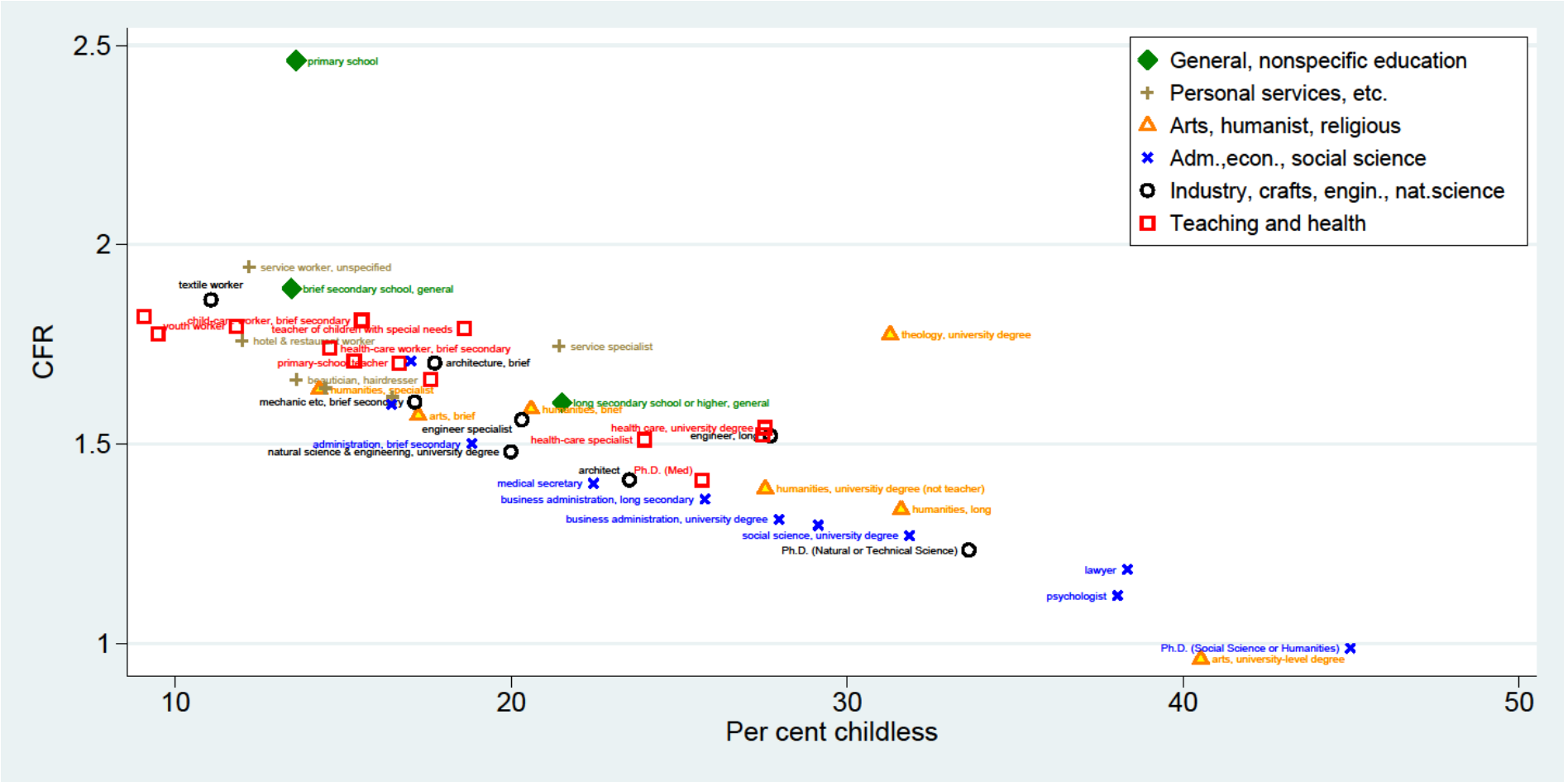
Source: FDZ der Statistischen Ämter des Bundes und der Länder, Mikrozensus 2008, own calculations

Figure 5: Ultimate fertility (CFR) by educational group; Western German women born 1955-59



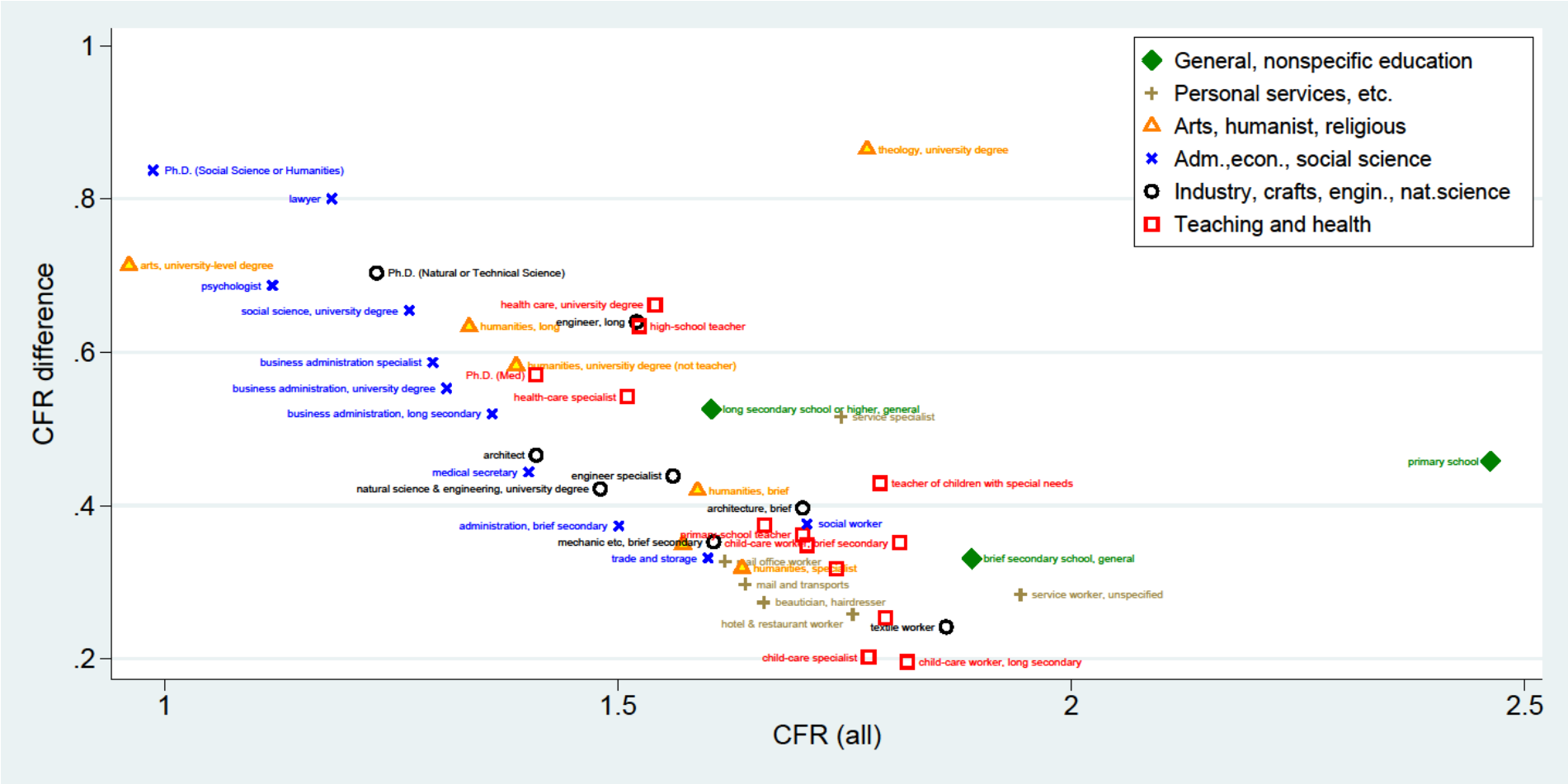
Source: FDZ der Statistischen Ämter des Bundes und der Länder, Mikrozensus 2008, own calculations

Figure 6: Ultimate fertility (CFR) vs. per cent childless; Western German women born 1955-59



Source: FDZ der Statistischen Ämter des Bundes und der Länder, Mikrozensus 2008, own calculations

Figure 7: [CFR (mothers) minus CFR (all)] vs. CFR (all); Western German women born 1955-59



Source: FDZ der Statistischen Ämter des Bundes und der Länder, Mikrozensus 2008, own calculations

Appendix

Table 1a: Basic childbearing statistic for Western German women born 1955-59

	edu level	all	% childless	% 2 or more children	mean number of children	% never married
general education, non specific						
primary school	2	770	13.6	70.8	2.46	11.0
brief secondary school, general	3	3,105	13.4	63.1	1.89	7.7
long secondary school or higher, general	4	336	21.5	52.3	1.60	13.7
art, humanist, religious						
theology, university degree	6	38	31.3	56.6	1.77	15.4
arts, brief	3	276	17.2	53.4	1.57	11.6
arts, university-level degree	6	138	40.5	30.7	0.96	26.2
humanities, brief	3	56	20.6	55.6	1.59	17.4
humanities, long	4	48	31.6	47.5	1.34	11.2
humanities, specialist	5	24	14.3	57.9	1.64	12.5
humanities, universitiy degree (not teacher)	6	177	27.6	47.4	1.39	17.9
personal service etc.						
hotel & restaurant worker	3	232	12.0	61.9	1.76	6.9
service worker, unspecified	3	426	12.2	70.0	1.94	5.6
service specialist	5	109	21.4	60.0	1.75	9.7
beautician, hairdresser	3	588	13.6	60.0	1.66	4.7
mail office worker	3	112	16.4	55.7	1.62	10.8
mail and transports	4	19	14.5	49.4	1.64	10.2
administration, economy, social sciences						
administration, brief secondary	3	2,583	18.8	53.9	1.50	8.0
business administration, long secondary	3	431	25.8	46.5	1.36	15.5
business administration specialist	4	179	29.1	42.8	1.30	14.1
business administration, university degree	5	273	28.0	45.2	1.31	14.6
medical secretary	6	730	22.4	47.2	1.40	8.4
trade and storage	3	2,523	16.4	55.0	1.60	7.1
social worker	5	54	17.0	63.7	1.71	7.0
psychologist	6	44	28.0	40.4	1.12	29.1
lawyer	6	100	38.3	41.4	1.18	15.3
social science, university degree	6	457	31.9	44.3	1.27	23.0

Table 1a: Continued

	edu level	all	mean number children (never married)	mean number children (ever married)	mean number children (mothers)	mean age at completion of education
<u>general education, non specific</u>						
primary school	2	770	0.52	2.72	2.92	17.00
brief secondary school, general	3	3,105	0.51	2.01	2.22	18.94
long secondary school or higher, general	4	336	0.20	1.88	2.13	27.12
<u>art, humanist, religious</u>						
theology, university degree	6	38	0.00	2.12	2.64	26.48
arts, brief	3	276	0.59	1.71	1.92	20.84
arts, university-level degree	6	138	0.15	1.29	1.67	26.76
humanities, brief	3	56	0.52	1.77	2.01	21.72
humanities, long	4	48	0.17	1.49	1.97	23.36
humanities, specialist	5	24	0.52	1.83	1.96	22.91
humanities, universitiy degree (not teacher)	6	177	0.36	1.65	1.97	25.74
<u>personal service etc.</u>						
hotel & restaurant worker	3	232	0.26	1.88	2.02	21.59
service worker, unspecified	3	426	0.39	2.04	2.23	19.46
service specialist	5	109	0.00	1.95	2.26	26.22
beautician, hairdresser	3	588	0.50	1.72	1.93	20.61
mail office worker	3	112	0.68*	1.73*	1.95	19.56
mail and transports	4	19			1.94	23.11
<u>administration, economy, social sciences</u>						
administration, brief secondary	3	2,583	0.26	1.62	1.87	20.33
business administration, long secondary	3	431	0.23	1.57	1.88	23.50
business administration specialist	4	179	0.23	1.50	1.88	26.03
business administration, university degree	5	273	0.13	1.54	1.86	26.67
medical secretary	6	730	0.18	1.52	1.85	19.64
trade and storage	3	2,523	0.32	1.70	1.93	18.78
social worker	5	54	0.00	1.85	2.08	25.39
psychologist	6	44	0.42	1.43	1.81	30.71
lawyer	6	100	0.13	1.39	1.98	27.83
social science, university degree	6	457	0.40	1.56	1.92	28.10

*due to a small number of cases the lines mail office worker and mail and transport had to be combined

Table 1a: Continued

	edu level	all	% childless	% 2 or more children	mean number of children	% never married
industry, crafts, engineering, natural sciences						
mechanic etc, brief secondary	3	406	17.1	55.0	1.61	7.0
engineer, long	4	68	27.7	58.8	1.52	15.1
engineer specialist	5	85	20.3	58.0	1.56	9.1
textile worker	3	496	11.1	64.6	1.86	6.1
natural science & engineering, university degree	6	312	20.0	54.8	1.48	10.6
architecture, brief	3	66	17.7	65.8	1.70	9.6
architect	6	65	23.5	50.8	1.41	13.0
agriculture						
farm worker, brief secondary	3	98	23.0	59.1	1.75	10.6
agronomist, veterinarian	6	40	30.0	51.8	1.40	23.0
health professions						
health-care worker, brief secondary	3	1,889	14.6	62.4	1.74	8.1
health-care worker, long secondary	4	278	17.6	61.4	1.66	10.2
health-care specialist	5	410	23.9	56.3	1.51	16.9
health care, university degree	6	192	27.5	52.5	1.54	14.6
child-care worker, brief secondary	3	313	15.5	66.0	1.81	7.7
child-care worker, long secondary	4	91	9.1	62.5	1.82	12.0
child-care specialist	5	141	9.5	64.2	1.78	7.4
Ph.D. (Med)	7	77	25.7	51.3	1.41	22.1
teaching						
youth worker	3	165	11.8	64.7	1.80	7.9
primary-school teacher	6	208	16.7	63.2	1.70	10.3
teacher of children with special needs	6	71	18.6	65.4	1.79	15.0
high-school teacher	6	197	27.5	55.3	1.52	18.9
other teacher	6	301	15.3	60.7	1.71	9.2
non-medical research						
Ph.D. (Social Science or Humanities)	7	45	45.0	38.3	0.99	25.8
Ph.D. (Natural or Technical Science)	7	37	33.6	46.7	1.23	18.2
total		19,879	17.8	57.6	1.67	9.64

Table 1a: Continued

	edu level	all	mean number children (never married)	mean number children (ever married)	mean number children (mothers)	mean age at completion of education
industry, crafts, engineering, natural sciences						
mechanic etc, brief secondary	3	406	0.40	1.70	1.96	20.17
engineer, long	4	68	0.26	1.77	2.16	22.13
engineer specialist	5	85	0.09	1.75	2.00	22.94
textile worker	3	496	0.66	1.94	2.10	18.74
natural science & engineering, university degree	6	312	0.26	1.66	1.90	25.83
architecture, brief	3	66	0.55	1.82	2.10	19.71
architect	6	65	0.00	1.66	1.88	26.30
agriculture						
farm worker, brief secondary	3	98	0.37	1.92	2.29	21.55
agronomist, veterinarian	6	40	0.25	1.76	2.02	26.29
health professions						
health-care worker, brief secondary	3	1,889	0.40	1.87	2.06	21.65
health-care worker, long secondary	4	278	0.49	1.81	2.04	25.06
health-care specialist	5	410	0.14	1.86	2.05	25.16
health care, university degree	6	192	0.26	1.80	2.20	26.93
child-care worker, brief secondary	3	313	0.20	1.94	2.16	21.26
child-care worker, long secondary	4	91	0.46	2.01	2.02	23.87
child-care specialist	5	141	0.35	1.89	1.98	22.33
Ph.D. (Med)	7	77	0.20	1.84	1.98	29.27
teaching						
youth worker	3	165	0.85	1.88	2.05	19.21
primary-school teacher	6	208	0.34	1.88	2.07	25.37
teacher of children with special needs	6	71	0.46	2.05	2.22	30.51
high-school teacher	6	197	0.28	1.85	2.16	26.69
other teacher	6	301	0.24	1.89	2.06	26.47
non-medical research						
Ph.D. (Social Science or Humanities)	7	45	0.00	1.36	1.82	33.24
Ph.D. (Natural or Technical Science)	7	37	0.00	1.56	1.94	30.95
total		19,879	0.34	1.82	2.06	21.90

Source: FDZ der Statistischen Ämter des Bundes und der Länder, Mikrozensus 2008, own calculations

Table 2a: childlessness by level of education, Western German women born 1955-59

educational level	% childless	N (childless)
2	13.6	770
3	15.8	14,064
4	21.8	1,271
5	21.7	1,002
6	26.1	2,613
7	32.9	159

Source: FDZ der Statistischen Ämter des Bundes und der Länder, Mikrozensus 2008, own calculations

Table 3a: Educational attainment and childlessness in Western Germany, Sweden, Austria and Greece, women born 1955-59

		% childless			
field of education	level	W-Germany	Sweden	Austria	Greece
general education, non specific					
primary school	2	13.6%	14.7%	13.0%	10.0%
personal service etc.					
hotel & restaurant worker	3	12.0%	22.4%	11.7%	20.0%
administration, economy, social sciences					
administration,brief secondary	3	18.8%	14.7%	18.0%	n.a.
business administration, long secondary	4	25.8%	16.5%	22.0%	14.4%
business administration sepecialist	5	29.1%	21.1%	24.0%	n.a.
social worker	5	17.0%	16.5%	24.0%	18.7%
social science, university degree	6	31.9%	22.1%	37.0%	15.1%
Ph.D. Social Sciences	7	45.0%	31.9%	n.a.	37.0%
industry, crafts, engineering, natural sciences					
textile worker	3	11.1%	13.9%	9.0%	n.a.
engineer, long	4	27.7%	18.4%	15.0%	15.3%
engineer specialist	5	20.3%	17.0%	27.0%	n.a.
natural science & engineering, university	6	20.0%	20.2%	27.0%	22.8%
Ph.D. Natural Sciences	7	33.6%	25.1%	n.a.	28.0%
agriculture					
farm worker	3	23.0%	15.5%	7.0%	11.3%
agronomist	6	30.0%	22.0%	14.0%	17.3%
health professions					
health-care worker, brief secondary	3	14.6%	10.2%	17.0%	n.a.
health-care worker, long secondary	4	17.6%	10.4%	n.a.	15.3%
health-care specialist	5	23.9%	13.0%	14.5%	n.a.
Ph.D. Medicine	7	25.7%	18.9%	n.a.	32.0%
teaching					
child-care worker, brief secondary	3	15.5%	8.6%	n.a.	n.a.
child-care worker, long secondary	4	9.1%	8.6%	n.a.	14.9%
child-care specialist	5	9.5%	8.6%	n.a.	n.a.
primary school teacher	6	16.7%	10.3%	16.5%	11.9%
high school teacher	6	27.5%	17.3%	28.0%	12.4%
total		17.8%	15.7%	15.7%	12.3%

Source: FDZ der Statistischen Ämter des Bundes und der Länder, Mikrozensus 2008, own calculations; (Bagavos 2010; Hoem et al. 2006a; Neyer & Hoem 2008), values that are not available in Tables or mentioned in the paper were extracted from graphs.

The Educational System in Western Germany

Structure and organization of an educational system influence fertility outcomes (Hoem et al. 2006a). This overview of the educational system in Western Germany focuses on the system in place in the 1960s, 70s and 80s and therefore effective during educational attainment of the cohort under examination[9].

The description of the educational system follows the one by Schneider (2008) dedicated to applying the International Standard Classification of Education (ISCED-97) to the German educational degrees. This description closely fits the data management applied in the following analysis.

One main characteristic of the German educational system is early tracking (Jacob & Tieben 2009; Shavit & Müller 2000). Nevertheless, it is generally possible to change tracks both downwards and upwards (Schneider 2008, p. 85), but in general the flexibility of the educational system is rather low (Kerckhoff 2001). Track change usually takes place during the first two years in secondary school or after graduation from a lower school by upgrading the level achieved (Schneider 2008, p. 81). After four years of elementary school, students are sent to a secondary school in accordance with their performance (ibid.).

Lower secondary school aims at preparing students for vocational training (Schneider 2008, p. 81 et seqq.). Students who attended middle school typically continue with a vocational training in fields which require a higher level of general education such as trade, technical and administrative professions (Schneider 2008, p. 80 et seqq.). Grammar school prepares children for higher education. The leaving certificate (Abitur) opens up access to all types of higher education (Allgemeine Hochschulreife) (Schneider 2008, p. 83 et seq.).

[9] Despite variations among the federal states, the main elements of the educational systems are the same in all federal states (Schneider 2008, 77).

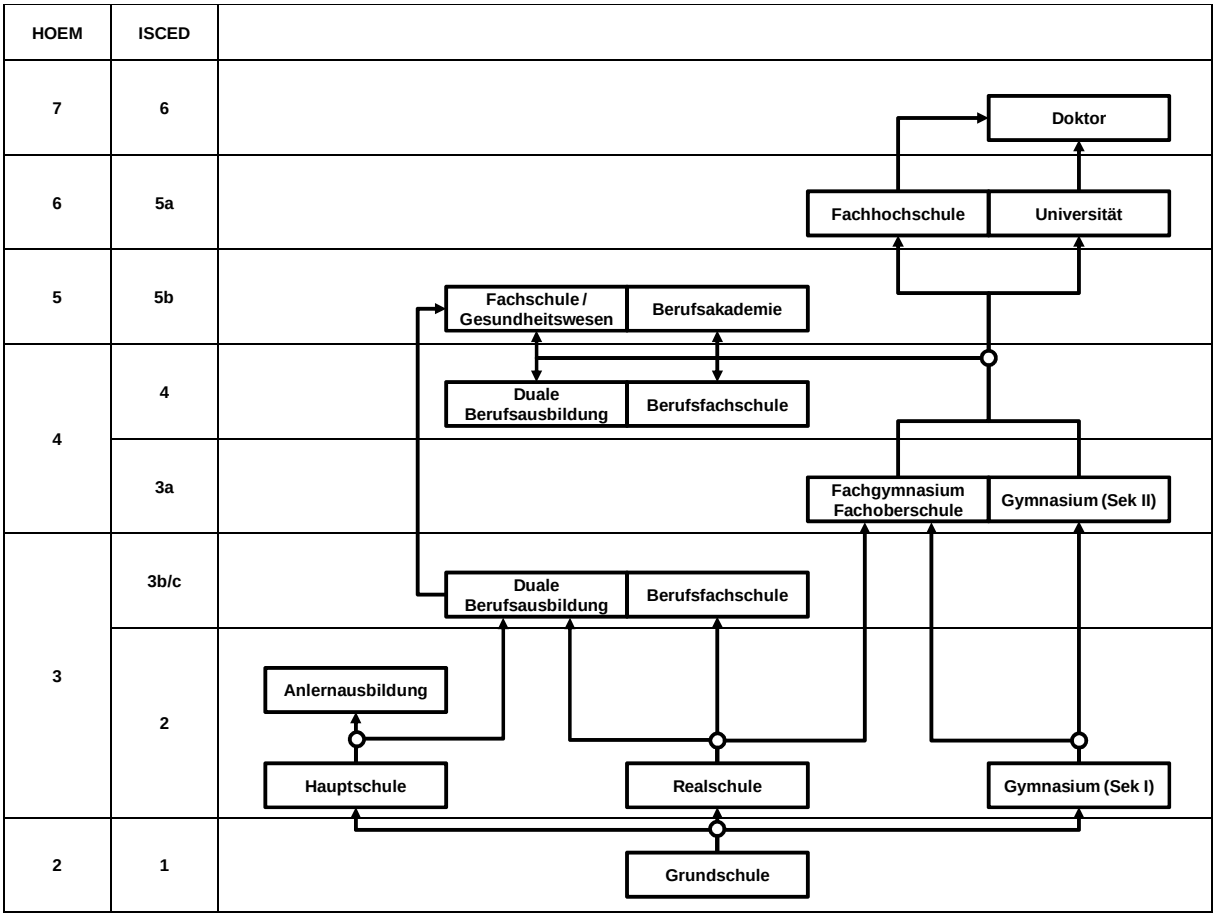
Vocational training can follow all types of secondary school, while it is most common for students from lower secondary school and middle school. It takes place in the so called “dual system of vocational training” (Duales System der Berufsausbildung), which consists of vocational training on the job within a company and one or two days a week general schooling in vocational schools (Schneider 2008, p. 87 et seq.). This system is “relatively unique and largely restricted to German-speaking countries”, as Schneider (ibid.) puts it. Some vocational trainings such as in the fields of banking and insurance, require graduation of grammar school (Schneider 2008, p. 88).

It is very common in Germany to earn a qualification, often closely related to an occupation, and to stick to this occupation throughout working life (Kerckhoff 2001). Childbirth is postponed until after graduation (Blossfeld & Huinink 1991; Kreyenfeld & Konietzka 2008; Kreyenfeld 2010). Numerous occupations are tied to formal educational qualification (Buchmann & Charles 1995, p. 85). The bond between educational system and labor market opportunities is tight, flexibility is low (Shavit & Müller 2000).

The highest levels of education can be achieved at two types of universities: The research-orientated traditional universities (Universität) and the universities of applied science (Fachhochschule), which focus on application of knowledge in professional life rather than academic research (Schneider 2008, p. 90 et seqq.).

Education at upper secondary or post secondary level is most common in Germany, while only a small number of students enter tertiary education (Hillmert & Jacob 2010; Hippach-Schneider, Krause, & Woll 2007). While the share of women participating in secondary and tertiary education increases, choices of educational fields are still strongly gender segregated (BMBF 1997, 2007; Wirth & Dümmler 2004).

Figure 1a: German educational system (German terms)



Source: own representation