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DIW BERLIN

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A New Color in the Picture:

The Impact of Educational Fields on Fertility in Western Germany

Anja Oppermann

September 2012

Abstract

The extensive research on the impact of educational attainment on fertility behavior has been expanded by a new dimension. According to these recent findings, not only the level but also the field of education has to be taken into account. The field of education determines a great deal about labor market options and influences opportunities to combine employment and family life. The question this paper aims to answer is: How does the educational field influence the transition to parenthood of women and men in Western Germany?

The German Socio Economic Panel (1984-2010) provides the data. Discrete time event history models are applied to examine the impact of the field of education on the transition to parenthood, looking at the time after graduation until a first child is born. Educational fields are grouped according to their most salient characteristic with regard to the share of women, the occupational specificity, the share of public-sector employment, and the share of part-time employment among people educated in the field. The models take the educational level into account and control for marital status, episodes of educational enrollment, and migration background.

The results show that educational fields matter for the transition to a first birth only for women. For men, the results do not show a significant impact of educational fields on the transition rates to parenthood. However, they point at the importance of the educational level for the probability of men to become fathers. High transition rates are found among women educated in both female-dominated and male-dominated fields. The finding of low transition rates among women educated in public-sector fields come as a surprise, since, given the high workplace security in the public sector, they were expected to be among the women with high transition rates.

Keywords: field of education, level of education, fertility, childlessness, Western Germany
JEL: J12, J13, J16, I24

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Introduction

Germany is a low-fertility country with one of the highest rates of childlessness worldwide (Dorbritz 2008, 557). Being childless has become a socially accepted lifestyle. Despite efforts, family policy has failed to increase fertility rates. This failure is attributed 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. Women in their reproductive years seem to face the choice between either employment and career, or children. Consequently, highly educated women often remain childless (Dorbritz 2008). The focus of this paper is a closer look at the educational impact on the transition to parenthood.

A prevailing theme in the public discussion as well as research in Western societies is the increased participation of women in education and the labor market and the question of whether this is compatible with childbearing and childrearing (e.g., Blossfeld and Huinink 1991; Liefbroer and Corijn 1999; Brewster and Rindfuss 2000; Kravdal and Rindfuss 2008). It is assumed that higher education leads to higher earning potential and, given a limited compatibility of employment and children, to higher opportunity costs of children and therefore higher childlessness among highly educated women compared to women with a lower educational level. Most studies concentrate on the fertility behavior of women (e.g., Blossfeld and Huinink 1991), while fewer studies look at men (e.g., Tölke and Diewald 2003), often finding different patterns between women and men (Kravdal and Rindfuss 2008) or couples (e.g., Corijn, Liefbroer and Jong Gierveld 1996; Dribe and Stanfors 2010).

A new approach to examining the connection between education and fertility is the distinction between an individual´s educational level and their educational field (e.g., Lappegård and Rønsen 2005; Hoem, Neyer, and Andersson 2006a; Martín-García and Baizán 2006; Van Bavel 2010; Begall and Mills 2012). Generally speaking, the idea is that people educated in the same field of education have a lot in common that is important for fertility behavior. The field of education not only determines many opportunities in the labor market, but also indicates personality traits, preferences and socialization and is therefore of importance when analyzing differences in fertility behavior, like the transition to a first child or the number of children. One key assumption is that educational fields differ with regard to the opportunities to combine employment and family as well as anticipated employment security.

The persistence of differences in family behaviors such as childbearing or marriage between Eastern and Western Germany so many years after reunification is a prevailing

theme in research (e.g., Goldstein and Kreyenfeld 2011; Henz 2008). To ensure results of this analysis are not confounded by these differences this paper focuses on Western Germany. The impact of education and other attributes on fertility behavior is not the same for women and men. In Norway, for example, being highly educated leads to greater childlessness among women, but to less childlessness among men (Kravdal and Rindfuss 2008). Employment insecurity prompts men and highly educated women to postpone parenthood (Tölke and Diewald 2003; Kreyenfeld 2010), while less educated women use it as occasion to become mothers (Kreyenfeld 2010).

This paper contributes to the research on education and fertility by taking the field of education into account when examining the transition to parenthood. This focus is chosen because the transition from being childless to parenthood is a major change in life, for example with regard to opportunities in lifestyle and career. It constitutes a bigger change than the change brought about by having a second or a third child and of course is a prerequisite for higher order parity. The question of how the educational field impacts fertility has not been dealt with in the German context in detail [1] yet. Previous research has concentrated on women in Sweden, Norway, Spain, Austria, Greece, and the Netherlands and on one comparison across twenty-one European countries [2] (Hoem, Neyer, and Andersson 2006a; Hoem, Neyer, and Andersson 2006b; Tesching 2012; Lappegård and Rønsen 2005; Ronsen and Skrede 2010; Martín-García and Baizán 2006; Neyer and Hoem 2008; Bagavos 2010; Begall and Mills 2012). Little is known about the impact of field of education on men´s fertility (Martín-García 2009).

The question this paper aims to answer is: How does the educational field influence the transition to parenthood of women and men in Western Germany? To answer this question, the German Socio-Economic Panel is used, which provides a database of very high quality that allows looking at the transition to a first birth within a time context. Discrete time event history models are applied to look at the time from graduation until a first child is born, separately for women and men. Two different strategies are applied to determine the impact of the educational field. The first step is to look for a general impact of the educational field on the transition to a first birth. For this, a large number of fields can be used as the focus is only on whether significant differences between women and men educated in different fields occur. How these differences look like in detail is addressed in the second step.

[1] For Germany, Maul's study (2012) examines the relationship between actual occupational field and family formation, but not the educational field.

[2] Germany as a whole is included in Van Bavel (2010), which focuses on the impact of field characteristics on the postponement of first birth. The multilevel-design of the study only allows for a general impression on the impact of field characteristics, without looking at single countries in detail.

Previous research has identified characteristics of educational fields that account for differences between people educated in different fields and their transition to a first birth. Among these characteristics are the share of women in a field, how likely an educational field is to lead to secure employment in the public sector, the occupational specificity (i.e., how directly a particular education leads to a particular job), and the opportunities to combine family and employment by working part-time. The educational fields were grouped by these characteristics according to their most salient attribute. This grouping resulted in seven groups that were included in the event history models. The rank order of transition rates of these seven field-groups is analyzed.

The next section gives an overview of the studies that examine the impact of field of education on fertility. The theoretical background of the research on the connection between educational fields and transition to parenthood is presented. The theory section ends with a model based on these theoretical considerations and with hypotheses derived from this model.

Previous findings

All studies examining the relationship between educational field and fertility find differences in individuals' fertility behavior that are independent of their educational level. The empirical evidence is mixed with regard to common trends and patterns, which highlights the lack of transferability of findings from one country to another.

From their analysis of fertility behavior of Norwegian women, Lappegård and Rønsen (2005) conclude that opportunity costs resulting from a break from employment differ depending on the field. They also suspect that differences of preferences toward a family influence the choice of field of education (Lappegård and Rønsen 2005).

Hoem et al. (2006a) find that in Sweden, the field of education is a better indicator of women's fertility behavior than educational level. Childlessness within a field increases with increasing educational level, but the differences between fields are more pronounced. The authors do not know the occupational career of the women in their study, but they interpret their findings in light of literature dealing with the Swedish labor market. They form five groups of educational fields in function of their outcome, namely employment in the public or private sector, their respective gender composition, and occupational specificity (i.e., how directly a particular education leads to a particular occupation). They find that

1. education leading to a *reliable career in the public sector* does not always lower childlessness like it does in teaching and health care, since higher levels of

childlessness among music and art teachers, librarians, or pharmacy employees were also found;

2. *highly feminized occupations in the private sector* are associated with high levels of childlessness, which the authors explain by working conditions, because occupations in hotels or restaurants are extremely time-demanding and often require high mobility;
3. *gender-mixed educational lines with little occupational specificity* are associated with moderate to high childlessness;
4. g*ender-mixed educational lines with high occupation specificity* are associated with higher than average childlessness. The similarity between this and the previous group led the authors to conclude that occupational specificity is less important than other explanatory factors; and
5. *male-dominated lines of education* are associated with low childlessness.

Looking at ultimate fertility in Sweden, Hoem et al. (2006b) find that educational groups with relatively little childlessness also have relatively high ultimate fertility and vice versa. The ultimate fertility for all women decreases with an increasing level of education, and the differences (with respect to ultimate fertility) between educational fields are more pronounced.

Rønsen and Skrede (2010) adapt Hoem et al.'s groups (2006a) to Norway. They find that different educational levels do not create large differences in fertility behavior between women, but at the same time, the differences between educational fields leading to different labor market segments are large and persistent (gender-segregated labor-market). The fertility of women whose education leads to a female-dominated field in the public sector is higher than the fertility of women in more gender-mixed or male-dominated sectors (Rønsen and Skrede 2010). On average, there seems to be a stronger tendency toward parenthood for women educated in fields that most likely lead to an occupation in the public sector. This finding, both by Hoem et al. (2006a), and Rønsen and Skrede (2010),[3] indicates a reduction of opportunity costs of children by greater workplace security and more generous parental benefits.

Most studies find especially high fertility among women educated in teaching or health care (Hoem, Neyer, and Andersson 2006a; Neyer and Hoem 2008; Lappegård and Rønsen 2005; Tesching 2012; Begall and Mills 2012; Bagavos 2010). This finding is

[3] See also Adsera (2011).

interpreted as displaying a personality trait or disposition toward the care of other people. This personality trait is expressed by the educational choice as well as the high tendency to parenthood. Generally, the empirical evidence is mixed with regard to the question of whether a personality trait of being oriented toward other people is responsible for the educational choice and the tendency toward parenthood. On the one hand, some results can be interpreted that way, but only for women (Martín-García and Baizán 2006; Martín-García 2009); on the other hand, alternative explanations such as a better compatibility of jobs in this sector with parenthood cannot be ruled out.

All these studies use field categories of different count for their analysis. For an analysis across twenty-one European countries, Van Bavel (2010) uses measurements of field characteristics that have been identified as important features of the fields with regard to the transition to parenthood. He finds that women educated in fields in which traditional family attitudes prevail are less likely to postpone the birth of a first child.[4] The same is found for women educated in female-dominated fields. High earning potential in a field, consisting of the expected starting wage and the steepness of the wage, on the contrary leads to stronger postponement (Van Bavel 2010).

The clear result of this research is that looking only at the level of education, as it is often done, does not capture the whole picture. The level of education is easier to observe, evaluate, and compare, but if the field of education can explain the same or even more variance in fertility behavior, it should not be ignored.

Theoretical background and hypotheses

Empirical research on the field of education and fertility is based on a broad spectrum of theoretical arguments. This section arranges the explicit and implicit ideas and assumptions in the literature in a theoretical model that provides the basis for examining the research question of this paper. The following remarks draw mainly on the work by Hoem, Neyer, and Andersson (2006a; 2006b; 2008), as well as on Lappegård, Rønsen, and Skrede (2005; 2010). Hoem et al.'s work (2006a and 2006b) is the most comprehensive in outlining the ideas behind this research.

There are three possible effects of education on fertility, as indicated by theory (Becker 1991) and supported by empirical studies (Blossfeld and Huinink 1991; Brüderl and

[4] It has to be noted that Van Bavel uses cross-sectional data, looking at women between twenty and forty years of age. The postponement of the first birth (not having had a first birth at the time of the survey) can therefore not be distinguished from permanent childlessness.

Klein 1993; Liefbroer and Corijn 1999; Klein 2003; Lappegård and Rønsen 2005; Martín-García and Baizán 2006; Kravdal and Rindfuss 2008): the institutional effect (the postponement of a first birth until after graduation), a positive income effect and a negative opportunity cost effect.

Opportunity costs derive from labor market potential. They are constituted by income potential, job security, and the compatibility of parenthood and employment. The argument is straightforward: Parenthood may damage an occupational career; the more promising the career, the greater the damage. The extent of this damage can be influenced by other aspects: If job security is high, it might be easy to re-enter the labor market after months or years of child-rearing. If compatibility is high, it might be possible to continue a career shortly after the birth of a child. All these three aspects are to a great extent defined by a person's specific labor market status. Working conditions that are assumed to be important and to differ between the fields are job content and the prospects of finding a job, job security, the probability of (secure) public-sector employment, income perspectives, gender dominance on the job (which is path dependent on the gendered structure in the respective study field[5]), and "skill depreciation" (Hoem, Neyer, and Andersson 2006a, 338 et seq.). The latter term refers to the damage to career prospects caused by a break, such as parental leave, which results in losing or reducing one's ability to perform on the job (Martín-García and Baizán 2006, 262).

Completing the argument, a tight bond between educational attainment and labor market potential is assumed. The effect of education can be distinguished in the effects of the level of education and the field of education. The level of education influences the level of employment and therefore labor market and income opportunities. The field of education determines in many cases the field of employment and therefore impacts upon labor market opportunities and income opportunities as well. In addition, the field of employment is crucial for compatibility and job security. The choice of educational field is a key decision and determines several subsequent options that influence fertility decisions. Lappegård and Rønsen (2005) conclude that the field of education has a stronger impact on the opportunity costs of children than the level of education.

To sum up: The educational field influences the field of employment, which determines labor market opportunities, job security, and compatibility of parenthood and employment. These three aspects form the opportunity costs that are crucial to whether a person becomes a parent.

[5] A higher share of women within a field is connected to higher compatibility with motherhood. Whether the higher share of women directly leads to that higher compatibility or a given higher compatibility leads to more women choosing a certain field remains an open question.

Obviously, there are more influencing factors and underlying mechanisms. Three will be highlighted and integrated into the model: First, the compatibility of parenthood and occupation is one main target of family policy. Literature discusses how important this effect is and whether it affects only the timing of fertility or also the ultimate fertility (e.g., Hoem, Neyer, and Andersson 2006b; Ronsen and Skrede 2010; Neyer and Hoem 2008; more generally, Gauthier 2007). Public policies that are most often discussed are monetary support, possibilities of parental leave, and daycare coverage. In general, generous support for families is assumed to reduce opportunity costs, but this reduction is not equal for all educational fields. Because this paper is looking at one country and one single-family policy regime only, the effect of family policy is not the focus.

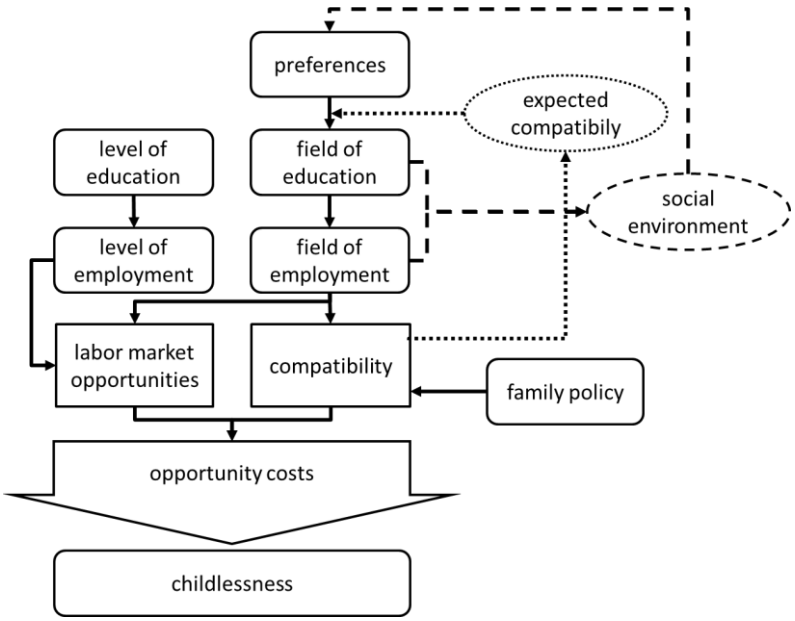
The selection of a field of education, which was the starting point of the core model described above, is an expression of preferences. Preferences regarding the future lifestyle, like the content of work and preferences toward childbearing, are assumed to play a crucial part in an individual's educational choice. Therefore, it might be that both the field of education and fertility depend on one underlying pattern of preferences or personality trait. The selection of a field of education might be an expression of anticipated working conditions and/or aspects of the compatibility of occupation with parenthood. Following this argument, educational field not only influences opportunity costs, but also the anticipated opportunity costs already determine the choice of educational field. The connection between education and fertility therefore is assumed to be "dynamically interactive processes that mutually determine each other" (Hoem, Neyer, and Andersson 2006b: 382).

Finally, a person's preferences lead to selecting a specific field of education. This choice in turn has an impact on the social environment during the "formative years" (Hoem, Neyer, and Andersson 2006a, 334; Van Bavel 2010; Martín-García and Baizán 2006). This environment is also closely related to the future social environment and future employment. The social environment during education and adult life (and the anticipation of the latter) impact and shape a person's preferences.

Figure 1 shows the described model of a relationship between educational attainment (level and field of education) and the probability of becoming a parent. This model provides the theoretical framework or, more precisely, the general idea behind the research question. Looking at Western Germany, one also has to keep in mind that compatibility has not been a political priority in the past (Gauthier 1999; Hank and Kreyenfeld 2003) and that it only matters for people who want to combine parenthood and employment. The underlying mechanism seems to be a non-linear causal structure. The dynamic process or feedback loop between

preferences and environmental impact, like the peer group, does not have a clear starting or ending point. Looking at Western Germany, one also has to keep in mind that compatibility has not been a political priority in the past (Gauthier 1999; Hank and Kreyenfeld 2003) and that it only matters for people who want to combine parenthood and employment.

Figure 1: Theoretical model of the relationship between educational attainment (level and field of education) and childlessness



Based on this theoretical basis I expect to find that:

1. the field matters. Examining the impact of education on differences in the transition to parenthood, I expect models that include the field of education to have a higher explanatory power than a model that only includes the level;
2. high compatibility leads to less childlessness. A higher share of women within a field is associated with higher compatibility and therefore lower opportunity costs, even though the causality of this effect is unclear because it is probably at least partly caused by self reinforcement. For women and men, I would expect this higher compatibility to increase the probability of having a child. I would expect an outstandingly high share of women in a field to display high compatibility in this field and therefore to increase the probability of having a child;
3. security leads to less childlessness, insecurity to more. High workplace security should lower opportunity costs and therefore increase the probability of having children. High workplace security can be expected in fields that are likely to lead to employment in the public sector;

a) being educated in a field that leads to employment in the public sector should have a positive impact on the transition to parenthood for women and men, because it ensures re-entering employment after parental leave and provides secure income;

b) on the contrary, fields leading to a high share of private-sector employment should be characterized by more insecurity and therefore lower the transition rates for women and men; and

c) another indicator for security, or the prospect of security, is the occupational specificity of a field. Therefore, high occupational specificity should increase the probability of having children for women and men;

4. gender-differentiated impact of low compatibility. A low compatibility of employment and family should not impact the transition to a first birth in the same way for women and men. While I expect a low compatibility to lower the transition rates for women, I do not expect this to matter for men. This argument is based on the still common pattern of traditional division of labor between women and men in Western Germany. Low compatibility does not affect men as it does affect women, since women are the ones usually taking care of the children;

   a) therefore, a high share of men in a field, most likely associated with low compatibility, should lower the transition rates of women but not affect men;

   b) a low share of part-time employment should also lower the transition rates of women but not affect men; and

   c) a higher share of part-time employment should increase the transition rates of women but not men.

Data and method

The data for the analysis come from the German Socio Economic Panel (SOEP) (Wagner, Frick, and Schupp 2007). The data were partly extracted using the Add-On package PanelWhiz for Stata®[6].

[6] PanelWhiz (http://www.PanelWhiz.eu) was written by Dr. John P. Haisken-DeNew (john@PanelWhiz.eu). See Haisken-DeNew and Hahn (2006) for details. The PanelWhiz-generated DO file to retrieve the data used here is available from me upon request. Any data or computational errors in this paper are my own. The following authors supplied PanelWhiz Plugins used to ensure longitudinal consistency, John P. Haisken-DeNew, Markus Hahn.

Educational fields

The starting point of measuring the educational field was rather complex because information on vocational and university degrees derive from different sources and were coded according to different classifications. On the one hand, the field is known for respondents who completed a vocational or university education while observed by the SOEP. On the other hand, additional information derives from datasets provided by the SOEP upon request. These datasets cover information on educational fields that were collected via questionnaires that were offered only once, when the respondent entered the SOEP, and were collected since 2001. Gap questionnaires were given to respondents who temporarily left the SOEP but rejoined. Vocational degrees from the annual person questionnaire were coded by the classification of occupations provided by the Bundesanstalt für Arbeit from 1988, while those from the biography questionnaire were coded according to a classification provided by the Statistisches Bundesamt from 1992 (for further information, see: Documentation PGEN[7]). University degrees are coded according to a classification of its own. In the latest release of the SOEP, they are provided as a generated variable in the pgen-dataset combining information from the different sources.[8]

All these different classifications were re-classified using the Klassifikation der Berufe 2010 (KLdB2010) of the Bundesagentur für Arbeit[9] (BA). In addition to the obvious advantage of getting all information classified in the same way, this classification also has a theoretical advantage that is relevant to this analysis. The focus of the KldB2010 is to group jobs in accordance with their content; this classification therefore represents what is understood by "field of education" in this paper. The KldB2010 is ordered hierarchically with different levels of abstraction (BA 2011a; BA 2011b). There are ten main fields at the top (one-digit level) and 1,286 job classes at the bottom—the most detailed level (five digits). Transformation keys are available to transform these job classifications into KldB2010.[10] Some categories of the classification of the university degrees were too broad to be transferred to the KldB2010, and in these cases, additional information provided by the SOEP

[7] http://www.diw.de/documents/dokumentenarchiv/17/diw_01.c.60055.de/pgen.pdf, January 31st 2012 (Anger et al. 2011).

[8] The latest release of the SOEP (2011) provides five new generated variables containing information on the educational fields of the respondents from these three sources. For several reasons, only the university degree variable is used for the present analysis. See section "Data management: Educational fields" in the appendix for further information.

[9] The Bundesanstalt für Arbeit was renamed into Bundesagentur für Arbeit in 2003.

[10] http://statistik.arbeitsagentur.de/Navigation/Statistik/Grundlagen/Klassifikation-der-Berufe/KldB2010/Umsteigeschluessel-Nav.html, May 6th, 2012, (BA).

was used to ensure coherent re-classification. For a more detailed description of the data situation and management, please see the appendix.

It was possible to code the educational fields on a two-digit level that contains thirty-seven categories.[11] The only distinction between the original KldB2010 two-digit level and the one used here is that here respondents with degrees in economics are a group of their own instead of being part of a group with respondents with degrees in language, literature, the humanities, or social science.[12]

Previous research on the connection between educational fields and fertility has discussed several characteristics of study fields to be of importance. Among them, gender composition (mentioned by all authors), the share of public-sector employment within a field, the occupational specificity of a field (i.e., how directly it leads to a certain occupation), and the share of part-time employment in a field. To get an overall impression of these characteristics over the time of the SOEP, for each educational field in every year of the SOEP, the share of women, the share of public-sector employment, occupational specificity, and the share of part-time employment was calculated. This was done by looking at the respondents holding degrees in the respective fields and year.[13] The data were weighted with the cross-sectional weight provided by the SOEP. The average values over the whole time of the SOEP per field can be seen in Table 2a in the appendix.

The gender composition expresses the share of women within each field. There is no limit with regard to the age of the respondents. The sample for this variable contains all respondents in the field of education in the respective year. A higher share of women is associated with more compatibility of employment and children and is therefore expected to be positively associated with the transition to parenthood.

The average proportion of public-sector employment compared to private-sector employment is restricted to employed respondents between eighteen and sixty-five. The share of public-sector employment is supposed to measure expected job security and accordingly insecurity of fields. High security is assumed to reduce the opportunity costs of children.

[11] The two-digit level seems to most adequately represent what is understood as field of education in this study. A nurse and a physician are in the same group at this level: They would be in different groups at the three-digit level, but at the one-digit level, they would be grouped with teachers and social workers (Bundesagentur für Arbeit (BA) 2011b).

[12] Very few people (men) in the SOEP have a military degree. Because this group has very special living conditions that can hardly be compared to others, those cases are not used.

[13] A minimum of ten observations per year and field are the prerequisite for calculation of a characteristic-value in this field/year.

Occupational specificity was calculated as the share of people (employed respondents between eighteen and sixty-five) who report working in the occupation they were educated for. The occupational specificity of a field is probably highly related to the time span between graduation and establishing a stable working situation and is therefore probably especially important for the timing of the first birth. Part-time employment within a field is supposed to measure opportunities to combine employment and parenthood.

These characteristics are used to group the fields according to the hypotheses. The aim is not groups that are most alike with respect to all four characteristics, but instead groups that are defined by one stand-out characteristic. The grouping strategy can be described as a prioritizing process of elimination. It starts with the most salient characteristic, namely an outstandingly high share of women in a field. The next criterion, a high share of public-sector employment, is only applied to the remaining fields, and so on. On the basis of six criteria, seven groups of educational fields were identified. The six criteria and seven groups are:

1. a share of women above 80% - female-dominated fields;
2. a share of public-sector employment above 40% - public-sector fields;
3. a share of public-sector employment below 10% - private-sector fields;
4. occupational specificity above 80% - qualified specialists fields;
5. a share of women below 40% - male-dominated fields;
6. a) a share of part-time employment below 15% - gender-mixed job only fields; and
   b) a share of part-time employment above 15% - non-distinctive attributes fields.

Table 1 shows how the educational fields are assigned to the seven groups. Given the hypotheses, a positive impact of educational field on the transition rate can be expected for women educated in female-dominated fields, public-sector fields, and qualified specialists fields – the fields with high compatibility and/or high security. A negative impact can be expected for women educated in private-sector fields, gender-mixed job-only fields, or male-dominated fields due to lower security and/or lower compatibility. The transition rate of women educated in non-distinctive attributes fields should be located in between; compatibility should be higher than in the gender-mixed job-only fields due to a higher share of part-time employment in these fields.

Table 1: The assignment of educational fields to seven field groups

groups	fields of education (KldB 2010)
female-dominated fields	• non-medical health care, hygiene, wellness, medical technology • textile and leather • medical health care
public-sector fields	• protection, security, observation • pedagogy and child care, social and home economics, theology • teaching and training • performing and entertainment • law and administration
private-sector fields	• paper and printing • product design, arts and crafts • sales • purchase, distribution, and trade
qualified specialists fields	• architecture and construction planning • financial service, accountancy and tax advice • computer science, information and communication technology
male-dominated fields	• construction above and below ground • building maintenance • interior fitting • metal production and processing • mechatronics, energy, electronics • machine and automotive engineering • plastic production, woodworking • transport and vehicle driving • primary production, glass and ceramic • agriculture, forestry • food production and processing • economics • geology, geography, environment protection
gender-mixed job-only fields	• technical research, development and construction • mathematics, biology, chemistry, physics • transport and logistics (without driving) • language, literature, humanities, social sciences • company management and organization
non-distinctive attributes fields	• advertising, marketing, media • tourism, hotel and restaurant • cleaning • gardening and floristry

For men, the expectations differ. Generally it is expected that the impact of educational fields is less pronounced for men than for women. This argument is based on the theoretical assumption that the educational field determines a great deal of compatibility between employment and family. Since compatibility is still predominately a women's issue, men should be less affected by low compatibility. High compatibility and security, on the other hand, are assumed to have a positive impact on both sexes, with security probably being more important. Therefore, high transition rates are expected for men educated in public-sector fields, qualified specialists fields, and female-dominated fields. Low transition rates are expected among men educated in private-sector fields. Male-dominated, gender-mixed, and non-distinctive attributes fields are expected to be located in between, without differing much from each other.

Event History Models

To test the hypotheses, a subsample of the SOEP waves from 1984 to 2010 was constructed. The SOEP contains information on all members of a household ages seventeen and older (Wagner, Frick, and Schupp 2007, 9). The subsample was restricted to respondents who have completed vocational education in a known field. Respondents who had a child before graduation were excluded.[14] For the analysis, a time-discrete logit model is applied (Yamaguchi 1991). Individuals leave the sample as soon as they become parents, females leave at age forty-five, and males at sixty or when they are no longer observed by the SOEP. These observations are right censored.[15]

The field of education was gathered from different sources, as described above, leading to different time-spans between graduation and reporting the field to the SOEP. For those respondents for whom the source of this information was the annual person questionnaire, the year of completion was set to the year before the respective survey year. For respondents for whom the biography questionnaire was the source, the year in which the degree was received was extracted from the bio-dataset in SOEP-long.[16]

The dependent variable is the transition to parenthood.[17] This variable is zero in every year a person is childless and becomes one in the year a child is born. The female-sample contains 2,381 persons, 18.897 person-years, and 1,103 events (i.e., birth of a first child); the

[14] Tables 3a and 4a in the appendix show how many cases per field are excluded due to having had a child prior to graduation.

[15] The oldest respondents in the sample was born in 1950 and the youngest in 1989.

[16] Only respondents who graduated in 1984 or after are used for the analysis.

[17] The year of birth of the first child is taken from the biobirth dataset for women and biobirthm for men.

male-sample contains 2,766 persons, 24.579 person-years, and 995 events. Several independent variables are included in the model. Table 2 gives an overview of the variables with a short description of what they contain and the descriptive sample statistics. Discrete time event history models require a time spell over which the transition rate to an event, in this case the transition to parenthood, can be observed. The years since graduation are used as time axis. The models also contain a variable with the logarithm of the years since graduation. This variable was included to model an increased probability of childbirth in the first years after graduation, and this variable has shown to improve the models significantly. Additionally, the models control for the respondents' age at the time of graduation.

The design already captures part of an effect of educational level on the timing of a first birth. Nevertheless, the educational level might still matter for the transition rates to a first birth, especially for men. As described above, the division of labor between women and men is still rather traditional. While this might lower the impact of compatibility issues for men, their provider abilities are highly important. A high educational level is related to high earning potential in the labor market. Therefore, two additional variables control for educational level. One dummy variable that distinguishes between people with an abitur and those without, and the second distinguishes between respondents with a tertiary degree and those with a vocational education. The models control for the marital status of the respondents because it can be expected that married individuals have a higher transition rate to a first birth than unmarried individuals.[18] The models control for episodes of further educational enrollment, since educational enrollment usually is not the time for family formation (institutional effect).[19] The present analysis focuses on Western Germany. The models include people who lived in Western Germany at the time of graduation and control for possible movement to Eastern Germany in the years after. Another variable controls for a migration background of the respondents, since it has been shown that women with a migration background are less often childless than native German women (Sobotka 2008). The models are unweighted, therefore samples of the SOEP that are not representative are excluded, namely sample G and I. The models control for the sample a respondent belongs to as well as the birth cohort.

[18] The information on marriage biography was taken from the biomarsy dataset.

[19] The information on educational enrollment was taken from the pbiospe dataset.

Table 2: Variables and Descriptive Sample Statistics for the Discrete Time Event History Analysis

variables	women M (SD)	men M (SD)
birth of a first child 0 for all years no child is born 1 in the year a child is born *respondents leave the sample in the year after*	0.06	0.04
years since graduation year of graduation: 0	5.27 (4.48)	5.97 (5.3)
logarithm of years since graduation *as logarithm of 0 is not defined, 0 was recoded to 0, 1*	0.996 (1.48)	1.14 (1.47)
age at graduation	21.81 (3.62)	22.56 (4.39)
abitur 0 for respondents without abitur 1 for respondents with abitur	0.28	0.25
educational Level 0 for respondents with a vocational education 1 for respondents with a tertiary degree	0.17	0.19
educational field (%)		
female-dominated fields	23.46	3.16
public-sector fields	19.89	8.08
private-sector fields	15.38	7.14
qualified specialists fields	7.17	8.43
male-dominated fields	7.40	61.00
gender-mixed job-only fields	21.32	10.43
non-distinctive attributes fields	5.38	1.76

married 0 for unmarried respondents 1 for married respondents	0.22	0.19
in education 0 for not in educational enrollment 1 for in education enrollment	0.09	0.11
move 0 for respondents living in Western Germany 1 for respondents living in Eastern Germany	0.007	0.006
migration background 0 for respondents without migration background 1 for those with a direct or indirect migration background	0.14	0.17
N (person-years)	18,897	24,579
N (persons)	2,381	2,766
N (events)	1,103	995

Source: SOEP 1984-2010, own calculations. Additionally, the models control for cohort and sample-membership.

Analysis

The hypotheses predict, on the one hand, a general impact of the educational field on the transition to a first birth. On the other hand, they state how different characteristics of the educational fields should cause these differences. The educational field is expected to have more impact on the transition rates of women than men. To test these hypotheses, several multivariate analyses were estimated, each for women and men separately. The samples of the analysis only include women and men who have not become parents prior to graduation. This applies to the majority of women and men. For the analysis on women, 163 out of 2,544 are excluded because they had already had a child by graduation (about 6.4%). Table 3a in the appendix shows how the share of women with children at graduation is distributed among the seven field groups. For men, 252 out of 3,018 are excluded (8.3%); see Table 4a in the appendix.[20]

Two strategies were applied to test for a general impact of the educational field on the transition to parenthood. The first tests whether a model that includes the above-described control variables like educational level, marital status, and dummy variables for educational fields (33 for women and 35 for men[21]) significantly improves due to these field dummies. A Wald-test and a likelihood-ratio test are applied. Both tests show significant improvement for the models on women (5% level), but not for men (see Tables 5a-8a in the appendix). The second is a multi-level approach using the educational fields as macro-units, modeling individuals nested in fields (Hox 2010). The advantage of this approach is that multi-level analysis does not require many observations on the micro-level. Nevertheless, fields with fewer than five persons were excluded. The results of the multilevel models confirm the previous findings, showing a small but significant (0.1% level; see Table 9a in the appendix) variance in the transition rates to a first birth between women nested in different educational fields even when controlling for important factors like educational level and marital status. The findings for men are also confirmed as no significant variance between the transition rates to a first birth for men nested in different fields, is observed (Table 10a in the appendix).

[20] Looking at the share of fathers at graduation by the field groups, it is striking that they are not distributed equally among the groups. 13% of the male graduates in female-dominated fields and 14% in public-sector fields are already fathers at the time of graduation. It has to be noted that these figures are not weighted.

[21] For these models, fields with fewer than five persons per field were excluded.

Table 3: The Share of Women (Age 40) with Children by Educational Fields (N=626)

	% children (N)
female-dominated fields	77 (165)
public-sector fields	63 (133)
private-sector fields	74 (91)
qualified specialists fields	66 (35)
male-dominated fields	67 (46)
gender-mixed job-only fields	71 (126)
non-distinctive attributes fields	57 (30)

Source: SOEP 1984-2010, own calculations, unweighted data.

Table 3 shows the proportion of women with children by the seven groups of educational fields for a subsample of the women used in the multivariate analysis. The subsample only includes women who were observed until they reached the age of 40, and therefore most likely have already made a decision to have children or stay childless. These descriptives can only be interpreted very cautiously because they neither are weighted nor control for any composition factors. As expected, the highest share of mothers is found among women educated in female-dominated fields. Rather surprising is the high share of mothers among women educated in private-sector fields as well as the lower share of mothers in public-sector fields.

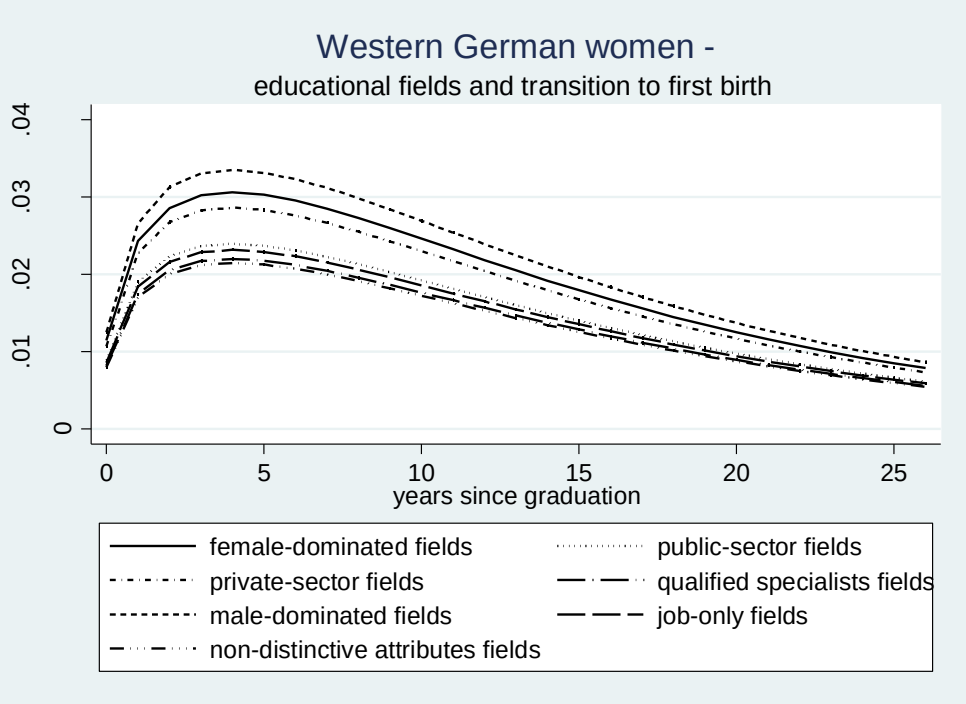
To examine the impact of the educational fields grouped according to their most outstanding characteristic, two models were calculated for women and men separately: The first only contains all other variables that can be expected to impact the transition to parenthood, and the second adds the seven groups of educational fields. For women, a likelihood-ratio test shows a significant improvement of the models (1% level) due to adding the fields. This implies that the grouped fields can capture the differences that were observed when adding the ungrouped fields. Figure 2 show women's predicted probabilities of transition rates to parenthood by their educational fields; all control variables are set to their mean value.

Table 4: The Effect of Educational Fields on the Transition to Parenthood for Western German Women (discrete time logit model, average marginal effects)

	(1) transition to first birth	(2)
years since graduation	-0.00475***	-0.00461***
	(-7.23)	(-7.04)
ln years since graduation	0.0185***	0.0183***
	(6.80)	(6.75)
age at graduation	-0.00119+	-0.00103
	(-1.90)	(-1.64)
married	0.175***	0.175***
	(26.17)	(26.23)
abitur	-0.0105*	-0.00798+
	(-2.30)	(-1.68)
university degree	0.00145	-0.00130
	(0.25)	(-0.22)
female-dominated fields		Ref.
public-sector fields		-0.0117*
		(-2.55)
private-sector fields		-0.00332
		(-0.67)
qualified specialists fields		-0.0149**
		(-2.60)
male-dominated fields		0.00462
		(0.63)
gender-mixed job-only fields		-0.0132**
		(-3.05)
non-distinctive attributes fields		-0.0158*
		(-2.39)
N(person years)	18,897	18,897
N(persons)	2,381	2,381
N(events)	1,103	1,103
pseudo R^2	0.196	0.198
chi²	1,649.4	1,668.3

Notes: t statistics in parentheses
+p<0.1, * p < 0.05, ** p < 0.01, *** p < 0.001
The models also control for migration background, episodes of educational enrollment, movement to Eastern German, cohort, and sample membership.
Source: SOEP 1984-2010, unweighted data, own calculations.

Figure 2: Educational Fields and the Transition to a First Birth for Western German Women



Source: SOEP 1984-2010, own calculations, unweighted data
Note: predicted probabilities, analysis time: years since graduation, all control variables set to their mean value

The order of these transition rates is only partly in line with the expectations. Even though the transition rates of women educated in female-dominated fields are high, the transition rates of women educated in male-dominated fields are even higher. Women educated in private-sector fields are also among those with high transition rates. These three groups do not significantly differ from each other. Contrary to expectation, women educated in public-sector fields have significantly lower transition rates than women educated in female-dominated fields. On average, the difference between them is 1.17%.[22] Everything else being equal, this difference is significant on a 5% level. Low transition rates are observed among women educated in qualified specialists fields, contrary to the expectation that these women would have high transition rates. On average, their transition rate is 1.49% lower than for women educated in a female-dominated field (significant on a 1% level).

Table 5 shows the corresponding descriptive findings for men as are in Table 3 for women. In these descriptive findings, men educated in male-dominated fields have the highest share of fathers at the age of 40. Again, it has to be considered that these numbers are unweighted.

[22] To display the results of the event history analysis, the average marginal effects (AME) were calculated using the STATA-ado margeff (Bartus 2005; see also: Mood 2010).

Table 5: The Share of Men (Age 40) with Children by Educational Fields (N=806)

	% children (N)
female-dominated fields	39 (28)
public-sector fields	51 (86)
private-sector fields	48 (48)
qualified specialists fields	55 (83)
male-dominated fields	66 (461)
gender-mixed job-only fields	64 (89)
non-distinctive attributes fields	45 (11)

Source: SOEP 1984-2010, own calculations, unweighted data

So far the analysis has not shown an impact of the educational field on the transition to a first birth for men. Therefore, it is not surprising that adding the grouped educational fields to a model does not improve its explanatory power as it did for women. Figure 3 shows men's predicted probabilities of transition rates to parenthood by their educational fields. All control variables are set to their mean value. None of these fields differ significantly from each other.[23] In contrast with the findings for women, the level of vocational education has a highly significant impact on the transition rates to a first birth for men. This finding is in line with the expectation of provider abilities of men to impact their probabilities of becoming fathers.

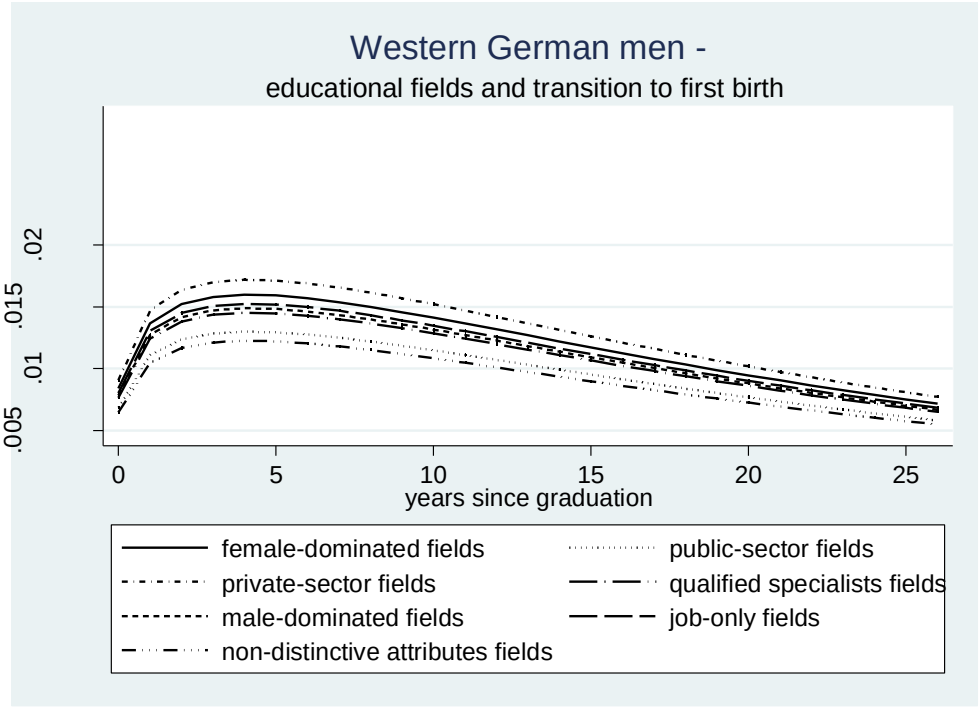
[23] This has also been tested by using other fields than the female-dominated fields as reference category. These models are not displayed as none shows any significant difference between men's educational field and the transition to a first birth.

Table 6: The Effect of Educational Fields on the Transition to Parenthood for Western German Men (discrete time logit model, average marginal effects)

	(1) transition to first birth	(2)
years since graduation	-0.00196***	-0.00196***
	(-4.64)	(-4.63)
ln years since graduation	0.00820***	0.00816***
	(4.43)	(4.40)
age at graduation	-0.00163***	-0.00164***
	(-4.13)	(-4.13)
married	0.176***	0.177***
	(24.75)	(24.71)
abitur	-0.00427	-0.00418
	(-1.28)	(-1.19)
university degree	0.0136**	0.0145**
	(3.07)	(3.20)
female-dominated fields		Ref.
public-sector fields		-0.00677
		(-0.93)
private-sector fields		0.00263
		(0.29)
qualified specialists fields		-0.00321
		(-0.42)
male-dominated fields		-0.00248
		(-0.34)
gender-mixed job-only fields		-0.00162
		(-0.21)
non-distinctive attributes fields		-0.00840
		(-0.85)
N(person years)	24,579	24,579
N(persons)	2,766	2,766
N(events)	995	995
pseudo R^2	0.230	0.231
chi²	1,918.3	1,921.3

Notes:
t statistics in parentheses
+p<0.1, *p < 0.05, **p < 0.01, ***p < 0.001
The models also control for migration background, episodes of educational enrollment, movement to Eastern German, cohort and sample-membership.
Source: SOEP 1984-2010, unweighted data, own calculations

Figure 3: Educational Fields and the Transition to a First Birth for Western German Men



Source: SOEP 1984-2010, own calculations, unweighted data.
Note: predicted probabilities, analysis time: years since graduation, all control variables set to their mean value

Summarizing the findings with regard to the hypotheses, it can be stated that the educational field does matter for the transition to a first birth for Western German women, but not for men. Looking at the transition rate of men who did not become fathers before graduation, a higher educational level increases the probability of becoming a father compared to a vocational education. The design of the present analysis might be the reason for the absence of a field effect of men, since the descriptive results shown in Table 4a in the appendix showed an unequal distribution of fathers among the fields at graduation. For women, the hypotheses on a high compatibility, expressed by an outstandingly high share of women in a field, was confirmed. The hypothesis that high job security, expressed by a high share of public-sector employment, would lead to higher transition rates was not confirmed. This result comes to a surprise because as educational fields like teaching or pedagogy are among the fields in this group. In other studies of other countries, women educated in these fields have the highest transition rates (e.g., Hoem, Neyer, and Andersson 2006a; Begall and Mills 2012). The hypothesis on low compatibility lowering transition rates was also not confirmed because women educated in male-dominated field actually do have high transition rates. Hoem et al. (2006a) also find surprisingly low rates of childlessness among women educated in male-dominated fields.

Discussion

The initial starting point for the present analysis was the question of how educational fields influence the transition to a first birth for women and men in Western Germany. The results show different patterns for women and men who did not become parents prior to graduation. For women, the educational field matters for the probability of becoming a mother. This is found with all applied strategies to examine an impact of educational field on transition rates. These strategies involved testing the improvement of event history models and examining the transition rates to a first birth, by including dummy variables for the different fields. The other strategy was the application of a multi-level approach, modeling individuals nested in fields, finding a significant variance between the transition rates. The same strategies did not show any significant impact of educational fields on men's transition rates to a first birth.

Several characteristics of educational fields are assumed to cause differences in transition rates to a first birth. These characteristics are the share of women, the share of public-sector employment, the occupational specificity, and the share of part-time employment within a field. They display the expected amount of compatibility of employment with children as well as the expected amount of security or insecurity within an educational field. Measurements of these were used to group the initially large set of 37 educational fields by their most salient characteristic, resulting in seven groups of educational fields.

The expectations with regard to the rank order of transition rates to a first birth could only be partly confirmed for women, while again no significant effect of educational field for men is observed. The finding of high transition rates among women educated in female-dominated fields is in line with the hypotheses as well as previous findings (e.g., Hoem, Neyer, and Andersson 2006a; Ronsen and Skrede 2010; Van Bavel 2010). The high transition rates of women educated in male-dominated fields were not expected. On the one hand, it can be argued that this was already found in Sweden (Hoem, Neyer, and Andersson 2006a), but on the other hand, the overall compatibility of employment and children should be higher in Sweden than in Western Germany. The most surprising finding are the low transition rates of women educated in public-sector fields. This comes as a surprise not only because of higher workplace security among graduates in this field that should have a positive impact on the transition to a first birth, but especially because women educated in teaching or pedagogy belong to this group. One common finding of research in other countries is low childlessness among women educated in teaching and health care. The present analysis can only confirm this common finding for women educated in health care, since they belong to female-

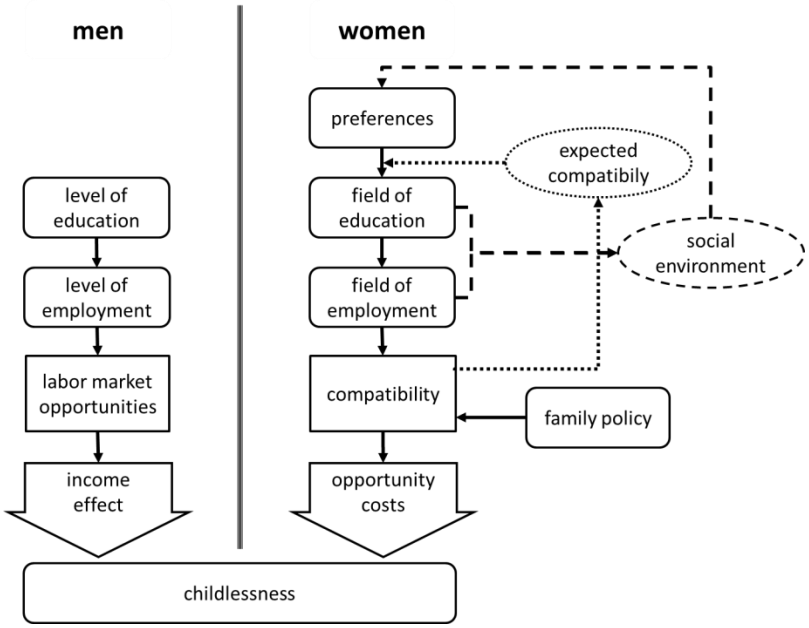
dominated fields. It is often assumed that a personality trait, a certain orientation toward caring for other people is responsible for the choice of educational field as well as for becoming mothers. Another more practical argument is the assumption that being educated in health care, teaching, or pedagogy equips women (and men) with skills that are also useful when they are taking care of their own children.

The present analysis is a contribution to increasing knowledge about the connection between educational fields and the transition to parenthood. The overall finding is that educational field matters for women's transition to a first birth, but not for men's. The results also highlight that findings from one country cannot easily be transferred to another country. Fertility behavior in Germany constitutes a unique case, and the persistent differences between West and East are much researched. A comparison between Eastern and Western Germany might be fruitful to further examine the connection between field of education and transition to a first birth.

Revisiting the theoretical model, the hypotheses were derived from, the question arises whether the model only applies to women. The results imply that for women, compatibility of family and employment and therefore the amount of opportunity costs within a field matters for the transition to parenthood. The absence of a field effect and the positive effect of a high educational level on men's transition rates imply that a positive income effect can be observed. For Western Germany, the model has been adapted in light of these findings (see Figure 4).

The analysis controls for the impact of level in two ways: first, by using the years since graduation as time axis and therefore controlling for graduation at a higher age for highly educated people, and second, by using dummy variables for secondary and tertiary degrees. The design is probably the reason for the weak impact of educational level on transition rates to a first birth for women. In the case of men, the difference between men holding university degrees and those holding vocational degrees is highly significant, highlighting the importance of provider abilities of men in Western Germany. It has to be noted that more men than women are excluded from the analysis due to having had a child prior to graduation. Educational fields might differ with regard to how compatible children are with educational enrollment (Lappegård and Rønsen 2005). This question was not addressed in this paper, but might be interesting for further research.

Figure 4: Adapted Theoretical Model of the Relationship between Men's and Women's Educational Attainment (Level and Field of Education) and Childlessness in Western Germany



Another question of interest is how educational field, field of occupation, and current employment status are interrelated from the perspective of the transition to parenthood (Begall and Mills 2012). This might help explain the finding of unexpectedly high transition rates among women educated in male-dominated or private-sector fields. One possibility is that they benefit from high incomes; another is that this finding shows the structural impact of field of education on one's partner market. It might be that these women are not employed due to low compatibility and low security. They may have found partners in the same field who have high income potential and thus may have chosen a traditional division of labor. This question cannot be addressed with the data used for this analysis because part of the data were collected retrospectively and provide information only on a yearly basis.

Many researchers share the idea that underlying factors such as preferences toward family formation have an impact on educational choices. Recent findings support this idea (Tesching 2012; Maul 2012). A closer look at young adults who face educational choices and their preferences toward family and children would help strengthen this argument. It would be interesting to examine whether the findings of the present paper imply that women take their preferences toward family formation into account when choosing a field while men do not.

References

Adsera, Alicia. 2011. Where Are the Babies? Labor Market Conditions and Fertility in Europe. *European Journal of Population-Revue Europeenne De Demographie* 27 (1): 1–32. doi:10.1007/s10680-010-9222-x.

Anger, Silke et al. 2011. *Documentation PGEN*. http://www.diw.de/documents/dokumentenarchiv/17/diw_01.c.60055.de/pgen.pdf.

Bagavos, Christos. 2010. Education and Childlessness: The Relationship Between Educational Field, Educational Level, Employment and Childlessness Among Greek Women Born in 1955-1959. *Vienna Yearbook of Population Research* 8: 51–75. doi:10.1553/populationyearbook2010s51.

Bartus, Tamás. 2005. Estimation of Marginal Effects Using Margeff. *The Stata Journal* 5 (3): 309–329.

Becker, Gary S. 1991. *A Treatise on the Family*. Harvard University Press.

Begall, Katia and Melinda C Mills. 2012. The Influence of Educational Field, Occupation, and Occupational Sex Segregation on Fertility in the Netherlands. *European Sociological Review*. doi:10.1093/esr/jcs051. http://esr.oxfordjournals.org/content/early/2012/04/26/esr.jcs051.

Blossfeld, Hans-Peter and Johannes Huinink. 1991. Human Capital Investments or Norms of Role Transition? How Women's Schooling and Career Affect the Process of Family Formation. *American Journal of Sociology* 97 (1): 143.

Brewster, Karin L. and Ronald. R. Rindfuss. 2000. Fertility and women's employment in industrialized nations. *Annual Review of Sociology* 26: 271–296. doi:10.1146/annurev.soc.26.1.271.

Brüderl, Josef and Thomas Klein. 1993. Bildung Und Familiengründungsprozeß Deutscher Frauen: Humankapital- Und Institutioneneffekt. In *Der Familienzyklus Als Sozialer Prozeß: Bevölkerungssoziologische Untersuchungen Mit Den Methoden Der Ereignisanalyse*, ed. Andreas Diekmann and Stefan Weick, 194–215. Berlin: Duncker & Humblot.

Bundesagentur für Arbeit (BA). 2011a. *Klassifikation Der Berufe 2010 - Band 1: Systematischer Und Alphabetischer Teil Mit Erläuterungen*. http://statistik.arbeitsagentur.de/Statischer-Content/Grundlagen/Klassifikation-der-Berufe/KldB2010/Dokumentationen/Generische-Publikationen/KldB2010-Printversion-Band1.pdf.

———. 2011b. *Klassifikation Der Berufe 2010 - Band 2: Definitorischer Und Beschreibender Teil*. http://statistik.arbeitsagentur.de/Navigation/Statistik/Grundlagen/Klassifikation-der-Berufe/KldB2010/Dokumentationen-Nav.html.

———. Umsteigeschlüssel - Statistik.arbeitsagentur.de. http://statistik.arbeitsagentur.de/Navigation/Statistik/Grundlagen/Klassifikation-der-Berufe/KldB2010/Umsteigeschluessel-Nav.html.

Corijn, Martine, Aart C. Liefbroer and Jenny De Jong Gierveld. 1996. It TakesTwo to Tango, Doesn't It? The Influence of Couple Characteristics on the Timing of the Birth of the First Child. *Journal of Marriage & Family* 58 (1): 117–126.

Dorbritz, Jürgen. 2008. Germany: Family Diversity with Low Actual and Desired Fertility. *Demographic Research* 19: 557–597.

Dribe, Martin and Maria Stanfors. 2010. Family Life in Power Couples. *Demographic Research* 23: 847–878. doi:10.4054/DemRes.2010.23.30.

Gauthier, Anne H. 1999. *The State and the Family: A Comparative Analysis of Family Policies in Industrialized Countries*. Clarendon Press.

———. 2007. The Impact of Family Policies on Fertility in Industrialized Countries: A Review of the Literature. *Population Research and Policy Review* 26 (3): 323–346. doi:http://www.springerlink.com/link.asp?id=102983.

Goldstein, Joshua R. and Michaela Kreyenfeld. 2011. Has East Germany Overtaken West Germany? Recent Trends in Order-Specific Fertility. *Population and Development Review* 37 (3): 453–472. doi:10.1111/j.1728-4457.2011.00430.x.

Haisken-DeNew, John P. and Markus H. Hahn. 2006. *PanelWhiz: a Flexible Modularized Stata Interface for Accessing Large Scale Panel Data Set*s. http://www.panelwhiz.eu/.

Hank, Karsten and Michaela Kreyenfeld. 2003. A Multilevel Analysis of Child Care and Women's Fertility Decisions in Western Germany. *Journal of Marriage and Family* 65 (3): 584–596. doi:10.1111/j.1741-3737.2003.00584.x.

Henz, Ursula. 2008. Gender Roles and Values of Children: Childless Couples in East and West Germany. *Demographic Research* 19: 1451–1500. doi:10.4054/DemRes.2008.19.39.

Hoem, Jan M., Gerda Neyer and Gunnar Andersson. 2006a. Education and childlessness - The relationship between educational field, educational level, and childlessness among Swedish women born in 1955-59. *Demographic Research* 14: 331–380.

———. 2006b. Educational attainment and ultimate fertility among Swedish women born in 1955-59. *Demographic Research* 14: 381–403.

Hox, Joop J. 2010. *Multilevel Analysis: Techniques and Applications*. New. Taylor & Francis.

Klein, Thomas. 2003. Die Geburt Von Kindern in Paarbezogener Perspektive. *Zeitschrift Für Soziologie* 32 (6): 506–527.

Kravdal, Oystein and Ronald R. Rindfuss. 2008. Changing Relationships between Education and Fertility: A Study of Women and Men Born 1940 to 1964. *American Sociological Review* 73 (5): 854–873.

Kreyenfeld, Michaela. 2010. Uncertainties in Female Employment Careers and the Postponement of Parenthood in Germany. *European Sociological Review* 26 (3): 351–366. doi:10.1093/esr/jcp026.

Lappegård, Trude and Marit Rønsen. 2005. The multifaceted impact of education on entry into motherhood. *European Journal of Population-Revue Europeenne De Demographie* 21 (1): 31–49. doi:10.1007/s10680-004-6756-9.

Liefbroer, Aart C. and Martine Corijn. 1999. Who, what, where, and when? Specifying the impact of educational attainment and labour force participation on family formation. *European Journal of Population-Revue Europeenne De Demographie* 15 (1): 45–75. doi:10.1023/A:1006137104191.

Martín-García, Teresa. 2009. Bring Men Back In-1: A Re-examination of the Impact of Type of Education and Educational Enrolment on First Births in Spain. *European Sociological Review* 25 (2) (April): 199–213. doi:10.1093/esr/jcn041.

Martín-García, Teresa and Pau Baizán. 2006. The Impact of the Type of Education and of Educational Enrolment on First Births. *European Sociological Review* 22 (3): 259–275.

Maul, Katharina. 2012. *Der Einfluss Der Beruflichen Tätigkeit Auf Die Familiengründung*. 1st ed. Ergon.

Mood, Carina. 2010. Logistic Regression: Why We Cannot Do What We Think We Can Do, and What We Can Do About It. *European Sociological Review* 26 (1): 67–82. doi:10.1093/esr/jcp006.

Neyer, Gerda and Jan M. Hoem. 2008. Education and Permanent Childlessness: Austria Vs. Sweden; a Research Note. In *Demographic Challenges for the 21st Century: a State of the Art in Demography; Conference Organized as a Tribute to the Continuing*

Endeavours of Prof. Dr. Em. Ron Lesthaeghe in the Field of Demography., ed. Surkyn, J., Deboosere, P. and Van Bavel, J. Brussels: VUBPRESS.

Rønsen, Marit and Kari Skrede. 2010. Can public policies sustain fertility in the Nordic countries? Lessons from the past and questions for the future. *Demographic Research* 22: 321–346.

Sobotka, Tomáš. 2008. The rising importance of migrants for childbearing in Europe. *Demographic Research* 19: 225–247.

Tesching, Karin. 2012. *Education and Fertility [Elektronisk Resurs]: Dynamic Interrelations Between Women's Educational Level, Educational Field and Fertility in Sweden*. Stockholm: Acta Universitatis Stockholmiensis. http://urn.kb.se/resolve?urn=urn:nbn:se:su:diva-63761.

Tölke, Angelika and Martin Diewald. 2003. Insecurities in Employment and Occupational Careers and Their Impact on the Transition to Fatherhood in Western Germany. *Demographic Research* 9: 41–68. doi:10.4054/DemRes.2003.9.3.

Van Bavel, Jan. 2010. Choice of Study Discipline and the Postponement of Motherhood in Europe: The Impact of Expected Earnings, Gender Composition, and Family Attitudes. *Demography* 47 (2): 439–458.

Wagner, Gert G., Joachim R. Frick and Jürgen Schupp. 2007. The German Socio-Economic Panel Study (SOEP) – Scope, Evolution and Enhancements. *Schmollers Jahrbuch – Zeitschrift Für Wirtschafts- Und Sozialwissenschaften* 127 (1): 139–169.

Yamaguchi, Kazuo. 1991. *Event History Analysis*. Sage Publications (CA).

Appendix

Data Management: Educational Fields

The latest release of the SOEP contains five generated variables that provide information on educational fields of respondents. These variables (FIELD and TRAINA-TRAIND) combine information that was collected from three different sources:

- the regular annual questionnaire asking about educational attainment within the last year;
- questionnaires on respondents' biography that are offered only when respondents enter the SOEP and that have been collected since 2001; and
- gap questionnaires given to respondents who temporarily left the SOEP but rejoined.

The first variable contains information on the field of a given tertiary degree, differentiating between fifty-eight fields and a residual one ("other"). For respondents with vocational educations, four different variables are available, all coded by the Klassifikation der Berufe 1992 (KldB1992) on a two-digit level (TRAINA-TRAIND). The first contains fields of apprenticeships, differentiating eighty-six categories. The second contains fields of full-time school based vocational training, differentiating seventy categories. The third contains fields of higher level vocational training, differentiating seventy-two categories. The fourth contains fields of civil servant training, differentiating seventeen categories (for further information on these variables, see the documentation of the PGEN-dataset). The fields of university degrees (FIELD) were coded according to a classification of its own, instead of the KldB1992.

The two-digit level of the KldB1992 turned out not to be ideal for examining the question addressed in this paper. It also was difficult to assign the university degrees in a satisfying way. It appeared that, even though assigned to the correct KldB1992 code, this new category often did not seem to really represent the field of the university degree.

The Klassifikation der Berufe 2010 (KldB2010) appears to offer a better solution, grouping jobs in function of their content. Therefore, this classification represents what is understood by "field of education" in this paper. The KldB2010 is ordered hierarchically with different levels of abstraction (BA 2011a). The two-digit level was the aim of the data recoding, except that I wanted to create an additional category for respondents with degrees in economics. In the KldB2010, on a two-digit level, they would be in the same category as respondents with degrees in language, literature, the humanities, or social science.

Even though transformation keys are available for transferring the KldB1992 to the KldB2010, this is not possible from the two-digit level provided in the TRAIN variables. Fortunately the SOEP provides the more detailed data basis of the TRAIN variables upon request. As described, these variables combine information from various sources. The more detailed information on vocational education that was collected via the annual person questionnaire are, up to 2009, coded by the classification of occupations provided by the Bundesanstalt für Arbeit from 1988. In the wave 2010, this information is coded according to the classification provided by the Statistisches Bundesamt from 1992, as is the information from biography and gap questionnaires.

Therefore, different transformation keys were applied. For vocational degrees from the person questionnaire up to 2009, the key that transforms the four-digit KldB1988 to a five-digit KldB2010 and for 2010 as well as the degrees from biography and gap questionnaires, the respective keys are for transforming KldB1992, four-digits to KldB2010, five-digits.[24] Afterward, all new codes were reduced to three digits. The code 914 for economics was recoded to 950, and afterward, all new codes were reduced to two digits.

The generated variable FIELD in the pgen-dataset also combines the information on university degrees collected via all sources, as described above. A flag variable enables researchers to identify the respective source of the information. It was possible to assign most, but not all, categories of university degrees to the KldB2010 on a three-digit level. Table 1a shows how university degrees were assigned to the KldB2010[25]. The label of some categories is too broad to make a substantiated assignment. These categories are marked with a star in Table 1a. For these categories, I applied a stepwise procedure to identify the accurate KldB2010-code. First, I looked at the plain text, the exact answer given by the respondents. These data were also given to me by the SOEP. Unfortunately, they are not always available. If this was the case, I checked old codes of the university degree that was provided in earlier versions of the SOEP. Some mistakes occurred in the current release, but I was provided with corrections, and in the cases that I checked, they were coherent with the new codes. The third step was to look at the employment biography of the respondents and assign a KldB2010 code if they reported working in the occupation they were trained for (and if this was plausible,

[24] In some cases, the transformation keys do not uniquely point from an old to a new code, but provide all possible new codes and a prioritization. In these cases, the new code with the highest priority level was used. In most cases, the alternative codes differ only on the five-digit level. Therefore, using an alternative code would, at least in the majority of cases, not led to a different two-digit level code.

[25] University education may be specifically designed to lead to a teaching job. The information of the variable DEGREE "Type of tertiary degree" (pgen) is used to determine these cases. For example, a person who studied math to become a math-teacher was assigned to teaching (84) instead of math (41).

given the code for the university degree). Via this procedure, it was possible to assign a majority of respondents to the correct KldB2010 code.

This information was then combined as a new field variable that contains the field of a completed vocational or university education. For the calculation of the field characteristics, the field of a respondent was used upon data collection. Only since the data collection the necessary information for calculation the field characteristics are available. For the event history analysis, the timing of graduation and birth of the first child is of great importance. For this analysis, the different data sources matter. For information received via person questionnaires, the year of graduation was the year before, while for information from the biography questionnaires, the time between graduation and reporting the field to the SOEP is in most cases much longer. For the latter, the year in which the degree was received was extracted from the bio-dataset in SOEP-long.

Table 1a: The assignment of field of tertiary education to the KldB2010

	FIELD: "field of tertiary education"		KldB 2010
1	language, humanities	91	language, literature, humanities and social sciences
2	protestant theology	83	pedagogy and child care, social and home economics, theology
3	katholic theology	83	pedagogy and child care, social and home economics, theology
4	philosophy	91	language, literature, humanities and social sciences
5	history	91	language, literature, humanities and social sciences
6	librarianship/documentation/publication	*	
7	literature/language	91	language, literature, humanities and social sciences
8	philology	91	language, literature, humanities and social sciences
9	german philology	91	language, literature, humanities and social sciences
10	anglistics	91	language, literature, humanities and social sciences
11	roman studies	91	language, literature, humanities and social sciences
12	slavic studies	91	language, literature, humanities and social sciences
13	non-european studies	91	language, literature, humanities and social sciences
14	cultural studies	91	language, literature, humanities and social sciences
15	psychology	81	medical healthcare
16	pedagogy	83	pedagogy and child care, social and home economics, theology
17	orthopedagogy	83	pedagogy and child care, social and home economics, theology
22	sports	63	tourism, hotel and restaurant**
23	law/economics/social science	*	
24	regional science	91	language, literature, humanities and social sciences

	Table 1a continued		
25	political science	91	language, literature, humanities and social sciences
26	social science	91	language, literature, humanities and social sciences
27	welfare	73	law and administration
28	law	73	law and administration
29	administration	73	law and administration
30	economics	95	economics
31	industrial engineer	27	technical research, development and construction
36	math/natural science general	*	
37	math	41	mathematics, biology, chemistry, physics
38	computer science	43	computer science, information and communication technology
39	physics	41	mathematics, biology, chemistry, physics
40	chemistry	41	mathematics, biology, chemistry, physics
41	pharmaceutics	81	medical healthcare
42	biology	41	mathematics, biology, chemistry, physics
43	geology	42	geology, geography, environment protection
44	geography	42	geology, geography, environment protection
48	healthcare	81	medical healthcare
49	medicine	81	medical healthcare
50	dentistry	81	medical healthcare
51	veterinary medicine	81	medical healthcare
57	horticulture	12	gardening and floristry
58	agriculture	11	agriculture, forestry
59	forestry	11	agriculture, forestry
60	home economics	82	non medical healthcare, hygiene, wellness, medical technology
61	engineering general	*	
62	Mining	21	primary production, glas and ceramic

	Table 1a continued		
63	engine building	25	machine and automotive engineering
64	electrical engineering	26	mechatronics, energy and electronics
65	traffic engineering	51	transport and logistics (without driving)
66	architecture	31	architecture and construction planning
67	urbanism	31	architecture and construction planning
68	civil engineering	31	architecture and construction planning
69	mapping	31	architecture and construction planning
74	arts, science of art general	*	
75	fine arts	93	product design, arts and crafts
76	design	*	
77	performing arst/movie and television/theatrical studies	*	
78	music	94	performing and entertainment

*assigned according to procedure described in the text

**KldB2010 code 631 is tourism and sports

Table 2a: The average share of women, share of public sector employment, occupational specificity and share of part-time employment for each field of education

		share of women	share of public sector employ-ment	occu-pational specifi-city	share of part-time employ-ment
11	agriculture, forestry	.23	.19	.61	.05
12	gardening and floristry	.63	.24	.69	.23
21	primary production, glas and ceramic	.22	.34	.62	.06
22	plastic production and wood working	.05	.11	.71	.04
23	paper and printing	.45	.06	.66	.14
24	metal production and processing	.03	.20	.60	.02
25	machine and automotive engineering	.04	.13	.62	.01
26	mechatronics, energy and electronics	.04	.16	.73	.01
27	technical research, development and construction	.52	.12	.60	.07
28	textile and leather	.86	.17	.55	.25
29	food production and processing	.31	.12	.69	.11
31	architecture and construction planning	.29	.25	.89	.09
32	construction above and below ground	.00	.13	.72	.02
33	interior fitting	.03	.12	.72	.04
34	building maintenance	.01	.14	.64	.01
41	mathematics, biology, chemistry, physics	.45	.20	.76	.09
42	geology, geography, environment protection	.36	.19	.62	.12
43	computer science, information and communication technology	.15	.10	.85	.05
51	transport and logistics (without driving)	.41	.27	.63	.12
52	transport and vehicle driving	.11	.28	.56	.01
53	protection, security and observation	.07	.91	.80	.01
54	cleaning	.43	.20	.36	.17

Table 2a continued

61	purchase, distribution and trade	.45	.09	.66	.13
62	sales	.79	.08	.67	.19
63	tourism, hotel and restaurant	.74	.14	.64	.16
71	company management and organization	.80	.21	.67	.14
72	financial service, accountancy and tax advice	.51	.33	.89	.12
73	law and administration	.54	.47	.76	.14
81	medical healthcare	.85	.33	.83	.19
82	non medical healthcare, hygiene, wellness, medical technology	.89	.19	.67	.23
83	pedagogy and child care, social and home economics, theology	.79	.63	.72	.21
84	teaching and training	.47	.57	.74	.16
91	language, literature, humanities and social sciences	.65	.25	.56	.14
92	advertising, marketing, media	.67	.13	.74	.16
93	product design, arts and crafts	.52	.06	.75	.10
94	performing and entertainment	.63	.48	.89	.23
95	economics	.34	.12	.78	.05

Source: SOEP 1984-2010, own calculations

Table 3a: The share of women with children before graduation by educational fields (N=2,544)

	% children (N)
female dominated fields	7 (611)
public sector fields	7 (502)
private sector fields	3 (386)
qualified specialists fields	3 (181)
male dominated fields	5 (190)
gender-mixed job-only fields	9 (541)
non-distinctive attributes fields	7 (133)

Source: SOEP 1984-2010, own calculations, unweighted data.

Table 4a: The share of men with children before graduation by educational fields (N=3,018)

	% children (N)
female dominated fields	13 (110)
public sector fields	14 (232)
private sector fields	4 (204)
qualified specialists fields	7 (251)
male dominated fields	8 (1,830)
gender-mixed job-only fields	10 (325)
non-distinctive attributes fields	8 (66)

Source: SOEP 1984-2010, own calculations, unweighted data.

Table 5a: The improvement of explaining the transition to parenthood by adding the educational field, Western German women (discrete time logit model, average marginal effects)

	(1) transition to first birth	(2)
years since graduation	-0.00475***	-0.00457***
	(-7.21)	(-6.95)
ln years since graduation	0.0185***	0.0185***
	(6.80)	(6.82)
age at graduation	-0.00117+	-0.00102
	(-1.86)	(-1.60)
married	0.174***	0.175***
	(26.08)	(25.93)
abitur	-0.0107*	-0.00832+
	(-2.34)	(-1.70)
university degree	0.00155	-0.00231
	(0.26)	(-0.33)
N(person years)	18,827	18,827
N(persons)	2,375	2,375
N(events)	1,101	1,101
pseudo R^2	0.195	0.201
chi^2	1,639.7	1,689.8

Notes:
t statistics in parentheses
+p<0.1, * p < 0.05, ** p < 0.01, *** p < 0.001
Source: SOEP 1984-2010, unweighted data, own calculations.
Note: Model 2 adds 32 dummy variables for educational fields (Ref. field 81), three fields (34, 52, 54) were not used due to an insufficient number of observations, the models also control for migration background, episodes of educational enrollment, movement to Eastern Germany, cohort and sample-membership.

Table 6a: Likelihood Ratio Test and Wald-test, models on Western German women

test	chi^2	p-value
Wald-test	49.52	0.0187
Likelihood-Ratio test	50.12	0.0217

Table 7a: The improvement of explaining the transition to parenthood by adding the educational field, Western German men (discrete time logit model, average marginal effects)

	(1) transition to first birth	(2)
years since graduation	-0.00195***	-0.00185***
	(-4.60)	(-4.36)
ln years since graduation	0.00814***	0.00821***
	(4.39)	(4.43)
age at graduation	-0.00162***	-0.00140***
	(-4.11)	(-3.47)
married	0.176***	0.177***
	(24.72)	(24.68)
abitur	-0.00422	-0.00327
	(-1.26)	(-0.89)
university degree	0.0136**	0.0217***
	(3.07)	(3.68)
N(person years)	24,548	24,548
N(persons)	2,759	2,759
N(events)	993	993
pseudo R^2	0.230	0.236
chi^2	1,915.6	1,958.5

Notes:
t statistics in parentheses
+p<0.1, * p < 0.05, ** p < 0.01, *** p < 0.001
Source: SOEP 1984-2010, unweighted data, own calculations.
Note: Model 2 adds 34 dummy variables for educational fields (Ref. field 81), two fields (54, 94) were not used due to an insufficient number of observations, the models also control for migration background, episodes of educational enrollment, movement to Eastern Germany, cohort and sample-membership.

Table 8a: Likelihood Ratio Test and Wald-test, models on Western German men

test	*chi^2*	*p-value*
Wald-test	*39.60*	*0.1993*
Likelihood-Ratio test	*42.86*	*0.1168*

Table 9a: The variance in transition to parenthood by educational field, Western German women (multi-level discrete time logit model, log odds)

	(1) transition to first birth	(2)
years since graduation		-0.0958***
		(-7.11)
ln years since graduation		0.380***
		(6.83)
age at graduation		-0.0220+
		(-1.70)
married		2.565***
		(33.50)
abitur		-0.199+
		(-1.92)
university degree		-0.0108
		(-0.08)
cons	-2.781***	-3.944***
	(-64.47)	(-8.96)
σ_u^2	0.013***	0.021***
N(person years)	18,827	18,827
N(persons)	2,375	2,375
N(events)	1,101	1,101
N(fields)	33	33

Notes:
t statistics in parentheses
+p<0.1, * p < 0.05, ** p < 0.01, *** p < 0.001
Source: SOEP 1984-2010, unweighted data, own calculations.
Note: the models also control for migration background, episodes of educational enrollment, movement to Eastern Germany, cohort and sample-membership. (three fields (34, 52, 54) were not used due to an insufficient number of observations)

Table 10a: The variance in transition to parenthood by educational field, Western German men (multi-level discrete time logit model, log odds)

	(1) transition to first birth	(2)
years since graduation		-0.0568***
		(-4.61)
ln years since graduation		0.237***
		(4.40)
age at graduation		-0.0471***
		(-4.11)
married		3.087***
		(36.12)
abitur		-0.125
		(-1.24)
university degree		0.366***
		(3.31)
cons	-3.167***	-4.358***
	(-93.40)	(-11.66)
σ_u^2	0.0012	0
N(person years)	24,548	24,548
N(persons)	2,759	2,759
N(events)	993	993
N(fields)	35	35

Notes:
t statistics in parentheses
+p<0.1, * p < 0.05, ** p < 0.01, *** p < 0.001
Source: SOEP 1984-2010, unweighted data, own calculations.
Note: the models also control for migration background, episodes of educational enrollment, movement to Eastern Germany, cohort and sample-membership. (two fields (54, 94) were not used due to an insufficient number of observations)

Table 11a: Number of observations per educational field (women, N= 2,381; men, N= 2,766)

		women (N)	women %	men (N)	men %
11	agriculture, forestry	9	0.38	34	1.23
12	gardening and floristry	26	1.09	27	0.98
21	primary production, glas and ceramic	5	0.21	15	0.54
22	plastic production and wood working	12	0.50	109	3.94
23	paper and printing	24	1.01	24	0.87
24	metal production and processing	6	0.25	213	7.70
25	machine and automotive engineering	15	0.63	459	16.59
26	mechatronics, energy and electronics	9	0.38	303	10.95
27	technical research, development and construction	42	1.76	43	1.55
28	textile and leather	43	1.81	7	0.25
29	food production and processing	46	1.93	114	4.12
31	architecture and construction planning	12	0.50	41	1.48
32	construction above and below ground	-	-	98	3.54
33	interior fitting	7	0.29	109	3.94
34	building maintenance	2	0.08	100	3.62
41	mathematics, biology, chemistry, physics	55	2.31	78	2.82
42	geology, geography, environment protection	7	0.29	16	0.58
43	computer science, information and communication technology	19	0.80	81	2.93
51	transport and logistics (without driving)	28	1.18	33	1.19
52	transport and vehicle driving	1	0.04	7	0.25
53	protection, security and observation	9	0.38	23	0.83
54	cleaning	2	0.08	4	0.14

Table 11a continued

		women (N)	women %	men (N)	men %
61	purchase, distribution and trade	62	2.60	82	2.96
62	sales	270	11.34	75	2.71
63	tourism, hotel and restaurant	75	3.15	19	0.69
71	company management and organization	322	13.52	115	4.16
72	financial service, accountancy and tax advice	144	6.05	112	4.05
73	law and administration	224	9.41	128	4.63
81	medical healthcare	363	15.25	62	2.24
82	non medical healthcare, hygiene, wellness, medical technology	162	6.80	27	0.98
83	pedagogy and child care, social and home economics, theology	197	8.27	31	1.12
84	teaching and training	24	1.01	15	0.54
91	language, literature, humanities and social sciences	46	1.93	23	0.83
92	advertising, marketing, media	21	0.88	11	0.40
93	product design, arts and crafts	18	0.76	15	0.54
94	performing and entertainment	13	0.55	3	0.11
95	economics	61	2.56	110	3.98