

Title

Contextualizing the education effect on women's employment:

A cross-national comparative analysis

## *Abstract*

The study examines *how* and *why* the effect of education on women's employment varies cross-nationally. First, we present a theoretical model that (a) outlines the micro-level mechanisms underlying education effects on women's employment in the couple context and (b) proposes contextual moderators at the country level. Second, we test the theoretical model against survey data from the United Nations Generations and Gender Programme for five European countries (Austria, France, Germany, Hungary, and Norway). The data comprise 10,048 educationally homogamous heterosexual couples involving a woman aged 20-45. Our results indicate that more highly educated couples are more likely to have dual-earner arrangements in each country, yet the strength of education effects varies substantially between countries and across the family life-cycle. In contrast to prior work, we find that education effects are not generally smaller in countries that are supportive of women's employment. This relation only holds for later child-rearing phases.

*Keywords:* education, gender, couple employment, dual-earner, cross-national comparisons

More highly educated women are more strongly involved in the labor market. This general pattern has been confirmed by numerous studies covering different parts of the world (e.g., England, Garcia-Beaulieu, & Ross, 2004; England, Gornick, & Shafer, 2012; Evertsson, England, Hermsen, & Cotter, 2007; Evertsson, England, Mooi-Reci, Hermsen, de Bruin, & Cotter, 2009; Nieuwenhuis, Need, & van der Kolk, 2012; Rubery, Smith, & Fagan, 1999; Author, 2014). It is consistent with human capital theory and the logic of opportunity costs: the more highly educated have a greater wage potential and therefore it is relatively more costly for them not to work. Moreover, higher education tends to be associated with more egalitarian gender-role attitudes and better labor market opportunities. It has in fact become a truism – in the academic community and beyond – that women’s employment is higher at higher levels of educational attainment. Yet, the literature shows interesting variations across countries in the strength of education effects on women’s employment (e.g., England et al., 2012; Evertsson et al., 2009; Kenjoh, 2005) which warrant closer examination and explanation. The central aim of the present study is to foster our understanding of *how* and *why* education effects on women’s employment vary cross-nationally.

To this end, we first present a comprehensive theoretical model that (a) outlines the micro-level mechanisms commonly argued to underlie education effects on couple’s employment arrangements and (b) lays out the contextual conditions at the country level under which we may expect the different micro-level mechanisms to be of greater or lesser relevance. Second, we use international survey data to test hypotheses derived from the theoretical model. The focus of the investigation is on educationally homogamous couples that represent the majority of couples in the countries analyzed. We examine education effects on couples’ employment in five countries – Austria, France, Germany, Hungary, and Norway – each with different structures of opportuni-

ties and constraints for high-educated and low-educated women and men. Following a small-country-sample approach (Yu, 2015), we use comparable survey data from a limited number of countries that show a theoretically informative variation in welfare state arrangements, socio-economic conditions, family policies, and gender cultures (Sainsbury, 1999; Author, 2006). Austria and Germany represent the conservative welfare state arrangement that is geared to maintaining social stratification and offers limited state support to maternal employment in the context of a traditional gender culture. Norway represents the *social-democratic* North of Europe with a strongly redistributive welfare state arrangement that is based on egalitarian principles fostering wage equality and supporting an equal integration of women and men into the labor market. France combines a *conservative* welfare state with a strong state support to families with small children. Finally, Hungary is our representative of the *former socialist countries* of Central and Eastern Europe that still feature lower levels of welfare (e.g., low wage levels) and that have a long tradition of integrating women into the labor market despite the prevalence of traditional beliefs about women's role in society (Author, 2006).

Within this comparative setting we explore how cross-national differences in contextual conditions translate into variations in the effect of education on the employment arrangements of educationally homogamous couples. In contrast to prior studies, we do not assume the educational gradient in employment participation to be stable across the life course. Instead, we examine the ways in which education effects vary with the presence and age of children.

The remainder of this article is structured as follows. The next section presents the theoretical framework to study education effects on the employment arrangements of educationally homogamous couples. Then, we describe the data and methods used in the empirical analyses. This is followed by a description of the contextual conditions in the countries analyzed and our specific

hypotheses regarding cross-national differences in education effects on employment. The subsequent section presents our empirical results. The final section concludes.

## THEORETICAL FRAMEWORK

### *Education effects: Micro-level mechanisms*

Education is key to understanding labor market behavior. In theoretical and empirical work, it tends to be used as a proxy for human capital and wage potential (Mincer, 1958). Classic human capital theory holds that the more highly educated are more likely to be employed than the lower educated because their *opportunity costs* of not having a job are higher (in terms of ‘forgone income’, see Becker, 1991). Against the backdrop of assortative educational mating and marriage (Blossfeld & Timm, 2003; Schwartz & Mare, 2005), however, the effect of partner’s income represents a mechanism that may counteract the opportunity cost effect of women’s own education. High-educated women tend to earn high wages and to be partnered with high income-earning men. Whereas their own income potential increases their incentive to join the labor market (opportunity cost effect), their partner’s income serves to reduce this incentive (income effect, cf. Killingsworth & Heckman, 1986). Conversely, low-educated women tend to have lower wages and they also tend to be partnered with low income-earning men. In terms of opportunity costs, their incentives to engage in paid work are weak. Yet, in the presence of a low income-earning partner, they may face a strong economic pressure to contribute to the household income. In sum, in terms of the monetary incentive structure two counteracting mechanisms are typically held to shape employment decisions — the *opportunity cost effect* and the *income effect*. These two mechanisms interact in shaping couples’ employment decisions (Shafer, 2011).

Departing from purely economic rationales, the non-pecuniary quality of work may also play a role in labor supply decisions (Gerson, 1985; Damaske, 2011). Reminiscent of the economic theory of opportunity costs, it can be argued that the non-employed forgo economic but also non-economic rewards of paid work (England et al., 2012). The more highly educated have access to higher quality jobs not only in terms of wages but also in terms of intrinsic rewards (e.g., opportunities for learning and personal development). They thus have greater non-economic incentives to engage in paid work. This assumption is corroborated by findings that show greater levels of intrinsic work motivation among the higher educated (Gesthuizen & Verbakel, 2011).

Other factors that have played a prominent role in research on women's employment pertain to attitudes and normative constraints. Women with more traditional views on women's and men's role in society are less likely to join the labor force and to maintain strong links with the labor market when they become mothers (Greenstein, 1986). And because more highly educated couples tend to hold more egalitarian attitudes to gender-roles and more favorable views on maternal employment and non-maternal child care (Schaninger & Buss, 1986), women as part of highly educated couples are also more likely to be employed for attitudinal reasons (Crompton & Lyonette, 2005; Author, 2009, 2012).

The employment incentives and disincentives mentioned thus far cover only the supply-side of employment. Conceivably, employment is also shaped by *demand-side factors*, that is, by the opportunities and constraints that women face when they wish to enter the labor market or re-enter it after a family-related employment interruption (Drasch, 2012). The employment chances for lower educated women and men tend to be inferior to those enjoyed by their more highly educated peers. Lower educated workers are more likely to have less secure jobs and face a higher risk of involuntary non-employment (e.g., Erlinghagen, 2008; Gesthuizen, Solga, & Kün-

ster, 2011). In the context of pronounced educational homogamy of couples, this leads to a situation in which low-educated partners both face low employment chances (Konietzka & Kreyenfeld, 2010). The consequence may be a strong tension between a high financial pressure for low-educated couples to follow a dual-earner model and their limited employment opportunities which may prevent them from taking up paid work (Author, 2006).

The five *micro-level mechanisms* assumed to underlie education effects on couple employment that were discussed in this section (monetary opportunity cost effects, non-monetary opportunity cost effects, income effects, attitudinal effects, and demand-side constraints) are summarized in Table 1. They posit that more highly educated women as part of educationally homogamous couples are more likely to be employed because they tend to earn higher wages (mechanism 1), they have access to more rewarding jobs in intrinsic terms (mechanism 2), they tend to hold more modern attitudes concerning women's role in society (mechanism 3), and they face fewer demand-side constraints to employment (mechanism 4). The counteracting mechanism – the income effect – would suggest that more highly educated women are less likely to be employed, because they tend to have partners with high incomes (mechanism 5). These basic mechanisms derived from economic and sociological theories of labor supply and employment are likely to be of varying relevance in different countries, depending on moderating contextual conditions.

#### *Contextual moderators of education effects*

The size of the education effect can be theorized to vary depending on the degree to which contextual conditions increase or decrease the relevance of the different micro-level mechanisms that are commonly argued to underlie education effects on employment. First, we expect education effects of greater magnitude in contexts of high education-based wage inequality that feature *larger returns to education in terms of earnings*. In such contexts, we anticipate strong monetary

opportunity cost effects on employment (mechanism 1, see Table 1). It evidently pays off more for the high-educated to work when wage differentials between education groups are larger. Second, stronger education effects on employment would be predicted for labor markets that feature large *education-based gaps in intrinsic job quality*, where opportunity costs in terms of forgone intrinsic rewards are much larger for the high-educated than for the low-educated (mechanism 2). Third, stronger education effects may result from large differences between the low-educated and the high-educated in terms of their *gender role attitudes and normative views on child care* (mechanism 3). Only in contexts in which the high-educated do in fact place greater value on gender equality and are more favorably disposed towards maternal employment can attitude-based education effects on mothers' employment be expected. Fourth, stronger education effects may arise in contexts that feature large education-based differences in employment outlooks and unemployment risks (mechanism 4). In labor markets, where the lower educated face a substantially higher *risk of involuntary non-employment* than their more highly educated counterparts, we would expect to find a demand-driven employment gap to the disadvantage of the lower educated. Finally, muted education effects would be expected in contexts where counteracting *income effects* can be observed (mechanism 5). Such effects are likely to be of greater relevance in countries where the gender earnings gap tends to be larger, that is, where men tend to earn more than their female partners (Shafer, 2011).

[Table 1]

Our approach to explaining differences across countries in terms of couple employment arrangements throughout the life course is based on the notion of constrained choice. We pay attention to the fact that not all arrangements – that may be preferred by couples – are equally *financially viable* or, in fact, *available* in different societal contexts. For instance, opportunity cost



effects (mechanisms 1 and 2) and attitudinal effects (mechanism 3) that imply lower employment participation among low-educated women may be of lesser relevance in societies that feature low wage levels. In such a context, most couples will have to generate two household incomes to make ends meet. Reservation wages of low-educated women may thus be fairly low and they may be as likely to seek employment as their higher educated counterparts (Author, 2006). From this perspective, we may expect to find muted education effects on couples' employment in labor markets that feature low wage levels for men and women. Finally, any supply-side mechanism is conditional on job availability. For instance, when low-educated women would like to work in order to compensate for a low income of their partner (mechanism 5), they will be more likely to realize such a preference if they do not face high risks of unemployment.

### *Family policy*

Family policy is a central contextual factor for women's employment (Author, 2012). State support to maternal employment in the form of subsidized childcare, in particular, can moderate education effects on women's employment based on the logic of opportunity costs (mechanism 1). Whether or not it pays off for a mother to work depends on her potential earnings and the costs of non-parental child care. Low-educated mothers may only be able to 'afford having a paid job' if the income they generate is higher than the costs of child care. Child care costs have in fact been shown to be more important for the labor supply of lower educated mothers (Del Boca, Pasqua, & Pronzato, 2009; Hegewisch & Gornick, 2011). For many low-educated couples, mothers' employment is not a viable option when child care is seen as a private responsibility or is left to the market and therefore tends to be rather costly. Overall, in terms of family policy, we would therefore expect education effects on the employment of couples with small children to be

weaker in welfare states that support women's employment by providing affordable child care (e.g., Evertsson et al., 2009; Gutiérrez-Domènech, 2005; Kenjoh, 2005; Pronzato, 2009).

### *Education systems and labor market institutions*

Education systems evidently shape the moderating context described above; they affect the degree to which higher levels of education are associated with larger or smaller returns to wages, intrinsic job quality, and unemployment risks ('structure of returns to education'). It has been argued, for example, that returns to education in terms of occupational attainment tend to be higher in countries with a strong tradition of vocationally specific training such as Austria and Germany (Gangl, 2003). Similarly, Andersen and van de Werfhorst (2010) suggest that the relationship between education and occupational status is stronger in 'transparent' systems that feature extensive tracking, a strong vocational orientation, and limited tertiary enrolment. Yet, it is important to note that such education systems tend to focus on medium levels of education that provide occupationally-specific and market-relevant qualifications (the majority of the population is medium-educated), while they tend to feature relatively low shares of tertiary education. More occupationally-specific systems thus tend to be less strongly *polarized* in terms of the distribution of educational attainment (Anxo, Bosch, & Rubery, 2010), which may mitigate education-based inequality in labor market outcomes. It is beyond the scope of this paper to detail the many ways in which different education systems – the degree to which these are stratified and standardized and the degree to which they feature institutionalized vocational specificity – affect returns to education in interaction with other important institutional factors (e.g., industrial relations, tax systems, family policy). Instead, we focus on the country-specific 'structure of returns to education' – that is co-determined by education systems – to describe the contextual conditions that moderate the micro-level mechanisms underlying education effects.

## METHOD

We use data from the first wave of the Generations and Gender Survey (GGS) which is coordinated by the United Nations Economic Commission for Europe. We examine education effects on couples' employment arrangements in five European countries that feature very different structures of opportunities and constraints for low-educated and high-educated women and men: Austria, France, Germany, Hungary, and Norway (see Introduction for detail). The GGS surveys were fielded in the period 2004-2008 (see Table 2). In Austria, France, and Germany, data were collected through computer-assisted personal interviews. In Hungary, face-to-face paper-and-pencil interviewing was performed and a mixed mode design applied in Norway (technical information on the survey is available from the GGS website at [www.ggp-i.org](http://www.ggp-i.org)).

### *[Table 2]*

The main reason for choosing this international survey as the empirical basis for the present study is that it provides sample sizes for individual countries that are large (see Table 2) compared to other cross-national surveys that provide couple-level data. This feature allows for an examination of population subgroups and, in particular, of the specific sample of analysis selected for this study, that is, heterosexual couples living together in the same household that include a woman aged 20-45 at the time of interview. Couples in this age range are of specific interest because education effects on women's labor supply have been shown to be most relevant among married or cohabiting women with dependent children (England et al., 2012). The overall sample consists of 13,718 couples. Depending on the country, between three quarters and 80% of these couples have children below age 12. Moreover, the majority of the couples (N=10,048) are educationally homogamous (see Table 2 for details on the country-specific samples).

A formal test of the entire theoretical model outlined above (micro-level mechanisms and their moderation at the country level) would require data for a very large set of countries and ideally for different points in time to increase variation in contextual context conditions and hence in the statistical power needed to test moderating effects. Moreover, to test each of the micro-level mechanisms and the degree to which these mediate education effects, information on women's and their partners' wages, their attitudes, and the quality of their jobs would be required. Such data are not available to date. The available data for large sets of countries either do not provide information on wages, attitudes, and job quality or they do not provide large enough samples for the proposed couple-level analysis. For this reason, the empirical part of this paper carries out a test of the proposed theoretical model using data for five European countries that serve as case studies. Our selection of countries provides a very useful comparative setting, because it covers a wide range of different contextual conditions (e.g., in terms of labor markets, wage structures, job quality, family policies, and gender culture) as outlined in detail below.

### *Analytic strategy*

The empirical part of the study focuses on the analysis of contextual moderation effects. Based on our theoretical framework and the description of moderating contextual conditions (see below), we formulate hypotheses about the relative strength of education effects in the five countries. These hypotheses are then tested against the micro-data from the GGS surveys.

We examine education effects on women's employment, embedding women in a couple household context. Examining the effect of education on couples' employment arrangements, we distinguish between the '*dual breadwinner model*' (both partners work full-time), the '*male breadwinner model*' (the man works full-time, the woman is non-employed), the '*modernized male breadwinner model*' (the man works full-time, the woman part-time), the '*dual part-time model*'

(both work part-time), the '*female breadwinner model*' (the woman works more than the man, i.e., the man is non-employed while the woman works part-time or the man works part-time and the woman full-time), and the '*no full earner model*' (both are non-employed or only the man works part-time). Part-time work is defined as working 1-29 hours per week, in accordance with the OECD standard (based on usual weekly hours). The non-employed include respondents on maternity or parental leave, the unemployed, homemakers, and full-time students.

The employment arrangements are used as the dependent variable in multinomial logistic regression analyses. Dual breadwinners serve as the baseline against which the relative odds of living in one of the other arrangements are estimated. The main predictor of interest is couples' education. Educational attainment is measured according to the international standard classification of education (ISCED). Low education pertains to at most upper secondary education (ISCED 0-3); high education ranges from post-secondary to the second stage of tertiary education (ISCED 4-6). Four combinations of couples' education can be distinguished (both low, woman low/man high, woman high/man low, both high). Yet, due to the fact that the majority of couples today are educationally homogamous (Domanski & Przybysz, 2007), we focus on couples in which partners have similar levels of education. Depending on the country, between 68% and 75% of the couples in our sample are educationally homogamous, that is, they involve partners who are either both low-educated or both high-educated according to our definition.

Dividing couples into two education groups in this way is preferable to alternative dichotomizations given the distribution of our samples. The categorization chosen (ISCO 0-3 versus ISCO 4-6) allows for a more balanced distribution of low-educated and high-educated couples (see Table 2) than if we were to define those who attained at most lower secondary education (ISCO 0-2) as low-educated and those who attained at least upper secondary education (ISCO 3-6) as high-

educated. In the latter case the share of low-educated couples becomes very low in all countries. However, to the extent that this is possible with the sample sizes at hand, we carry out sensitivity analyses of our broad categorization of education using this alternative definition. In Norway, information on the partner's education is missing for 17% of respondents (see Table 2), who are retained in the sample within a separate category of the couple education variable (both-high, both-low, missing). The missing at random assumption is supported by regression analyses that show no significant impact of this category on employment outcomes.

The regressions are run country-per-country. In addition to education, they include a control for the family life-cycle defined by the presence and age of children, and an interaction between education and the family life-cycle. We define four stages in an ideal-typical *family life-cycle*: 'young childless couples' (no dependent child, woman below age 36), 'couples with infants' (youngest child is below age 3), 'couples with preschool-aged children' (youngest child is age 3 to below the compulsory age at school entry, i.e., age six in all countries studied) and 'couples with school children' (youngest child has reached the compulsory schooling age and is below age 12). All children living in the household are considered (biological, step, foster, and adopted). All models control for the woman's age (and its square term) and the age gap between partners (similar age, man 3 or more years younger, man 4-8 years older, man 9 or more years older). For a description of sample characteristics and the distribution of dependent and independent variables see Table 2. A control for residence in rural or urban areas has been tested. Because the variable has not shown statistical significance in most cases – and has not been measured in similar ways across countries or not at all – it was not retained in the analyses.

The focus of the empirical analysis on educationally homogamous couples allows us to test the impact of the woman's education on her employment, while accounting for her partner's educa-

tion (held constant at the level of the woman's). Moreover, using the couple's employment arrangement – instead of the woman's employment – as the dependent variable, our models account for the partner's employment participation. This empirical approach is chosen because the woman's education shapes her employment decision in interaction with her partner's education and employment (as shown by preliminary analyses of the data at hand). The chosen focus on educationally homogamous couples allows us to account for these interactions and furthermore to investigate the interaction of the couple's education with the presence and age of children.

#### *Data for describing contextual conditions*

Instead of using common typologies of welfare state or gender regimes to broadly characterize the contextual conditions of female employment in different countries (e.g., Sainsbury, 1999), we take a more direct empirical approach and describe the varying contexts in the five countries using a diverse set of indicators that relate back to our five mechanisms. First, we use data from the OECD to obtain information on moderating conditions for mechanism 1. One indicator pertains to the relative earnings of women at different levels of education, allowing us to compare monetary opportunity costs across countries (see Table 3 for details). Moreover, the OECD provides a comprehensive measure of adverse employment incentives for low-wage second earners that result from expensive child care and childrearing-related tax and benefit policies (Richardson, 2012). This measure accounts for the total increase in the effective tax burden and costs incurred from taking up low-paid employment (child care fees, withdrawal of home-care allowance, change in taxes and benefits relative to earnings in the new job including social contributions and childcare-related tax concessions). It allows us to determine the country-specific degree to which monetary disincentives discourage the employment of low-educated mothers. Second, we use data from the European Social Survey (ESS) to obtain a measure for the gap between

low-educated and high-educated women in terms of the intrinsic quality of their jobs (moderating condition for mechanism 2), measured in terms of the levels of task discretion and employee participation as central indicators of intrinsic job quality (cf. Gallie, 2013, see notes below Table 3 for details). Third, we use the micro-data from the GGS to obtain information on moderating conditions for mechanism 3, calculating the average gap between low-educated and high-educated women in terms of their attitudes to gender roles and child care. These attitudes are measured as women's agreement to the statements '*When jobs are scarce, men should have more right to a job than women's*' and '*A pre-school child is likely to suffer if his/her mother works*'. Fourth, we use micro-data from the *EU Labour Force Survey* to compare female unemployment rates between education groups (moderating condition for mechanism 4). Finally, we use data from the OECD (2014) to evaluate the differential size of the gender wage gap in the five countries (moderating condition for mechanism 5), defined as the difference between male and female median wages, divided by the male median wages. The data refer to full-time employees and to the year in which the individual-level GGS data have been collected.

#### CONTEXTUAL VARIATION ACROSS COUNTRIES

As shown in Table 3, the largest *education-based gaps in female earnings* are observed in Hungary, followed with some distance by Austria. Wage structures by education are more compressed by comparison in France and especially in Norway. Germany ranks in-between. Based (only) on the logic of wage-based opportunity costs (mechanism 1), we would thus expect the strongest education effect in Hungary and the weakest in Norway.

[Table 3]



Another cost factor for parents is *child care*. Adverse employment incentives for low-wage second earners that result from expensive child care and childrearing-related tax and benefit policies are highest in Germany (87% of the earnings in the added job would be eaten up by the costs of employment), moderate in Austria (64%) and Norway (57%), and low by comparison in Hungary (49%) and France (41%) (Richardson, 2012). Based on opportunity cost considerations for mothers in particular, we would thus expect the strongest education effect in Germany.

Germany and Austria show the greatest level of *education-based inequality in intrinsic job quality* (see Table 3 for details) followed by Hungary, whereas inequality is lower by comparison in France and Norway. Based (only) on the logic of forgone intrinsic rewards (mechanism 2), education effects would therefore be predicted to be weakest in Norway and France.

In a country comparison, Norwegians are the most gender egalitarian and favorable to maternal employment, Hungarians the least (see Table 3). Within countries, the largest education-based differences in gender-role attitudes are found in Hungary, France, and Germany; the largest education-based differences in care attitudes in France and Germany. Norwegians at all educational levels are strongly in favor of gender equality. Overall, this suggests that based on mechanism 3, we may expect comparatively strong education effects in France and Germany, where education-based differences in gender and care attitudes are more substantial than in the other countries.

Whereas in Norway and Austria unemployment is modest at all levels of education, the most strongly pronounced education-based inequality in unemployment is found for Germany, where the unemployment rate is twice as high for the low-educated than the high-educated (see Table 3). Comparatively high education-based gaps in unemployment are also observed for France and Hungary. In regard to demand-side constraints (mechanism 4), we would thus expect stronger education effects in Germany, France, and Hungary compared to Austria and Norway.

Accounting for potentially counteracting income effects (mechanism 5), we may expect education effects to be mitigated in societies such as Germany and Austria that feature large *gender gaps in earnings*. According to the OECD (2014), the gender wage gap in earnings is highest in Germany (23) and Austria (21), followed by France (12) and Norway (10), whereas it is rather small in Hungary (3). Finally, the considerations of constrained choice suggest that education effects are muted in countries that feature low wage levels. Wages are by far the lowest in Hungary with average annual wages amounting to less than 50% of those in the other countries (see OECD, 2012a, p. 248).

#### COUNTRY-SPECIFIC HYPOTHESES

There are various reasons to expect education effects in Germany to be comparatively large. Sizeable education effects would be expected due to the strongly pronounced disincentives for low-educated women to take up employment (family policy). Moreover, Germany features comparatively large education-based gaps in the intrinsic quality of jobs, in attitudes to gender roles and child care, and in unemployment risks. Education effects may be muted through income effects, however, given the comparatively large gender gap in earnings.

Although commonly treated as similar cases in gender regime analysis, somewhat weaker education effects may be expected in Austria compared to Germany. Adverse incentives to take up a job for low-educated second earners are weaker in Austria (family policy), the education-based gap in gender-role and care attitudes is somewhat smaller, and the relative disadvantages of the lower educated in terms of their employment chances are less pronounced.

There are several reasons to expect strong education effects in Hungary: the low-educated face weak incentives to engage in paid work due to a large education-based female earnings gap; we

observe a large education-based gap in gender-role attitudes; and the low-educated are at much higher risk of unemployment. There are also several reasons to expect education effects to be mitigated in Hungary. The wage levels are much lower than in the other countries under investigation. For this reason, most women face the economic necessity to contribute to the household income and are thus likely to seek employment irrespective of their wage potential. At the same time, Hungarian family policy does not discourage the employment of low-educated mothers. Finally, Hungary is a gender traditional society, where women's employment is not deemed desirable irrespective of the level of education (see Table 3). High-educated women may thus be prone to reduce their employment in response to the presence of a high income-earning partner, or in other words, income effects are likely to be of greater relevance (Goldin, 2006).

For various reasons, we expect to find the weakest education effects in Norway. The returns to education are comparatively small in terms of wages, job quality, attitudes, and unemployment risks. In France, we may also expect comparatively small education effects that would however be predicted to be somewhat larger than in Norway, despite the fact that both countries support the labor force integration of women (e.g., wide availability of subsidized child care). The substantial education-based gaps in gender-role and care attitudes as well as in unemployment risks may translate into more pronounced education effects in France than in Norway.

In sum, we find that the individual-level mechanisms of our theoretical model hold in all countries. The more highly educated earn more, have higher quality jobs, hold attitudes that are more favorable to female employment, and face lower risks of unemployment (see Table 3). Moreover, high-educated women in all countries tend to be partnered with high-educated men (as evidenced by the high shares of educationally homogamous couples). Yet, the degree to which the high-educated are advantaged in these respects varies across the countries. Based on our theoret-

ical model and the structure of returns to education described above, we expect to find the smallest education effects in Norway where the structure of returns is coherently pointing to the most equal outcomes by education. Larger education effects, by comparison, would be expected in Austria, Germany, France, and Hungary, albeit for different reasons.

## RESULTS

Due to space limitations, we present the results from the multinomial logistic regression analyses as predicted probabilities of practicing different employment models (see Figure 1). The probabilities are estimated separately for the low-educated and the high-educated, holding the couples' age structure constant. Full regression models are available from the authors upon request. They confirm that women's odds of employment are lower in low-educated couples (education effect) and in the presence of children (child effect). Moreover, in some of the countries, the education effect varies with the presence and the age of children (significant interaction effects).

*[Figure 1]*

### *Child effects*

Figure 1 summarizes our results in terms of the predicted probabilities that a woman is employed in any one of the couple employment arrangements that involve an employed woman (dual breadwinners, female breadwinners, dual-part-timers, or modernized male breadwinners). The height of the bars thus pertains to the share of women who are employed in the different stages of the family life-cycle. Comparing countries, two broad patterns of life-cycle employment can be discerned. Austria, Germany, and Hungary show *strong child effects*: women's employment is at a very low level in the presence of an infant child and only gradually increases with the age of the youngest child. When children reach the age of three, part-time work is a common way of

combining female employment with childrearing in Austria and Germany, but not in Hungary. France and Norway show rather *weak child effects*: female employment varies much less across the family life-cycle; dual-earner arrangements dominate also in the presence of small children.

### *Education effects*

The pattern of education effects is shown to be highly complex. Their magnitude varies across countries but also across the family life-cycle. Moreover, as shown in Figure 1 and confirmed by regression analyses, education is much more relevant for the employment decision than for working hours (working part-time or full-time, for a similar finding see England et al., 2012). For this reason, Table 4 summarizes our results in terms of ‘education effects’ defined as education-based differences in the predicted rates of female employment.

#### *[Table 4]*

With the notable exception of Hungary, education effects do not reach statistical significance for childless couples (see also England et al., 2012). In the presence of dependent children, education effects are found to be statistically significant in all countries. In France, for example, about 50% of low-educated women are employed when they have an infant child, compared to 80% of high-educated women (see Figure 1 and Table 4). The education-based gap in female employment thus amounts to 30 percentage points (pp), compared to 15 pp in Germany, 11 pp in Norway, and 10 pp in Austria and Hungary. In couples with pre-school aged children education effects amount to 37 pp in Hungary, 15 pp in Austria and in Germany, 13 pp in France, and 5 pp in Norway. Finally, for couples whose youngest child has reached school age, we find education-based gaps in maternal employment participation of 27 pp in Hungary, 21 pp in Germany, 15 pp in Austria, and 6 pp in France and Norway. In sum, in the very early childrearing phase we ob-

serve the largest education effect in France, while Hungary shows the largest education effect once the youngest child reaches the age of three. Education effects are thus not generally found to be smaller in the countries where female employment tends to remain at a high level across the family life-cycle (i.e., where child effects are small as in Norway and France). When we look at mothers of infants, France stands out as the country with the largest education effect and Norway shows an effect of similar size to the one observed in Austria. But, among mothers of older children education effects are in fact comparatively small in France and especially in Norway.

#### *Sensitivity analyses with education*

Our results may be sensitive to the definition of high and low levels of education. In any cross-national analysis involving education, it is important to bear in mind that education levels may not be strictly comparable across countries because they do not account for the structure of educational attainment or the types of skills involved. For instance, in countries such as Germany and Austria individuals with an educational attainment that corresponds to ISCED level 3 tend to have more vocationally-specific skills than their counterparts in other countries. To test if our results are sensitive to whether ISCED level 3 is defined as low or high education, we re-run the analyses defining those with ISCED levels 0-2 as low-educated and those with ISCED levels 3-6 as high-educated. Using this alternative classification tends to increase the size of education effects, as may be expected, yet the pattern of results remains very similar. In the presence of infants, France still shows by far the largest effect. Hungary still shows the largest effect in the presence of pre-school aged children as well as in the presence of school-aged children. And finally, Norway shows the smallest effect both in the pre-school and the school phase.

## DISCUSSION

Prior cross-nationally comparative research on the topic has tended to suggest that education effects on women's employment are weaker in egalitarian societies that are supportive of women's employment (e.g., Evertsson et al., 2009; Gutiérrez-Domènech, 2005; Kenjoh, 2005; Pronzato, 2009). In this context it has further been suggested that cross-national differences in women's employment derive mainly from the behavior of the low-educated, whereas the high-educated tend to be in paid work, irrespective of the presence of children and the policy context (Del Boca et al., 2009; Korpi et al., 2013). Our findings challenge this contention, showing that in Austria, Germany, and Hungary, neither low-educated nor high-educated women tend to work when their children are below the age of three (see also Author, 2014). This is consistent with the observation that in these countries, and especially in Hungary, attitudes to gender roles and child care tend to be rather traditional *across* educational levels. For this reason, we find moderate education effects in the presence of infants – effects that are comparable to what we find in Norway. In the presence of an infant child, the largest education effect by far is found in France. Our findings would thus not support the assumption that education effects are *generally* smaller in societies that are more supportive of women's employment. However, for the later child rearing phases our findings do corroborate earlier findings of smaller education effects in countries where the state encourages maternal employment through the provision of affordable child care. When children reach the age of three and beyond, the largest education effect by far is found in Hungary while much smaller effects are observed in France and especially in Norway.

It may thus be argued that family policies encouraging dual-earner arrangements for parents reduce education effects for couples with children aged three and above. This mitigation effect of family policies works in interaction with the micro-level mechanisms presented in this study.

State efforts to removing economic disincentives to maternal employment (e.g., reducing the costs of childcare) weaken opportunity cost effects for low-educated couples (mechanism 1) and thus encourage dual-earner arrangements also among the lower educated. Moreover, family policy may weaken attitudinal effects (mechanism 3), for instance, when the provision of *high-quality* public child care reduces concerns about child well-being when both parents work.

Whereas most prior work estimated the effects of children and education separately, our results underscore the importance of the family life-cycle when studying education effects on couples' employment arrangements. The strength of education effects is shown to vary substantially across societal and policy contexts and with the presence and age of children.

Our results are consistent with our hypotheses to the extent that Norway shows the smallest education effect, at least in the later childrearing phases. Moreover, the finding that the country ranking in the size of the education effect varies with the age of children suggests that *different mechanisms are at work in different stages of the life course*. In the infant phase, for instance, a theory of labor supply predicting higher rates of employment at higher potential wages and job quality does not appear to apply. France shows modest education-based gaps in wages and the intrinsic quality of jobs (implicating modest education effects based on mechanisms 1 and 2). Nevertheless, education effects are found to be the largest by comparison. A potential explanation for the large education effect found in France is the substantial education-based gap in care attitudes (mechanism 3). In the later childrearing phases, when Hungary shows the largest education effect by far, the potential explanations include the large education-based gap in earnings (mechanism 1), gender-role attitudes (mechanism 3), and unemployment (mechanism 4).

The relative extent to which these mechanisms mediate the education effects observed in the different countries (micro-level mediation analysis) is beyond the scope of this study. Our focus



has been on the analysis of moderation (country-level analysis). In future work it will be important to more deeply investigate the micro-level mechanisms and their varying relevance in different stages of the family life-cycle. The data at hand allows us to estimate the degree to which the observed education effects are driven by attitudinal effects in the different countries (attitudinal data is provided in the GGS data). These analyses (not shown) suggest that among educationally homogamous couples with children below age 12, the observed education effects are to a substantial degree confounded by gender-role and care attitudes (particularly in Germany and Austria where about a third of the education effect can be explained by such attitudes, followed by France where about a quarter of the education effect reflects attitudinal effects). Due to limited sample sizes we were not able to carry out this mediation analysis for different stages in the family life-cycle. Moreover, data limitations do not allow us to carry out similar analyses on other micro-level mechanisms. Future work may further our understanding of education effects on couples' employment choices by testing the micro-level relations of the theoretical model proposed in this study (using survey data for one or more countries that contain information on women's and their partners' wages, intrinsic job quality, and attitudes).

The present study focused on the moderation of education effects on couple employment by contextual factors at the country level. A limitation of the study pertains to the use of comparative data for a limited number of countries. A larger set of countries in combination with large sample sizes at the country level would allow for direct tests of cross-level interaction effects, that is, of the contextual moderation of education effects. Moreover, larger sample sizes would enable us to analyze not only educationally homogamous couples but also educationally heterogeneous couples and single parents. Finally, avenues for future research include access to previously unavailable international panel data that would allow for comparative analyses of the longer-term em-

ployment trajectories at different levels of education. This relates to a limitation of the present study, which is based on cross-sectional data and is therefore not able to account for potential selection effects that arise when different types of women move through the family life-cycle at different ages. More highly educated women tend to have their children later, when they are more firmly established on the labor market and they tend to have fewer children, with the result that motherhood penalties tend to be smaller for them than for lower educated women (Kahn, García-Mangano, & Bianchi, 2014). Education-based differences in the mean age at first birth and the average number of children per woman could be considered as additional factors for explaining variations in the education effect on women's employment across countries.

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TABLE 1: MICRO-LEVEL AND MACRO-LEVEL THEORIES OF EDUCATION EFFECTS

Micro-level mechanism	Explanation: Higher educated women...	Contextual moderation
1. Monetary opportunity costs	... have higher potential wages -> greater financial incentives to work ( <i>forgone income</i> )	Where the <i>returns to education in terms of earnings</i> are greater, the relative incentives to seek employment for the high-educated are greater -> stronger monetary opportunity cost effect -> stronger education effect
2. Non-monetary opportunity costs	...have access to jobs of higher quality -> greater intrinsic work motivation ( <i>forgone intrinsic rewards</i> )	Where the <i>returns to education in terms of intrinsic job quality</i> are greater, the relative incentives to seek employment for the high-educated are greater -> stronger non-monetary opportunity cost effect -> stronger education effect
3. Attitudes and norms	...tend to place greater value on <i>gender equality</i> and face weaker <i>normative constraints</i> to maternal employment	Where the <i>education-based gap in terms of gender/care attitudes</i> is greater, the relative incentives/constraints to employment for the high-educated are stronger/weaker -> stronger attitudinal effect -> stronger education effect
4. Labor market constraints	...tend to have better employment outlooks, face lower risks of unemployment -> weaker <i>demand-side constraints</i>	Where the differences between the high-educated and the low-educated in terms of their <i>unemployment risks</i> are greater -> stronger demand side constraints for the low-educated -> stronger education effect
5. Partners' income	...are more likely to be partnered with a high-income-earners -> weaker financial incentives to work ( <i>income effect</i> )	Where the <i>gender gap in earnings</i> tends to be greater -> stronger income effects for high-educated women -> muted education effect

Note: -> indicates consequent theoretical expectation. See Table 3 for country-specific data on contextual indicators.

TABLE 2: SAMPLE CHARACTERISTICS

		Austria	France	Germany	Hungary	Norway
<i>Dependent variable</i>						
Dual breadwinner		32.8%	48.9%	21.0%	42.6%	60.2%
Male breadwinner		33.1%	22.8%	41.6%	35.8%	13.1%
Modernized male breadwinner		26.7%	16.3%	20.9%	4.4%	17.4%
Female breadwinner/dual part-timer		4.2%	7.3%	6.1%	5.8%	5.8%
No full earner		3.2%	4.8%	7.8%	7.9%	3.0%
Missing		0.0%	0.0%	2.6%	3.5%	0.5%
<i>Independent variables</i>						
Woman's age	Mean (s.d.)	32.5 (6.0)	33.1 (6.2)	33.7 (6.1)	31.1 (5.6)	33.9 (6.0)
Age combination	Similar age	56.0%	59.4%	56.7%	54.4%	57.9%
	Man 3+ years younger	6.6%	6.5%	6.0%	6.2%	6.0%
	Man 4-8 years older	28.2%	23.6%	27.8%	29.9%	27.4%
	Man 9+ years older	9.3%	10.4%	9.2%	9.3%	8.6%
	Missing	0.0%	0.0%	0.3%	0.1%	0.2%
Couple education	Both low	47.6%	50.5%	49.3%	32.5%	30.5%
	Woman low, man high	15.0%	8.0%	16.3%	6.8%	8.2%
	Woman high, man low	16.5%	16.0%	8.0%	21.1%	17.2%
	Both high	20.9%	24.8%	21.3%	39.5%	26.8%
	Missing	0.0%	0.8%	5.2%	0.0%	17.3%
Family life-cycle	Childless	23.7%	19.6%	19.1%	22.7%	18.1%
	Infant	30.7%	30.2%	26.8%	26.4%	30.3%
	Preschool	19.5%	21.8%	22.9%	19.3%	21.1%
	School	26.1%	28.5%	30.8%	31.5%	30.4%
	Missing	0.0%	0.0%	0.4%	0.1%	0.1%
N of all couples		2,325	2,453	1,964	2,954	4,022
N of homogamous couples		1,592	1,861	1,463	2,129	3,003
Survey year		2008	2005	2005	2004	2007

*Note:* The overview provides unweighted summary statistics of dependent and independent variables. The survey year pertains to the year in which the majority of interviews were carried out. Sample sizes pertain to the number of observations without missing values, except for couple education in Norway, where cases with missing values on this variable are retained in the analyses.



TABLE 3: CONTEXTUAL INDICATORS

Country	Relative earnings (a)			Intrinsic job quality (b)			Gender attitudes (c)			Care attitudes (d)			Unemployment rate (e)		
	low edu	high edu	diff	low edu	high edu	diff	low edu	high edu	diff	low edu	high edu	diff	low edu	high edu	diff
Austria	68	160	92	2.57	3.08	0.51	2.33	1.94	-0.39	3.02	2.70	-0.32	4.6	2.0	-2.6
France	86	144	58	2.65	2.77	0.12	2.10	1.53	-0.57	3.10	2.55	-0.55	11.0	6.0	-5.0
Germany	88	156	68	2.30	2.82	0.52	2.35	1.83	-0.52	3.02	2.51	-0.51	12.3	5.6	-6.7
Hungary	73	217	144	2.17	2.49	0.32	2.58	1.96	-0.62	4.61	4.26	-0.35	6.8	2.8	-4.0
Norway	79	128	49	2.83	2.98	0.15	1.41	1.20	-0.21	2.02	1.67	-0.35	2.5	1.8	-0.7

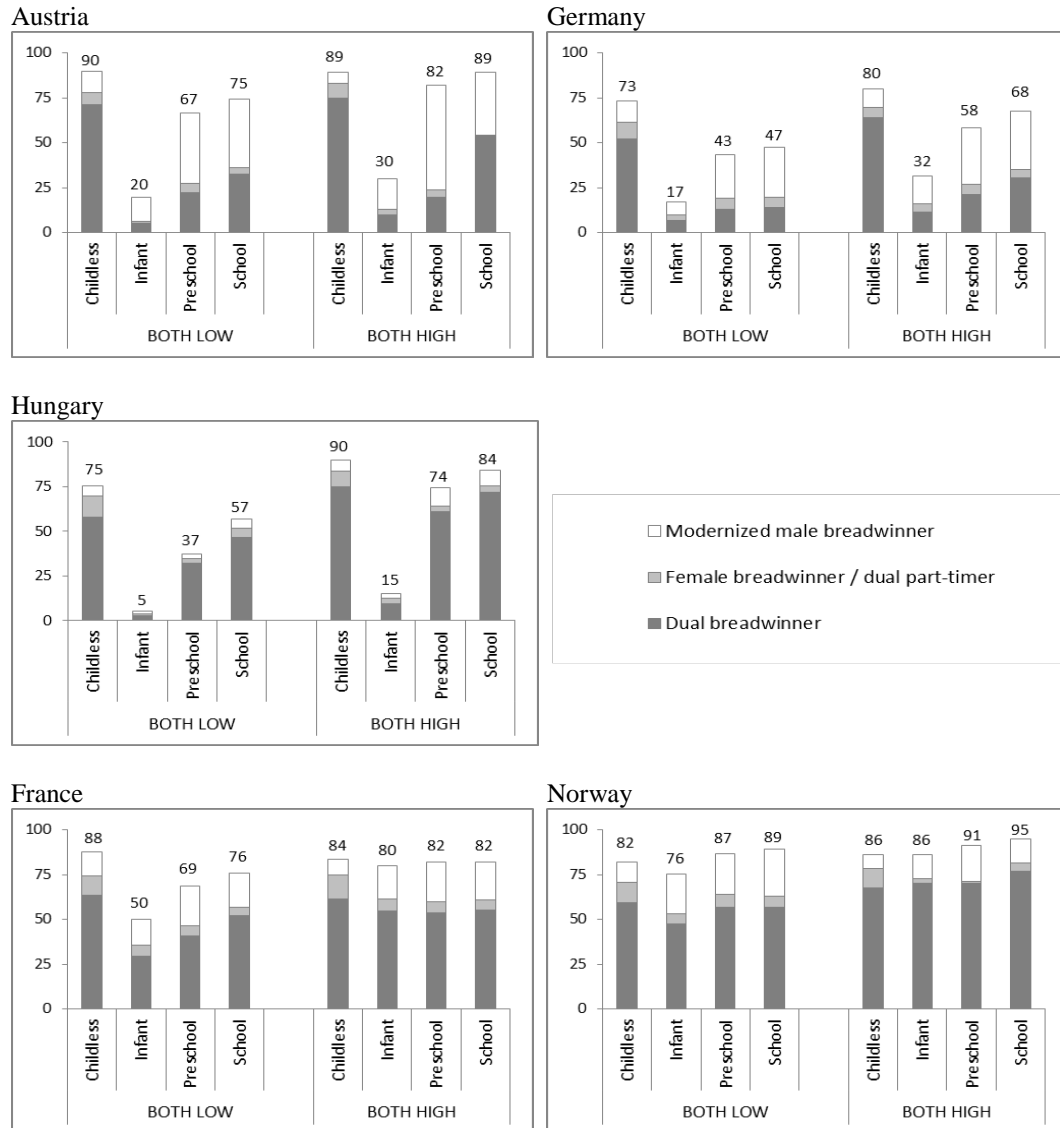
Notes: (a) Data from OECD Education at a Glance (2012b, p.152): Relative earnings of women of age 25-64 with below upper secondary education (low-edu) and tertiary education (high-edu) compared to upper secondary & post-secondary, non-tertiary education (=100), in the year in which the individual-level GGS data was collected (see Table 2 for survey years). (b) Own calculation based on data from the *European Social Survey Round 2*: Summative index of three indicators (scale 1-4) measuring discretion and participation (item wording: ‘How much does the management at work allow you to decide how your own work is organised, to influence policy decisions about the activities of the organisation, to choose or change your pace of work’), women age 20-45 reporting on their current or last job, higher values indicate higher quality. Indicators have equal weight (Cronbach’s Alpha: 0.80); low-edu pertains to ISCED 0-3; high-edu to ISCED 4-6. (c)-(d) Data from Gender and Generations Survey (GGS): low-edu pertains to ISCED 0-3; high-edu to ISCED 4-6; women aged 20-45, weighted (c) Mean of ‘When jobs are scarce, men should have more right to a job than women’s (d) Mean of ‘A pre-school child is likely to suffer if his/her mother works’. The variables are measured on 5-point scales and recoded so that higher values indicate more traditional attitudes. In Norway, attitudes were surveyed in a self-administered questionnaire that was returned by 72% of respondents. (e) Own calculation based on data from the *EU Labour Force Survey*: Unemployment rate of women age 25-49 at low (ISCED 0-3) and high educational attainment (ISCED 4-6); values refer to the year in which individual-level GGS data was collected.

TABLE 4: EDUCATION-BASED GAP IN THE EMPLOYMENT PARTICIPATION OF WOMEN (PREDICTED %-DIFFERENCE)

	Austria			France			Germany			Hungary			Norway		
	Both low	Both high	Education effect	Both low	Both high	Education effect	Both low	Both high	Education effect	Both low	Both high	Education effect	Both low	Both high	Education effect
Childless	90	89	-1	88	84	-4	73	80	7	75	90	15***	82	86	4
Infants	20	30	10*	50	80	30***	17	32	15**	5	15	10***	76	86	11***
Preschool	67	82	15*	69	82	13*	43	58	15*	37	74	37***	86	91	5
School	75	89	15**	76	82	6	47	68	21***	57	84	27***	89	95	6**

Notes: Shown are the predicted probabilities of women's employment for (1) couples with two low-educated partners and (2) couples with two high-educated partners. See Figure 1 for graphical representation. The underlying regression models are available from the authors upon request. The 'education effect' refers to the difference in the predicted rate of female employment between high and low-educated couples (i.e., to the education based gap in female employment rates). Separate analyses for Western Germany, which is more gender traditional than Eastern Germany (sample sizes are too small for a separate analysis of the latter) suggest similar results: no significant effect in the case of childless couples, 13 pp in the presence of infants, 19 pp in the presence of preschool kids, and 19 pp in the presence of school age kids. \*\*\*p < .001; \*\*p < .01; \*p < .05.

FIGURE 1: COUPLES' EMPLOYMENT ARRANGEMENT BY EDUCATION, PREDICTED PROBABILITIES



Notes: Predicted probabilities (PPs in %) from multinomial logistic regression analysis for arrangements in which the woman is employed (computed for couples with woman of average age and man of similar age as the woman). Together with 'male breadwinners' and 'no full earner arrangements', the PPs for 'dual breadwinners', 'female breadwinners', 'dual part-timers', and 'modernized male breadwinners' sum up to 100% in each stage of the family life-cycle. The values above the bars pertain to the sum of the illustrated arrangements in which women works part-time or full-time. For significance tests, see Table 4.