The Effect of Mothers' Education on Childbearing in Marriage or Cohabitation

Economic Independence versus Status Attainment

Alexander Mack, GESIS – Leibniz Institute for the Social Sciences

Abstract

The finding that mothers' education is negatively associated with the likelihood of a birth in cohabitation (Perelli-Harris et al. 2010) is likely the most central on this topic in the last decade. And while research has found that the size of the educational gradient of childbearing in cohabitation differs between countries (Goldstein and Kenney 2012, Potarca et al. 2013) there exists little research on the magnitude of this difference or the underlying mechanisms. In my paper I argue that the effect of women's education on likelihood of a birth in cohabitation versus marriage is dependent on whether mothers can utilize their education in the labor market. In reference to Oppenheimer (1994) I argue that mothers' education can have both positive and negative effects on likelihood of marriage. Building on arguments laid out by Cherlin (2004) and Edin and Kefalas (2005) I expect a negative "status attainment" effect of education on childbearing in cohabitation. On the other hand new home economics (Becker 1991) would predict a positive independence effect of education. I apply these arguments to parents' marital status at time point of birth and argue that independence effects are more pronounced when mothers can combine work and family and benefit from their education. I argue that this association is mediated by the degree of compatibility of work and family life (operationalized via childcare availability at the country level). In order to test these assumptions I employ cross-sectional data from the EU-SILC for 26 European countries and estimate multi-level models with cross-level interaction terms. I observe that higher levels of education are generally associated with lower likelihood of living in a cohabiting versus marital union at time of birth; however the degree of this educational gradient varies considerably between countries. Childcare availability mediates this effect particularly for mothers with tertiary education.

Background

Over the last decades, Europe has witnessed marked increases in childbearing outside of marriage. In 2012, 40 percent of all births in the European Union were to unmarried mothers (Eurostat 2016). Ever since the end of the "golden age of marriage" (Festy 1980), during which rates of childbearing outside of marriage were at historically low levels in most parts of Europe (compare for example data presented by Höpflinger 1985), rates of childbearing outside marriage have been steadily increasing in Europe. Rises in rates of childbearing outside marriage could first be observed in the countries of Northern Europe from the late 1960s onward.[1] By the mid to late seventies, rates had also begun to increase in most countries of Central and Western Europe. The development was more delayed in Southern European countries. In Greece and Cyprus, rates of non-marital fertility are still low today, but have begun to increase in the latter part of the last decade. In most post-socialist countries of Eastern Europe, dramatic increases could be observed after the end of state socialism.

Empirically, the rise in rates of non-marital fertility can be attributed largely to increases in childbearing to cohabiting couples rather than to single mothers (Kiernan 1998; Perelli-Harris et al. 2012). The underlying change in demographic behavior which is seen as chiefly responsible is the decline in shotgun marriages, i.e. marriages which take place between the conception and the birth of a child. This association has been documented in a number of studies which examine marriage following unmarried pregnancies over time.[2]

A recent trend in the literature on childbearing in cohabiting unions has been to examine the socio-demographic characteristics of mothers who have children in cohabiting unions. While there is considerable empirical evidence that the association between childbearing outside of marriage and the educational level of mothers is negative (Kiernan and Smith 2003; Perelli-Harris et al. 2010; Potârcă et al. 2013; Gavalas, Rontos and Salvati 2013; Lappegård, Klüsener and Vignoli 2014; Štípková 2015), it is less clear whether this pattern is truly universal. The most prominent article on the topic (Perelli-Harris et al. 2010) actually finds considerable variation in the degree of the negative educational gradient among the eight countries under study. In fact, in Italy Perelli-Harris et al. (2010) observe a positive educational gradient of childbearing in cohabitation. Similarly, Stropnik and Šircelj (2008) find that childbearing outside of marriage in Slovenia tends to be associated with higher levels of education in recent times. Konietzka and Kreyenfeld (2005) find a similar association for Western Germany and Hărăguş (2015) observes a positive association in Hungary.

[1] For a detailed overview of trends, compare Sprangers and Garrsen (2003) and Klüsener (2015)

[2] See for example Steele et al. (2006) for the UK, Baranowska (2011) for Poland, Hărăguş (2015) for Hungary, Romania and Bulgaria. For comparative evidence see Sobotka and Toulemon (2008, p.113) and Perelli-Harris et al. (2012).

This paper adds to the existent research on children born in cohabiting unions by attempting to contextualize the effect of education on likelihood of a child being born in cohabitation. Additionally this research will not only limit itself to the analysis of mothers but also consider the socio-economic characteristics of fathers as well.

Theory and hypotheses

The main objective of this paper is to examine whether the association between socio-economic resources of mothers, operationalized via their highest level of education, and their marital status at time of childbirth. In reference to Oppenheimer (1994:315) who argues that women's education can have both positive and negative effects on likelihood of marriage I propose that the effect of women's education on likelihood of a birth in cohabitation versus marriage is dependent on whether mothers can utilize their education in the labor market, and thus remain financially independent from their spouse. It is argued that women's education has two separate and partially contradictory effects on likelihood of being married at time of birth. On the one hand a *status attainment effect*, according to which mothers with higher levels of social status should be more likely to be married when a child is born.[3] And on the other hand the *independence hypothesis* which, in line with New Home Economics (Becker 1991), argues that higher levels of education improve women's position in the labor market and their ability to fend for themselves financially. The argument which is put forward here is that in some contexts the effect of *status attainment* will be far more predominant, whereas in contexts in which compatibility of work and family is high we will also witness an *independence effect*.

Status Attainment

A recent trend in American Sociology emphasizes the changing cultural significance of marriage. Cherlin (2004: 855) argues that as marriages' practical significance as a social institution declines its symbolic importance increases. Edin and Kefallas (2005) build on this argument and apply it to non-marital fertility. Their qualitative study on lower class single mothers from poor inner city neighborhoods attempts to understand young mothers' motives for having children outside of marriage. They argue that attitudes towards marriage and non-marital childbearing in the U.S. have become more liberal, which in turn leads to a reduction in the social pressure to legitimize a non-marital conception. They emphasize that the benefits that used to be exclusive to marriage such as a shared household, sex and the raising of children are now no longer tied to marriage. If marriage becomes less common, and in a sense more special it is open to reinterpretation and thus marriage is increasingly perceived as status symbol with economic prerequisites. Edin and Kefalas (2005: 202pp) argue that these economic prerequisites are hard

[3] This effect is essentially what Perelli-Harris et. al. (2010) and Perelli-Harris and Gerber (2011) term the „pattern of disadvantage".

to attain for lower class women, children however can be had early as the opportunity costs of children weigh far less on lower class women (46pp). In the perspective of Edin and Kefalas the decision to have a child is not so much one of economic consideration but much more a process of creating meaning for one's own life. Thus childbearing and marriage become disconnected for women with lower levels of education.

In its initial formulation this hypothesis was more geared towards single mothers, however it is analytically equally applicable to childbearing in cohabitation (see for example Perelli Harris et al. (2010)). The status attainment hypothesis assumes that higher levels of education are associated with higher likelihood of being married versus cohabiting at time point of birth of a child.

Economic Independence

According to New Home Economics gains from marriage are the result of specialization. Becker (1991: p.32) argues that the optimal division of labor within households entails specialization of partners on household and market activities. I posit that this argument, which in Becker's thinking explains why women would prefer to remain single and childless than to marry and have children, can also be applied to the decision to have a child in a marital or cohabiting union. In the thinking of New Home Economics, the key advantage of marriage is its contractual underpinning which functions as an insurance mechanism.

Becker (1991: p.44) argues that the main difference between marriage and cohabitation is the contractual nature of marriage, and that this contractual nature is particularly important when mothers are economically dependent on fathers. Brines and Joyner (1999) applied this logic to the comparison of marriage versus cohabitation when they studied union dissolution behavior of married and cohabiting couples. They argue that marriage contracts ensure partners against the risks of specialization. In cohabiting unions, there is no such insurance and thus a more egalitarian division of labor and power strengthens such unions. In cohabiting unions, there is no such insurance and thus a more egalitarian division of labor and power strengthens such unions. Thus in situations where there is no need for parents to specialize on household and labor market specific tasks marriage contracts offer less insurance and instead reduce future options. Thus having a child in a cohabiting union might be a rational strategy for couples with a more egalitarian division of labor. I argue that women with higher levels of education have invested human capital in labor market specific resources and thus should be less interested in a specialized division of labor in the family. Thus, the economic independence hypothesis assumes that higher levels of education are associated with lower likelihood of being married versus cohabiting at time point of birth of a child.

However as time out of the labor force makes mothers economically dependent on their spouse in the short term and reduces their earnings potential in the long term (Waldfogel 1998) I argue

that the availability of affordable childcare, as a measure of compatibility of work and family life, should increase mothers' ability to fend for themselves economically and that this prospect is of greater interest for mothers with higher levels of education. Thus I propose that the independence effect of education should be more pronounced in contexts with higher levels of childcare availability.

Data and Methods

This analysis employs microdata from the EU-SILC User Database (Eurostat 2013). The sample includes 12748 couples from 26 European countries[4] and pools data for the years 2004-2012. The analysis only examines couples with a single child, less than one year of age. As the analysis employs cross-sectional data it cannot study transitions and thus examines the marital status of couples close to the time of birth of a child. This approach is similar to that employed by Konietzka and Kreyenfeld (2005) and Lappegård, Klüsener and Vignoli (2014). As the EU-SILC includes no information on children outside of the household, the age of mothers is limited to 40. This step was deemed necessary as older mothers might have had prior children who already moved out of the household. Limiting the analysis to mothers 40 years or younger, deals with potential right censoring of the data.[5] The choice to conduct this analysis on the basis of cross-sectional data was motivated by two factors. For one the large sample sizes and large number of countries in the EU-SILC allows me to test for the contextual nature of effects with multilevel models. Additionally this analysis strategy allows me to consider both father and mother characteristics as the EU-SILC contains detailed socio-demographic characteristics on all household members. The microdata are supplemented by country level data on childcare enrolment. It is calculated as the percentage of children between ages 0 and 2 in formal childcare arrangements. This variable is taken from the OECD social policy database and refers to the year 2010.

The dependent variable of the regression is the relationship status at time of birth: cohabiting versus marriage. The central independent variable is mothers' education which is recoded to three categories from the ISCED classification. Fathers' education is also considered. Additionally models control for mothers' age, age difference between partners, household income (measured as percentiles of the countries income distribution), whether partners own their home and both parents' work intensity. This indicator is constructed on the basis of items which assess an individuals' labor market activity for each month of the previous year. For each month in which a person was not working a score of 0 is assigned, if a person was working part-

[4] AT, BE, BG, CY, CZ, DK, EE, ES, FI, FR, GR, HU, IE, IS, IT, LU, LV, NL, NO, PL, PT, RO, SE, SI, SK and UK

[5] Age 35 was also considered as a cut-off point, however as many highly educated women have their first child between 35 and 40 years of age 40 was chosen. Results for models in which the cut-off point was chosen at 40 did not show any substantial differences tot he results presented here.

time a value of .5 is assigned, when working full-time a score of 1 is assigned. The sum for all months is divided by 12. A score of 0 indicates that a person was economically inactive for the entire year while a score of 1 indicates that a person was employed full-time all year.

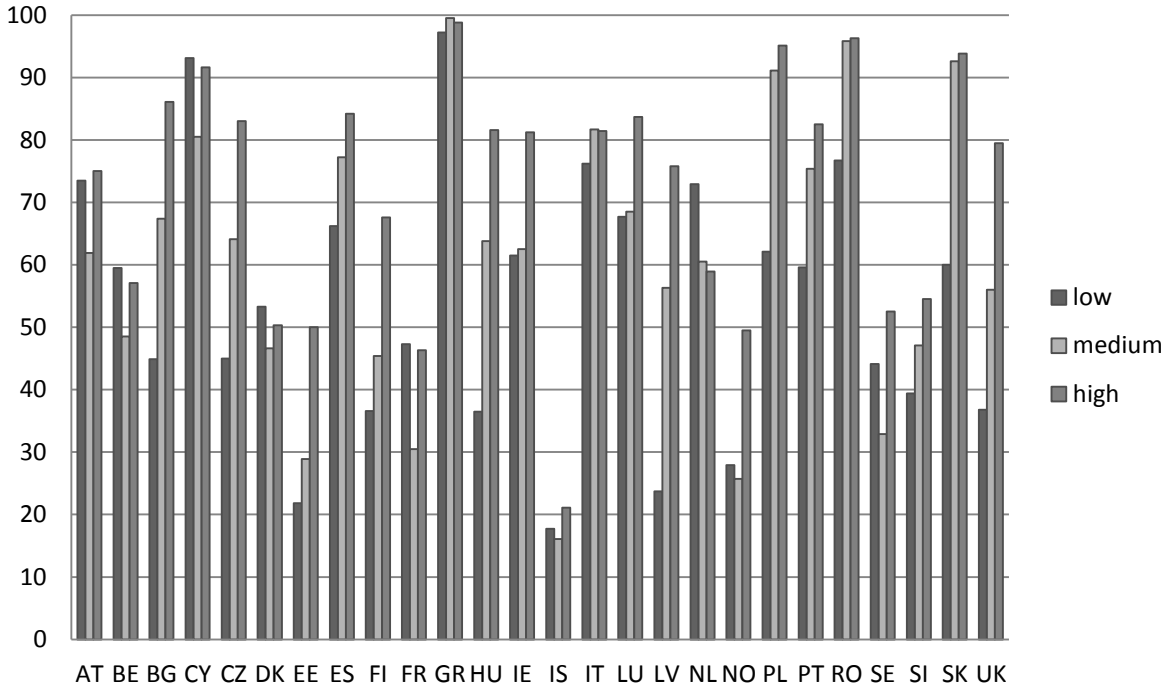
The regression results presented here utilize logistic multilevel models and were specified with Stata's melogit command. I chose a multilevel-modelling approach for this analysis, as it allows me to consider both the individual characteristics of parents and country level factors. The specified models include random slopes for mothers' education and household income[6] as well as cross level interaction terms between mothers' education and the childcare enrolment rate. Table3 in the Appendix includes descriptive results for all variables included in this analysis.

Results

In order to illustrate differences in the marital status of couples with young children throughout Europe Figure 1 below plots the proportion of partnered mothers who are married at time of birth by education for each country in the sample. It appears that marriage is more strongly associated with higher levels of education of mothers, particularly tertiary education. However considerable variation in educational differences can be observed across countries. Differences are largest in Eastern Europe and the UK. In a number of countries medium levels of education are not associated with higher marriage rates relative to those with little education. In the Netherlands and Denmark there is a negative association between education and marriage.

[6] The standard text book procedure, of specifying a model with all the fixed parts, then testing for random slopes of level 1 variables, and then simultaneously introducing all significant random slopes (compare for example Hox 2010), was not feasible with the data at hand. Graphical examination of country regression lines and likelihood ratio tests, indicate that for all explanatory variables, with exception of home ownership, the estimation of random slopes would be desirable. However such a model is unable to converge. As the variation of mother's education is a central theoretical assumption a random slopes were specified for mothers' education.

Figure 1: Proportion married at time of childbirth by education



In a first step of the analysis I will examine an integrated model which considers all countries in one model. Table 1 shows results of multi-level models. The dependent variable in all models is the family status and is coded 0 for cohabiting and 1 for married. Models 1 and 2 are random coefficient models which only consider individual level variables. Model 3 is a full multi-level model with random slopes and cross-level interaction terms which attempts to shed light on the contextual nature of the education effect. Model 1 considers characteristics of the household, the father and mother. This table only shows the effects of fathers' and mothers' work intensity (measured for the year prior to birth) and mothers' education. The result for the work intensity indicator is interesting as it demonstrates that the effect of labor market involvement on likelihood of living in a marital versus cohabiting union differs for men and women. While a higher level of labor market involvement is associated with reduced likelihood of marriage for mothers, the contrary is the case for fathers. This finding is in line with the independence hypothesis. The effect observed for education on the other hand is more in line with the status attainment hypothesis. While there are no significant differences between mothers with low and medium levels of education, mothers with high levels of education are significantly more likely to be married than mothers with low education.

Model 2 additionally includes fathers' education, this leads to a sizeable reduction in the magnitude of the effect of mothers' education. Thus part of the effect of mothers' education observed here and in previous studies can likely be attributed to more favorable partnering of mothers with higher levels of education. The other important observation from this model is that fathers with both medium and high levels of education are significantly more likely to live in

marriage at time point of birth of a child. The magnitude of this effect is also more pronounced than for mothers' education. In light of my proposed hypotheses I that the effect observed for fathers entails only status attainment effect of education while the effect for mothers can be interpreted as a positive status attainment effect minus a negative independence effect.

Table 1: Multi-level logistic regression models for couples with children (cohabitation-marriage)

		Model 1		Model 2		Model 3	
Work intensity (mother)		-0.184**	(0.063)	-0.157*	(0.064)	-0.166*	(0.064)
Work intensity (father)		0.275**	(0.085)	0.287**	(0.085)	0.261**	(0.085)
Education (mother)	low	Ref.		Ref.		Ref.	
	medium	0.122	(0.069)	0.056	(0.072)	0.091	(0.093)
	high	0.546**	(0.077)	0.378**	(0.082)	0.473**	(0.105)
Education (father)	low	Ref.		Ref.		Ref.	
	medium			0.165*	(0.065)	0.161*	(0.065)
	high			0.491**	(0.076)	0.503**	(0.076)
Childcare enrolment rate						-0.019	(0.011)
Education mother(medium)*childcare						-0.025**	(0.005)
Education mother (high)*childcare						-0.031**	(0.006)
Constant		0.773**	(0.268)	0.647*	(0.273)	0.654**	(0.191)
Variance (country)		1.238**	(.179)	1.253**	(.181)	0.564**	(0.180)
Variance (education mother medium)						0.066	(0.046)
Variance (education mother high)						0.074	(0.075)
Deviance (-2 log likelihood)		13681		13630		13493	
ICC		.317		.323		.216	

Source: EU-SILC 2004-2012; logit coefficients, standard errors in parentheses; * p < .05, ** p < .01; N=12748; models control for age, household income, home ownership and year fixed effects

In order to better understand how the effect of parents' individual socioeconomic resources varies between contexts, Model 2 was rerun for the four country groups: Nordic, Core, Southern and Eastern Europe.[7] The results of these regressions models can be found in Table 2. In order to allow for comparison of estimates from different populations, average marginal effects are shown. Before examining the effects of individual characteristics, a look at the intraclass correlation coefficient reveals an interesting pattern. Only very little variation between countries can be observed in the Nordic and Core Europe regions (ICC of .081 and .063 respectively), indicating that countries in these groups appear to be very homogenous. The same cannot be said for the Southern and Eastern European country groups. Here I observe considerable variation between countries (ICC values of .321 and .277 respectively).

A look at the work intensity variables reveals significant differences between regions, which come as a bit of a surprise, considering the results from the integrated model. For mothers' work intensity the only significant effect can be observed in the core European countries, and as the independence hypothesis would predict it is negative. For fathers' work intensity a significant positive effect can be observed in the Southern and Eastern European regions. I

[7] Nordic: DK, FI, IS, SE, NO; Core: AT, BE, FR, IE, LU, NL, UK; South: CY, ES, GR, IT, PT; East: BG, CZ, EE, HU, LV, PL, SI, SK

observe no effect in the Nordic and Core Europe regions. This might be due to the far lower degree of variation in this variable in these regions compared to Southern and Eastern Europe.

Table 2: Random intercept models by country group (Average marginal effects)

		Nordic		Core		South		East	
Work intensity (mother)		-0.023	(0.031)	-0.096**	(0.026)	-0.009	(0.014)	0.037	(0.023)
Work intensity (father)		-0.009	(0.043)	-0.017	(0.035)	0.083*	(0.037)	0.078*	(0.030)
Education (mother)	Low	Ref.		Ref.		Ref.		Ref.	
	Medium	-0.087*	(0.044)	-0.085**	(0.030)	0.039	(0.021)	0.102**	(0.036)
	High	0.011	(0.047)	-0.022	(0.032)	0.061*	(0.029)	0.163**	(0.044)
Education (father)	Low	Ref.		Ref.		Ref.		Ref.	
	Medium	0.052	(0.035)	0.015	(0.027)	0.013	(0.013)	0.106**	(0.034)
	High	0.169**	(0.040)	0.077**	(0.030)	0.024	(0.017)	0.182**	(0.045)
N		2216		3518		3357		3646	
Deviance (-2 log likelihood)		2788		4304		2796		3460	
ICC		.081		.063		.321		.277	

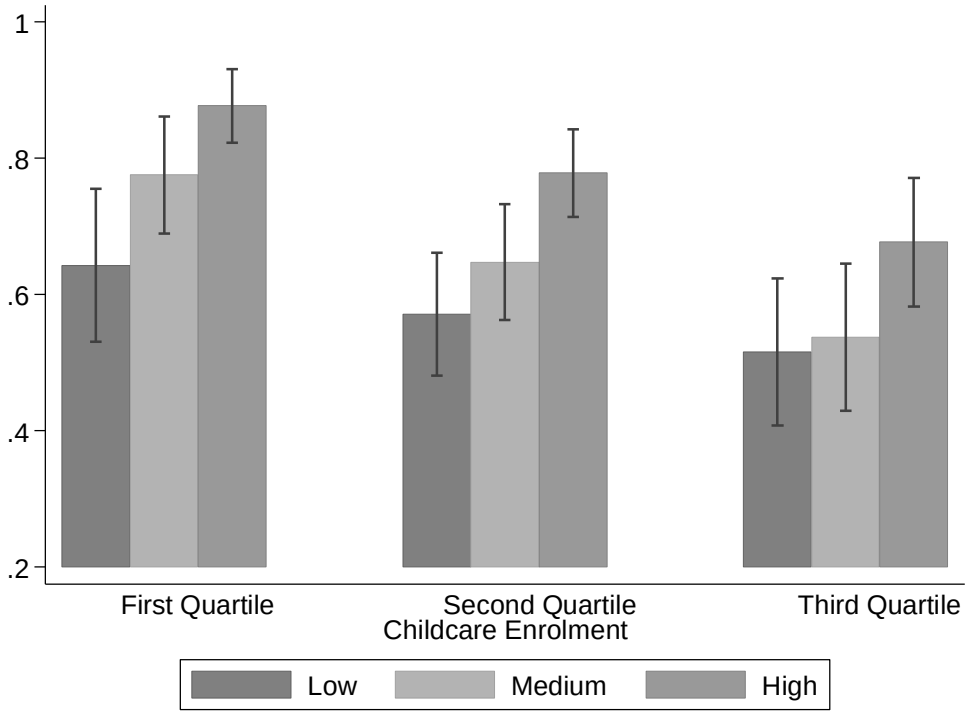
Source: EU-SILC 2004-2012; average marginal effects, standard errors in parentheses; * p < .05, ** p < .01; models control for age, household income, home ownership and year fixed effects

In regards to the effect of mothers' education, marked differences between the regions become apparent. Both in the Nordic and Core European countries, I observe that mothers with medium levels of education are significantly less likely to live in a marital union compared to mothers with low levels of education. However, no significant differences can be observed between highly educated mothers and those with low levels of education. This pattern differs from that observed in the integrated model, and from the effects observed for the Southern and Eastern European countries. In the Southern European countries, no differences between mothers with low and medium levels of education can be observed, while highly educated mothers are significantly more likely to be married at time of birth than mothers with little education. In the Eastern European countries mothers with medium and high education are significantly more often married compared to mothers with low education. These effects are much more pronounced than in the Southern European countries. Thus these results indicate that the effect of mothers' education differs considerably between contexts. Moving on to fathers' education, I find that highly educated fathers are married significantly more often than fathers with little education in all regions save for Southern Europe. This effect is most pronounced in Eastern Europe, much like it was for mothers. These findings clearly indicate that childbearing in cohabitation in Eastern Europe is more strongly associated with economic disadvantage than in other regions. Furthermore, results for these models indicate that the effect of mothers' socio-economic resources appear to be far more context dependent than the effect of fathers'.

In a next step random slopes and country level variables will be introduced into the model. The full multilevel model which is included in Table 1 (Model 3) includes a random slope for the effect of mothers' education as well as a cross level interaction between mothers' education and the childcare enrolment rate at the country level. While no significant effect can be observed for the childcare variable, the negative interaction terms for both medium and high

levels of education indicate that as childcare enrolment increases the magnitude of the education effect on likelihood of having a child in a marital union versus cohabitation declines. The likelihood of a marital birth decreases more rapidly for mothers with high levels of education education. Thus, as the independence hypothesis would predict, the effect of mothers' education on likelihood of living in a marital or cohabiting union is moderated by the compatibility of work and family life.

Figure 2: Mothers' education and child care enrolment in different contexts



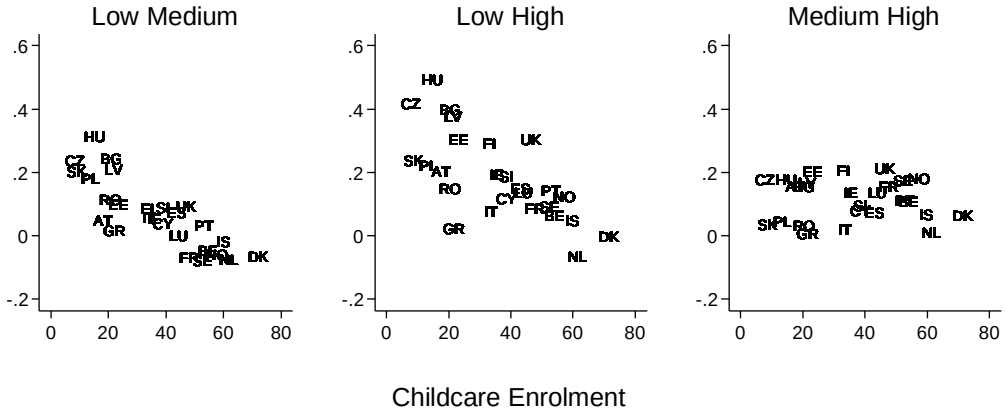
In order to better illustrate this association Figure 2 plots the predicted mean (and 5% confidence intervals) by education group for the first, second and third quartile of the childcare participation rate. The graph illustrates that the likelihood of marriage is overall lower for all education groups as childcare availability increases. The first set of bar charts shows the predicted means for the different education groups in countries with relatively low childcare availability. Women with tertiary education have the highest predicted mean of being married, a look at the confidence intervals reveals that the difference between the low and high education group are significant while there is no significant difference between low and medium or medium and high. When looking at the predicted means for the median of childcare enrolment, it is apparent that the likelihood of being married is lower for all education groups. The overall pattern is similar to that for the first quarter with the only significant difference being that between low and high levels of education. For countries with high levels of childcare enrolment (third quartile) no significant differences between educations groups can be

observed. The finding that the effect of education is less pronounced in contexts with high compatibility is in line with the independence hypothesis. However, the confidence of the multi-level model to confirm differences between education groups is not very high.

Figure 3 attempts to further illustrate the association between education, marital status and the childcare enrolment rate at the country level by plotting differences in the predicted mean by country. The plot on the left hand side shows differences between mothers with low and medium education. A very clear negative relationship (correlation of -.83), can be observed, indicating that differences between these education groups are far less pronounced in countries with high availability of child care. The same holds true when comparing mothers with low and high education. While the association is not as strong (correlation of -.66) overall differences are slightly larger. When comparing mothers with medium and high levels of education, no pattern can be observed (correlation of .01). These results support the idea that the effect of mothers' education on having a child in a marital versus a cohabiting union is indeed contextual and appears to be moderated by childcare availability. A look at individual countries makes it very apparent that a number of Eastern European countries, show the most pronounced differences between women with low education and other education groups.[8]

However as could be seen in Figure 2 differences between women with low levels of education and the other groups seem to be far more pronounced than differences between medium and high levels of education.

Figure 3: Differences between education groups



[8] In order to test whether the observed results are mainly driven by the special situation in Eastern Europe the integrated multi-level model was rerun excluding the Eastern Europe country group. While the results for such a model are consitent with the results presented here the interaction terms in this model are not significant. This might very well be due to the fact that N at the country level is too low to estimate cross-level interactions (Stegmüller 2013).

Conclusion

In summary this analysis has yielded a number of interesting results which will be discussed here in light of the proposed hypothesis. The focus of the analysis is placed on the comparison of the marital status at the time of birth of the first child. I find substantial differences between the group of married and cohabiting parents. Overall higher levels of education for both fathers and mothers are associated with higher levels of education, a finding which is in line with the status attainment hypothesis.

One objective of this research was to consider both fathers and mothers. And indeed the inclusion of information on fathers' socio-economic resources is very interesting. For one, I find that the effect of fathers' and mothers' work intensity is very much at odds, a finding which provides support for the independence hypothesis. The integrated model also indicates that father characteristics are more important for predicting whether or not parents are married at time of birth than mother characteristics. The models by country group helps to better understand why this is the case. The effect of mothers' socio-economic resources appears to be highly context dependent while the same is not true for fathers.

The contextual nature of mothers' education was further explored by specifying a random slope model with a cross-level interaction between education and the country level variably childcare enrolment. This model finds that childcare enrolment indeed moderates the effect of education, and that the direction of this interaction is in line with the assumption of the independence hypothesis. However the confidence of the multilevel model in confirming the differences between educational groups is largely limited to the comparison of low and high levels of education. While the analysis cannot prove with certainty that it is indeed the compatibility of work and family life (measured via the availability of childcare) which moderates the effect of mothers' education, this article does provide a sound theoretical argument and empirical evidence to support the claim.

However, the chosen research design also has a number of limitations. For one, the use of cross-sectional data is rather unusual when examining childbearing outside of marriage and brings with it the disadvantage that causality cannot be strictly inferred, and that the timing of events cannot be discerned without error. The chosen research design attempts to minimize potential errors which might result from timing of events. However this analysis cannot make causal claims as easily as could an analysis based on longitudinal data.

The analysis employs a multi-level approach in order to explore the context dependence of the education effect, since this is a more rigid test of hypothesis than comparing a small sample of countries via individual country regressions. The dataset employed in this analysis does meet the minimum level 2 sample size of 25 countries, which is advised for estimating cross-level interaction terms (Stegmüller 2013), the rather large confidence intervals on show in Figure 2

suggest that future studies exploring this association should attempt to include an even larger sample of countries.

References

Becker, G. S. (1991). A Treatise on the Family. Cambridge: Harvard University Press.

Brines, J., & Joyner, K. (1999). The ties that bind: Principles of cohesion in cohabitation and marriage. *American Sociological Review*, 333-355.

Cherlin, A. J. (2004). The Deinstitutionalization of American Marriage. Journal of Marriage and Family 66: 848-861.

Edin, K., & Kefalas, M. (2005). Promises I can keep. Berkeley, CA: University of California.

Eurostat (2013). Methodological Guidelines and Description of EU-SILC Target Variables. 2014 operation (Version September 2013).

Eurostat (2016). Eurostat Database. Retrieved from http://ec.europa.eu/eurostat/data/database

Festy, P. (1980). On the new context of marriage in Western Europe. *Population and Development Review, 6(2)*, 311-315.

Gavalas, V. S., Rontos, K., & Salvati, L. (2014). Who becomes an unwed mother in Greece? Sociodemographic and geographical aspects of an emerging phenomenon. *Population, Space and Place*, *20*(3), 250-263.

Goldstein, K. & Kenney, C.T.(2012). Too poor to marry ? A crossnational comparison of the SES-gradient in non-marriage. Paper presented at the European Population Conference 2012, Stockholm, June 13-16.

Hărăguş, M. (2015). From Cohabitation to Marriage when a Child Is on the Way. A Comparison of three Former Socialist Countries: Romania, Bulgaria and Hungary. *Journal of Comparative Family Studies*, *46*(3), 329-350.

Höpflinger, F. (1985). Changing marriage behaviour: some European comparisons. *Genus*, 41-64.

Hox, J. (2010). *Multilevel analysis: Techniques and applications*. London: Routledge.

Kiernan, K. (1998). Childbearing outside marriage in western Europe. *Population Trends*, (98), 11-20.

Kiernan, K., & Smith, K. (2003). Unmarried parenthood: new insights from the Millennium Cohort Study. *Population Trends, (114)*, 26-33.

Konietzka, D., & Kreyenfeld, M. (2005). Nichteheliche Mutterschaft und soziale Ungleichheit im familialistischen Wohlfahrtsstaat. *KZfSS Kölner Zeitschrift für Soziologie und Sozialpsychologie*, 57(1), 32-61.

Klüsener, S. (2015). *Spatial variation in non-marital fertility across Europe: recent trends, past path dependencies, and potential future pathways.* MPI Working Paper No.2015-001.

Lappegård, T., Klüsener, S., & Vignoli, D. (2014). Social norms, economic conditions and spatial variation of childbearing within cohabitation across Europe. Max Planck Institute for Demographic Research: Rostock. MPIDR Working Paper WP-2014-002.

Oppenheimer, V. K. (1994). Women's rising employment and the future of the family in industrial societies. *Population and development review*, 293-342.

Perelli-Harris, B., Sigle-Rushton, W., Kreyenfeld, M., Lappegård, T., Keizer, R., & Berghammer, C. (2010). The educational gradient of childbearing within cohabitation in Europe. *Population and development review*, 36(4), 775-801.

Perelli-Harris, B., & Gerber, T. P. (2011). Nonmarital childbearing in Russia: second demographic transition or pattern of disadvantage?. *Demography*,48(1), 317-342.

Perelli-Harris, B., Kreyenfeld, M., Sigle-Rushton, W., Keizer, R., Lappegård, T., Jasilioniene, A., Berghammer, C. & Di Giulio, P. (2012). Changes in union status during the transition to parenthood in eleven European countries, 1970s to early 2000s. *Population Studies*, *66*(2), 167-182.

Potârcă, G., Mills, M., & Lesnard, L. (2013). Family formation trajectories in Romania, the Russian Federation and France: Towards the second demographic transition?. *European Journal of Population/Revue européenne de Démographie*, 29(1), 69-101.

Sprangers, A., & Garssen, J. (2003). *Non-marital-fertility in the European Economic Area*. The Hague: Statistics Netherlands Division of Social and Spatial Statistics Department of Statistical analysis department.

Stegmüller, D. (2013). How many countries for multilevel modeling? A comparison of frequentist and Bayesian approaches. *American Journal of Political Science, 57*(3), 748-761.

Štípková, M. (2015). Ideational and Economic Causes of the Rise in Non-marital Childbearing in the Czech Republic. *European Journal of Population*, *31*(5), 473-494.

Stropnik, N., & Šircelj, M. (2008). Slovenia: Generous family policy without evidence of any fertility impact. *Demographic Research*, *19*(26), 1019-1058.

Waldfogel, J. (1998). Understanding the" family gap" in pay for women with children. *The Journal of Economic Perspectives*, 137-156.

Appendix

Table 3: Summary of variables employed in analysis by country groups

	Nordic	Core	South	East	Overall
Married (%)	46.3	54.8	82.1	81.6	67.2
Cohabiting (%)	53.7	45.2	17.9	18.4	32.8
Home owners (%)	68.7	53.6	65.8	45.1	56.5
Mean eq. income percentile	51.1	53.5	57.7	57.3	55.3
Mean age (mother)	28.1	28.1	29.9	26.3	28.3
Mothers w. low education (%)	9.6	10.4	27.2	10.9	15.5
Mothers w. medium education (%)	40.0	41.5	35.9	53.7	41.9
Mothers w. high education (%)	50.4	48.2	36.9	35.3	42.6
Work intensity (mother)	0.60	0.64	0.61	0.60	0.61
Mean age (father)	30.9	31.2	33	29.4	31.4
Fathers w. low education (%)	10.7	13.7	36.7	8.9	19.9
Fathers w. medium education (%)	49.9	46.6	35.4	63.1	46.1
Fathers w. high education (%)	39.4	39.7	27.9	28.0	34.0
Work intensity (father)	0.88	0.89	0.90	0.89	0.89
Childcare enrolment rate	46.5	41.8	33	8.9	34.4

Source: EU-SILC 2004-2012