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Brini, Elisa

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ORIGINAL ARTICLE

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# Childlessness and low fertility in context: evidence from a multilevel analysis on 20 European countries

Elisa Brini

Correspondence: [Elisa.Brini@unitn.it](mailto:Elisa.Brini@unitn.it)  
University of Trento, Via Verdi, 26,  
38122 Trento, Italy

## Abstract

Low fertility and childlessness have been largely interpreted as being driven by the same mechanisms, although they may be qualitatively different phenomena. The present article discusses this assumption and studies determinants of childlessness by comparing them with determinants of low fertility. Drawing on micro-level data from the European Labour Force Survey (2005–2010) and macro-level data from external data sources, it enters the debate on the micro- and macro-determinants of fertility and childlessness by analysing women who live with or without children when they are 35–39 years old. By means of a series of multilevel models, it discusses the moderating role of the institutional and normative context in the link between individual characteristics and childlessness, and it analyses the extent to which micro- and macro-level determinants of childlessness differ from factors associated with low-fertility. The results indicate that the macro-level factors associated with individual childlessness are similar to those identified in the literature on low fertility. However, interesting differences emerge in how reconciliation and family support policies relate on childlessness and low-fertility across different groups of women. Overall, these findings highlight the importance to study childlessness as a phenomenon on its own, distinguishing its determinants from determinants of (low) fertility.

**Keywords:** Childlessness, Low fertility, Multilevel analysis, Family reconciliation, Gender norms

## Introduction

Over the course of the twentieth century, Europe moved toward a new fertility model where the majority of women bore fewer than two children and childlessness was increasingly common across cohorts (Beaujouan et al., 2017; Frejka, 2017; Kohler et al., 2002; Poston and Trent, 1982; Rindfuss, et al., 2016; Rowland, 2007; Sobotka, 2017). Because fertility and childlessness rates across countries have remained negatively correlated for a long time, the mechanisms inducing women to have few children or be childless have long been perceived to be the same. Accordingly, changing patterns of childlessness have been understood in light of two theoretical approaches, also deployed to account for (low) fertility: the *Second Demographic Transition* (Van de Kaa,



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1987, 2002; Lesthaeghe, 1995, 2010) and Becker's New Home Economics (Becker, 1960, 1981). Both perspectives stress the importance of individual preferences, intentions, and behaviours in regard to having children, but they also recognise the importance of the context in which individuals are embedded, since childbearing is intensely institutionally stratified (Ahn and Mira 2002; Barbieri et al., 2015; Billari et al., 2006; Billingsley and Ferrarini 2014; Liefbroer et al., 2015). Childlessness, by contrast, has been mainly examined by considering how people without children differ from parents, primarily in terms of socioeconomic conditions and individual preferences (see Tanturri et al., 2015 for a review). In other words, childlessness has been largely framed as a private matter, with a limited exploration of the same societal institutions or norms cited by the literature on fertility (Miettinen et al., 2015).

Stemming from the empirical evidence of a decreasing correlation over time between childlessness and total fertility rates across European countries (Tanturri and Mencarini, 2008; Gobbi, 2013), this paper tests whether the theoretical explanations offered for fertility decision-making also hold in the case of childlessness. It does so by conducting a cross-country comparison and measuring macro-level factors. In particular, it relates childlessness and childbearing to macro-level institutions shaping the cost-opportunity of children, as well as to gender egalitarian norms. Both contextual factors have been recently hypothesised as contributing to changes in family and fertility behaviour (Mason, 1995; McDonald, 2000a; Neyer, 2006; Brinton and Lee, 2016). The paper also complements the existing literature on childlessness by providing an analysis of how micro-level determinants of childlessness vary in comparative terms.

### **Theoretical background and previous research**

Few theories have been developed to explain eventual childlessness, and research largely remains dominated by empirical findings that highlight how both economic conditions and individual preferences are important predictors of childbearing preferences and behaviour.

#### **Fertility, childlessness, and the New Home Economics perspective**

According to the New Home Economics (NHE; Becker, 1981, 1994), children can be conceived as durable consumer goods involving direct and indirect costs under the limited conditions of finance and time, for which parents make a rational decision that hangs in the balance between the level of utility and loss of a child. This microeconomic approach has been widely adopted by a body of empirical research directed at examining the relationship between individual socioeconomic circumstances and fertility preferences and outcomes. Extensive research empirically supports this perspective by showing how staying longer in the educational system, having better job and career opportunities, and greater affluence impact on women's fertility in a combination between quality and quantity of children (Blossfeld and Huinink, 1991; Bongaarts and Feeney, 1998; Mencarini and Tanturri, 2006; Impicciatore and Dalla Zuanna, 2017). For example, higher levels of education and consequently better working positions and earnings have been found to be associated with having fewer children, as well as with a postponement of parenthood for women born at the beginning of the twentieth century (Begall and Mills, 2012; Blossfeld and De Rose, 1992; Cigno and Ermisch, 1989;

Caldwell, 1980; Gustafsson, 2001, 2005; Gustafsson and Kalwij, 2006; Happel et al., 1984; Kneale and Joshi, 2008; Kreyenfeld, 2010; Monstad et al., 2008; Ní Bhrolcháin and Beaujouan, 2012; Rondinelli et al., 2010).

To the extent that childlessness can be a result of a choice, and not solely of an involuntary process (Miettinen et al., 2015), the economic perspective furnishes a valuable theoretical framework also for the understanding of factors involved in the lack of parenthood. Being childless prevents a series of direct and indirect costs associated with childbearing and childrearing (i.e. monetary investment of production and rearing, time investment for house and care work) that reduce the career opportunities and earning capacities for women (Balbo et al., 2013; Kravdal, 1992; Joshi, 1990). Consequently, childlessness may be especially attractive among women with higher human capital, which entails higher opportunity costs of parenthood (Baudin et al., 2018). In line with this argument, an increasing array of studies has linked socio-economic circumstances to childlessness. A greater prevalence of childlessness is documented for higher educated and working women (Burkimsher and Zeman, 2017 for Austria and Switzerland; Berrington, 2017 for the UK; Köppen et al., 2017 for France; Reher and Requena, 2019 for Spain; Mynarska et al., 2015 for Italy and Poland; Hoem et al., 2006 for Sweden; Abma and Martinez, 2006; Hayford, 2013 for the US), who also report greater intentions to be childless (Miettinen et al., 2015; Ciritel et al., 2019 for Romania; Biryukova and Tyndyk, 2015 for Russia).<sup>1</sup>

If the review of the empirical research on childlessness seeks to position explanations for it into discourses in line with the economic arguments, counterintuitive empirical evidence also suggests that economic factors alone might not be enough for understanding the mechanisms that work behind childlessness. Contrary to this neoclassical perspective, approaches focusing more on dimensions related to postmodern attitudes and norms have been proposed and are discussed in the next section.

### Low fertility and childlessness as a result of preferences and values

According to the second demographic transition thesis (SDT), low fertility rates at the societal level result from the ongoing cultural changes that since the Second World War have pointed towards post-materialist values that emphasise greater individual autonomy, secularisation, and self-realisation (Lesthaeghe, 1995, 2014; Lesthaeghe and Van de Kaa, 1986; Van de Kaa, 1987, 2002; Billari and Liefbroer, 2004). Although the approach is widely adopted when considering aggregate levels of fertility and for explaining changes in family behaviour over time, it has also been used to link childbearing behaviour to individual values and preferences. The literature linking micro-level fertility with factors related to the SDT mostly bases the empirical analysis on study of how religious belief and religiosity affect family formation, the idea being that secularisation well captures the dimensions associated with having post-materialist values (Inglehart and Norris, 2004). Overall, research documents how being religious positively affects the demand for children (i.e. Adsera 2006; Berghammer, 2012; Brañas-

<sup>1</sup>To be noted is that educational differences in childlessness among women appear to have diminished or disappeared over time (Beaujouan et al., 2016; Tanturri and Mencarini, 2008; Tocchioni, 2018 for Italy; Kravdal and Rindfuss, 2008 for Norway; Rotkirch and Miettinen, 2017 for Finland; Reher and Requena, 2019 for Spain).

Garza and Neuman, 2006; Derosas and van Poppel, 2006; Frejka and Westoff, 2008; Guetto et al., 2015; Ongaro, 2001; Philipov and Berghammer, 2007).

Empirical evidence on how childlessness might be an issue of personal preference derives principally from qualitative samples. By analysing motivations for childlessness, these investigations show how the desire for independence and freedom is often the basis of the choice to voluntarily remain without children for women (McAllister and Clarke, 1998; Tanturri and Mencarini, 2008). Considering high education as an indicator of less traditional attitudes (Inglehart, 1977; Inglehart and Baker, 2000), also quantitative analyses reporting highly educated women to be permanently childless more frequently or to have more frequent intentions match this interpretation. Moreover, childless women are usually found to be less traditional and more secularised than mothers (Hakim, 2003; Tanturri and Mencarini, 2008; Buber-Ennsner and Skirbekk, 2016).<sup>2</sup>

#### **How do contextual and normative conditions associate with fertility and childlessness?**

As outlined above, a series of outcomes associated both with fertility and childlessness corroborate the culturalist and structuralist perspectives. Nevertheless, both of these approaches have been subject to several criticisms. Besides the massive debate on the causal chain behind the mechanisms of the two perspectives (see Bystrov, 2014 for a summary), structuralist approaches have been exposed to extensive criticism due to their excessive emphasis on rational actions. On the other hand, culturalist perspectives have attracted criticisms because they fail to consider the existence of inequalities and thus mistakenly assume that all individuals have the power to exercise full and uniform personal freedom in terms of fertility choices, regardless of the social and economic context in which they shape their intentions and expectations related to fertility and family (see Zaidi and Morgan, 2017 for a review).

To overcome these limitations, social scientists have increasingly considered that the opportunity costs and preferences of children are not independent of institutional settings and labour market conditions, nor of the structure of norms that exists at the societal level (Ahn and Mira, 2002; Anderson and Kohler, 2015a, 2015b; Arpino et al., 2015; Bernhardt and Goldscheider, 2006; Esping-Andersen and Billari, 2015; Esping-Andersen, 2009; Gauthier, 2007; Goldscheider et al., 2015; McDonald, 2000a, 2000b; Mills et al., 2008; Mills, 2010).

The cost-opportunity women experience with the arrival of a child and the values associated with children are therefore different not only because the groups of women who experience these costs and preferences are diverse, but also because countries and welfare systems differ in the extent to which they are able to ease the work-family conflict. Accordingly, the same mechanisms by which policies targeted on families with children, as well as institutional settings without a specific demographic target raise fertility (Ermisch, 1986; Rindfuss and Brauner-Otto, 2008; Scherer and Steiber, 2007), may also contribute to understanding why some person remain without children. Several studies have linked ideational factors as well as material conditions to the normative and structural context in which people make their fertility choices. Conversely, on the

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<sup>2</sup>This feature is not found among childless men, who are conversely described as being less educated (Jalovaara et al., 2018 for Nordic countries; Kreyenfeld and Konietzka, 2017 for Germany).

link with the lack of children, empirical research has created room for understanding these influences and integrating the theoretical debate.

#### ***Public policies targeted on reducing the opportunity cost of children***

Institutions can compensate for the disadvantages of working women who want to be mothers through both social and family policies directed at promoting arrangements to outsource care work, thus helping in reconciling female careers with maternity (see Gauthier, 2007, Mills et al., 2011 for a review). Generous family policies that enable the reconciliation of work and family duties have been indicated as the way forward since the early 1980s, and expenditures to support families have considerably increased in recent decades (Bianchi, 2000; Björklund, 2006; Gauthier, 2007; Hoem, 1993; Korpi et al., 2013; Lewis, 2006; Thévenon, 2011). However, there is limited understanding of their impact on the decisions of women about fertility, and few studies have explicitly analysed their effect on childlessness. Despite some pronatalist evidence of family-related public policies (Castles, 2003; Neyer, 2003; Billingsley and Ferrarini, 2014; Chesnais, 1998; Gauthier, 2007), the question of whether policies facilitating the combination of working and childrearing have an effect on childlessness has not yet been satisfactorily answered, and the mechanisms by which these effects operate remain overlooked. A review of the literature shows only one research report on the link with childlessness, which states evidence of childlessness sensitivity to family-friendly arrangements and national family policies (Hakim, 2003). Policies might be targeted on subsidising the family income on the one hand (i.e. through direct or indirect money transfers or tax reductions); or on reconciling work and family life on the other (i.e. parental leaves, childcare). Only a few studies support the hypothesis that child income support can favour the transition to parenthood (Laroque and Salanié, 2004) or higher parity births (Milligan, 2005), while the vast majority shows that they have a minimum impact on fertility (Gauthier and Hatzius, 1997; Georgellis and Wall, 1992 for the USA), if not null (Zhang et al., 1994 for Canada). Conversely, policies aimed at reducing child costs have been reported to be a valuable factor in supporting birth, although the effect has sometimes been observed only for second or higher parity births (Björklund, 2006; Castles, 2003; Del Boca, 2002; Di Prete et al., 2003; Ekert-Jaffé, 1986; 2002; Hoem, 1993; Lalive and Zweimüller, 2005; Oláh, 2003) or to be limited in time (Buttner and Lutz, 1990).

On the assumption that the mechanisms underlying childlessness reflect the same mechanisms that influence low fertility, I will test the hypothesis that family policies supporting childcare are associated with a lower propensity to be childless (Hypothesis 1).

#### ***Structural and institutional conditions***

Structural and institutional arrangements can affect childbearing behaviour as well. They may do so by supporting particular gender relation models which allow women to be more or less involved in the family role (Ermisch, 1986; Rindfuss and Brauner-Otto, 2008). Pivoting on dimensions related to the labour market, governments can encourage—intentionally or unintentionally—a more equal distribution of paid and unpaid work within couples. First, governments can encourage men to assume family obligations, consequently relieving work-oriented women from family tasks and

supporting their fertility intentions (Esping-Andersen, 2009; Keck and Saraceno, 2013). Second, governments can regulate the incompatibilities between fertility and female employment by enacting labour market measures that enable women to organise their family time better (Del Boca, 2002). The organisation of working time in different European countries by means of national labour contracts constitutes an example of how institutional conditions may promote relations supportive for (potential) mothers. A lower amount of time spent by men on the main job (i.e. with lower average working hours) can enable men to assume greater responsibilities within the household, whereas a lower amount of time spent by women on the main job (i.e. through part-time jobs) can allow women with care requirements to reconcile family and work better if they wish to do so (Anxo et al., 2006; Baizan et al., 2016; Barbieri et al., 2019; Keck and Saraceno, 2013; Saraceno and Keck, 2011).

On these premises, it can be expected that in those countries where institutions support a more egalitarian investment of time within the household, women will not only combine work and family more easily but will also be less likely to be childless. I will therefore test the working hypothesis that childlessness is less likely in those contexts where reconciliation of work and family is made easier by structural conditions (Hypothesis 2).

### ***Gender norms***

Besides a greater division of roles within the couple, the perception of how fair the division of role is may be at least as important. In regard to gender role models, it has become increasingly important in the literature to distinguish between the dimensions of gender equality and gender equity. The former dimension relates to equality in results (i.e. equal access to education or to labour market participation), whereas the latter dimension refers to how the distribution of certain resources is perceived as fair by men and women, regardless of whether access to those resources is equal (McDonald 2000a, 2000b, 2013). Low fertility has been said to result from frictions between the structural opportunities and the normative context, i.e. to be the result where a structural context does not support the normative gender role model. Put differently, the involvement in care work may be unequal in practice, but as long as it is perceived as fair, it may have no consequences in terms of childbearing behaviour. Empirical research seems to corroborate this contention: in those societies where people express more egalitarian attitudes towards the division of gender roles and where there is a fairer division of household work and childcare time, fertility rates, as well as fertility intentions, are generally higher (Arpino et al., 2015; Cooke, 2008; Kaufman, 2000; Mills et al., 2008; Oláh, 2003; Puur et al., 2008). On the other hand, in those countries where the gender revolution has stalled, lower fertility rates are found (Esping-Andersen and Billari, 2015). The presence of high rates of childlessness in European countries with low scores in the gender quality indexes (i.e. Italy and Germany) suggests the existence of a similar pattern. However, counterevidence also exists, and low levels of childlessness emerge both in countries with a relatively high (i.e. Belgium, Ireland, Luxembourg) and low gender equality (i.e. Portugal) (Sobotka, 2017). As has



been documented for fertility, it is possible to expect that childlessness depends on a gender imbalance that persists despite the revolution in women's role (Esping-Andersen and Billari, 2015; McDonald, 2000a, 2006). Therefore, I test the working hypothesis that the effect of gender egalitarian conditions in buffering the risk of being childless is stronger the more gender-equal is the society (Hypothesis 3).

The general increase in female labour market participation suggests that women in all socio-economic groups have become more strongly affected in their fertility decisions by labour market opportunities. Nevertheless, the consequences of the birth of a child on employment chances, affluence, and returns to education are not uniformly distributed. On the one side, better-educated women are those who experience the worst effects of job insecurity. On the other, women who have invested more in their educations are also more likely to invest more in their careers before having children (Barbieri and Scherer, 2008), often postponing motherhood (Kreyenfeld, 2010). Accordingly, not all women benefit to the same extent from measures intended to reduce the constraints on fertility (Bratti and Tatsiramos, 2012). The potential effect of policies depends not only on individual preferences, but also on the opportunities and costs associated with motherhood. In societies that do not support high gender egalitarianism, and thus impose a choice between family and career, the decision to have children is harder for women who have invested more in their careers and jobs. Considering that these socio-economic groups perceive higher costs associated with maternity and often have less opportunity to reconcile work and family life, childlessness may be mitigated by policies.

I therefore assess the extent to which the effect of conditions and policies that reduce the opportunity-cost of having a child differs according to the actual opportunity cost of children, and test the working hypothesis that the role of policies and structural conditions in affecting childlessness is greater among highly educated women, as well as among women employed in better jobs (Hypothesis 4).

### **Data and methods**

The analyses reported in what follows are based on the micro-data of the European Union Labour Force Surveys (EU-LFS) which were complemented with macro-level indicators retrieved from several data sources, as described below. The EU-LFS is a large-scale household sample survey conducted to analyse labour force participation by people aged 15 and over and yielded three main benefits for the purpose of the analysis. First, the EU-LFS considers a large sample population—which is important when analysing childlessness. Second, it furnishes a reliable instrument with which to compare the determinants of childlessness and fertility across countries because it provides harmonised information at the European level. Third, it covers a large number of countries and years, which is well-suited to a multilevel setting. To gain reliable estimates of childlessness and fertility, respondents aged 35–39 years were selected, as explained below. Given the availability of macro information, the analysis covers the time span between 2005 and 2010 and considers 20 countries, namely: Austria, Belgium, Bulgaria, Czech Republic, Estonia, France, Germany, Greece,



Hungary, Ireland, Italy, Lithuania, Luxembourg, Latvia, the Netherlands, Poland, Portugal, Slovakia, Spain, and the UK.

### Dependent variables

The EU-LFS does not provide information on the number of children that women have had, but it furnishes information on the number of co-resident family members and kinship relations with them. This design makes it possible to measure whether or not a woman has cohabiting children at given ages, and in the former case to distinguish how many children live in the household. Accordingly, the Own-Children method (Grabill and Cho, 1965) was used to approximate childlessness and the number of children for women aged 35–39 who do not live in same-sex unions. Childless status is then a binary variable that takes the value of 1 when a woman is 35–39 and does not have co-resident children in her household, whereas it takes the value of 0 when a woman in the same age group has co-resident children. Fertility is a metric variable that mirrors the number of children present in the household if the 35–39 aged woman is a mother.<sup>3</sup>

### Independent variables

Variables at the individual level were level of education, current employment, and partnership status. To reduce the cross-country complexity in the different levels of education and allow for comparison, educational attainment was measured with three dummy variables based on the 1997 UNESCO International Standard Classification of Education (ISCED). The analyses distinguished among women with a low education (ISCED 1–ISCED 2), middle education (ISCED 3–ISCED 4), and high education (ISCED 5–ISCED 6). Female employment distinguished women depending on their job status and job position. Hence, women were differentiated among being inactive, unemployed, or employed. Within the last group, I further discriminated among women who were low-skilled blue-collar, high-skilled blue-collar, low-skilled white-collar, and high-skilled white-collar workers, according to the information provided by the ISCO-88 classification at one-digit level. Given that partnership plays an important role in childbearing (Keizer et al., 2008; Mynarska et al., 2015; Poston and Szakolczai, 1986; Raab and Struffolino, 2019) models furthermore controlled for relationship status. Hence, women were grouped in (a) previously married, if they declared that they were divorced, legally separated, or widowed; (b) women who were not in a union; and (c) married women. On excluding non-native women and considering missing information on the level of education, working position, or marital status, the final sample comprised over 673,488 women aged between 35–39 years old. Of these, nearly 95 thousand were childless whereas nearly 578 thousand were mothers.

Three time-varying country-level indicators provided information on the family policies and institutional settings discussed to affect the distribution of childlessness and fertility in the population, as well as on the normative climate. These

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<sup>3</sup>To assess the validity of these measures I compared country-year estimates with available macro information on childlessness and adjusted total fertility rates. Overall, there was a close match between childlessness and total fertility proxied as the absence of cohabiting children when women are 35–39 years old and the number of children living with this group of mothers, respectively. Results are presented in the [Appendix](#), Tables 4 and 5.

indicators were retrieved from several data sources, namely: the Multilinks Database on Intergenerational Policy Indicators (Multilinks, 2011), the European Value Survey (EVS), and the OECD database.

To test whether policies targeted on families might mitigate childlessness, I considered a measure of the generosity of leave regulations. Specifically, paid and unpaid parental leave was considered to be an indicator of policies designed to acknowledge care work for children and for dependent family members. This information was retrieved from the Multilinks Database on Intergenerational Policies 2011 (version 2.0)<sup>4</sup> and it represents the total length of paid and unpaid leave available to both parents, expressed in months, weighted according to the income replacement rate of the benefit. The indicator measures the duration of paid parental leave weighted by payment level. Hence, it is an indicator of both the duration and the quality of parental leave. In the period considered, parental leave was particularly stable and effective among the former Communist bloc. Czech Republic, Hungary, and Lithuania reported the highest level of leaves, whereas very low levels were registered in the UK, Spain, and Ireland. The indicator was available for 2004 and for 2009; therefore, the observations that range from 2005 to 2008 match the first value, while the observations collected in the period 2009 and 2010 are merged with the second one (Appendix, Table 6).

To the extent that structural conditions can also influence an equal sharing of family responsibility between partners and can thus support a more or less gender-equal setting, two indicators of countries' institutional settings were furthermore considered.<sup>5</sup> First, the share of voluntary female part-time work was considered as an indicator of an institutional setting that allow women to be both commodified and defamilialised as they wished. The indicator represented the proportion of voluntary part-time work among part-time female workers in the age group 25–54 for each year and country included in the analysis. The Netherlands was the country where there was a larger share of women who voluntarily worked part-time, whereas in Bulgaria, women worked part-time mainly for involuntary reasons (Appendix, Table 7). Second, the number of hours worked by men on the primary job was included as an indicator of labour market conditions that encourage men to take an equal share of family responsibilities. Because men who work longer hours in the labour market are less likely to engage in care and household activities, this indicator should account for the capacity of policies to “familialise men”, encouraging their access into the private sphere and incentivising fathers to share childcare. The number of hours worked weekly was considered among men aged 25–54. Comparatively, the countries with the lowest hours worked are the Netherlands and Lithuania, where men work overall less than 40 hours per week, while the countries where men work the most are Poland, Greece, and the UK (Appendix, Table 8). Both these indicators were derived from the OECD database. In order to consider that the potential effects of policies might exist not at the end of the reproductive period, but in the period during which women are more subjected to deciding about motherhood all the indicators are the average of the 5 years preceding the time of observation.<sup>6</sup>

<sup>4</sup>Available at the website: <https://multilinks-database.wzb.eu/>

<sup>5</sup>A measure of remote work was also included in the analyses. Being the relationship with both childlessness and fertility not significant, results are not reported but are available upon request.

<sup>6</sup>To give an example, the part-time indicator for women who were 35–39 years old in 2010 reflects the situation when these women were 30–35 years old.

Finally, a proxy for social beliefs about gender equality was considered to measure the extent to which the relationship between childlessness and structural conditions depends on the stage of gender equity reached within a country. In the EVS, the percentage of persons disagreeing with the statement “When jobs are scarce, men should have more right to a job than women” has been commonly used as a measure of cultural acceptance of gender equality norms (Tesch-Römer et al., 2008, Arpino et al., 2015). Higher values are interpreted as gender egalitarian views, whereas lower values are considered to express traditional views toward the role of women in the public sphere. The EVS provides the indicators for years 1999 and 2008. Hence, the values from the EVS 1999 are linked to observations in years from 2005 to 2007 and the estimates resulting from EVS 2008 to the years 2008 and 2010. The Netherlands shows the most widespread societal acceptance of gender equality, whereas Slovakia shows the lowest. A general improvement is apparent for almost all the countries considered as time goes by (Appendix, Table 9).

### Analytical strategy

To examine the association between institutional, normative, and socio-demographic factors with both childlessness and total fertility, analyses applying a multilevel technique were conducted with women (level 1) nested in a combination of country-year observations (level 2). I applied linear probability and linear regression models to examine the relationship between characteristics related to childless status and number of children, respectively. Besides a null model (Table 1), five multilevel models’ specifications were considered. First, I looked at how the same individual determinants influence being childless and women’s number of children. Several regressions were estimated to assess the relationship between a female’s current level of education, working status and position, and partnership status with both childlessness and fertility. Being interested in observing whether the effect of the predictors of fertility differs from that of childlessness, their impact was estimated through a series of nested models, so as to account for potential different direct effects of each of the predictors. This step

**Table 1** Null multilevel regressions on childlessness (left table) and number of children (right table)

	Childlessness	Number of children
Constant	0.137*** (0.005)	1.994*** (0.015)
var(cy)	0.003*** (0.000)	0.025*** (0.002)
var(Residual)	0.119*** (0.000)	0.730*** (0.001)
ICC	0.0254	0.0324
N	673,488	578,377

Source: EU-LFS 2005-2010, author’s elaboration. Sign. Levels: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ . Note: Beta coefficient. Standard errors in parentheses var(cy) variance of the random effect at the second level (country-year), ICC Intra Class Correlation

**Table 2** Multilevel regressions of individual level predictors on childlessness (left table) and number of children (right table)

	Childlessness				Number of children				
	C1a	C1b	C1c	C1d	N1a	N1b	N1c	N1d	
Education									
Low	– 0.030*** (0.001)			– 0.016*** (0.001)	0.260*** (0.003)			0.189*** (0.003)	
High	0.072*** (0.001)			0.039*** (0.001)	– 0.085*** (0.003)			– 0.047*** (0.003)	
Working position									
Unemployed		0.074*** (0.002)		0.042*** (0.002)	– 0.260*** (0.005)			– 0.231*** (0.005)	
HS blue collar		0.059*** (0.002)		0.051*** (0.002)	– 0.195*** (0.005)			– 0.199*** (0.005)	
LS blue collar		0.065*** (0.002)		0.050*** (0.002)	– 0.299*** (0.004)			– 0.298*** (0.004)	
HS white collar		0.136*** (0.001)		0.081*** (0.001)	– 0.456*** (0.003)			– 0.371*** (0.003)	
LS white collar		0.090*** (0.001)		0.064*** (0.001)	– 0.440*** (0.003)			– 0.393*** (0.003)	
Marital Status									
Previously married			0.078*** (0.001)	0.078*** (0.001)			– 0.194*** (0.004)	– 0.185*** (0.004)	
Single			0.414*** (0.001)	0.404*** (0.001)			– 0.419*** (0.004)	– 0.427*** (0.004)	
Constant	0.123*** (0.005)	0.055*** (0.005)	0.067*** (0.004)	0.007 (0.005)	1.961*** (0.017)	2.306*** (0.015)	2.054*** (0.016)	2.298*** (0.0184)	
var(cy)	0.003*** (0.000)	0.003*** (0.000)	0.002*** (0.000)	0.002*** (0.00)	0.032*** (0.002)	0.027*** (0.002)	0.030*** (0.002)	0.039*** (0.003)	
var. explained	0%	0%	33%	33%	– 8%	– 28%	– 20%	– 56%	
var(Residual)	0.118*** (0.000)	0.116*** (0.000)	0.099*** (0.000)	0.098*** (0.000)	0.715*** (0.001)	0.696*** (0.001)	0.715*** (0.001)	0.676*** (0.001)	
var. explained	1%	3%	16%	16%	2%	5%	2%	7%	
ICC	0.025	0.025	0.021	0.024	0.043	0.037	0.041	0.055	
N		673,488				578,377			

Source: EU-LFS 2005-2010, author’s elaboration. Sing. Levels: \*p < .05, \*\*p < .01, \*\*\*p < .001. Note: Beta coefficients, standard errors in parentheses. N country-year: 120. ICC is the intra Class Correlation. Baseline categories: Middle educated, inactive, and married women

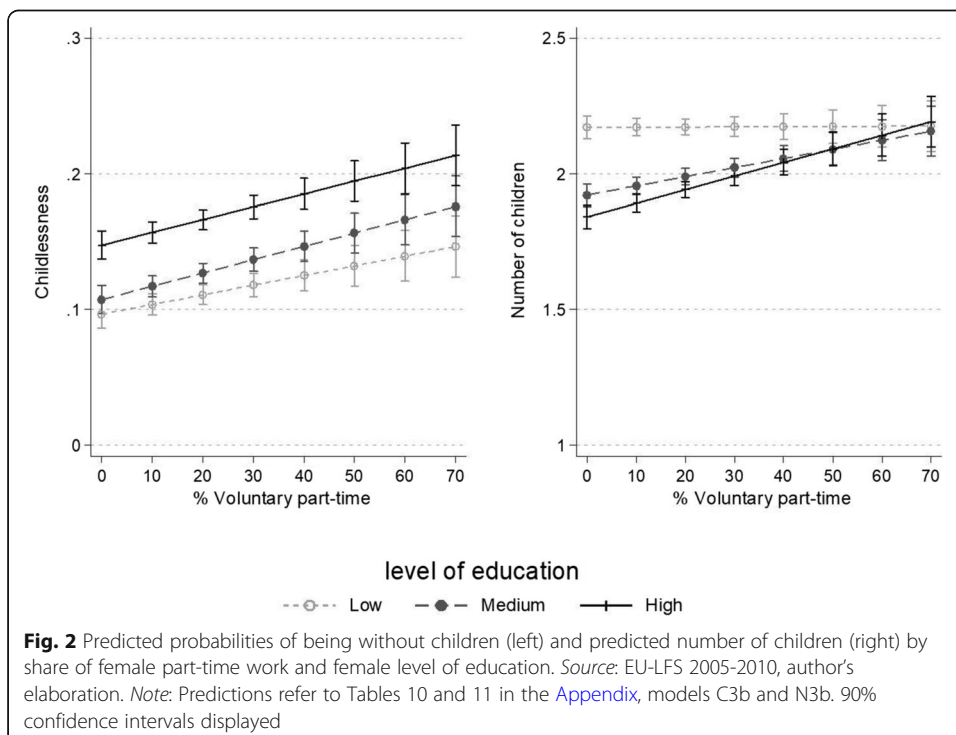
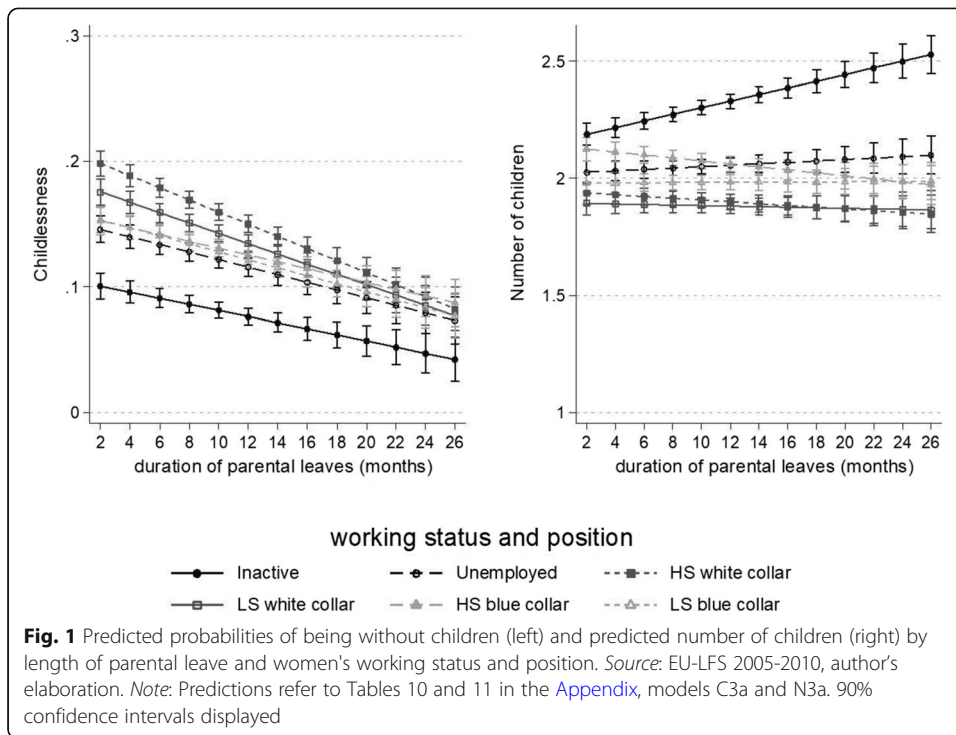
helped to identify the extent to which observed differences in the propensity to be childless between countries could potentially be due to either policies or institutional variations or to different population compositions of the countries

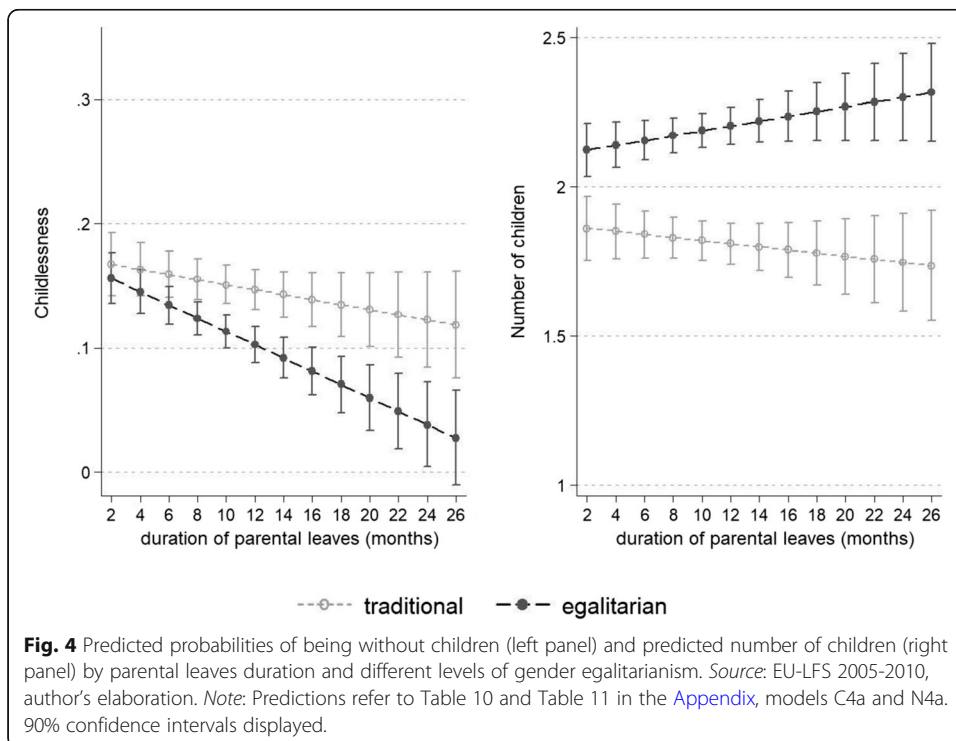
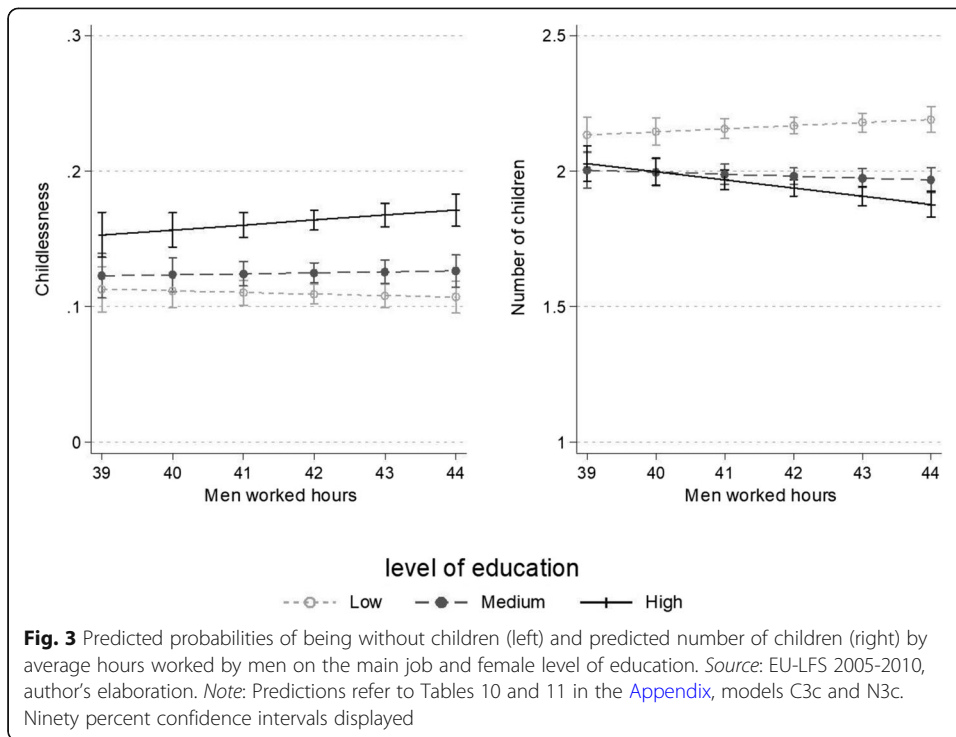
considered (Table 2). Second, the role of macro-indicators on fertility and childlessness was included in the analysis, by investigating it one at a time and jointly (Table 3). Third, a cross-level interaction to test if the relationship between macro-level factors and childlessness differed by individual characteristics was included. This cross-level interaction sought to determine whether the influence of macro-characteristics of childlessness differs significantly according to the

**Table 3** Multilevel regressions of country level predictors on childlessness (top table) and number of children (bottom table)

	Childlessness				
	C2a	C2b	C2c	C2d	C2e
Duration of parental leaves	- 0.004*** (0.001)				- 0.003*** (0.001)
Voluntary part-time		0.001*** (0.000)			0.001** (0.000)
Men working hours			0.001 (0.003)		0.000 (0.003)
Gender egalitarian norms				- 0.001+ (0.000)	- 0.002*** (0.000)
Constant	0.044*** (0.007)	- 0.010 (0.006)	- 0.044 (0.122)	0.059 (0.031)	0.112 (0.124)
var(cy)	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	0.00235*** (0.000)	0.002*** (0.000)
var(Residual)	0.098*** (0.000)	0.098*** (0.000)	0.098*** (0.000)	0.098*** (0.000)	0.098*** (0.000)
ICC	0.018	0.022	0.024	0.024	0.016
N	673,488				
	Number of children				
	N2a	N2b	N2c	N2d	N2e
Duration of parental leaves	0.001 (0.003)				0.005+ (0.003)
Voluntary part-time		0.003** (0.001)			0.003* (0.001)
Men working hours			- 0.010 (0.012)		0.018 (0.012)
Gender egalitarian norms				0.009*** (0.002)	0.008*** (0.002)
Constant	2.285*** (0.033)	2.241*** (0.025)	2.717*** (0.49)	1.694*** (0.114)	0.899 (0.539)
var(cy)	0.039*** (0.003)	0.036*** (0.002)	0.039*** (0.003)	0.032*** (0.002)	0.030*** (0.002)
var(Residual)	0.676*** (0.001)	0.676*** (0.001)	0.676*** (0.001)	0.676*** (0.001)	0.676*** (0.001)
ICC	0.055	0.051	0.054	0.045	0.043
N	578,377				

Source: EU-LFS 2005-2010, author's elaboration. Sing. Levels: +p < 0.1; \*p < .05, \*\* p < .01, \*\*\*p < .001. Note: Beta coefficient. Standard errors in parentheses. N country-year: 120. ICC is the Intra Class Correlation. Models are net of level of education, working status and position, and marital status (Complete model available in Appendix Table 10)







opportunity cost associated with children (Figs. 1, 2, 3). Finally, an interaction model of the macro relationship between policies and institutional assets together with the level of gender equality was investigated (Figs. 4, 5, 6).

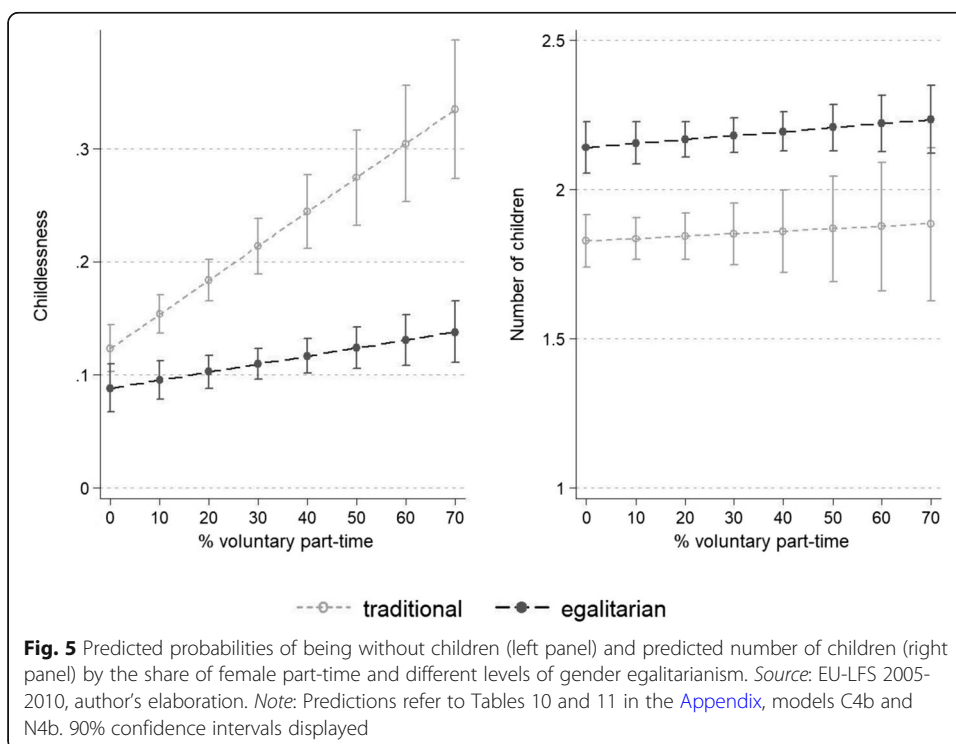
This method has two decisive advantages. First, analysing childlessness and fertility jointly—i.e. using the same data, techniques, and predictors—allows for comparison of the mechanisms behind the two phenomena and to estimate whether macro-level institutional factors influencing childlessness are different from those affecting fertility. Second, the multilevel technique makes it possible to take the nested structure of the data into account and to estimate the proportion of the total variance attributable to the individual and the contextual level.

**Results**

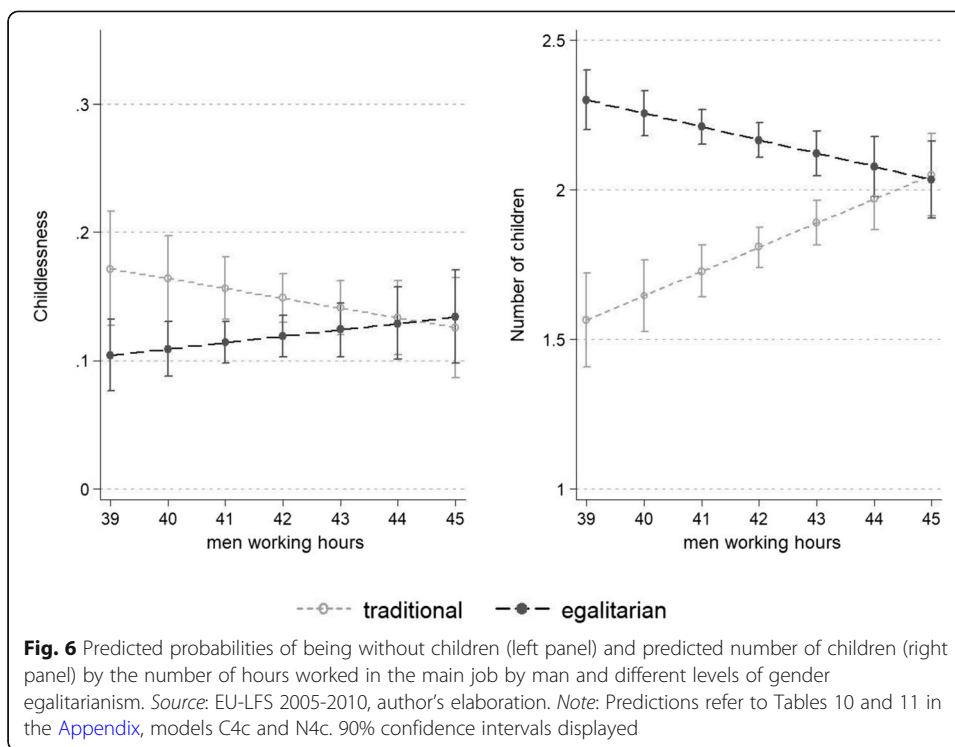
The variance decomposition of the null model confirms that fertility decisions are mainly an individual level phenomenon. However, a part of contextual variation related not only to fertility but also to childlessness remains unexplained at the micro-level. The proportion of the total variation at the country-year level shows that 3% of the variance in fertility is over country-years, and the remaining 97% at an individual level, whereas 2% of the variance in childlessness can be attributed to differences between country-years (Table 1).

**The role of individual characteristics on fertility and childlessness**

Table 2 presents the results of models studying individual characteristics associated with both childless status (C1a-C1d) and the number of children (N1a-N1d) of women aged 35–39. Several considerations can be made.



**Fig. 5** Predicted probabilities of being without children (left panel) and predicted number of children (right panel) by the share of female part-time and different levels of gender egalitarianism. Source: EU-LFS 2005-2010, author’s elaboration. Note: Predictions refer to Tables 10 and 11 in the Appendix, models C4b and N4b. 90% confidence intervals displayed



First, the model depicts a significant within country-year variation both in childlessness and fertility, which is in line with the increasing trend of childlessness and decreasing trend of fertility largely documented by the extant research. Since the within country-year variation is significantly different from zero in all the specifications, it also emerges that individual determinants of fertility and childlessness significantly differ among countries. This result further highlights the importance of considering the determinants of both childlessness and fertility depending on the context.

Second, the model makes it possible to observe the relationship between female socio-economic characteristics and both childlessness and fertility, net of the heterogeneous features of the institutional and normative context. Results are consistent with previous research. A consistent relationship between the level of education and parity emerges, so that better-educated women tend to have significantly smaller families than lower-educated women. Likewise, the more educated a woman is, the more likely she is to have an empty nest at 35–39 years old. Hence, education has a direct and significant negative effect on fertility, whereas it positively affects the likelihood of being a childless woman (models N1a and C1a).

In line with previous research, the working status and position of women emerge as important factors affecting both women's family size and likelihood of being childless at 35–39. Being inactive is associated with a higher propensity to have more children, whereas women who participate in the labour market—whether they are employed or unemployed—are overall less likely to give birth to large families. Especially, women employed in white-collar jobs tend to have fewer children than women in positions with less specialisation and with less earning (growth) prospects (model N1b). For childlessness, the pattern is nearly symmetrical: the propensity to be childless is higher

among women in the labour force than among inactive women, and it also prevails for female workers in white-collar jobs compared with lower-skilled ones (model C1b).

Large part of the variability in childlessness and fertility is accounted for by women's marital status. A strong association between partnership history and both fertility and childlessness is documented, so that mothers tend more often to be married, whereas childless women tend not to be. Likewise, women who are divorced, legally separated, or widowed, as well as women who are not in a union, have smaller families and a higher propensity to be childless compared to women who were married at the time of the interview (models N1c and C1c).

If we compare the present findings with the results for the null model (Table 1), it emerges that the inclusion of individual-level characteristics reduces the amount of unexplained variance associated with the overall error term related to fertility and childlessness. Furthermore, the proportion of explained variance at the individual level attests that individual predictors account for 16% of the variance in childlessness (C1d), whereas they only account for 7% of the variance in fertility (N1d). Since we are dealing with individual-level predictors, this is an expected reduction. A less expected result is that, when the model with individual predictors was compared with the unadjusted model, the unexplained variance of fertility at the country-year level increased, whereas it remained stable for childlessness. That is to say, once the variability in the two phenomena was accounted for through individual characteristics, there was an increase in the level-2 residual variance of fertility, whereas the proportion of level-2 residual variance of childlessness remained stable. This was confirmed also when we considered an index of the proportional reduction of the variance at level-2 and obtained negative values for fertility. Before controlling for individual characteristics, the levels of fertility were very similar across country-years, whereas after having added individual characteristics there was a greater variation. Such increased differences in the outcome might be attributable to differences of composition—i.e. to changed characteristics of the individuals in the different country-years—which might be indicative of the greater influence on fertility of individual characteristics compared with contextual features. The ICC showing variation from the adjusted in respect to the null model should also support this possible interpretation. Once individual predictors were included, only a small proportion of the variance of fertility and childlessness appeared to be explained by characteristics associated with the country-year level—i.e. 6% in the case of fertility—2% in the case of childlessness.

#### **Is childlessness lower in contexts that favour gender egalitarian relations?**

Country-level predictors were then included in the analysis in order to investigate how macro-level characteristics associate with fertility and childlessness. In particular, I observed how both policies—explicitly or implicitly targeted on families—and gender norms influence mothers to have more or fewer children and might do so for childlessness. According to the aforesaid literature, it is expected that if the mechanisms behind childlessness are the same as those behind low fertility, the propensity of women to be

childless will be also affected by institutional and normative contexts that support a more equal sharing of family responsibility. Consistently with this expectation, I started the analysis by looking at the unconditioned effects of policies and norms on individual fertility and childless status, net of individual characteristics (Table 3). It emerged that longer and better leaves are significantly associated with a lower propensity to be a childless woman, whereas they are poorly significantly associated with having more or fewer children. Where the opportunity for mothers and fathers to take parental leave is higher, and leaves are longer and of better quality, women more often become mothers, but their family size is the same as that of mothers living in contexts where parental leaves are lower (C2a N2a).

I then looked at how fertility and childlessness relate to voluntary part-time and average men's working hours in order to test the hypothesis that fertility is higher and childlessness lower in institutional settings that reduce the cost of a child. The results showed a significant association between female voluntary part-time work and both fertility and childlessness, so that the higher the share of women who voluntarily work part-time in a region, the higher is both the propensity to be childless and that to have bigger families (C2b and N2b). Contrarily, the amount of time spent by men on the primary job does not appear to be associated with different childbearing behaviour (C2c and N2c).

Lastly, in line with several recent theories which have suggested that gender equality and fertility are tied together, I tested whether a relationship also exists between either gender norms and fertility or gender norms and childlessness. The results showed that in societies where there are on average more people who think that a man has better right than a woman to work in presence of scarce jobs, women tend to limit their family size (N2d and N2e) and to be childless to a greater extent (C2d and C2e).<sup>7</sup> It emerges therefore that when and where women are considered as equal to men in the labour market, the level of fertility is higher and the level of childlessness is lower, which is in line with our expectations.

Considering the overall picture, it seems that childlessness as well as fertility are to some extent associated with family-friendly institutions, but they tend to be related with the level of gender equality reached in a society. This highlights that institutional and normative context may be relevant not only on affecting fertility but also childlessness. Further, the effect of macro-level factors on childlessness does not always display the same gradient as that on fertility, which contrasts with the hypothesis that the mechanisms leading to childlessness reflect those affecting fertility.

#### **Which women benefit most?**

Policies supporting motherhood and egalitarian gender relations may influence the nature and strength of the association between women's childbearing outcome and education, as well as the association between childbearing and women's working status. This appears to be of particular importance because evidence yielded by previous models shows that most of the variability in

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<sup>7</sup>The estimate of the effect of gender egalitarian norms in model C2d is significant at the 10% level.

childlessness is related to individual-level characteristics. Accordingly, the analysis considers the heterogeneity of women's population, the assumption being that different groups of women perceive different motherhood-related costs.

To investigate this, a cross-level interaction between women's socio-demographic and family policies and institutional arrangements was specified in the model. The series of multilevel modelling holding this specification is fully reported in [Appendix](#) Tables 10 and 11. The graphs plotted in Figs. 1, 2, and 3 show the extent to which the association between female socio-economic status on childlessness (left panel) and fertility (right panel) relates to the different macro-level conditions. Given that parental leaves are recognised as means to bring mothers back into the labour market following childbirth and conceived as instruments for job continuity with the collateral effect of boosting fertility, an interaction with woman's working condition was introduced. The other macro-level characteristics were interacted with the female's education, which is better suited to capturing the perceived cost associated with having a child. To facilitate substantive interpretation of the results, predicted probabilities are reported.

The relationship between parental leaves and fertility varies according to the working position of women, whereas the relationship between leaves and childlessness is stable across all the groups of female workers (Fig. 1). By contrast to countries in which short leaves are diffused, in contexts where there are longer paid leaves, women are—independently from their working position—less likely to be childless, while only inactive women tend to have bigger families.

The share of female voluntary part-time work does not seem to relate to the propensity to be childless, but it is positively associated with higher fertility among women with secondary or tertiary degrees (Fig. 2). Where the level of female part-time work is largely involuntary, women with the highest level of education are the group most penalised in terms of both fertility and childlessness: better educated women tend to have significantly fewer children compared to lower-educated women, as well as being childless to a greater extent. Instead, although childlessness is not lower in contexts where part-time work is more common as a voluntary option, the educational gap in fertility and childlessness diminishes until it becomes not significant.

Furthermore, the analysis considered the interplay between women's characteristics and the average number of hours that men spend on their main job, which is considered as an institutional condition that may encourage men to assume caring responsibilities. The results reveal that where men work on average longer hours there is an educational gradient of fertility, with higher educated women being more likely to have smaller families than their lower-educated counterparts (Fig. 3). By contrast, the amount of time men spend on the main job is unrelated to fertility for low-educated women. Similarly, lower hours spent by men in the job market help to reduce the educational gap in childlessness, whereas when men work longer hours, high-educated women are more likely to be childless compared to the lower educated. Therefore, it seems that in those contexts where men tend to spend a longer time on the labour market,

women face increasing opportunity costs of children and are less prone to have numerous children and to become mothers.

Overall, the results confirm the hypothesis that family policies supporting childcare and the stability of mothers' employment through conditions that help women to better combine work and family are associated with a lower propensity to remain childless, and that childlessness is lower in the context that favours gender relations, also thanks to institutional settings that support gender equality.

### **Is the influence of policies and institutional arrangements related to the broader normative context?**

In line with the literature on low fertility, it is also important to analyse whether the extent to which gender egalitarian policies are linked to childlessness is affected by the level of gender egalitarianism reached within countries. To this end, I investigated whether the positive association between gender egalitarian conditions and lower childlessness is stronger, the more the society is gender equal. This hypothesis was tested through a set of macro-level interactions between indicators of both family policies and institutional assets concerning gender egalitarian relation, and an indicator of gender egalitarianism at the societal level. Given in what follows are the predictive margins with 90% of confidence intervals that show the predicted probability of having no children in the household and the predicted numbers of children at different levels of gender egalitarianism. Separate figures indicate the moderating role of gender equity in the case of effective parental leaves (Fig. 4), female part-time (Fig. 5), and average male working hours (Fig. 6). The full outcome resulting from different models' specifications is available in [Appendix](#) Tables 10 and 11.

The level of generosity in parental leaves does not emerge to affect women's fertility either in traditional in gender equal countries, as is shown by the predicted number of children not being affected by the duration of parental leaves (Fig. 4). If we consider childlessness, instead, longer and better leaves are associated with a lower propensity for women to have an empty nest at 35–39, which is even lower in societies that score higher on the gender egalitarian norm index.

Also, the role that the spread of female voluntary part-time has in fertility does not appear to be linked to the normative contexts concerning gender equity, as women in egalitarian societies are overall more likely to have bigger families compared to women in traditional societies (Fig. 5). By contrast, the level of gender egalitarianism interacts with the level of voluntary part-time available in a country in shaping the likelihood of women to be childless. As observed, greater female part-time is associated with a greater propensity to be childless especially where a lower level of gender egalitarianism is diffused. Conversely, where women are perceived as having the same right to work as men in the presence of scarce jobs, the extent of voluntary part-time among women is marginally related to a slightly higher propensity to be childless.

Lastly, the normative climate surrounding gender egalitarianism modifies the relationship between men's working hours and childbearing behaviour only when considering number of children, whereas nothing changes in the case of childlessness (Fig. 6). The amount of time men spend on their main job is positively related to having bigger families in traditional countries. The opposite happens in gender egalitarian countries, where the longer men work on average, the smaller the family tends to be. Differently in the case of childlessness, the probability of not having children at 35–39 years old for women is unrelated to the amount of time men spend on their main job, neither in gender equal nor in traditional countries.

In short, after having found that there is an association between gender egalitarian condition and both fertility and childlessness, we also find that there is an interplay of institutional and normative conditions on the likelihood of having more children and to be childless for women.

## Conclusions

Throughout recent decades, increasing research has shown that fertility decisions largely are influenced by national contexts in which women make their preferences concerning families, as well as by institutional and normative structures that condition their opportunity costs. Policies, and characteristics of the labour market, as well as social norms directed at integrating women into the labour market and lowering the opportunity costs of children, have long been argued to be at the root of the below-replacement fertility levels and widely examined in several contexts. To date, a large body of theoretical and empirical literature has discussed the effects of family-friendly policies on fertility (e.g. Björklund, 2006; Billingsley and Ferrarini, 2014), whereas the empirical evidence on how national contexts or policies influence childlessness still needs to be enriched at the European level. Although there has been increasing interest among social scientists, both specific explanations and theoretical arguments for childlessness have received scant attention when compared to the determinants of fertility. This is especially true in regard to macro-level circumstances potentially inducing women to be childless.

The present work has studied whether the likelihood of being childless is linked to gender equalising policies, to test whether the macro context moderates the role of socio-economic characteristics usually found to shape the likelihood of being childless. I investigated this relatively unexplored aspect of childlessness, by considering not only several policies and institutional features that are usually considered to integrate women into the labour market, but also the level of gender norms in the society. The association tested is that policies and institutional setting favouring lower costs of children might be a buffer against being childless, and more so for women who perceive higher family costs. The analyses provided three main results.

First, macro-level factors correlate with both individual childlessness and fertility in a similar way. More generous family-friendly policies are to some extent associated with both a lower propensity to live in a childless household at 35–39, as well as to have a greater number of children.



Second, there exist interesting differences across groups of women—differing in terms of perceived opportunity costs—in how macro-level factors affect low fertility and childlessness. In particular, the association between policies directed at reducing the trade-off between work and family and both childlessness and fertility varies according to the level of education and earning potentials of women, being generally stronger for women in better socio-economic positions. The socio-economic gradient emerges to be wider where reconciliation family support policies are scarcer. Notably, better educated and work-oriented women tend to be childless more frequently in contexts where parental leaves are less generous, voluntary part-time job opportunities are scarce, and men spend longer hours in the labour market. Similarly, women with higher educational and working levels tend to have more children where voluntary female part-time is more diffused, and men spend less time in the labour market. Remarkably, some differences are found in how parental leaves correlates with fertility or childlessness. High-skilled women tend to be childless less often where parental leaves are longer, but their fertility level remains identical to that of high-skilled women who live in context with short parental leaves, being fertility responsive to leaves length only among inactive women. This seemingly counterintuitive result adds further evidence to the literature documenting the potential perverse effect of some family-friendly policies on mothers labour force, and especially of parental leaves entitlements (Boeckmann et al., 2015; Budig et al., 2016; Gangl and Ziefle, 2015; Mari and Cutuli, 2019; Pettit and Hook, 2005, 2009). A prolonged absence from paid work reduces women's human capital and delays their re-entry into the labour market (Gupta and Smith, 2002; Mincer and Polachek, 1974; Morgan and Zippel, 2003). In line with this, extended parental leave entitlements have been documented not only to lower women's labour force participation, but also to lessen their labour attachment after childbirth (Gangl and Ziefle, 2015), which could, in turn, encourage fertility especially of the inactive group of women (Matysiak and Szalma, 2014).

Third, the influence of policies and institutional arrangements emerges to be related to the degree of gender egalitarianism reached within countries. Even though with some specificities, the positive association between family-friendly policies and childlessness is stronger in gender egalitarian context, whereas it is minimum in more traditional societies.

Overall, results corroborate the hypothesis that labour market and family-friendly policies play an important role on individual childlessness as well as on fertility, especially for women who have invested more in their education or career. Family policies, therefore, might help in raising below-replacement levels of fertility, not only by boosting higher-parity births but also by reducing the number of women who are childless. The analysis contributes to the literature on childbearing behaviour by showing how macro-factors are important when analysing the determinants of childlessness, but that the childless status is not exclusively driven by the same determinants as having few children. Therefore, childlessness and low fertility are two distinct phenomena and further research is needed to disentangle the underlying reasons for childlessness, both empirically and theoretically.

## Appendix

**Table 4** The proportion of women aged 35–39 without cohabiting children slightly overestimates the share of childlessness

Country	Proportion of women living in household without children at 35–39 years old <sup>(a)</sup>						% childless women <sup>(b)</sup>			
	2005	2006	2007	2008	2009	2010	1965	1968	1970	1972
Austria	16.39	17.02	17.16	18.08	17.84	18.90	17.20	18.40	18.50	19.00
Belgium	17.28	17.37	18.04	17.65	17.96	17.73	16.00	16.10	–	–
Bulgaria	6.58	8.29	8.54	10.91	11.15	10.09	7.90	7.80	9.30	9.90
Czech Republic	6.07	7.42	7.68	6.56	6.65	7.15	6.60	7.80	7.70	9.40
Estonia	6.13	9.46	8.96	7.44	8.68	8.60	10.60	11.10	11.50	–
France	13.48	14.41	15.18	15.18	15.76	14.94	–	14.30	–	–
Germany	27.26	27.13	27.76	26.13	25.41	28.23	21.80	23.10	–	–
Greece	14.35	15.23	15.54	15.60	14.64	15.35	16.40	–	–	–
Hungary	7.88	7.90	8.23	9.63	10.20	10.59	9.30	10.90	–	–
Ireland	0.00	14.66	15.03	15.36	16.58	16.75	18.00	18.80	–	–
Italy	15.24	15.89	16.72	16.91	18.76	19.86	18.40	19.80	20.60	20.90
Latvia	6.35	6.83	8.02	7.99	9.42	10.49				
Lithuania	16.41	17.75	15.91	12.76	25.43	25.69	8.90	9.30	–	–
Luxemburg	13.63	13.33	12.86	11.53	12.49	14.60				
Netherlands	16.42	17.51	17.67	18.66	17.05	17.38	18.10	17.70	–	–
Poland	6.16	5.80	7.18	7.15	7.29	8.56	8.00	–	–	–
Portugal	7.26	7.19	7.10	9.49	9.70	10.02	12.90	12.30		
Slovakia	5.07	5.41	7.18	7.11	6.58	7.03	11.00	11.30	11.80	12.30
Spain	13.47	14.00	15.80	15.34	16.52	18.18	14.50	16.50	18.60	20.70
UK	19.55	20.72	19.22	21.26	20.49	20.02	20.00	18.00	18.00	–

<sup>a</sup>EU-LFS 2005-2010, author's elaboration

<sup>b</sup>Sobotka, 2017

**Table 5** The number of cohabiting children in the household when women are 35–39 reflect women's total fertility rate

Country	Average number of cohabiting children when the mother is 35–39 years old <sup>(a)</sup>						Adjusted total fertility rate <sup>(b)</sup>		
	2005	2006	2007	2008	2009	2010	2006	2008	2010
Austria	1.99	2.00	1.96	1.95	1.96	1.98	1.63	1.64	1.66
Belgium	2.11	2.15	2.11	2.10	2.13	2.07	1.77	1.86	1.85
Bulgaria	1.73	1.72	1.66	1.62	1.62	1.62	1.53	1.70	1.73
Czech Republic	2.00	2.01	1.98	1.95	1.94	1.92	1.67	1.76	1.79
Estonia	2.23	2.17	2.12	2.08	2.11	2.16	1.51	1.59	1.62
France	2.12	2.11	2.10	2.11	2.10	2.12	1.95	1.85	1.90
Germany	1.81	1.80	1.82	1.84	1.80	1.88	1.33	1.39	1.40
Greece	1.96	1.99	1.93	1.92	1.92	1.91	2.02	2.07	2.13
Hungary	2.09	2.08	2.06	2.08	2.10	2.08	1.49	1.52	1.52
Ireland		2.41	2.36	2.30	2.27	2.28	1.76	1.75	1.65
Italy	1.84	1.83	1.83	1.82	1.82	1.80	2.22	2.17	2.08
Latvia	2.01	2.01	1.97	1.97	1.94	1.92	1.41	1.48	1.47
Lithuania	2.00	2.00	1.96	2.00	2.00	2.03	1.66	1.68	1.75
Luxemburg	1.98	1.95	1.93	1.92	2.01	1.91	1.83	1.82	2.05
Netherlands	2.13	2.10	2.09	2.09	2.13	2.11	1.56	1.59	1.61
Poland	2.24	2.21	2.16	2.10	2.09	2.05	1.82	1.82	1.79
Portugal	1.83	1.83	1.83	1.81	1.79	1.76	1.64	1.58	1.50
Slovakia	2.23	2.20	2.18	2.13	2.05	1.99	1.80	1.65	1.56
Spain	1.80	1.78	1.77	1.80	1.78	1.73	1.60	1.66	1.66
UK	2.08	2.08	2.07	2.09	2.08	2.08	1.85	1.98	2.07

<sup>a</sup>EU-LFS 2005-2010<sup>b</sup>European Demographic Data Sheet 2006, 2008, 2010

**Table 6** Total leave-time in months weighted by payment level

Country	2005 <sup>(a)</sup>	2006 <sup>(a)</sup>	2007 <sup>(a)</sup>	2008 <sup>(a)</sup>	2009	2010 <sup>(b)</sup>
Austria	10.90	10.90	10.90	10.90	9.80	9.80
Belgium	4.70	4.70	4.70	4.70	4.60	4.60
Bulgaria	17.60	17.60	17.60	17.60	16.80	16.80
Czech Republic	25.20	25.20	25.20	25.20	17.90	17.90
Estonia	15.30	15.30	15.30	15.30	17.60	17.60
France	13.30	13.30	13.30	13.30	13.00	13.00
Germany	6.80	6.80	6.80	6.80	12.60	12.60
Greece	3.50	3.50	3.50	3.50	4.10	4.10
Hungary	20.20	20.20	20.20	20.20	20.50	20.50
Ireland	2.10	2.10	2.10	2.10	2.70	2.70
Italy	5.50	5.50	5.50	5.50	5.50	5.50
Latvia	12.90	12.90	12.90	12.90	12.10	12.10
Lithuania	16.70	16.70	16.70	16.70	24.30	24.30
Luxemburg	11.70	11.70	11.70	11.70	10.60	10.60
Netherlands	3.70	3.70	3.70	3.70	7.00	7.00
Poland	3.20	3.20	3.20	3.20	4.10	4.10
Portugal	3.90	3.90	3.90	3.90	5.20	5.20
Slovakia	8.80	8.80	8.80	8.80	11.90	11.90
Spain	3.70	3.70	3.70	3.70	3.70	3.70
UK	2.50	2.50	2.50	2.50	3.70	3.70

Source: Multilinks Database

<sup>a</sup>Data refer to 2004

<sup>b</sup>Data refer to 2009

**Table 7** Share of voluntary part-time as a percentage of the total part-time employment among women

Country	2005	2006	2007	2008	2009	2010
Austria	35.11	36.11	37.24	37.76	38.47	39.18
Belgium	32.07	32.52	33.27	33.44	33.66	33.84
Bulgaria	0.55	0.49	0.44	0.41	0.46	0.49
Czech Republic	6.35	6.07	5.97	5.89	5.87	5.97
Estonia	4.83	4.80	4.81	5.52	6.12	6.77
France	21.44	21.24	21.06	20.75	20.42	20.08
Germany	35.59	35.92	36.15	36.40	36.50	36.70
Greece	2.95	3.00	3.39	3.71	4.00	4.18
Hungary	3.17	3.25	3.23	3.24	3.15	3.15
Ireland	23.67	24.03	24.01	24.31	24.36	23.92
Italy	12.71	13.72	14.85	15.92	16.91	16.78
Latvia	5.55	5.53	4.96	4.67	4.16	3.69
Lithuania	3.40	3.41	4.25	4.85	5.35	5.50
Luxembourg	27.92	29.87	31.35	33.00	34.27	33.77
Netherlands	68.83	69.22	68.97	68.62	68.18	67.46
Poland	5.62	5.33	5.43	5.56	5.77	5.90
Portugal	6.78	6.67	6.28	5.93	5.44	5.23
Slovakia	2.46	2.44	2.48	2.69	2.72	2.67
Spain	12.40	12.92	13.12	13.42	13.47	13.07
UK	37.75	37.42	37.02	36.50	35.95	35.38

Source: Eurostat (lfsa\_eppgai). Note: yearly estimation is the average of the 5 years before. Last update: 23-10-2019

**Table 8** Average usual weekly hours worked on the main job by men aged 25–54

Country	2005	2006	2007	2008	2009	2010
Austria	41.95	42.56	43.19	43.82	44.36	44.15
Belgium	41.07	41.07	41.01	40.95	40.89	40.83
Bulgaria	41.60	41.65	41.70	41.82	41.98	42.04
Czech Republic	44.37	44.24	44.18	44.14	43.98	43.92
Estonia	41.97	41.84	41.72	41.63	41.49	41.22
France	40.49	40.72	41.06	41.53	41.55	41.57
Germany	41.17	41.02	40.90	40.82	40.86	40.89
Greece	44.95	44.97	44.97	44.89	44.77	44.72
Hungary	42.14	41.88	41.72	41.58	41.38	41.19
Ireland	42.68	42.43	42.11	41.85	41.58	41.19
Italy	41.59	41.68	41.76	41.84	41.88	41.74
Latvia	44.05	44.01	43.83	43.41	42.88	42.34
Lithuania	39.29	39.37	39.39	39.60	39.78	39.83
Luxembourg	41.16	41.01	40.75	40.48	40.20	40.25
Netherlands	39.28	39.19	39.13	39.14	39.17	39.21
Poland	44.27	44.40	44.38	44.34	44.21	44.02
Portugal	42.10	42.02	41.93	41.81	41.75	41.69
Slovakia	42.50	42.20	42.01	42.04	42.20	42.22
Spain	42.05	42.08	42.11	42.18	42.24	42.24
UK	44.95	44.69	44.39	44.17	43.97	43.71

Source: OECD.Stats. Note: yearly estimation is the average of the 5 years before

**Table 9** Gender egalitarian norms

Country	2005 <sup>(a)</sup>	2006 <sup>(a)</sup>	2007 <sup>(a)</sup>	2008 <sup>(a)</sup>	2009	2010 <sup>(b)</sup>
Austria	52.90	52.90	52.90	67.00	67.00	67.00
Belgium	70.10	70.10	70.10	78.80	78.80	78.80
Bulgaria	47.50	47.50	47.50	58.40	58.40	58.40
Czech Republic	65.30	65.30	65.30	59.40	59.40	59.40
Estonia	75.50	75.50	75.50	73.10	73.10	73.10
France	68.30	68.30	68.30	84.50	84.50	84.50
Germany	55.90	55.90	55.90	65.10	65.10	65.10
Greece	72.60	72.60	72.60	59.60	59.60	59.60
Hungary	67.90	67.90	67.90	84.10	84.10	84.10
Ireland	75.60	75.60	75.60	71.10	71.10	71.10
Italy	56.80	56.80	56.80	67.60	67.60	67.60
Latvia	69.50	69.50	69.50	70.90	70.90	70.90
Lithuania	65.10	65.10	65.10	62.90	62.90	62.90
Luxemburg	66.00	66.00	66.00	76.90	76.90	76.90
Netherlands	83.40	83.40	83.40	85.30	85.30	85.30
Poland	45.10	45.10	45.10	65.20	65.20	65.20
Portugal	61.40	61.40	61.40	63.60	63.60	63.60
Slovakia	54.20	54.20	54.20	54.00	54.00	54.00
Spain	62.50	62.50	62.50	70.90	70.90	70.90
United Kingdom	66.90	66.90	66.90	79.10	79.10	79.10

<sup>a</sup>EVS 1999<sup>b</sup>EVS 2008





**Table 10** Estimations of a series of linear probability multilevel models regressing the propensity to live without cohabiting children at 35–39 years old on various individual and contextual characteristics (Continued)

	C0	C2a	C2b	C2c	C2d	C2e	C3a	C3b	C3c	C3d	C4a	C4b	C4c
Unemployed # leave							- 0.001* (0.000)						
X LS blue-collar							- 0.001*** (0.000)						
X LS white-collar							- 0.002*** (0.000)						
X HS blue-collar							- 0.000 (0.000)						
X HS white-collar							- 0.002*** (0.000)						
Voluntary part-time		0.001*** (0.000)				0.001** (0.000)						0.006*** (0.001)	
x Low Education								- 0.000*** (0.000)					
x High education								- 0.000 (0.000)					
Men working hours			0.001 (0.003)			0.000 (0.003)			0.001 (0.003)				-0.0219 (0.021)
x Low education									-0.002** (0.001)				
x High education									0.003*** (0.001)				
Gender egalitarian norms					- 0.001	- 0.002***				-0.001	0.000	-0.001	-0.014

**Table 10** Estimations of a series of linear probability multilevel models regressing the propensity to live without cohabiting children at 35–39 years old on various individual and contextual characteristics (Continued)

	C0	C2a	C2b	C2c	C2d	C2e	C3a	C3b	C3c	C3d	C4a	C4b	C4c
x Low education					(0.000)	(0.000)				(0.000)	(0.001)	(0.001)	(0.012)
										-0.000*			
x High education										(0.000)			
										0.000**			
										(0.000)			
Macro level interaction													
Leaves x gender egalitarian norms											-0.000		
											(0.000)		
Voluntary part-time x gender egalitarian norms												-0.000**	
												(0.000)	
Men working hours x gender egalitarian norms													0.000
													(0.000)
Constant	0.007	- 0.01	- 0.044	0.0442***	0.059	0.112	0.033***	- 0.011	-0.023	0.060	0.052	0.039	0.977
var(cy)	0.0024***	0.0022***	0.0024***	0.0018***	0.0024***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***
var(Residual)	0.0977***	0.0977***	0.0977***	0.0977***	0.0977***	0.0977***	0.0976***	0.0977***	0.0977***	0.0977***	0.0977***	0.0977***	0.0977***
ICC	0.024	0.022	0.024	0.018	0.024	0.016	0.018	0.021	0.024	0.024	0.017	0.018	0.023

Source: own elaboration based on EU-LFS 2005-2010. N of women 719,832; N of country-year combinations 120. Beta coefficient. Weighted estimations. Sign. levels: \*p < .05, \*\*p < .01, \*\*\*p < .001. Note: var(cy) indicates the variance of the random effect at the second level (country-year). ICC is the intra Class Correlation. Baseline categories: Middle education, inactive, married women

**Table 11** Estimations of a series of linear multilevel models regressing the number of children of 35–39 years old women on various individual and contextual characteristics

	N0	N2a	N2b	N2c	N2d	N2e	N3a	N3b	N3c	N3d	N4a	N4b	N4c
Education													
Low	0.189*** (0.003)	0.188*** (0.003)	0.188*** (0.003)	0.189*** (0.003)	0.188*** (0.003)	0.188*** (0.003)	0.190*** (0.003)	0.250*** (0.004)	-0.589*** (0.082)	0.083*** (0.019)	0.188*** (0.003)	0.188*** (0.003)	0.188*** (0.003)
High	-0.047*** (0.003)	-0.047*** (0.003)	-0.047*** (0.003)	-0.047*** (0.003)	-0.047*** (0.003)	-0.047*** (0.003)	-0.053*** (0.003)	-0.080*** (0.004)	0.908*** (0.075)	-0.204*** (0.019)	-0.047*** (0.003)	-0.047*** (0.003)	-0.047*** (0.003)
Working position													
Unemployed	-0.231*** (0.005)	-0.231*** (0.005)	-0.231*** (0.005)	-0.231*** (0.005)	-0.231*** (0.005)	-0.231*** (0.005)	-0.140*** (0.008)	-0.232*** (0.005)	-0.231*** (0.005)	-0.231*** (0.005)	-0.231*** (0.005)	-0.231*** (0.005)	-0.231*** (0.005)
HS white collar	-0.371*** (0.003)	-0.371*** (0.003)	-0.371*** (0.003)	-0.371*** (0.003)	-0.371*** (0.003)	-0.371*** (0.003)	-0.216*** (0.005)	-0.368*** (0.003)	-0.370*** (0.003)	-0.370*** (0.003)	-0.371*** (0.003)	-0.371*** (0.003)	-0.371*** (0.003)
LS white collar	-0.393*** (0.003)	-0.393*** (0.003)	-0.393*** (0.003)	-0.393*** (0.003)	-0.393*** (0.003)	-0.393*** (0.003)	-0.265*** (0.005)	-0.390*** (0.003)	-0.393*** (0.003)	-0.393*** (0.003)	-0.393*** (0.003)	-0.393*** (0.003)	-0.393*** (0.003)
HS blue collar	-0.199*** (0.005)	-0.199*** (0.005)	-0.199*** (0.005)	-0.199*** (0.005)	-0.198*** (0.005)	-0.198*** (0.005)	-0.022* (0.009)	-0.205*** (0.005)	-0.204*** (0.005)	-0.200*** (0.005)	-0.199*** (0.005)	-0.198*** (0.005)	-0.199*** (0.005)
LS blue collar	-0.298*** (0.004)	-0.298*** (0.004)	-0.298*** (0.004)	-0.298*** (0.004)	-0.298*** (0.004)	-0.298*** (0.004)	-0.182*** (0.007)	-0.298*** (0.004)	-0.297*** (0.004)	-0.298*** (0.004)	-0.298*** (0.004)	-0.298*** (0.004)	-0.298*** (0.004)
Marital status													
Previously married	-0.185*** (0.004)	-0.185*** (0.004)	-0.185*** (0.004)	-0.185*** (0.004)	-0.185*** (0.004)	-0.185*** (0.004)	-0.185*** (0.004)	-0.183*** (0.004)	-0.185*** (0.004)	-0.185*** (0.004)	-0.185*** (0.004)	-0.185*** (0.004)	-0.185*** (0.004)
Single	-0.427*** (0.004)	-0.427*** (0.004)	-0.428*** (0.004)	-0.427*** (0.004)	-0.428*** (0.004)	-0.428*** (0.004)	-0.432*** (0.004)	-0.428*** (0.004)	-0.428*** (0.004)	-0.428*** (0.004)	-0.428*** (0.004)	-0.428*** (0.004)	-0.428*** (0.004)
Duration of parental leaves													
	0.001 (0.003)					0.005+ (0.003)	0.014*** (0.003)				-0.02 (0.019)		
x Unemployed							-0.011*** (0.003)						

**Table 11** Estimations of a series of linear multilevel models regressing the number of children of 35–39 years old women on various individual and contextual characteristics  
(Continued)

	N0	N2a	N2b	N2c	N2d	N2e	N3a	N3b	N3c	N3d	N4a	N4b	N4c
X LS blue-collar							(0.001) - 0.014***						
							(0.001)						
X LS white-collar							- 0.015***						
							(0.000)						
X HS blue-collar							- 0.021***						
							(0.001)						
X HS white-collar							- 0.018***						
							(0.000)						
Voluntary part-time			0.003**			0.003*		0.003**				0.000	
			(0.001)			(0.001)		(0.001)				(0.006)	
x Low education								- 0.003***					
								(0.000)					
x High education								0.002***					
								(0.000)					
Men working hours				-0.010		0.018			- 0.007				0.221**
				(0.012)		(0.012)			(0.012)				(0.072)
x Low education									0.019***				
									(0.002)				
x High education									- 0.023***				
									(0.002)				
Gender egalitarian norms					0.009***	0.008***				0.008***	0.006+	0.008***	0.140**
					(0.002)	(0.002)				(0.002)	(0.003)	(0.002)	(0.044)

**Table 11** Estimations of a series of linear multilevel models regressing the number of children of 35–39 years old women on various individual and contextual characteristics  
(Continued)

	N0	N2a	N2b	N2c	N2d	N2e	N3a	N3b	N3c	N3d	N4a	N4b	N4c
x Low education									0.002*** (0.000)				
x High education									0.002*** (0.000)				
Macro level interaction											0.000 (0.000)		
Leaves x gender egalitarian norms												0.000 (0.000)	
Voluntary part-time x gender egalitarian norms												0.000 (0.000)	
Men working hours x gender egalitarian norms													– 0.003** (0.001)
Constant	2.298***	2.285***	2.241***	2.717***	1.694***	0.899	2.180***	2.237***	2.598***	1.752***	1.883***	1.751***	– 7.611*
var(cy)	0.039	0.039***	0.036***	0.039***	0.032***	0.030***	0.039***	0.037***	0.039***	0.031***	0.031***	0.031***	0.029***
var(Residual)	0.676	0.676***	0.676***	0.676***	0.676***	0.676***	0.674***	0.675***	0.676***	0.676***	0.676***	0.676***	0.676***
ICC	0.055	0.055	0.051	0.054	0.045	0.043	0.055	0.052	0.054	0.044	0.044	0.044	0.041

Source: own elaboration based on EU-LFS 2005-2010. N of women 578,377; N of country-year combinations 120. Beta coefficient. Weighted estimations. Sign. levels: \*p < .05, \*\*p < .01, \*\*\*p < .001. Note: var(cy) indicates the variance of the random effect at the second level (country-year). ICC is the intra Class Correlation. Baseline categories: Middle education, inactive, married women

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Single authorship. The author read and approved the final manuscript.

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The author declares that she has no competing interest.

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