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# WITH OR WITHOUT YOU.
# INTENTIONS, CONSTRAINTS, AND CONSEQUENCES OF CHILDLESSNESS IN EUROPEAN COUNTRIES.

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# INTRODUCTION

The transition to parenthood is often one of the most significant milestones in people's life course. It is therefore no surprise that fields of academic research and the public debate attach great importance to parenthood and children. Children are generally acknowledged as goods of primary importance for both their parents and the whole society. Firstly, they are actively involved in constructing and organising the lives of their parents (Hagestad and Call, 2007). And secondly, they guarantee the existence of a society, to the extent that shifting from high to low fertility has an aggregate effect on the dynamics of the entire population (Bloom *et al.*, 2010). In line with this role of *meaning makers* and of *social reproduction* there is a rich body of the literature on fertility and families (Balbo, Billari and Mills, 2018). Major attention has been directed at analysing matters related with fertility decline.

The discussion on *low*- and *lowest-low* fertility (Billari and Kohler 2004; Kohler, Billari, and Ortega 2002) – defined as levels of total fertility below replacement level or below 1.3l, respectively – has indeed long dominated academic dialogues about fertility in advanced countries. This growing body of empirical research has especially focused on analysing the drivers leading to delayed transitions to parenthood and to smaller families, as well as on the possible consequences of these processes on the aggregate fertility decline. However, while many scholars have investigated below-replacement fertility dynamics (e.g., Dalla Zuanna, 2001; Goldstein, Sobotka, and Jasilioniene 2009; Morgan and Taylor, 2006; Sobotka, 2004), relatively little attention has been traditionally given to the rising phenomenon of childlessness.

While scientific research has focused on the circumstances that lead women to opt for fewer children with the ultimate goal of identifying what fosters or rather hinders fertility, conditions that lead to childlessness have been less thoroughly

analysed and entered the scientific debate more recently. Having overlooked the childless part of the population for a long time, the current debate suffers several *lacunae* about dynamics related to population and family formation. First, this *selective inattention* toward childless people (Veevers, 1972) led to some degree of agreement in the sociological and demographic literature that all women in western European countries want a child, and that all women will have one in their life (De Sandre *et al*, 1997; Goldstein, Lutz, and Testa, 2003). Empirical evidence, conversely, has shown that not all women become mothers (Houseknecht, 1987; Tanturri and Mencarini, 2008). Indeed, not only an increased proportion of women and men opts to rear fewer children today than in the past, but also the share of the population without children is on the rise in the majority of western and non-western European countries (Sobotka, 2017). Second, the idea that all women in their life desire to become mothers implicitly supports the argument that the transition to parenthood is evenly distributed in the population. On the contrary, sociological research has documented how this life course transition is far from equally distributed, and fertility changes significantly in relation to *micro*-, *meso*- and *macro*-level dimensions of the social structure (Balbo, Billari and Mills, 2018). Third, the relative scant attention that research has been paying to childlessness is shown by the existing measures of the phenomenon. Aggregate measures of total population, fertility rates, or mean age at first birth are readily available for most of European countries, but the same is not true for childlessness. Social scientists, as well as international organisations and agencies only recently started to provide statistics about the proportion of people living without children in a country. This lack of statistics that make possible to reconstruct childlessness over long periods of time is partly attributed to the complexity of the reasons behind being childless, as well as to the poor quality of available data, but is also an example of how simple questions related to childlessness have not yet been appropriately addressed. More to this point, much has been said about what holds people back from having large families and what lead people to have children later, whereas relatively little is

known about the factors determining childlessness. As a result, childlessness remains a matter for further enquiry in both academia and the public debates.

In this dissertation I focus specifically on the experience of childlessness. Namely, I will deal with the drivers and consequences that distinguish the life of childless individuals from that of parents. In particular, this thesis is structured to mirror each phase of a hypothetical individual lifecycle. It starts by analysing intentions to be childless and their realizations (Chapter 2). It then goes on to investigate the individual and contextual determinants of childlessness (Chapter 3 and Chapter 4). Last it considers the consequences that childlessness might induce in adulthood and later life (Chapter 5).

This is done by combining demographic and sociological perspectives. Demographers and sociologists have analysed the phenomenon from different perspectives, focusing on distinctive analytical components. For example, the primary interest of demographers has long been quantifying the *prevalence* of childlessness at the population level (Lappegård, 2000; Rowland, 2007; Sobotka, 2004b; 2017), whereas sociologists have been concentrating more on the *consequences* of childlessness at the individual level. Namely, special attention has been addressed to the detrimental implications of a lack of children on an individual's life (Dykstra and Keizer, 2009) and to the adaptive strategies of people without children (Adloff, 2009; Hurd, 2009).

Possibly as a consequence of the different focus of different disciplines, not only the reasons leading more people to childlessness among the younger cohorts remained unexplained, but also the theoretical framework for studying childlessness has remained underdeveloped compared to that on fertility. Fertility and childlessness have indeed long been perceived as equivalent phenomena (Poston and Trent, 1982; Rowland, 2007), but the evidence of a low and declining correlation between fertility and childlessness rates (Sobotka, 2017) suggests that they increasingly follow different and specific logics. The first three empirical chapters of the thesis build on this evidence and analyse the determinants of childlessness asking first, whether and to what extent childlessness is chosen by

individuals (Chapter 2) and, second, what factors shape the social stratification of childlessness and how these factors change over time (Chapter 3) and across contexts (Chapter 4).

Before delving into such matters, *Chapter 1* provides an overview of the conditions that characterise childlessness. It charts the history of childlessness definitions used in empirical research in order to distinguish heterogeneity behind it. I show that childlessness is not unprecedented in the history of Europe, but the lack of children in modern societies is likely to be characterised by different social and individual determinants as compared to pre-modern times. I then discuss how few theories have been advanced to explain determinants behind childlessness, and propose avenues for their understanding by critically focussing on the explanations that existing literature provides about childbearing. In so doing, the strong criticisms of the theories of *New Home Economics* (Becker, 1991) and *Second Demographic Transition* (Lesthaeghe, 1995; Lesthaeghe and Van de Kaa, 1986; Van de Kaa, 1987) underpin the discussion on how the on-going transformation of gender roles and gender structures needs to be considered when trying to incorporate the two perspectives into a comprehensive framework. At the heart of the proposed perspective is an idea drawn from the concepts of *gender equity* and *gender equality* (McDonald, 2000a, 2000b, 2013). Namely, to explain the increase in childlessness we must consider the influence of both ideational factors (pertaining to *gender equity*) as well as material conditions (pertaining to *gender equality*), and put both in relation to the normative and structural context in which people choose or not to remain childless.

It emerges from the chapter that several questions about childlessness still loom, especially when it comes to the reasons that underlie the recent peak of childlessness and to the distinction between the motives behind having zero rather than just fewer children. In particular, the recent increase in childlessness rates has been interpreted as a result of *involuntary childlessness* due to fertility postponement, or of *voluntary childlessness* due to individual's choice (Tanturri and Mencarini, 2008; Nicoletti and Tanturri, 2008). Most of the literature has

focused on childlessness as a result of conditions external to the individual rather than on childlessness as an active, individual choice. *Chapter 2* zooms in on this dichotomy. I consider whether people intend to be childless, and track the persistence and realisation of these intentions over life course time. I investigate the leading social and cultural factors underlying the choice of being childless for men and women living in European countries, as well as the conditions associated with the stability and realisation of childlessness intentions in the short term. The analysis makes it possible to contribute both to the specific literature about voluntary childlessness and to the broader research on the link between fertility intentions and behaviour. On the one hand, it shows how social pressure and attitudes toward parenthood matter more than economic conditions in affecting voluntary childlessness. On the other hand, it shows how short-term intentions seem to be a better predictor of future behaviour in the case of childlessness than in the case of parenthood, highlighting the need to adopt a dynamic perspective rather than a static one when studying individuals' fertility intentions and their determinants.

Further, the chapter also indicates how intentions to be childless are more reversible over the life course as compared to intentions to have children. For this reason, the following two chapters focus on the *status* of childlessness at the end of reproductive life. Besides moving on to a more objective dimension of childlessness, these chapters highlight the dynamic character of social phenomena, as well as their institutional and cultural dimension. On the one hand, my objective is to analyse the evolution of the social determinants of childlessness over time. On the other, my goal is to address how the heterogeneity in terms of institutions and cultural norms influences the levels and distribution of childlessness among different social groups.

In line with this, *Chapter 3* addresses the issue of the changed costs and value of children over recent decades to provide an explanation for the increasing rate of childlessness among women. Accordingly, I consider how women's participation in tertiary education is related to the spread of childlessness in nine European

countries, by analysing how the propensity to be childless has changed over time and across groups of women with different educational levels. The chapter makes a significant contribution to the literature by documenting differences in the probability of childlessness and women's educational levels across European contexts and over time. Results that the educational gradient of childlessness persists over time and that childlessness has generally risen among all educational groups, thus providing evidence against the assumption that the increase in women's educational attainment is related, univocally, to increased childlessness.

It also emerges from the chapter that a substantial portion of the variance in the probability of remaining childless is unexplained by individual characteristics. This further motivates the study of childlessness in relation to institutional, structural and normative dimensions that might condition individual behaviour. *Chapter 4* is dedicated to these specific aspects and examines how the propensity to be childless across different socio-economic groups of women depends on macro-level conditions that support gender egalitarian relations, both in terms of institutional settings that sustain gender equality and in terms of normative conditions characterised by comparatively high levels of gender egalitarianism. On the one side, I am interested at understanding which groups of women benefit most from contexts supporting equal gender relations. On the other, I am also interested in addressing the extent to which the effect of policies and institutional arrangement relates to the broader normative context in which policies are implemented. I show that longer and better-paid parental leaves, as well as gender egalitarian societies associate to a lower propensity to be childless across all social strata, thus suggesting that a significant component of childlessness also emerges from women who face considerable constraints on motherhood. Besides, the role of institutional characteristics in affecting the probability of remaining childless varies according to the broader normative context. Namely, it is stronger in gender egalitarian contexts, and weaker in countries with traditional gender norms. Including these institutional and normative factors at the macro-level, one can also test if available theories, rather focused on micro-level factors, can adequately capture what is

distinctive of the emergence of childlessness vis-à-vis that of low fertility. Overall, the paper contributes to the literature on childlessness in several ways. First, the analysis of the micro-level determinants of childlessness is integrated by an analysis of macro-level determinants associated with childlessness from a comparative perspective. Second, the analysis provides a comparison of the determinants of childlessness with the determinants to have few children, and in this way makes it possible to understand whether the mechanisms driving the choice of being childless differ from the mechanisms driving the choice of having few children. Third, we account for childlessness differentials across European societies over a relatively long period of time.

Studying childlessness is not only relevant because of the gap identified in the socio-demographical literature, but also because understanding the drivers involved offers a way to interpret the possible effects that being childless has on the life of individuals. All in all, studying childlessness is not limited to a mere academic exercise, but is embedded in practical issues that concern the future of populations and the wellbeing of individuals. In the face of the constraints associated with childlessness, analysing the consequences of lacking children is particularly relevant in view of the rising proportion of childless people in an ageing population. *Chapter 5* offers a perspective on this, asking what consequences lifetime childlessness brings to individuals particularly with respect to their subjective wellbeing. I examine whether childless people suffer from worse wellbeing conditions than parents, focussing on social and emotional loneliness. Overall, I show that the presence of children matters for loneliness in mid and later life, as parents are overall less lonely than childless. However, the consequences of childlessness also depend on how people came to childlessness, and parents who lost contacts with their children are lonelier than parents who meet often their children.

There are three lessons emerging from this dissertation.

The *first* is that the lack of children is related to a wide range of factors, and factors not just ideational or economic in nature. On the one hand, the second chapter highlights how part of the phenomenon of childlessness is related to individual values and social norms. It emerges how the development and realisation of an intention to remain childless are related, both among men and women, to having attitudes that are in contrast with parenthood and perceiving less social pressure to become parents from significant others. On the other hand, results from the third and fourth chapters highlight the critical role of structural opportunities and constraints. Institutional and normative arrangements set different constraints for childbearing across specific social categories. However, taken alone, the context provides little explanation, which adds evidence to the necessity of considering in combination the influence of cultural, economics and policy factors when analysing fertility-related behaviour.

The *second lesson* is that the social determinants of childlessness have not changed much over recent decades. Chapter 3 shows how there is a general *"persistence of persistent inequality"* (Shavit, Yaish and Haim, 2007) of educational attainment in relation to childlessness. Namely, I show how there is a general persistent educational gap in relation to childlessness, which has not significantly reduced over time neither in relation to the spreading of post-materialist values that are supposed to nurture individual self-realisation in societies nor in relation to policies aimed at reducing costs of motherhood over time. On the contrary, inequalities related to childlessness endure over time, as it emerges from the continuing educational gap in childlessness that is present over the past two decades across European countries.

The *third* lesson is that there is still ample space to add nuance on issues related with childlessness. Building on evidence on the unequal distribution of childlessness across educational groups, one can speculate that there will be fewer children born from mothers with a high level of education, and more children born from mothers with a relatively lower educational attainment. As the human capital of mother is related to that of their children, which is further linked to children's

socio-economic position in society, future research could shed light on whether the expansion of the childless population translates to increased socio-economic inequalities at the individual and the societal levels.

Another example that emerges from previous analyses is that having a stable partnership is part of the decision-making process concerning being a parent rather than childless. However, it emerges that childlessness is related to, but different from singleness, being a decision that is also made within the couple. The scope of my study was limited to the analysis of individuals, but future research should also shed light on within couple dynamics. These dynamics should be studied not only to understand how much the absence of children is related to the lack of access to a (stable) relationship, but also to analyse the overall importance of having and the role that the fertility intentions of the partner play in the couple. The understanding of how partners reciprocally shape their preferences within the couple and how conflicting preferences concerning future fertility are coped with could highlight gender-related bargaining powers. Moreover, how partner shapes reciprocally their fertility itnentions and behavio in relation to life courses could illuminate about how costs for children are coped at the couple level. Also, how much the stability or instability of couples is affected by the absence of children represent ground for future research.

# CHAPTER I.

# A FRAMEWORK FOR ANALYSING CHILDLESSNESS

**Brief summary**

*Childlessness represents a challenging topic in the field of family sociology and socio-demography, which potentially can help to set out fundamental ideas about new family forms and new family households in Europe, as well as changed social meaning of parenthood. However, socio-demographic studies of fertility and family have largely focused on parents, whereas the childless have generally been overlooked. In this chapter I reconstructs the theoretical debate around childlessness, providing the basis to the whole thesis regarding the socio-economic drivers and consequences of a life without children. The main theoretical perspectives that can be applied to understanding the changed composition of the childless population are discussed, together with the possible new causes that might bring the youngest cohorts of women to opt for childlessness. Several definitions of childlessness are offered. On the one hand, they illustrate the difficulty of quantifying the phenomenon. On the other hand, they show how opting for one definition rather than another makes it possible to capture some information, but at the cost of losing other information. I describe the U-shaped trend of childlessness and introduce the basis of the research questions that drive this work, addressed at studying the changed causes that characterise the second peak in the childless levels and the consequences of not having children in an individual life. Overall, the chapter provides a tool for answering questions about childlessness raised throughout the thesis.*

## 1. Defining and Measuring Childlessness

The lack of fertility in demography and sociology has been studied as such since the early 1970s when fertility was already declining in the majority of Western European countries, and scholars were mainly interested in providing a definition and operativization of the phenomenon of childlessness.

In historical demography, childlessness has often been inspected as sterility, which led *childlessness* to be frequently intended and discussed as a synonym of *infertility*. Nevertheless, even if childlessness appears to be readily observable as the general condition of the absence of children (Houseknecht, 1987), it is linked with several problems of data collection and definitions. Measuring childlessness is indeed difficult not only because data sources for accurately measuring it are relatively scarce, but also because the reasons behind childlessness are very complex, and the dichotomous discrimination between people with and without children ignores many ways of being childless (Sobotka, 2017).

To the extent that the condition of childlessness is far from being homogeneous and that the motivations leading people not to have children are different and complex both at a theoretical and an operative level, an increasing effort has gone into the identification of different types of childlessness. Poston and Trent (1982), and Houseknecht (1987) were among the first to break down this non-discriminatory classification by introducing the distinction between people who do not experience parenthood due to external constraints and people for whom the lack of a child is the result of an intentional and active choice, *i.e.* distinguishing between *involuntary childlessness* and *voluntary childlessness*. Since then, scholars have frequently used this typology, although distinguishing between someone who is infertile but would like to be a parent and someone who does not have children and does not want any constitutes a challenge. Voluntary childlessness is indeed difficult to measure because it is difficult to measure the concept of voluntariness:

people might rationalize the lack of children *ex-post*, thus declaring that the lack of children was a choice even though it was not so initially. Therefore, even in the presence of the best retrospective data to measure voluntariness, the bias due to *ex-post* rationalization might lead to an underestimation of the condition of involuntary childlessness and to an over-estimation of voluntary childlessness. Furthermore, childlessness is complemented by other conditions that do not pertain solely to the concept of voluntary or involuntary childlessness.

Theoretically, the way in which an involuntary condition of childlessness arises might include both *natural sterility* and *social sterility*, which designate either the lack of children due to the inability to conceive or to induce in conception (Martin, 2015) or the lack of children due to living conditions that are incompatible with raising a child, e.g. the inability to sustain the cost of children (Baudin, De la Croix, and Gobbi, 2017). This last aspect enlightens how the distinction between social and natural sterility as sub-types of involuntary childlessness is inaccurate, since the boundaries between social sterility and voluntary childlessness are blurred: reasons behind social sterility, e.g. poor living conditions or inadequate housing for raising a child, might indeed be an expression of a *temporary* voluntary condition of childlessness. Research has shown how people change their mind easily, and how fertility desires and fertility intentions fluctuate very much over time (Ní Bhrolcháin and Beaujouan, 2012; Quesnel-Vallée and Morgan, 2003). Hence, someone who wants a child today might not want one in later life, and vice versa someone who does not want children today might desire children later in life. Still, someone who wants children might postpone the having a child until it is no longer possible and someone who cannot have children might adopt or make use of assisted reproduction technologies and have a child later in life. Some authors have, therefore, placed the emphasis on the timing of the decision toward childlessness and introduced the distinction between *early articulators*, who decide to be childless very early in life, and *postponers,* who remain childless after a series of childbearing delays (Callan, 1984; Houseknecht, 1979). Whatever definition is used, the distinction between types of childlessness is questionable and, without

drawing on theoretical assumptions, it is almost impossible to determine whether someone should be considered as *childless by choice* or *childless by constraints*. Nevertheless, although we do not know the real reasons, the various motivations for being childless belong to these two categories of involuntary and voluntary childlessness.

Given these aspects, it is more reasonable to consider childlessness not as a status achieved once and for all, but as an intention and a condition that can change during the reproductive lives of individuals. In other words, it is most likely that the decision of being childless is not taken by complete and definite reasoning, but rather by accident or by circumstances, at least until it is still possible to conceive a child.

Considering how difficult is to fully distinguish childless conditions, several authors have suggested the existence of a continuum of childlessness (Albertini and Kohli, 2017; Berrington, 2017; Letherby, 2002). At the one end of this continuum, there are those people who are naturally sterile, whereas on the other end are grouped those people who decide firmly not to have children (Houseknecht, 1987). In the middle of the two extremes positions that range from primary sterility to voluntary childlessness lie all the possibilities that might lead someone to be without children. In the strongest form of this argument, Albertini and Kohli (2017) sustain the childless status to be a *continuum* not only between involuntary and voluntary childlessness, but also between parenthood and voluntary childlessness, and conceptualise childlessness as the opposite endpoint to parenthood.

The variety of childless conditions that lies in the middle is considerable and distinguishing one type of childlessness from another has become increasingly complex, also because motivations often overlap. Moreover, given the impossibility of identifying the real reasons for actual childlessness from childlessness in the data, the conceptual definition of childlessness often differs from the operational definitions that studies adopt when dealing with such a phenomenon. Given these limitations, one among the most common ways to overcome these obstacles has been to analyse the proportion of childless people at different period over their

lifecycle. In this regard, literature refers to Definitive childlessness when the status of childlessness is measured at the end of the reproductive period. Given the different biological limit between men and women, definitive childless is a measurement that is traditionally applied only for studying childlessness among women, by setting to 45-49 the age group to distinguish whether the condition of childlessness is transitory or permanent.

## 2. The growth and rise of childlessness in Europe

A very common assumption is that contemporary high childlessness rates constitute a novelty. To the contrary, the large number of childless women among cohorts born before the middle of the 20th century shows how the actual levels of childlessness are similar to the past ones. For instance, between the 1500s and 1750s, in several villages in Britain, France and the Netherlands, more than one out of five women were without children at the end of their lives (Chrastil, 2017). Therefore, notwithstanding the recent surge, childlessness is not entirely unprecedented in Europe.

However, at a time when childlessness has become increasingly common in Western European countries, the reasons why men and women are not having children might have become progressively heterogeneous and complex. Therefore, notwithstanding diffused childlessness is not entirely unprecedented in Europe, the determinants behind past and present childlessness are likely to be different.

The childlessness trends remained at rather high and increasingly increasing levels among the cohorts of women born between the 1800s and 1900s, up to a peak among the cohorts of women born in the first decades of the twentieth century. The share of childless women at the beginning of the 20th century stood at around 20-25% in several Western, and Nordic European countries. Southern contexts also

reported high levels, where before 1915 more than one over four women were childless in Spain and Portugal (Beaujouan *et al.*, 2017; Sobotka, 2017).

Before the end of the 1800s, marriage was anything but a universalistic model: people did not always get married, and those who did, tended to do so in old age, mainly due to economic constraints. Being childless was, therefore, a relatively widespread condition, mainly linked to the lack of access to marriage or precarious living conditions (Toulemon, 1966). What changes in the following years is not only the total of people without children, rather the characteristics of childlessness. Unlike what it had been up to that time, the peaks of childlessness that were registered among the cohorts born at the turn of the two centuries occurred above all among married couples, a rather uncommon occurrence before the end of the nineteenth century(Coontz, 2004). This result of a widespread condition of childlessness within marriage reflects both the effects of the Great Depression, on the one hand, and the effects of the First World War on the other. The great economic and financial crisis that shook the world economy in the late twenties had recessive effects not only on the economic side but also on the side of family formation, leading many couples to postpone the moment of birth of unwanted children. The Great Depression did not have a direct impact on childlessness (Morgan, 1991), but the cohort reproductive behaviours born in the early 1900s were also conditioned by the advent of the First World War, which had a combined effect to that of the Great Depression. Couples who had previously postponed the birth of their children found themselves unable to carry out their childbearing, so remaining childless (Borrie, 1944).

In relation to the post-world war II baby boom in the years that followed, there was an overall decline in the rate of childlessness, and a low point was reached among the cohorts of women born around the first half of the 1940s (Toulemon, 1996). Notwithstanding country specificities – e.g. Southern Europe and West Germany were lagging behind the events taking place (Gonzalez and Jurado-Guerrero, 2007; Rowland, 2007) – this downtrend was diffused on a generalised basis. Still, the minimum levels of childlessness reached were very different: in the

Nordic Countries, the share of childless women ranged from 8% to 15%, while in Western Europe it was around 10-12%. The lowest-low point occurred in German-speaking and Southern European countries, where the rate of childlessness reached 10%.

After this all-time low, childlessness started to rise again. The probability of being childless for cohorts of women born in the 1960s has been reported to be around 14.5% on average in Europe, and around 20% for women born in the 1970s (Sobotka, 2017). Still, this average point comes together with country specificities, as well as differentials across social groups, and childlessness in some regions seems to be levelling off to lower or higher level. For example, Germany, Switzerland and Italy are the countries with the highest scores of childless women, 23.1%, 20.9% and 19.8% respectively, while the former socialist countries represent the context in which childlessness is much rarer (Chapter 2, but see also Beaujouan, Brzozowska, and Zeman 2016 for Switzerland; Kreyenfeld and Konietzka 2017 for Germany). Moreover, if in the majority of contexts, childlessness appears to be settled or increased, there are some countries in which childlessness has decreased, for example passing in Switzerland from 22% for the cohort of women born in the mid-1960s to 19% for the women born in the early 1970s (Beaujouan *et al.,* 2017; Sobotka, 2017).

Overall, this pattern shows how the trend of childlessness has been following a u-shaped pattern: starting from high childless levels among the cohorts born in the early 20th century, a sharp decline followed across the cohorts born before the 1950s and, after having reached this all-time low, the number of women without children began to increase again, with a steady increase in the most recent cohorts born after the Second World War (Miettinen *et al.*, 2015; Rowland, 2007; Sobotka, 2010).

The considerable changes in European generational behaviour have been mentioned as reasons for this resurging increasing trend, in relation to a diminished nuptiality of younger adults, declining birth rates (Livi Bacci, 2015).

### *2.1. Characteristics of the second peak of childlessness*

The development of childlessness over a long period allows drawing some considerations. Notwithstanding parenthood is increasingly viewed in public discourse as a moral and social imperative, empirical research shows that not all people have children, neither they all had children in the past. On the contrary, the history of European populations shows how the proportion of people without children was also significant in the past. This further means that the decline of the importance of motherhood and fatherhood, which has been described as a recent phenomenon (Ariès, 1980), should be questioned. Third, although childless levels nowadays appear to be similar to the levels of childlessness in the past, the individual and social determinants of it were different.

Therefore, although childlessness does not represent a new phenomenon per se, it has new characteristics compared to the past. The high rate of childlessness for women born at the turn of the 20th century was mainly connected with what have been defined as traditional causes such as exclusion from marriage and permanent sterility, and to a lesser extent entering marriage late in life (Mencarini and Tanturri, 2006). In pre-industrial western Europe, men and women could end their life without children for several reasons, most of which were related to involuntary circumstances. First of all, war and poverty not only introduced malnutrition and precarious living conditions, but also a gender imbalance due to higher mortality rates of males on the one side and a postponement mechanism on the other (Rowland, 2007). The chances of finding a stable partner decreased widespread during, married women remained more often widowed without the possibility to marrying again, and some couples postponed the birth of the child to better time until it was too late (Baudin, De La Croix and Gobbi, 2017). Moreover, a higher incidence of disease and pregnancy-related infection are also among the most common cause of infertility in developing countries (Kreyenfeld *et al.*, 2010).

New causes have since then been proposed in the literature to explaining rising childlessness, such as new systems of preferences, different attitudes to gender and

family, as well as social, economic, and cultural changes (Van De Kaa, 1987; Esping-Andersen and Billari, 2015; Tanturri *et al.,* 2015).

On the one side, contemporary childlessness become less and less related to poverty and economic adversity. The diffusion of contraception and other effective methods of birth control in the 1960s gave women greater power and control over motherhood. With better education and improved career opportunities, women gained economic independence and delayed marriage and fertility (Becker, 1981b; Blossfeld and De Rose, 1992; Blossfeld and Huinink, 1991). On the basis of this evidence, contemporary childlessness has been regarded more as the result of new individual preferences alternative to motherhood and new structural conditions, and not only a matter of fate.

On the other side, the timing of entry into marriage and into parenthood have also been affected by new sets of constraints. The increasing demands of education and new economic and career aspirations for both men and women are commonly linked to a delayed family formation. Those who intend to have a family now face different obstacles than in the past when deciding whether to have children, which do not always allow individual preferences toward fertility to be fully expressed. For example, in Southern European countries, family and work policies barely keep up with the new demands and changed values related to the family. Furthermore, research shows how the intended family size is still larger than the actual family size (Harknett and Hartnett, 2014).

## 3. Theoretical perspectives: fertility and childlessness

Few theories have been advanced to explain definitive childlessness and the research is largely dominated by empirical findings. Most of previous empirical studies have explored and examined the consequences of childlessness on the life

of individuals, whereas less attention has been paid to explain how and why childlessness – both voluntary and involuntary – occurs and what factors affect it. However, these results shed light on some mechanisms of why people are without children.

In the work stream of determinants, research on childlessness mainly describes the individual reasons given by people who are childless, or shift the focus by collating the childless and parents. Among the first group, qualitative exploratory studies investigate the "vocabularies of motives" or "accounts" for the decision not to parent. Very often this research collects narratives of women who identify themselves as being voluntarily childless (Blackstone and Stewart, 2012; Tanturri and Mencarini, 2008). Gender differences in the motivations for voluntary childlessness have been also explored, including male perspectives in the analysis (see Houseknecht 1987; Park, 2005). Among the second group, factors associated with a more general childless status are explored, often contrasting childless people and parents with regard to several personal and psychological traits (e.g., Bloom and Pebley, 1982; Keizer, Dykstra, and Jansen, 2008; Koropeckyj-Cox, Romano, and Moras, 2007; Sobotka, 2010; Tanturri and Mencarini, 2008). The empirical research tended somehow to be part in the analysis of voluntary childlessness by means of qualitative studies on the one hand, and in involuntary or definitive childlessness by means of survey interviews on the other. In both the cases, speaking about mechanisms leading to zero parity is complex. In the first case, individual motivations might be representative of the real reasons for being childless, but the social construction of actions, as well as subsequent mechanisms of ex-post rationalisation in fertility-related behaviour (Westoff and Ryder, 1977), might suggest a misleading interpretation. In the light of research showing social sanctioning of people without children also in post-industrial economies (Dykstra and Hagestad, 2007), this reconstruction of a sanctionable action as a socially accepted narrative seems particularly relevant. This social sanctioning associated with childlessness, enlightens how there is a loss of the meaning of the real reasons for childlessness. In the second case, the problem lies in the fact that studies

observing how the individual characteristics associated with the propensity to be childless have changed over time are relatively rare and they often lack theoretical backing, thus leading to a blurred understanding of the different mechanisms that drive to zero or lower-order parity. For these reasons, the study of childlessness offers extensive room for theoretical investigations on how the complex phenomenon of childlessness can be explained. This section discusses some theories that might represent a background in this direction, and represents, therefore, a key for understanding the present study. The theories will be presented by grouping them into two macro perspectives, differentiating between theories that are framed in an economic or a cultural perspective. For each, the discussion will cover fundamental conception and their potential contribution to explaining definitive childlessness. Whenever possible, empirical studies that can be framed with those theories will be reviewed.

Research on childbearing has been strongly influenced by two main theoretical frameworks: *New Home Economics* (NHE; Becker, 1981a, 1994), which takes a structuralist perspective, and the *Second Demographic Transition* concept (SDT; Lesthaeghe and Van de Kaa, 1986; Van de Kaa, 1987), which represents a culturalist perspective. Around these perspectives, several alternative explanations have been suggested, representing in the majority of the cases a correction or an improvement of the statements and mechanisms described by the two. Although not explicitly referring to childlessness, the theories that will be discussed can serve as theoretical and modelling tool, useful for interpreting why younger cohorts of people remained without children. Besides these two theories, empirical research has been associating several factors with the propensity to be childless. One plausible explanation for increasing childlessness that such research suggests is that an increased number of people without children is only a side phenomenon, largely driven by the postponement and, eventually, the rejection of parenthood. Before examining the two aforementioned perspectives, the next section explicates this latter interpretative framework.

### *3.1. Childlessness as the result of postponement syndrome.*

Before discussing theories that could represent valuable tools for interpreting childlessness, it is worthwhile to question whether the increasing childlessness represents a phenomenon per se, or if it is trained by other social phenomena. An increase in the number of people without children might indeed be the result of two causes that have been taking place since the mid-1960s in Western European countries, namely *low fertility* on the one hand and *late fertility* on the other.

After the post II World War baby boom, fertility dropped to very low levels in many western European countries, and by the late 1980s and early 1990s, women in countries such as Germany, Spain, and Italy started having fewer children and fertility rates dropped far below the replacement level of 2.1 births per woman (Morgan and Taylor, 2006). Many authors have analysed the renewed drop in fertility and the long-term effects (e.g. Kohler *et al.,* 2002; Morgan, 2003; Morgan and Taylor, 2006) and researchers increasingly started drawing attention not only on the *quantum*, but also on the *tempo* of fertility (Bongaarts and Feeney, 1998). Women were limiting the number of children, but they were also postponing births to older ages: the increasing mean age at first delivery – or "postponement transition" as later labelled by Kohler and colleagues (2002) – became one of the most important features of the new fertility decline.

The postponement transition not only had a direct effect on the first age at motherhood, but it had also wide negative implications on the dimensions of families (Billari and Kohler, 2004; Billari, Liefbroer, and Philipov, 2006; Sobotka, 2004a). Indeed, the increased motherhood age reduced higher order births at the beginning, but it started very soon to be also related to a decline of lower parity (Sobotka, 2004b; 2004a). A relatively late transition towards motherhood together with an unchanged biological clock implies indeed fewer available years for conceiving, and rising childlessness might be eventually connected to this. A substantial contribution to period total fertility rates comes indeed from women over their thirties (Gustafsson, 2001), an age that represents the moment when

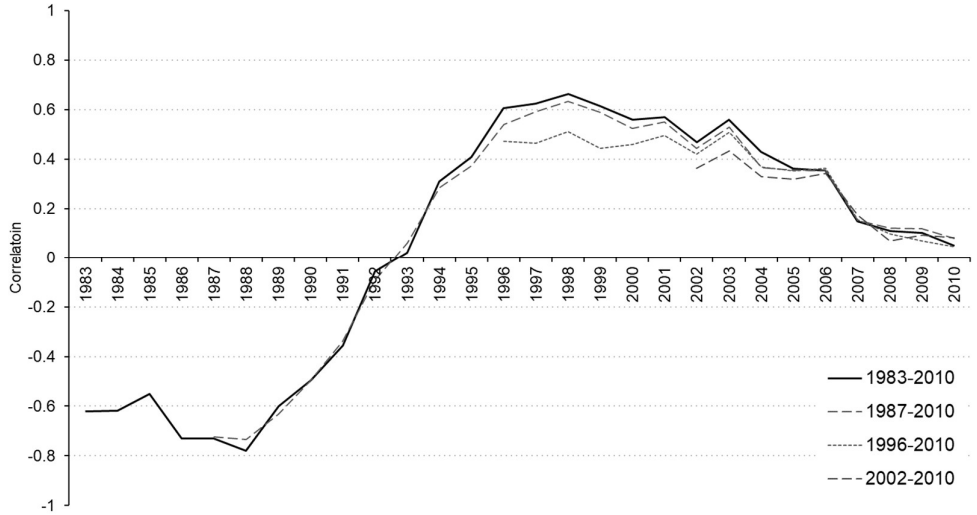
chances of conception start to decrease (ESHRE Capri Workshop Group, 2001; Te Velde and Pearson, 2002). Hence, the more people postpone, the lower the chances that their transition to parenthood will actually happen (Kneale and Joshi, 2008). For this reason, childlessness has also been considered a secondary outcome of low fertility and postponement of first childbirth, which often paves the road to sterility.

Similarly, processes behind childlessness have long been perceived equivalent to those that lead women to have fewer children. This thought has been reinforced by empirical evidence of an initial inverse correlation between the trend of childlessness and the trend of total fertility rate. According to this view, therefore, childlessness has been understood as an endogenous component of the fertility fall (Kohler *et al.*, 2002; Poston and Trent, 1982; Rowland, 2007). However, if we compare rates of childlessness with rates of total fertility over time (Figure 1.1) it is possible to appreciate a decreasing correlation between the two trends at the country level: not only similar fertility levels characterise countries with different proportions of women without children, but this association also varies in time[1]. As already pointed out by Mencarini and Tanturri (2008), such a declining correlation indicates that, even if childlessness has become an important component of the decline in fertility that has occurred in many European countries, it remains a phenomenon itself, to which little attention has been given. If the two phenomena diverge, the underlying explanations might be different, both at the individual- and at the country-level.

This evidence partially challenges a strand of research according to which the rationale for remaining without children should lie within the same justifications that discourage women from having more children, as well as, within the same factors that lead to postponing parenthood.

[1] The correlation between Childlessness and Total Fertility Rates also decreases when looking at it from a cross-country comparison (see Table 2 in the Appendix of Chapter 1).

**Figure 1. 1** – Trend in the cross-country correlation between Total Fertility Rate and Childlessness (1983-2010)




*Sources*: EU-LFS, Eurostat, OECD, Human Fertility Database, author's elaboration. *Notes:* Childlessness rates are computed as the proportion of women 35-39 living without children and by using the European Labour Force Survey. Total fertility rate proportions refer to Eurostat for all countries (http://goo.gl/j7gz5j), except for OECD data retrieved for France 1982-1997 (https://data.oecd.org/chart/4Buv). For Croatia (1983-1996), Slovakia (1983-1999), Hungary (1993-1999), Bulgaria (1983-2000), Germany (1983-1986, only East) and Lithuania (1995-2001) data refer to the Human Fertility Database (http://www.humanfertility.org). *1983-2010* includes data on Belgium, Bulgaria, Czech Republic, France, Greece, Hungary, Italy, Luxemburg, Slovakia, United Kingdom. *1987-2010* adds data on Estonia, the Netherlands, Portugal, Spain. *1996-2010* adds data on Austria and Lithuania. *2002-2010* adds Slovenia, Romania, Cyprus, Poland, Latvia, and Germany.

### *3.2. Childlessness as a result of economic and institutional conditions*

Research on fertility has highlighted the importance of economic conditions for childbearing behaviour.

The significance of economic influences on fertility has often been analysed both with regard to mechanisms operating through individual characteristics (Blossfeld and Huinink, 1991; Cigno and Ermisch, 1989; Gustafsson, 2001, 2005; Happel, Hill, and Low, 1984; Impicciatore and Dalla Zuanna, 2017; Kneale and Joshi, 2008; Mencarini and Tanturri, 2006; Mills *et al.*, 2008; Rondinelli, Aassve, and Billari, 2010), as well as with regards to the mechanisms operating through

economic and institutional arrangements (Billari and Kohler, 2004; Engelhardt, Kögel, and Prskawetz, 2004; Engelhardt and Prskawetz, 2002; Esping-Andersen, 1990; Mills, Blossfeld, and Klijzing, 2005; Myrskylä, Kohler, and Billari, 2009; Sobotka, 2010; Comolli, 2017; Comolli and Bernardi, 2015), which in both the cases have been said to influence individuals' reproductive behaviour and, as a consequence, macro levels of fertility.

The majority of the studies that have been looking at the economic effects on fertility rely on a neoclassical microeconomic perspective of the family, under the banner of New Home Economics (Becker, 1981a, 1994). According to this perspective, the decision to have a child has to be interpreted as a rational choice taken in a context of limited resources. This hypothesis is supported by a vast literature that shows how economic factors affects fertility in a balance between quality and quantity (Bongaarts and Feeney, 1998). To the extent that childlessness can no longer be interpreted solely as the result of an involuntary outcome, the economic perspective offers a valuable theoretical framework for understanding the factors involved in the lack of parenthood. By taking a microeconomic approach to the family, and by considering children as durable consumer goods involving direct and indirect costs under the limited conditions of finance and time, it can be argued that the decision not to have children will hang in the balance between the level of utility and loss related to having a child. Being childless implies indeed the avoidance of 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, (Joshi, 1990)), which would normally be translated into a decline in career opportunities and earning capacity, especially for women who face higher opportunity-costs (Balbo, Billari, and Mills, 2013; Kravdal, 1992). However, costs are also related to being childless, for example, as a result of social penalties and stigma, as well as lack of care in old age. Hence, childlessness will be especially attractive among those women with high human capital (*i.e.* high-income and highly-educated women), which is when the direct, indirect and opportunity

costs associated with parenting are more unfavourable (Baudin, De La Croix and Gobbi, 2017).

The economic approach has been adopted very effectively by a body of empirical research directed at examining the relationship between individual socioeconomic circumstances and fertility. Particularly, education, career and wealth have received considerable attention when related to childbearing, especially when looking at the timing of fertility. A few studies have also investigated the association with socio-economic circumstances and childlessness stressing the important role that they play (Tanturri *et al., 2015*). Notably, it has been shown how spending more time in education and having, consequently, better working positions and earnings, is often associated with a postponement of motherhood (Bavel, 2006; Begall and Mills, 2012; Cigno and Ermisch, 1989; Gustafsson, 2001; Gustafsson and Kalwij, 2006; Happel, Hill and Low, 1984; Kneale and Joshi, 2008; Ní Bhrolcháin and Beaujouan, 2012; Rondinelli, Aassve and Billari, 2010). A large body of literature confirms that this relation holds true also among childless women, whereas it does not hold among men (Barthold, Myrskylä, and Jones, 2012; Rotkirch and Miettinen, 2017; Tanturri *et al.*, 2015). Specifically, education, career orientation, work and occupational status, and income have been reported to play an essential role in shaping childless patterns among women, with higher levels of human capital being positively related both to being childless overall, as well as to being voluntary childless. For example, highly educated women have been shown to be more likely to remain childless than the lower educated in the US (Houseknecht, 1987), in Norway (Kravdal and Rindfuss, 2008), and in Sweden (Hoem, Neyer and Andersson, 2006). Besides, a strong positive educational gradient has been found to be related both to having stronger intentions to be childless (Miettinen *et al.*, 2015), as well as to being voluntary childless (Berrington, 2017 for the UK; Abma and Martinex, 2006; Frejka, 2017 for the US). Childlessness, in all these cases, is therefore interpreted as having economic origins, because women have increased "their investments in education and job careers. The higher the level of education of women and the better their job

perspectives, the more they will try to postpone or even to avoid marriage and motherhood" (Blossfeld and Huinink, 1991: 146). Nevertheless, recent research shows also evidence that contrasts this perspective. For example, the rise of childlessness has been reported to be scarcely related to female's growing educational attainment (Beaujouan, Brzozowska, and Zeman, 2016) and levels of definitive childlessness have been found to be higher among the least educated women in Scandinavian countries (Jalovaara *et al.*, 2018), which might suggests that preferences and constraints have changed over the last decades.

The economic perspective and its subsequent developments also offer a useful source for explaining the rise of childlessness, by interpreting this increase in terms of changes in the population, and in terms of the economic situation. A vast literature has analysed the link between economic development and family-related behaviour. Notably, relating to fertility many authors have focused on the macro-level correlation between economic cycles and family formations. The underlying mechanisms of the association between these two phenomena have often been interpreted in the area of economic and labour uncertainty (Easterlin, 1976; Mills, Blossfeld and Klijzing, 2005; Oppenheimer, 1988, 2003), and, for this reason, they can be considered to stem from the neoclassical perspective. Notably, empirical investigation has shown how economic development and fertility are pro-cyclically related (Ahn and Mira, 2002; Andersson, 2000; Sobotka, Skirbekk, and Philipov, 2011). Particularly, economic downturn or recessions have been found to defer the transition to the first child (Matysiak and Vignoli, 2013; Mills and Blossfeld, 2003), leading to a steady decline of both fertility rates overall, and to a downward decision toward childbearing both among very young women and women at older reproductive ages (Aarssen and Altman, 2006; Engelhardt, Kögel and Prskawetz, 2004; Myrskylä, Kohler and Billari, 2009; Tragaki and Bagavos, 2019; Sobotka, Skirbekk and Philipov, 2011). Research also evidence that the link between economic shocks and childbearing behaviour also exists in the case of childlessness, to the extent that women who arrive childless near the end of their reproductive

period are found to being permanently affected by the economic crisis (Caltabiano, Castiglioni, and Rosina, 2009 for Italy; Comolli and Bernardi, 2015 for the US).

However, the extent to which economic slowdowns affect childlessness and the mechanisms underlying it, are unclear. It has been argued that economic shocks bring a delay and an abandonment of parenthood (Livi Bacci, 2015), therefore raising the share of childlessness, but empirical results are mixed. Arguing in terms of uncertainty, Comolli and Bernardi (2015) studied the effect of the economic downturn on childlessness in the US and found that childlessness was overall increased during the crisis. On the contrary, by applying the same analytical strategy in the Italian context, Caltabiano, Comolli and Rosina (2017) show that the proportion of childless women during the crisis did not increase in excess of an existing long-term trend. Furthermore, countries with highest levels of childlessness have very different economic structures. For instance, Italy and Greece, which represent inefficient economies and labour markets, report high and increasing levels of childlessness. Germany, with one of the most robust European economies, is also one of the countries with the most significant share of childless people.

The aforementioned divergent results in analysing childlessness between different European assets, envisages the institutional argument of the economic perspectives. The institutional perspective enlightens how the different institutional assets that differentiate welfare regime types, and labour market regulations in different countries, might contribute to explaining why transition toward childlessness is not uniform across countries.

In the wake of Esping-Andersen's work (1990), a more extensive explanation for childlessness involves institutional influences and the constellation of policies that regulate labour market conditions and family services (Adsera, 2004; Sobotka, 2017). In the light of the evidence of a negative relation between childlessness and female labour market participation (Miettinen *et al.*, 2015) together with a rise in the relative cost of childbearing among specific social groups, welfare state arrangements could make having children more or less attractive, or more or less

difficult. The welfare state approach toward fertility has been increasing over the years and the role of national configurations on fertility has been widely examined and discussed in the literature (Barbieri and Bozzon, 2016; Mills and Blossfeld, 2001; Mills, Blossfeld, and Klijzing, 2005).

Vast research shows how in liberal and socio-democratic regimes there have typically been high levels of fertility, whereas in central and southern Europe low fertility has lately been a more persistent pattern (Goldstein, Sobotka, and Jasilioniene, 2009). In the case of childlessness, the country variation seems, however, to be not entirely coherent with the classifications of Esping-Andersen and Ferrera. Notwithstanding the need to dig deeper into this relationship, the intensification of competition and deregulation in the labour market that accompanied an increase in precarious employment (Mills, Blossfeld and Klijzing, 2005) might suggest a detrimental effect on the formation of new families, thus reinforcing childlessness. This is especially true among the younger cohorts, which more than others suffer from these recent developments (Mills and Blossfeld, 2001) and in those countries – like Italy – where the welfare regime is hardly generous toward families with children (Barbieri and Bozzon, 2016; Bozzon and Guetto, 2012). The fear of failing to raise and to support children might, in this situation, become a sufficient reason not only to postpone having children, but also to not having any. Nevertheless, whereas the welfare state hypothesis has been empirically tested in the case of fertility differentials across different countries, it remains unclear how this should anticipate patterns of childlessness, since empirical research on this topic is still relatively scarce.

In search of a possible solution for low fertility, generous family policies which enable the reconciliation of work and family, have been indicated as the way forward since the early 1980s (Bianchi, 2000; Björklund, 2006; Gauthier, 2007; Hoem, 1993; Korpi, Ferrarini, and Englund, 2013; Lewis, 2006). But the understanding of the impact of policies in influencing or in determining the decisions of women about fertility is limited, and few studies have specifically analysed this effect on childlessness.

Some researchers have documented a weak relationship between family policies and fertility (Castles, 2003; Neyer, 2003), whereas others have found an alleviating impact of the cost of children in money transfers, parental leave, care services and nursing, as well as in the labour market and fiscal manoeuvrings (Billingsley and Ferrarini, 2014; Chesnais, 1998; Gauthier, 2007).

Concerning childlessness, the review of the literature shows only one research report on the link between childlessness and family policies, which states evidence of a sensitivity of childlessness to family-friendly arrangements and national family policies (Hakim, 2005). Therefore, if quantitative research provides some pronatalist evidence of family-related public policies, the question about what effects policy have on childlessness have not been satisfactorily answered and the mechanisms by which these effects would operate remain unclear and untested.

To sum up, the review of the empirical research on childlessness seeks to position explanation for it into discourses in line with the economic arguments. However, counterintuitive empirical evidence also suggests that economic factors alone might not be sufficient in understanding mechanisms that work behind childlessness. In front of the empirical evidence about how socio-economic conditions are linked to a decrease of high-parity births, but not much to a decrease in low-parity births (Bulatao, Lee, Hollerbach, and Bongaarts, 1983), rational motivations might not be enough for explaining childlessness. Against this neoclassical perspective, the concept of the Second Demographic Transition and several other perspectives that focus more on a cultural shift toward postmodern attitudes and norms (Van de Kaa, 2001) have been proposed, and are discussed in the next section.

### *3.3. Childlessness as a result of socio-cultural changes and new preferences and values*

Whether a person is childless or not also depends on the preferences and values they have with regard to childbearing. Hence, besides institutional and economic

factors, a further explanation for increasing childlessness comes from theories that emphasize a value component and that see in the changed European socio-cultural contexts the reasons for recent modifications in family formation (Bernhardt and Goldscheider, 2006; Billingsley, 2010; Lesthaeghe, 1983; Liefbroer, 2005). A leading hypothesis which has been widely adopted to explain changes in family formations as a result of cultural changes comes from the concept of the Second Demographic Transition (Billari *et al.*, 2004; Lesthaeghe, 1995, 2014; Lesthaeghe and Van de Kaa, 1986; Van de Kaa, 1987, 2002; Zaidi and Morgan, 2017).

In its original wording, the drop of fertility well below the replacement levels is what defines this second transition, which differs from the first transition in the factors driving to it (for a discussion see: Zaidi and Morgan 2017). To highlight the contrast between the first and the second demographic transition, Van de Kaa argues indeed that "the first transition to low fertility was dominated by concerns for family and offspring", whereas "the second emphasises the rights and self-fulfilment of individuals" (Van de Kaa, 1987, p. 5). Highlighting how the contraceptive revolution, the sexual revolution and the sex revolution accompanied the SDT, Lesthaeghe specifies how the argument behind the concept was rooted in new individual value orientations and ideologies, *i.e.* the rejection of institutional control, the accentuation of individual autonomy and of personal satisfaction and self-realization (Lesthaeghe, 2014; Surkyn and Lesthaeghe, 2004; Van de Kaa, 2002). Increasing childlessness can also be the result of this profound socio-cultural change that originated from individual values and ideas about family. Particularly, the lack of children can be interpreted in the light of the general weakening of pronatalistic values and of new socialisation experiences that have been shaping the individual preferences for children and family, especially among women (Gillespie, 2001). This deep cultural change that turned out in new attitudes and values among people, increasingly oriented towards greater individual freedom and self-realisation, might explain why childlessness is now more appealing than in the past.

Empirical evidence about how childlessness might be an issue of personal preference comes, primarily, from qualitative samples. By analysing motivations

for childlessness, these investigations show how the desire for independence and freedom often represents the basis of the choice to voluntarily remain without children for women (McAllister and Clarke, 1998; Tanturri and Mencarini, 2003; 2008). Considering high education as an indicator of less traditional attitudes (Lesthaeghe, 1995; Van de Kaa, 1987), also quantitative analyses reporting highly educated women to be more frequent within the permanent childless group or to have more frequent intentions to be childless go along with this interpretation (Burkimsher and Zeman, 2017 for Austria and Switzerland; Köppen, Mazuy, and Toulemon, 2017 for France and UK; Rotkirch and Miettinen, 2017 for Finland). Besides, childless women are usually found to be less traditional and more secularised than mothers (Hakim, 2005; Tanturri and Mencarini, 2008).

This evidence 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). This male-female polarisation serves as an introduction to one of the most significant criticisms made of the SDT, which also applies in explanation of childlessness. Some of the most negative remarks have claimed the SDT has considered changes in male and female preferences to lead to the same consequences, and therefore has overlooked the role of gender (Billari *et al*, 2004). Several scholars then translated these criticisms into alternative or integrative corrections that include the new role of women (see Zaidi and Morgan, 2017 for a review). The need of a gender-based approach is all the greater if we consider that, notwithstanding there are far more men than women who end their life without children (Jalovaara *et al.*, 2018), when it comes to voluntary childlessness, the female counterpart is more significant (Buhr and Huinink, 2017).

On these bases, Hakim's Preference Theory (Hakim, 2003, 2005) assigns a prominent role to women. According to her theory, the choices toward childbearing depend mostly on women's preferences, which after the contraceptive and sex revolutions became more heterogeneous within the population, due to a new structure of chances and risks. Such preferences, which are based on women's new values and not on structural characteristics, make it possible to describe women

according to their preferences allocated to the family rather than to work, and to distinguishing between *a)* adaptive, *b)* work-centred, and *c)* home-centred women. Childlessness, therefore, would be a frequent outcome especially among those women who prioritise work over family. Research on this is also limited, and, thus far, it has only been reported that family-oriented women represent the group which is more likely to have more children, whereas the inverse relations have so far not been investigated (Vitali *et al.*, 2009). Furthermore, the theory does not explain what mechanisms underlie these preferences, and, moreover, assumes that women's preferences do not change over time and in different contexts, which has never been verified.

Perhaps one of the main contributions of theories that underlie the change in values and different cultural traits is to offer an evolutionary explanation (McDonald, 1999) for the fertility decline and increase childlessness.

According to this perspective, the changed composition of the population due to the generalised shift towards values oriented to individualism and self-fulfilment, in contrast to traditional family values, would explain long-term developments, while structural explanations would only be able to explain short-period change (Sobotka, 2017). In this respect, therefore, the SDT makes a valuable contribution to the interpretation of the increased levels of childlessness. Especially Van de Kaa, at the dawn of the conceptualisation of the SDT, and Lesthaeghe later, described the increase in the levels of voluntary childlessness as one of the essential steps in the SDT sequences (Lesthaeghe, 2014; Van de Kaa, 1987). Several empirical analyses support this role in explaining the childless uptrend. For example, albeit not directly analysing determinants of childless diffusion, research shows that in those countries which experienced a shift in public acceptance of childlessness, also levels of childlessness are higher (Merz and Liefbroer, 2012; Noordhuizen, de Graaf, and Sieben, 2010). Moreover, the link between culture and childlessness is also highlighted by research showing a negative relationship between childlessness and traditional family role (Houseknecht, 1987; Hudde, 2018; Jacobson and Heaton, 1991; Kaufman, 2000).

### *3.4. An integrative approach with the concept of "institutionalized gender inequalities"*

As outlined before, the culturalist and structuralist explanations are corroborated by a series of indicators that empirical research finds to be associated with the absence of children. Nevertheless, also several criticisms have been made to both the approaches. Beyond 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, and especially the SDT, have drawn criticisms because failing to take into account the existence of inequalities and thus mistakenly assuming 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 (Zaidi and Morgan, 2017).

To overcome these limitations, explanations that social scientists have been offering to account for fertility levels in different contexts, have been increasingly considering the ongoing transformations of gender roles (Anderson and Kohler, 2015a, 2015b; Arpino, Esping-Andersen, and Pessin, 2015; Bernhardt and Goldscheider, 2006; Esping-Andersen, 2009; Esping-Andersen and Billari, 2015; Goldscheider, Bernhardt, and Lappegård, 2015; McDonald, 2000a, 2000b; Mills, 2010; Mills *et al.*, 2008). Stemming from the pioneering works of Folbre (1983), and Oppenheimer (1982, 1988), the contribution of McDonald goes into this direction with the development of the theory of *gender equity-gender equality* (McDonald, 2000a, 2000b, 2013). Particularly, the theory incorporates ideas of the SDT and acknowledges, at the same time, the structure of actions framed by the economic perspective. Furthermore, in light of the changed role and changed preferences of women, the theory focuses more on the indirect and opportunity

costs that eventually occur through the loss of earnings of the mother, therefore giving a special emphasis to the new role of women in society.

McDonald's core argument is that women are subjected to face a "conflict or inconsistency" (McDonald, 2000b) between the cultural and institutional context in which they perform their decision toward fertility. This conflict, that originates from institutions that lag behind new cultural orientations, arises especially in high-income countries and contribute to rise low fertility. Specifically, to the extent that every system is characterised by a substantial gender stratification and gender roles (Mason, 2001), McDonald's theory predicts that gender equity can occur in two types of institutions: *a)* within institutions oriented to the individual (*i.e.* education and the labour market); *b)* within institutions oriented to the family (*i.e.* division of household and care tasks). Hence, when institutional gender equity and family gender equity are unevenly related – for example when the new opportunity form women in the labour market are not welcomed to the same extent in the household – they can lead to an incoherent perception of equality, and women can recognise the formation of their family to be in contrast with their individual and career aspirations. Under these mechanisms, they will be more likely to opt for childlessness rather than having children. The mechanism that according to the theory would explain the individual choice for childlessness is, therefore, that some groups of women in specific contexts perceive a strong work-family conflict, which largely depends not only on individual preferences but also on external dimensions.

In so doing, the theory provides an innovative framework that integrates together multiple dimensions of analysis, to the extent that it recognises the influence of ideational factors, material factors and gender structure.

Moreover, the theory and its further developments (Anderson and Kohler, 2015a; Esping-Andersen and Billari, 2015; McDonald, 2013), are also useful in understanding the divergences in the pace of childless rates across countries. The U-shaped relationship that McDonald posits between gender equity and fertility, meaning that at the beginning of the female role revolution there was a period of low fertility and high marital instability, which persisted until gender role became

more egalitarian (Esping-Andersen and Billari, 2015), could be also applied to childlessness. This means that childlessness is likely to be more common where women's roles have changed, but where institutions and families have not yet adapted.

For example, Arpino and colleagues (2015), exploring how attitudes in support of men's and women's equal right to paid work are associated with fertility trends at the country level, show how a shift from a context dominated by traditional gender role attitudes to a context which is more gender-symmetrical, is positively related to an increase in fertility. Although they conducted their analysis at a macro level, this has also been proved to work at a micro-level, and greater differences in partners' attitudes have been showed to be associated with lower chances of childbirth events also (Hudde, 2018).

Evidence on childbearing behaviour and childlessness suggests that this perspective can also be useful to explain the increase of childless levels, by also shedding some lights about past and new characteristics of the phenomenon. The share of childlessness started to decline among the 1940s birth cohorts of women, who had on average their first child during the '60s. They represent indeed cohorts of women who were socialised to a traditional gender role model, but for whom the extent of family-work conflict was weak. A disconnection instead characterized the second part of the century with traditional family and gender roles. Yet, this generalised trend toward gender equity within individual-oriented social institutions happened with different speeds – as documented by the varying diffusion of dual-career households (Blossfeld and Drobnic, 2001; Hook, 2006) – and was unequally sustained by gender equity in family-oriented social institutions (McDonald, 2000a). The reiterated rise in childlessness occurred indeed at different stages of this transition: in Southern European countries, for instance, childlessness started to increase again among the cohort of women born in 1955, while in Northern European countries the increase happens before and seems not to have stabilised (Sobotka, 2017).

The key element of the theory is not so much the general level of gender equality achieved by society, as the presence of different degrees of equity within different institutions of the same society and the inconsistency of how each of these relates to women. By and large, the theory is useful in explaining childless trend and differentials, which, more than other approaches seems to able to relates childlessness with socio-economic developments and women's changing role. Nevertheless, empirical investigations of these links are still rare and focus in the most of the cases on transitions toward second births (Oláh and Fratczak, 2003; Torr and Short, 2004).

In light of the theories discussed above, to explain the increase in the lack of children, we must consider the influence of ideational factors as well as material condition, which are not independent of the normative and structural context in which people choose or not to remain childless. On this, empirical research left ample space for the understanding of these influences and integrating the theoretical debate (Bloom *et al.*, 2010).

## 4. Consequences of childlessness

Consequences of childlessness represent probably one amongst the most growing part of research within the field of childlessness. For a long time, studies concentrating in analysing the effect that primary sterility has in the life of people dominated the academic research on childless consequence, mainly by looking at consequences regarding psychological distress due to the lack of experiencing something desired (Greil, 1997). Nevertheless, in the past years also studies about the consequences of voluntary childlessness or compete childlessness have risen, and have been focusing primarily on the effects that being childless could have on mental health in mid and elderly life, as well as on the social and support network

of elderly individuals (Albertini and Mencarini, 2014). Moreover, although analyses have been much more concentrating on the consequences for individuals, increasing attention of rising childlessness has also been paid on the possible implications for the society (Bloom and Plebley, 1982).

### *4.1. Individual consequences of childlessness*

By looking at the individual consequences of lacking children, literature has long framed the studies of childlessness within the assumption of penalties for childless individuals in multiple domains of life. Particularly, vast research has been focussing on the psychological consequences of childlessness, interpreting children as a source of emotional and physical support. According to this view, childless people are expected to suffer from worse perceive health (see Dykstra and Hagestad, 2007). In line with this, there is research showing that having children reduces psychological distress (Lechner, Bolman, and Van Dalen, 2006; Wu and Hart, 2002) and protects people against mental disorder like depression (Buber and Engelhardt, 2008; Koropeckyj-Cox, 1998) or suicidability (Shani *et al.,* 2016).

To the extent that children have always been described as one amongst the primary sources of social integration (Brody, 1985; Shanas, 1971), the distress and worsening conditions concerning health because of childlessness have been generally interpreted in light of the lack of intergenerational relationship. Theoretical expectation predict higher disadvantages for childless people compared to parents, and especially for the childless elderly sub-group because of lacking the social support provided or activated by offspring (Allen and Wiles, 2013; Bachrach, 1980; Gillespie, 2001; Keizer, Dykstra, and Poortman, 2010; Schröder-Butterfill and Marianti, 2006). Yet, empirical research does not seems to fully support this interpretation, and childless people have been described to not worst-off in late life than parents on every dimension (Albertini and Mencarini, 2014; Gibney *et al.*, 2015; Hank and Wagner, 2013; Koropeckyj-Cox, 1998; Zhang and Hayward, 2001).

First of all, several are the studies showing how childless people are not more likely than parents to suffer from isolation, and how they are better off in many ways. To the contrary, childlessness might also bring several beneficial effects in the life of individuals, both in the case of a longer period of life experienced as childless, as well as when looking at childlessness consequences in elderly life. In the domain of psychological wellbeing, despite the strong positive value that is traditionally attached to children, empirical research has shown that raising children might be negatively associated with the health status of mothers (Beckman and Houser, 1982), since, being without children allows people to experience more freedom, less stress, fewer responsibilities and worries, as well as less financial constraints (Mirowsky and Ross, 2003). Positive effects of childlessness have also been found in terms of wages and living conditions (Budig and England, 2001). Not only childless people do not incur the direct costs of raising children, but they also avoid a series of indirect costs related with the accumulation of material resources, job stability, and status positioning. Compared to parents, childless couples have been found to have higher incomes and higher accumulation of wealth over the course of live (Plotnick 2009, for US).

All in all, research has shown that the consequences of childlessness should be taken considered in relation to the context of others aspects of life, like age, gender and social life (Albertini and Kohli, 2009; Albertini and Mencarini, 2014; Chappell and Badger, 1989; Wenger and Burholt, 2001; Wenger, Scott, and Patterson, 2000 for Wales). Higher vulnerability due to childlessness is generally anticipated among elderly compared to adult people (Mahne and Huxhold, 2014; Koropecky kox 1988). However, childless people have also been found to activate several substitution mechanisms to cope with childlessness, throughout their entire life course (Schnettler and Wöhler, 2016). This could explain why some studies find childless elderly people to be equally integrated into the community as well as parents (Kohli and Albertini, 2009; Wenger, 2009). With regard to gender, studies about fertility and family transitions have largely focused on women. Literature has investigated more in detail the characteristics associated with childlessness among

women, whereas relatively little is the work done about the consequences in life of nulliparous men specifically. To the extent that parenthood has been described to be a more significant transition in the life of women than in the life of men (Keizer and Ivanova, 2017; Letherby, 2002; Veevers, 1980), the lack of children has been generally assumed to be more detrimental for a childless woman than for a childless man. However, recent studies documented the importance of including the male counterpart in the analyses, not least because consequences for them might be different that consequences for women (e.g., Eggebeen and Knoester 2001; Keizer *et al.,* 2010; Keizer and Ivanova 2017; Koropeckyj-Cox, 1998).

Furthermore, the impact of lacking children in an individual's life is particularly conditioned by the partnership status. Notably, partnering effects are often described as more important than parental effects for the wellbeing of people, and especially among men (Dykstra and Wagner, 2007; Kendig *et al.*, 2007; Wenger *et al.*, 2007; Umberson *et al.*, 2010, Keizer and Ivanova, 2017). Keizer and colleagues (2010), show that the transition to parenthood in the Netherlands has only a moderate impact on the well-being of individuals, whereas it is largely attributable to other modification in the life sphere, such as partner status or working conditions. More on this, Keizer and Ivanova (2017) illustrate that what matter most for protecting for physical and mental health for men is the relationship satisfaction rather than parenthood. All in all, research has shown how the direct consequences of childlessness are limited once other factors that might play a role in the well-being of elderly people are taken into consideration (Keizer, Dykstra and Poortman, 2010; Koropeckyi-Cox, 1998; Zhang and Hayward, 2001).

If the worst-off consequences for childlessness are not present in elderly age, it might be that they take place when people are still in reproductive age. Literature has shown indeed how there exists a strong social stigma toward childless men and women, who adopt several coping strategies in order to deal with stigmatisation (Chancey and Dumais, 2009; Letherby, 2002; Mueller and Yoder, 1999; Veevers, 1972; 1975; 1980). Such a phenomenon, which appears to be very much widespread, and with no signs of abating also in industrialised countries (Sobotka

and Testa, 2008), suggests, moreover, little value shift of the traditional way of doing family. Procreation within marriage, that traditionally has been perceived as the norm (Veevers, 1980), parenthood, that was seen as a central development stage toward adulthood (Gutmann, 1975), associated with sexual competence (Veevers, 1972) and good health (Rainwater, 1965) mostly remains the normative behaviour. To the contrary, childlessness is perceived as a deviant behaviour, and childless people are typically perceived as less socially desirable, less mature, more materialistic and individualistic (Sobotka and Testa, 2008). This lack of social acceptance of individuals, and to a greater extent of couples, who do not have children underlines how, under the dominant pro-natalists cultural forces, childless people are considered less worthy than other couples, hampering the possible negative consequences childless people might be exposed to.

Overall, it is not clear whether these effects are due to social effects (*i.e.*, parenting has a positive effect on mental health or on socialization) or selection effects related to parenthood (*i.e.*, people with better mental health and with better network abilities are more likely to be parents).

### *4.2. Societal consequences of childlessness*

While the persistence of fertility below the replacement rate has long been taught as one of the primary concerns for many advanced countries, there are no recent studies that have explicitly examined potential economic and societal implication of the enlargement of the childlessness population. As a result, we know little on how changes in the composition of the population due to childlessness affected economy, social institutions and dependency ratios.

Stemming from the work on low and lowest-low fertility it is common to believe that childlessness would have negative consequences on society, since it might tighten up the effects of below replacement. An increased proportion of people who are childless might indeed exacerbate the rapid and ongoing ageing of society, changing not only the structure of population but also the interdependencies

across age. An increased proportion of older adults means that more people need forms of long-term care. This, therefore, confronts the broader economy with several challenges concerning increased government expenditure for health care and pensions (Coale, 1986). In the debate on health policy, the ageing of the population has, furthermore, a knock-on effect on the level of inequalities. Notably, in the face of the tendency toward increasing health care privatisation (Albreht, 2009) inequalities might grow and be related to childlessness, with parents and childless people having different access and quality to health services.

As a result of population ageing, there will also be an increasing number of retired workers and of resources required to pay for their pensions. This increased demand, in turn, will require governments to face new challenges in terms of labour market equilibrium and dependency ratios (Bloom *et al.*, 2010).

However, in a moment in which Malthusian concerns about the consequences of an overpopulated planet are resurgent (e.g. Gee and Gutman, 2000), there is research emerging that shows that childlessness, and the related decline of the population, not always translates into serious economic challenges. A moderate population decline might favour the broader material standard of living (Lee and Mason, 2014). Also, the strong economic interdependencies across generations might lead to potential positive effects. Considering indeed how during childhood and adolescence consumption is higher than production, a diminished part of the young population might also bring to diminish public expenditure for welfare states and national governments.

Nevertheless, a specific attention on the societal implication of childlessness is still lacking, and future research should address it by investigating the changes in the demographic structure of countries due to childlessness, to understand the extent to which policymakers and government will be called upon planning new services.

## 5. Conclusions

Questions about childlessness that still want an answer are several, and research still needs to understand better which causes underlie the second pick of childlessness and that distinguish the rationale of being without children, from the rationale of having fewer children. The analyses I present in this book are widely driven by these aforementioned theoretical perspectives. Namely, the present work seeks to gain interpretation about the changing social factors related with childlessness at the individual level, leaving to future research the scope of analysing consequences at the societal level.

In the following chapters I will focus on the new individual characteristics and societal constraints that are associated with being childless, by focussing on intentions to be childless and their realizations (Chapter 2), on the individual and contextual determinants of childlessness (Chapter 3 and Chapter 4), and, finally, on possible implications that childlessness might entail in later life (Chapter 5).

# CHAPTER II.

# I'VE CHANGED MY MIND. INTENTIONS TO BE CHILDLESS, THEIR STABILITY AND REALISATION IN THE SHORT-TERM[2]


**Brief summary**

*Childlessness has been increasing over the last decades but literature on childlessness mostly focuses on the involuntary component of childlessness, overlooking the part of the population who voluntarily decide to not have children. This chapter focuses on this by shedding lights on the factors related to the development of intentions to be childless, as well as with the stability and realisation of childless intentions in the short-run. The theory of planned behaviour (TPB) is adopted for the understanding of the link between intentions and actual behaviour. Data from the Generation and Gender Survey are investigated through multinomial logistic regressions, which model the relation between individual socio-demographic characteristics and both the stability and realisation of the intentions to be childless in the short run. Although the majority of respondents had stable fertility intentions, a significant proportion of prospective parents and childless changed their mind within three years. We show that individual attitudes towards parenthood and perceived social pressure to become a parent are important correlates of the stability and realisation of childlessness intentions, whereas factors concerning financial, work and housing conditions play a marginal role in affecting their stability and realisation. Overall, the study highlights the importance of adopting a dynamic and long-term perspective when studying childbearing intentions and their realisation.*


[2] A slightly different version of this chapter is currently under review at international peer-reviewed journal European Societies.

## 1. Introduction

In recent decades decreasing fertility and increasing childlessness rates in European societies have stimulated conspicuous research on fertility and its determinants (for a review see Balbo, Billari, and Mills, 2013). However, while the factors affecting fertility intentions and their realisation have been extensively explored, also shedding light on that part of involuntary childlessness connected with the so-called "postponement syndrome" (Kneale and Joshi, 2008), the determinants of voluntary childlessness have received less attention, especially in regard to the formation of the intention to remain childless. A specific focus on zero-fertility intentions and determinants is warranted also because of the decreasing correlation between completed cohort fertility and the prevalence of childlessness (Tanturri *et al.*, 2015). This paper analyses the main correlates of individuals' intentions to remain childless, the factors that explain the stability of these intentions and their realisation in the short term.

The trend in the childlessness rate among cohorts of women born in the 20th century is a U-shaped one.[3] The proportion of women without children at the end of their reproductive life was substantial among the birth cohorts of the beginning of the 1900, reached its lowest point among women born between 1935 and 1945, to then increase significantly among the post-WWII birth cohorts, reaching levels as high as 25-30% in several European countries (OECD, 2015; Rowland, 2007; Sobotka, 2017; Tanturri *et al.*, 2015). Even if in many countries the proportion of childless women among the 1970s birth cohorts is similar to that registered among those born at the beginning of the century, there are marked differences in the composition of non-parents in terms of both the motivations for and pathways to childlessness. In particular, it has been suggested that among the most recent

[3] However, to be noted is that recently, in some countries, there have been signs of a reversal of this trend: see for example the cases of Germany (Destatis, 2017), UK (Berrington, 2017), Sweden (Persson, 2010), and Denmark (Miettinen *et al*., 2015).

cohorts a pivotal role in explaining the increasing childlessness rate has been played by: (*i*) the growing number of women who are (involuntarily) childless due to the postponement of their reproductive decisions (Miettinen *et al.*, 2015); and (*ii*) the increasing amount of women who are voluntarily childless, or child-free (Tanturri and Mencarini, 2008). It has been argued, in other words, that "modern" causes of infertility are emerging and substituting more traditional ones, such as celibacy and sterility (Baudin, De la Croix, and Gobbi, 2017; Kohli and Albertini, 2009; Tanturri *et al.*, 2015).

There are, of course, many and various reasons for the lack of a child, and recent research leaves open the question of whether the increase of recent decades in childlessness is mainly due to the intensification of involuntary childlessness by postponement or to voluntary childlessness (Tanturri and Mencarini, 2008; Nicoletti and Tanturri, 2008). The distinction between voluntary and involuntary childlessness is common in the literature and important for understanding emerging paths to childlessness, despite being to a large extent a theoretical distinction that may not fully reflect the complexity of the reasons for being without children and their variation along individuals' life courses (Dykstra and Hagestad, 2007; Houseknecht, 1987; Tanturri *et al.*, 2015). Previous studies suggest, indeed, that only a small minority of women envisage a life without children as their ideal fertility option, *i.e.* less than 2% on average across OECD countries, and about 4% in Austria and Germany, where the level is the highest (Hakim, 2003; OECD, 2016).

To date, research on the absence of children has mainly treated childlessness as a non-event while studying the timing and quantum of childbearing (Bongaarts and Feeney, 1998; 2000), focusing on the factors related to fertility postponement and implicitly assuming greater likelihood of pregnancy (and fertility) once all the obstacles have been removed. In most cases, therefore, the emphasis has been on the "involuntary" or "accidental" component of childlessness, seeing the lack of children as the failure to realise desired fertility levels, rather than as an active choice. This "selective inattention" (Veevers, 1973) has led to the neglect of the

active childless group, and to less attention being paid to childlessness as a voluntary process. Moreover, demographic and sociological studies of childlessness have been more concerned to analyse the socio-economic and health consequences of a life without children than to explore the factors engendering the intention of childlessness and its realisation (Albertini and Mencarini, 2012; Allen and Wiles, 2013; Buber and Engelhardt, 2008; Dykstra and Wagner, 2007; Gibney *et al.*, 2015; Gillespie, 2001; Hansen, Slagsvold, and Moum, 2009; Keizer, Dykstra, and Poortman, 2010; Kendig *et al.*, 2007; Reibling and Möhring, 2018). As a result, evidence on the factors associated with the intention not to become a parent is relatively scant.

In this chapter we present an analysis of the factors associated with intentions to be childless, and the stability and realisation of these intentions in the short term. The focus is therefore on individuals' negative fertility intentions and subsequent behaviour; the study contributes to shedding light on people who voluntarily live without children. Aside analysing these dynamics on the female population, men are also included in the analysis. Therefore, the study also contributes to knowledge on male childlessness, for which much less research is available than for women.

In the next section we describe our theoretical approach to the study of the formation of intentions to remain childless. Section 3 sets out our research questions and hypotheses, and section 4 presents the data and analytical approach adopted. In the two following sections we report the results of the empirical analyses and, finally, discuss their relevance to research on fertility and childlessness.

## 2. Theoretical background

Numerous mechanisms may operate in the transformation of intentions into actual behaviour, and the Theory of Planned Behaviour (henceforth: TPB; Ajzen,

1985; 1991; Ajzen and Klobas, 2013) provides a useful theoretical framework in which to understand and define these mechanisms and their functioning. The TPB has been usually employed to study fertility intentions and their realisation (e.g., Dommermuth, Klobas and Lappegård, 2001; 2015; Mencarini, Vignoli, and Gottard, 2015; Régnier-Loilier, Vignoli and Dutreuilh, 2011), but we maintain that it can also be effectively applied to understanding childlessness intentions and their realisation.

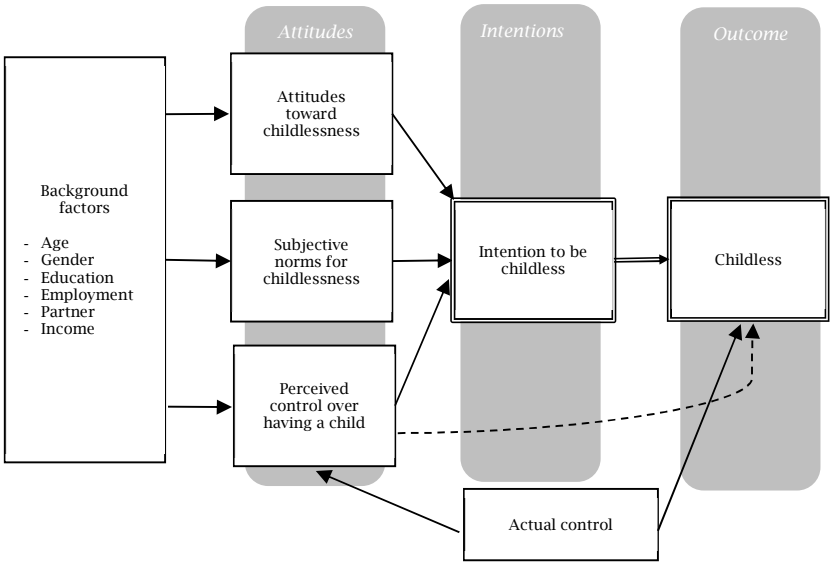
According to the TPB, intentions to attain a behavioural goal are driven by and can be predicted from individuals' (*i*) attitudes toward the specific action; (*ii*) subjective norms associated with the behaviour; (*iii*) perceived behavioural control. In the context of fertility research, attitudes are associated with the consequences of having (or not) a child as perceived by the individual (*behavioural beliefs*). Subjective norms refer to perceived social desirability and social pressure (*normative beliefs*) in regard to having or not having a child among individuals or groups that are important for the individual. Finally, perceived behavioural control (*self-efficacy*) relates to both the perception about the presence of factors that might help or impede the realisation of individual fertility intentions, and the perceived power of these factors in affecting the behaviour. The TPB assumes that perceived control also reflects past experiences; it is also commonly assumed that perceptions of control are a good proxy for actual control, which is influenced by actual conditions (Ajzen, 2005; Bandura, 1977; Klobas and Ajzen, 2015).

The TPB considers the effect of other factors that indirectly influence the formation of intentions; these factors include individual and social background characteristics. Figure 2.1 schematizes the TPB theoretical framework when applied to childlessness.

The central assumption of the TPB is that intentions "capture the motivational factors that influence behaviour" (Ajzen, 1985: 181), because to engage in a specific behaviour people perform a rational or reasoned action based on intentions – which are shaped through a process of reasoning. Therefore, according to the

TPB, the intention to pursue a specific goal is a good predictor of that particular behaviour (Ajzen, 1985; 2005; Dommermuth, Klobas, and Lappegård, 2015).

**Figure 2. 1 –** Antecedents of the intentions to be childless based on the Theory of Planned Behaviour




Source: Authors' adaptation from Ajzen and Klobas (2013), Klobas and Ajzen (2015).

The TPB has given rise to research on different types of behaviour. For instance, the TPB has been applied to the study of health-related behaviours (Norman, Conner and Bell, 1999), leisure choices (Ajzen and Driver, 1992), consumption behaviour (Pavlou and Fygenson, 2006) and – most relevant to the present study – fertility intentions (Ajzen and Klobas, 2013; Billari, Philipov and Testa, 2009; Dommermuth *et al.*, 2011; 2015; Klobas and Ajzen, 2015; Mencarini *et al.,* 2015; Testa and Bolano, 2018; Testa and Stephany, 2017; Trappe and Kuhnt, 2016). Previous studies on fertility intentions and their relation with actual behaviour, however, have some limitations. First, relatively little attention has been paid to the stability of intentions over time and an individual's life course. Most

studies have focused on the mechanisms driving the formation of childbearing intentions, whereas they have overlooked the factors related to the stability of those intentions and their realisation. Second, while previous studies have provided consistent evidence that a significant number of individuals do not realise their desired fertility (OECD, 2016; Toulemon and Testa, 2005), research analysing, at the micro level, the link between fertility intentions and behaviour yields mixed results. For instance, while Trappe and Kuhnt (2016) show that in Germany fertility intentions are a good predictor of childbearing, Berrington and Pattaro (2014) and Spéder and Kapitány (2015) suggest that there are substantive differences between individuals' fertility intentions and their realisation, respectively in the UK and Hungary. Third, the majority of previous studies on fertility intentions and realisation have focused specifically on positive fertility intentions and their consequent realisation, and on the mismatch between ideal and actual fertility (Bernardi, Mynarska and Rossier, 2015; Bongaarts, 2001; Bühler, 2008; Dommermuth *et al.*, 2015; Miller, 2011; Thomson, 1997). Differently, the study of the intention to remain childless and its realisation has not attracted scholars' attention. As a result, the full variability of possible fertility outcomes, which include voluntary childlessness, does not appear to have been satisfactorily addressed and analysed.

The analysis of childlessness intentions and their realisation can contribute to improving our understanding of the micro-level social mechanisms that drive reproductive and non-reproductive behaviour. In the following analyses we explicitly consider the voluntary component of the phenomenon of childlessness. In doing so, this work contributes both to the specific literature about voluntary childlessness, and to the broader research on the link between fertility intentions and behaviour.

## 3. Research questions and hypotheses

The main aim of the study is to analyse the extent to which the intention not to have children in the near future – the reference period being the three years following the interview – is maintained and realised. The reduced length of the observational window clearly limits the generalizability of our findings, especially with respect to the individual's life course. On the other hand, previous studies adopting the TPB approach have shown that intentions that are "in close temporal proximity to the prospective behaviour" are more likely to be better predictors of the related behaviour than intentions referred to an unspecified time in the future (Ajzen and Fishbein, 1973: 49; Billari *et al.*, 2009; Philipov, 2009). Furthermore, by adopting a short-term perspective we are able to use a set of variables from the Generations and Gender Survey which ensure that our study complies with the "principle of compatibility", a necessary condition in studies adopting the TPB framework (Ajzen and Klobas, 2013). Besides providing a description of the main factors associated with the intention to remain childless in the short term, the analyses focus (*i*) on the determinants of the stability, from one wave of the survey to the next, of the individual's intention to remain childless, and (*ii*) on factors associated with the realisation, in the three years following the first interview, of the intention to remain childless. Following the TPB approach and in light of the findings from previous studies, we also develop a set of hypotheses to be tested in the analyses.

Previous empirical studies have consistently shown that – despite the many changes registered in the second part of the 20th century in the area of family-related values (Lesthaeghe, 1995; 2010; McLanahan, 2004; Van de Kaa, 2001) – parenthood is still considered a key step in the individual's transition to adulthood and is often perceived as a social and moral imperative (Ashburn-Nardo, 2017; Duvall, 1962; Gutmann, 1975; Veevers, 1972). It is not surprising, therefore, that a

number of studies have documented that childless men and women are subject to a strong social stigma. Non-parents, whether by choice or by circumstances, are described and perceived less favourably than parents, with the strongest stigma being attached to the voluntary childless (Chancey and Dumais, 2009; Koropeckyj-Cox, Romano and Moras, 2007; Letherby, 2002; Mueller and Yoder, 1999; Park, 2002; Sobotka and Testa, 2008). As a consequence, expressing the intention to be childless is in contrast with the (still) dominant social and cultural values, and it can be seen as a non-normative preference. To the extent that people who do not conform to the prevalent norm are likely to be more convinced in pursuing their intentions and behaviour, we expect that childlessness intentions tend to be stronger, and consequently, more stable and more frequently realised, than the intention to become a parent (Hypothesis 1).

Three further hypotheses are developed in close connection with the TPB approach (Figure 2.1). First, according to the TPB if someone holds strong attitudes towards a specific behaviour, their intentions regarding that behaviour are more stable across time and, in addition, there is a higher probability that these intentions will be realised. Therefore, in the case of childlessness, we should expect that people with stronger attitudes against children and parenthood are more likely to maintain their preference and realise it (Hypothesis 2).

Second, following the TPB, normative beliefs constitute a key factor affecting individual's intentions, their stability and realisation. In line with this prediction, a number of empirical studies have documented that individuals tend to conform to social expectations about childbearing in order to receive the approval of, and avoid conflict with, their significant others, pointing to the crucial role of social interactions in affecting reproductive behaviour (Bernardi and Klärner, 2014; Billari *et al.*, 2009; Kohler, Behrman, and Watkins, 2001). Normative pressure affects both the tempo and quantum of fertility (Balbo and Mills, 2011; Lois and Becker, 2014). Accordingly, we expect perceived social pressure and social desirability to exert an effect on childlessness intentions, their stability and realisation. We hypothesise that the perception of a stronger normative pressure to

have children will reinforce the intention to become a parent, while reducing the likelihood of maintaining the intention to be childless and realising it (Hypothesis 3).

Third, according to the TPB, individual's beliefs about the circumstances/conditions "necessary" to have a child – in particular those regarding the individual's socio-economic situation – may hamper or facilitate the transition to parenthood. Extant studies provide empirical support for this expectation: the lack of a stable partnership (e.g., Gonzalez and Jurado-Guerrero, 2006; Rutigliano and Esping-Andersen, 2018 for Norway and Spain.), suitable housing (e.g., Kulu and Vikat, 2007 for Finland; Vignoli, Drefahl and De Santis 2012 for Italy), financial and job stability (Barbieri *et al.*, 2015 for Southern Europe; Berninger, Weiß and Wagner, 2011 for West Germany; Testa and Basten, 2014 for European Countries) have frequently been found to be important constraints on the decision whether to have a child. In accordance with both these findings and the TPB, we hypothesis that perceived socio-economic condition influences stability and reliability of intentions toward childlessness as well. Specifically, we expect that higher sensitivity of transition to parenthood to people's socio-economic condition is related to having less favourable intentions to having a child in the short run, and to maintain and realise these intentions (Hypothesis 4).

Besides perceived control, and behavioural and normative beliefs, a number of background factors are expected to affect the probability of developing the intention to remain childless, maintaining and realising this preference, as also evidenced by studies on the determinants of childlessness (Hoem, Neyer, and Andersson, 2006; Tanturri and Mencarini, 2008; Tocchioni, 2018). In particular, since the absence of children has been found to be associated with a lack of intensive personal care in later life (Albertini and Kohli, 2017), we expect that the decision to remain childless will be more stable and more often realised among those individuals who have more resources available to cope with the care needs related to old age, in particular we expect a positive correlation between the stability and realisation of childlessness

intentions and (*i*) having a partner, (*ii*) being employed and (*iii*) highly educated (and thus being more likely to enjoy a better economic situation) (Hypothesis 5).

## 4. Data and measures

### *4.1. Data*

The data used for the empirical analyses were taken from the first and second wave of the Generations and Gender Surveys (GGS).[4] The GGS is a longitudinal dataset specifically designed to study family dynamics; it provides high quality and comparable data on respondents who were aged 18-79 at the first wave. The panel data are collected with an interval of three years between the first and the second wave.[5] The GGS is a valuable source for analysing the formation and stability of individual's intentions in regard to childlessness, since it makes it possible to link subsequent behaviour with a previously stated intention. Moreover, the questionnaire includes an extensive set of variables concerning factors related to the TPB. The TPB was adopted as the theoretical framework for developing the core questionnaire, indeed (Vikat *et al.*, 2007).

At the time of the analyses, longitudinal information about childbearing intention and realisation was available for nine countries, namely: Austria, Bulgaria, Czech Republic, France, Georgia, Germany, Italy, Lithuania and Russia (Table 2.1).[6] The sample utilized in the analyses comprised first wave-respondents who were childless at the time of the interview, excluding also individuals who

[4] Access to the GGS data is available at the following link: https://www.ggp-i.org

[5] In Italy the time between waves is four years. However, the period refers to November/December in 2003 and February in 2007, thus making minimal differences compared to the other countries. The sample interviewed in the second wave consisted entirely of respondents who had participated in the first wave, but did not include all the respondents of the first Wave. Between the two waves, indeed, there was a 43% dropout rate.

[6] Hungary was excluded from the analysis because of concerns about the identification of cases between the two waves.

were expecting a child and those who were sexually inactive or beyond reproductive age and people enrolled in education and training (*i.e.* men older and women older than 45 years). Individuals not participating in the second wave of the survey were also excluded from the analyses, since we could not observe these people's fertility intentions and behaviour three years after the first interview. Moreover, we did not include in the analysis subjects lacking information on socio-demographic characteristics, as well as those with more than one item related to the TPB missing. The final sample consisted of 2198 men and 1782 women aged 20-45.

**Table 2. 1** – Years of data collection for each country in the GGS.

| | Wave 1 | Wave 2 |
|---|---|---|
| Austria | 2008/09 | 2012/13 |
| Bulgaria | 2004 | 2007 |
| Czech Republic | 2005 | 2008 |
| France | 2005 | 2008 |
| Georgia | 2006 | 2009 |
| Germany | 2005 | 2008/09 |
| Italy | 2003 | 2007 |
| Lithuania | 2006 | 2009 |
| Russia | 2004 | 2007 |

### *4.2. Sample selection and variables*

In line with our hypotheses, the empirical analyses focused on two dependent variables: the first dependent variable captured the stability of intentions toward childlessness and matched the intention to be childless expressed during the first wave with the intention to be childless three years later. Respondents were asked about their intention to have a child in the next three years.[7] The same question was

[7] Possible answers were "definitely yes", "probably yes", "probably not", and "definitely not". The responses "definitely yes" and "probably yes" were grouped to indicate intentions towards

asked in the second wave, and this made it possible to identify the stability of the intention within a short time.[8] There were three possible outcomes in the stability of intentions (Table 2.2):

*i.* *Prospective parents:* individuals who maintained the intention to be a parent in both waves;

*ii.* *Wavers:* individuals who changed their intention between the two waves. This group includes both those who moved from intended parents to intended childless; as well as from intended childless to intended parents[9];

*iii.* *Prospective childless*: individuals who maintain a stable intention toward childlessness.

**Table 2. 2** – Stability of intentions toward childlessness in the short-term.

| Stability of intentions | | Wave II: Do you intend to have a child in the next three years? | |
|---|---|---|---|
| | | YES | NO |
| Wave I: Do you intend to have a child in the next three years? | YES | *Prospective Parents* (71%) | *Wavers* (28%) |
| | NO | *Wavers* 43% | *Prospective Childless* (57%) |

The second dependent variable had a similar structure and was a measure of the coherence between the expressed intention to be childless and subsequent

parenthood, whereas responses "definitely not" and "probably not" were considered as expressing intentions to be childless.

[8] The GGS also collects information about long-term fertility intentions, and asks respondents the following question "Supposing you do not have a/another child during the next three years, do you intend to have any (more) children at all?" with the same possible responses available for the short-term question. As already pointed out, the decision to examine only short-term planned intentions stems from the fact that intentions that are "in close temporal proximity to the prospective behaviour" are more likely to be better predictors of the related behaviour (Ajzen and Fishbein 1973: 49, Billari et al. 2009, Philipov 2009) and because this enabled us to use the same time window when assessing both the stability of fertility intentions and their realisation.

[9] Due to the small sample size, we considered jointly groups who showed inconsistency in their intentions across waves (or in the intention-realisation process), whether they moved from prospective parenthood to childlessness or vice versa.

behaviour. By matching intention with outcome three years later, we distinguished among (Table 2.3):

*i.* *Voluntary parents*: individuals who intended to be parents and had a child;

*ii.* *Inconsistent*: individuals whose behaviour was inconsistent with their declared intention;

*iii.* *Voluntary childless*: individuals who intended to be childless and were childless.

**Table 2. 3** – Realisation of intentions toward childlessness in the short-term

| Coherence of realisations | | Wave II: Respondent is childless | |
|---|---|---|---|
| | | NO | YES |
| Wave I: Do you intend to have a child in the next three years? | YES | *Voluntary Parents* (27%) | *Inconsistent* (73%) |
| | NO | *Inconsistent* (8%) | *Voluntary Childless* (92%) |

Questions on the factors related to the TPB constituted our main independent variables. In particular, three separate sets of questions gathered information about beliefs and attitudes, subjective norms, and perceived behavioural control toward childlessness (Table 2.4). To maximise the number of observations, in the case of one missing-item within a specific set of variables, we replaced the absent information with the average value of the remaining non-missing questions within the same set. Principal component analysis was applied to extract the factors connected with the TPB; each measurement was rescaled from 0 to 5 so as to have a unitary variance among all the factors and to ease comparison and interpretability. Each factor was measured as follows.

To gauge attitudes toward childbearing, we relied on questions investigating the individual's expected consequences of having a child across eleven items. Respondents were requested to express the extent to which they thought a child would have better or worse consequences on their life, by using a five-point scale

where five represented the worst. Following Billari *et al.* (2009) and Dommermuth *et al.* (2011), we retained the division between positive and negative attitudes, and distinguished between attitudes related to the costs and attitudes regarding the benefits of childbearing. Seven items were included in the analysis [10]; viz. respondent's opinions on the fact that having a child would have negative effects on "*the possibility to do what you want*", "*employment opportunities*", and "*financial situation*", were utilized to construct an index of negative attitudes toward childbearing (henceforth: Negative Attitudes). Similarly, we created an indicator of positive attitudes toward childbearing on the basis of the respondent's answers to statements about childbearing consequences on "*what people around you think of you*", "*the joy and satisfaction in life*", "*the closeness with partner*", and "*the closeness with parents*".

To measure subjective norms toward childlessness we examined the strength of perceived social pressure to have a child. Respondents were asked about the extent to which they agreed with the statement that their parents and friends thought that they should have a child in the next three years, with 1 representing the strongest agreement and 5 the lowest. We reversed the scores to obtain an index that provided a weighted measure of perceived social pressure toward parenthood, with higher scores corresponding to the stronger social pressure to become parents.

The measurement of the perceived behavioural control was limited to the perceived importance of control factors, since respondents' beliefs about being in control of that factor were imperfectly measured in the GGS (for a discussion see: Ajzen 2013: 216). This means that the PBC can only be assessed by means of questions investigating individuals' perceptions of factors that they think will influence their decision, but without considering the extent to which they think they will be able to overcome difficulties related to such factors..

[10] Items related to the effects of childbearing on sexual life, on partner's employment opportunities, on the care and security that respondents expected during old age, and on certainty in life were also present in the questionnaire, but were excluded from the analyses since they were not asked in all the countries considered.

**Table 2. 4** – Factor loadings of factors related with the TPB

| | Factor A: Negative Attitudes (related to cost) | Factor B: Positive Attitudes (related to benefits) | Factor C: Norms | Factor D: PBC | Uniqueness |
|---|---|---|---|---|---|
| *If you were to have a child during the next three years, would it be much better (1) or much worse (5) in terms of:* | | | | | |
| *a*. the possibility to do what you want | 0.7703 | | | | 0.3246 |
| *b*. your employment opportunities | 0.7974 | | | | 0.3387 |
| *c*. your financial situation | 0.7867 | | | | 0.3360 |
| *If you were to have a child during the next three years, would it be much worse (1) or much better (5)* | | | | | |
| *d*. what people around you think of you | | 0.6912 | | | 0.4516 |
| *e*. the joy and satisfaction you get from life | | 0.7181 | | | 0.3722 |
| *f*. the closeness between you and your partner | | 0.8107 | | | 0.3169 |
| *g*. closeness between you and your parents | | 0.7196 | | | 0.4671 |
| *To what extent do you agree with these statements: Strongly disagree (1) strongly agree (5)* | | | | | |
| *h*. most of your friends think that you should have a/another child. | | | 0.9270 | | 0.1064 |
| *i*. your parents think that you should have a/another child | | | 0.9231 | | 0.1105 |
| *The decision on whether to have a child during the next three years depends on: (1) not at all (4) a great deal* | | | | | |
| *j*. your financial situation | | | | 0.8368 | 0.2919 |
| *k*. your work | | | | 0.8291 | 0.3027 |
| *l*. your housing conditions | | | | 0.7984 | 0.3538 |
| *m*. your partner's/spouse's work | | | | 0.6625 | 0.5422 |
| *n*. availability of childcare | | | | 0.6622 | 0.5326 |
| *Cronbach's α* | *0.75* | *0.76* | *0.88* | *0.83* | |

*Source*: GGS Wave 1 and Wave 2, authors' calculation. *Note*: Principal Component Analysis, Varimax Rotation, Loadings <0.03 not showed.

In detail, GGS questions investigate whether and to what extent the decision to have or not to have a child depends on the following factors: "*financial situation"*, "*work"*, "*housing conditions"*, "*partner's work"*, and "*childcare availability"*. For each item, responses ranged from 1 (not at all) to 4 (a great deal).

Information on gender, age, socio-economic status, job stability and partnership history of respondents were included as background characteristics. Age was categorised into 5-year groups. Education was measured as the highest level of educational attainment in terms of the International Standard Classification of Education (ISCED), and we distinguished among respondents with low (ISCED 0-2), intermediate (ISCED 3-4), or a high level of education (ISCED 5-6). Furthermore, we differentiated between homeowners and non-homeowners, people in employment and people who had a stable partner.

Employment situation discriminates between the group of those who are unemployed in both the waves or move from employment to unemployment and vice versa (*unstable or unemployed*), and those who maintain an employment situation in both the waves (*stable employed*). Partnership history is also included in the analysis. Therefore, we distinguished between the group of those who have the same partner between the two waves (*stable partnership*), those who start a new relationship (*new partnership*), those who end their relationship and are still single after three years (*ended partnership*), and those who in both waves are without partners (*never partnered*).

### *4.3. Analytic strategy*

The empirical analyses were organized into three steps. The first step considered the main correlates of the intention to remain childless reported by the respondents during the first wave of the survey. In the second step we focused on the stability and reliability of such intentions. To address this issue, we observed whether and how the intention to be childless changed between the first and the second wave (Table 2.2) and evaluated the extent to which the intention to be

childless measured in the first wave related to the fertility outcome measured in the second wave (Table 2.3). Finally, in the third step we applied the TPB framework to examine factors associated with the stability and instability of both intentions and realisations, and considered which factors facilitated or interfered with the accomplishment of the intentions.

Multinomial logistic regression models were estimated separately for men and women because of different mechanisms being likely to affect childbearing behaviour between men and women. Although the majority of studies on childlessness have been carried out on women only, the few analyses that have taken men into account show the existence of a gendered pattern in the effects of socio-demographic characteristics on childlessness (Jalovaara and Fasang 2017, Keizer, Dykstra, and Jansen, 2008, Tocchioni, 2018).

Models were fitted on the pooled sample of countries of the GGS, by controlling for the absence of significant differences between the nine countries considered with country dummies. Checks are provided in the dedicated section "sensitive analyses". The final sample includes 2198 men and 1782 women (Table 2.5).

In what follows, the results from multinomial regressions are expressed as changes in the conditional probability of maintaining and realising both intentions toward parenthood and toward childlessness and presented by comparing factors affecting the stability of intentions with factors affecting the realisation of these intentions in the short run. We comment on the effects of the factors of the TPB first (Figure 2.3), and the effects of socio-demographic characteristics second (Figure 2.4). It is thus possible to avoid the partial redundancy that would have emerged by describing each table separately.

Complete models are available in the appendix of Chapter 2 (Table 2.7 and Table 2.8).

**Table 2. 5** – Description of the sample in the GGS.

| | | Childless at Wave1 | Voluntary Parents | Inconsistent | Voluntary Childless |
|---|---|---|---|---|---|
| | Observations | 3980 | 520 | 1594 | 1866 |
| | Male | 2198 | 283 | 890 | 1025 |
| | Female | 1782 | 237 | 704 | 841 |
| Male | Mean age | 28 | 33 | 32.2 | 31.6 |
| | % Primary education | 18.1 | 11 | 10.5 | 9.1 |
| | % Secondary education | 37.7 | 58.7 | 60.3 | 72.6 |
| | % Tertiary education | 44.3 | 30.4 | 29.2 | 18.3 |
| | % with a stable employment | 85 | 76.3 | 76.5 | 78.4 |
| | % with a partner | 45 | 71.7 | 40.1 | 25.3 |
| | Mean negative attitudes | 2.9 | 2.8 | 2.8 | 3.1 |
| | Mean Positive Attitude | 3 | 3.1 | 3.1 | 2.9 |
| | Mean Subjective Norms | 2.6 | 3.1 | 2.9 | 2.1 |
| | Mean Perceived control | 2.2 | 1.8 | 2.1 | 2.3 |
| Female | Mean age | 28 | 32.6 | 32.7 | 29.7 |
| | % Primary education | 6.1 | 8 | 5 | 6.5 |
| | % Secondary education | 57.1 | 54.9 | 51.6 | 62.4 |
| | % Tertiary education | 36.8 | 37.1 | 43.5 | 31 |
| | % with a stable employment | 85 | 81.9 | 83.7 | 87 |
| | % with a partner | 47.3 | 80.6 | 45.7 | 39.1 |
| | Mean negative attitudes | 3.2 | 3 | 3.1 | 3.4 |
| | Mean Positive Attitude | 2.9 | 2.9 | 3.1 | 2.8 |
| | Mean Subjective Norms | 2.7 | 3.3 | 3 | 2.2 |
| | Mean Perceived control | 2,04 | 3 | 2 | 2.2 |

*Source*: GGS Wave 1 and Wave 2, author's elaboration

## 5. Results

### *5.1. Developing intentions toward childlessness*

We first look at factors associated with reporting the intention to be childless in the first wave of the GGS (Table 2.6). The characteristics associated with the intention of not having children are similar for men and women: age, level of education and partnership status play a significant role, whereas employment status does not show a strong association with the outcome.

In particular, for both men and women, there is a U-shaped relationship between age and the likelihood to remain childless in the short term. Both men and women in young adulthood (20-24) are more likely than older people to express

intentions toward childlessness. Consequently, as we move toward older ages, the probability of observing negative intentions toward parenthood decreases until it starts to grow again over 35 for both men and women.

**Table 2. 6** – Factors associated with the intention to be childless. Logistic Regression (Average Marginal Effects – Wave I)

| | Men | | Women | |
|---|---|---|---|---|
| | AMEs | Std. Err. | AMEs | Std. Err. |
| *Age (ref. 20-24)* | | | | |
| 25-29 | -0.14*** | 0.02 | -0.13*** | 0.03 |
| 30-34 | -0.19*** | 0.03 | -0.10*** | 0.03 |
| 35-39 | -0.15*** | 0.03 | -0.02 | 0.04 |
| 40-45 | -0.07* | 0.04 | 0.18*** | 0.03 |
| *Level of education (ref. Intermediate)* | | | | |
| Low Educated | -0.04 | 0.03 | 0.08* | 0.04 |
| High Educated | -0.05*** | 0.02 | -0.03 | 0.02 |
| *Partnered (ref. Not partnered)* | | | | |
| Partnered | -0.15*** | 0.02 | -0.15*** | 0.02 |
| *Employment status (ref. Not employed)* | | | | |
| Employed | -0.02 | 0.03 | 0.04 | 0.03 |
| *Factors of the TPB* | | | | |
| Negative Attitude | 0.21*** | 0.02 | 0.17*** | 0.01 |
| Positive Attitude | -0.18*** | 0.01 | -0.18*** | 0.02 |
| Subjective Norms | -0.16*** | 0.01 | -0.16*** | 0.01 |
| Perceived Control | 0.03*** | 0.01 | 0.03*** | 0.01 |
| N. of cases | 2,198 | | 1,782 | |

Source: GGS Wave 1 and Wave 2, authors' calculation. * p < .10, ** p < .05, *** p < .01.
Note: Country fixed effects not significant (Complete outcome available in the Appendix of Chapter 2, Table 2.6)

Interestingly, gender differences are found in the relation between individual's educational level and the intention to remain childless. Among men without children those with an intermediate educational level are significantly more likely than the highly educated to express a preference for childlessness. Among women who are childless, the low educated are more likely to report the desire not to

become a mother in the following three years than the middle educated, whereas no differences are found between women with a middle and a high level of education.

There are no gender differences instead concerning the effects of the TPB factors. People with negative attitudes toward children are more likely to not express parenting intentions. This is mirrored on people who have positive attitudes toward children, who are instead less likely to express intentions toward childlessness. Finally, stronger subjective norms related to parenthood are negatively related with intentions toward childlessness, and people with higher scores on the behavioural control index are more likely than people with lower scores to intend to be childless.

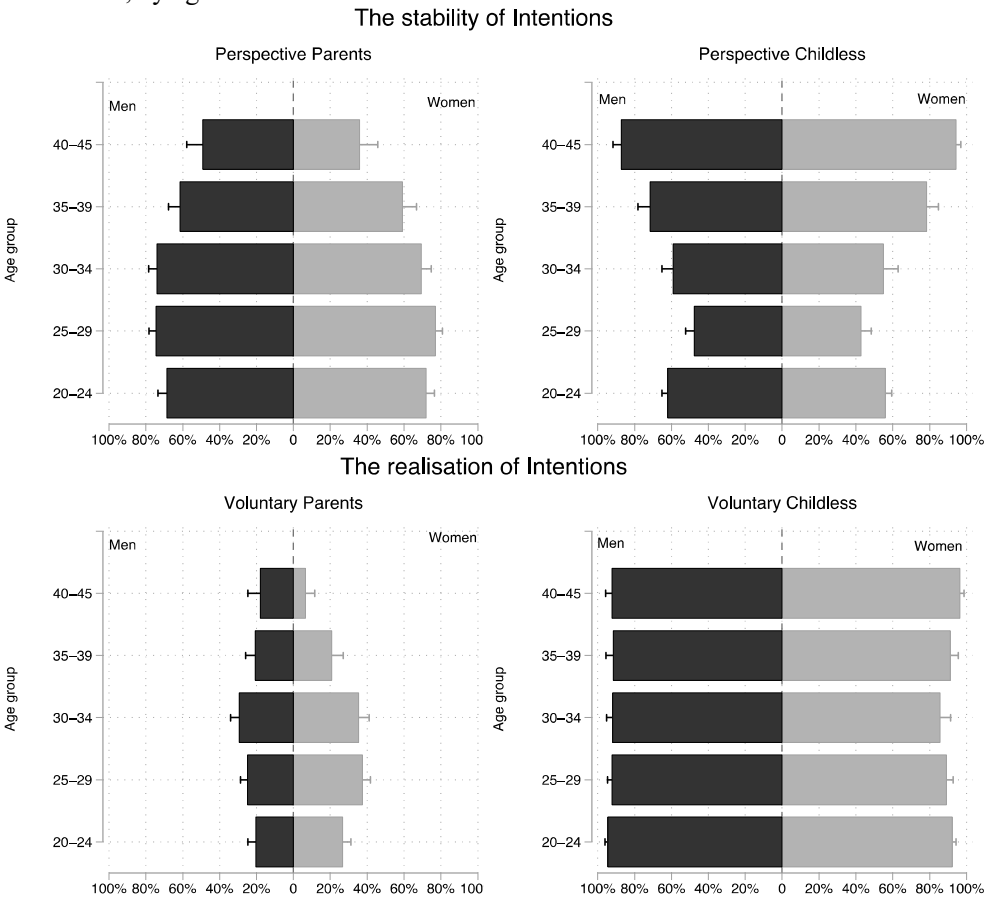
### *5.2. Maintaining and realising intentions toward childlessness*

Our main interest is in analysing which factors influence the stability and realisation of childlessness intentions. To examine descriptively how intentions of childlessness change in the short term, we looked at how previously stated intentions change after a period of three years among different age groups (Figure 2.2).

Contrary to what was suggested by our first hypothesis, on average intentions to be childless are less often maintained in the short-run than the intentions to become a parent: among those who said they did not want to have children in the next three years, 63% reported the same preference three years later, whereas among the prospective parents 69% maintained their intention at the second interview. Also, the likelihood of maintaining a preference for not having a child varies considerably among the different age groups; the prevalence of prospective parents, instead, seems to be less age-dependent. If on the one hand the intentions to be childless are less stable, on the other hand they are more often realised than the intentions to become a parent. Also, the realisation of parenthood plans decreases considerably among those who are 40 years old or older, whereas the

likelihood of realising childless plans seems to be less correlated with the respondent's age.

**Figure 2. 2** – Share of people who maintain and realise their intentions to be a parent or to be childless, by age and sex.




*Source*: GGS Wave1 and Wave 2, authors' calculation.

All things considered, the descriptive evidence provides partial support to our *first hypothesis* and suggests that fertility intentions change over individuals' life courses and particularly unstable in young adulthood. Not only do people often give up on the desire to become a mother or a father, but they also change their mind

with regard to intended childlessness. Overlooking the dynamic aspect of fertility intentions, therefore, may undermine our understanding of the micro-level social mechanisms driving fertility choices and behaviour.

Individuals' characteristics, current situation and expectations influence the stability of intentions and of realisation. Therefore, we utilize multivariate analysis techniques to explore which are the most important factors correlated with maintaining and realising intentions toward childlessness.

The results reported in Figure 2.3 provide support for the hypothesis that people with stronger negative attitudes toward parenthood have more stable intentions to be childless and less stable intentions to be parents. Moreover, they have a higher probability of realising childlessness intentions in the short run, while they more often quit their plans regarding parenthood. At the same time, people with stronger positive attitudes toward parenthood tend to quit their intentions to be childless more often and not to realise them. Thus, at the second interview, these individuals were more likely to have experienced a fertility outcome in contrast with their reproductive plans at the time of the first wave of the survey. These findings partially corroborate our *second hypothesis*: that stronger negative attitudes towards parenthood are positively correlated with the stability of childlessness intentions and their realisation.

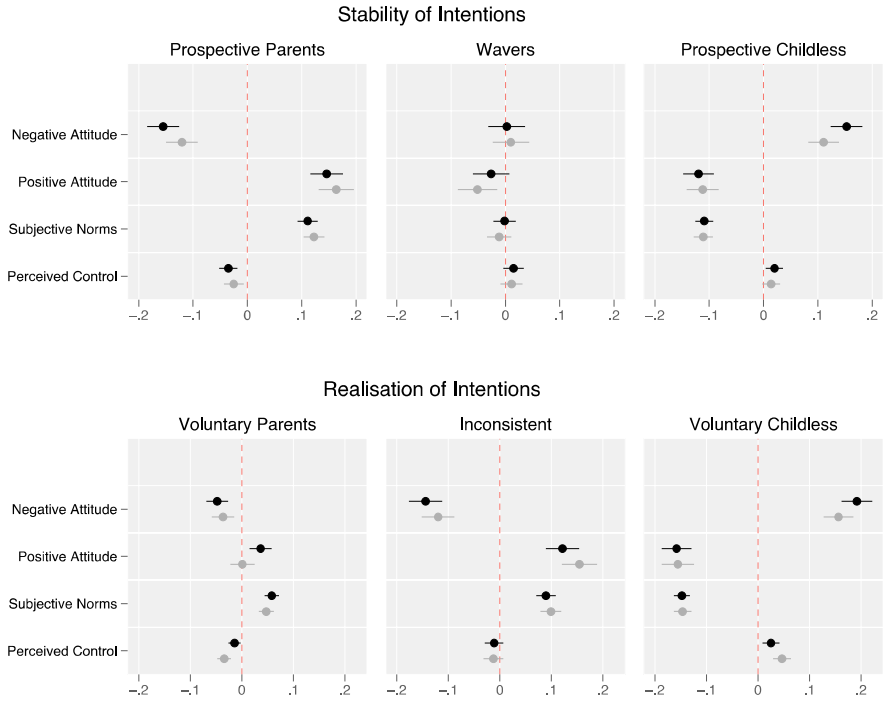
Next, in line with the third hypothesis, the results of the multivariate analyses suggest that stronger subjective norms related to parenthood are significantly associated with a lower likelihood of maintaining childlessness intentions and realising them; whereas, they are positively correlated with the stability and realisation of parenthood plans. This confirms that the perception of a normative pressure for having a child decreases the chances of maintaining and realising childlessness intentions.

Finally, in support of the state hypothesis 4, we found that individuals with higher scores on the behavioural control index are overall less likely to maintain plans toward parenthood and to realise these plans in the near future than people with lower scores. At the same time, results show that people who give more

importance to socioeconomic conditions have higher probability to maintain their intentions to be childless in the short run, as well as a greater probability to realise their plans to remain childless. Despite significant, the effect of the perceived controls is however low in size, indicating how once the decision to be childless has been taken, factors concerning financial, work and housing conditions play a marginal role in affecting their stability and realisation.

**Figure 2. 3** – Stability of Intentions to be childless and coherence of their realisation. Multinomial Logistic Regression (Average Marginal Effects).

• Male • Female




*Source*: GGS Wave 1 and Wave 2, authors' calculation. *Note*: Average Marginal Effects and 95% conf. int. reported. Models control for groups of age, education, partnership and working history and home ownership. Country fixed effect. The model about stability of intentions also controls for birth of a child between the waves (Complete outcome in the Appendix of Chapter 2, Table 2.8 and Table 2.9).

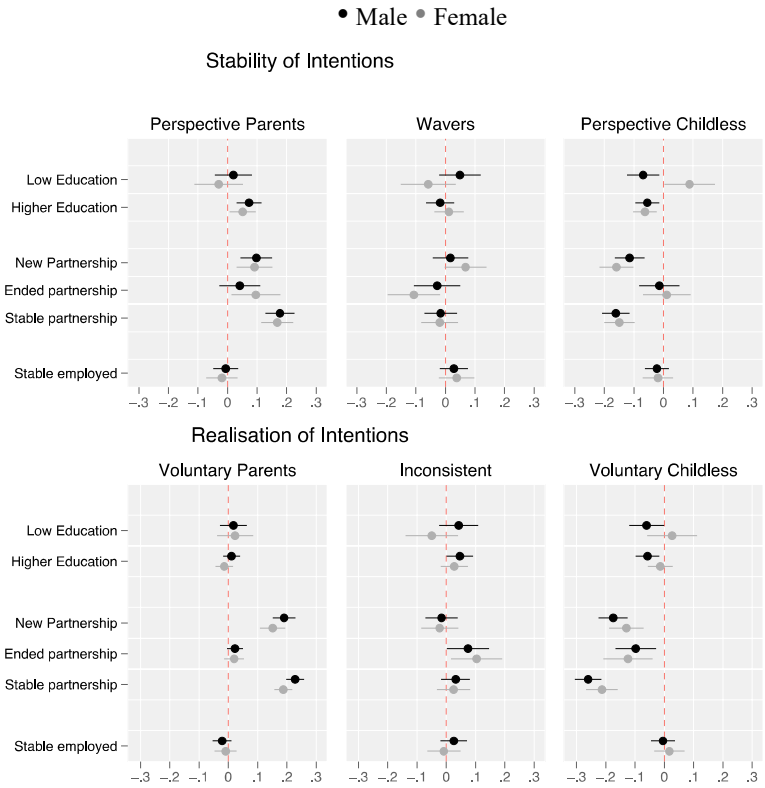
All in all, there are no significant gender differences concerning the role that the attitudes related with benefits and costs brought by children, subjective norms and perceived control play on the probability of maintaining and realising individual intentions to be childless. The only observable differences concern the maintenance and realisation of intentions toward parenthood. Notably, the results show that having more favourable attitudes related with the benefits of children is a factor that positively correlates with the probability of maintaining the intentions to have children among men, while it does not affect female behavior.

On considering the stratification of the phenomenon of voluntary childlessness (Figure 2.4) it is difficult to draw any firm conclusion about the relation with individuals' different socio-economic characteristics. In line with recent findings (Kreyenfled and Konietzka, 2017), we found a negative correlation between education and childlessness. Highly educated people generally are less likely to maintain childless intentions in the short run, compared to lower educated people and they also have a lower probability of realising those intentions. Nevertheless, gender patterns appears when considering the role of education on the stability and reliability of intentions toward childlessness. Among women, the better educated are those with the lower propensity to maintain intentions toward childlessness in the short run, whereas no differences related to women's education level are found regarding the realisation to not attain having a child. Differently, among men, are those with an intermediate level of education those who maintain and realise more often the stated intentions toward childlessness.

Changes in family life play a role in intended childlessness and its realisation. Being in a stable partnership, or entering a new one, is strongly and negatively correlated with maintaining and realising childlessness intentions, whereas it is positively associated with making the transition to parenthood in the three years between the two waves of the GGS. This appears to be true both among women and among men, and it highlight the positive role of being in a couple on having children.

Differently, stable employment does not seem to be significantly associated with fertility intentions and outcomes in the short term, neither for women, nor for men.

Figure 2. 4 – Stability of intentions to be childless and their realisation. Multinomial Logistic regression (Average Marginal Effects).




*Source*: GGS Wave 1 and Wave 2, authors' calculation. *Note*: Average Marginal Effects and 95% conf. int. reported. Models control for groups of age, TPB factors, and home ownership. Country fixed effect. The first model also controls for birth of a child between the waves (Complete outcome in the Appendix of Chapter 2, Table 2.8 and Table 2.9).

In consideration of the above, the relationship between socio-economic status and the decision to remain childless, as well as to realise the intention to be childless, appears more complex than expected and results are not clear enough to

provide support for the fifth hypothesis: that the decision to be without children is more stable among people with higher economic resources and opportunities.

### *5.3. Sensitivity analyses*

One potential limitation of the empirical analyses reported above is that they include both partnered and non-partnered individuals. Fertility choices, however, are typically made at the couple level and looking for a partner is part of the decision-making process in regard to having a child (Jalovaara and Fasang, 2017), as it also shows our analysis. Therefore, we replicated our analyses considering only partnered individuals – and thus respondents who were at risk of making the transition to parenthood. We found small differences in the size of (some of) the coefficients and their significance levels; however, the overall pattern of the associations reported in previous sections does not change (Appendix Table 2.10 and Table 2.11).

A further test was conducted with regard to the age of the respondents. It may be argued that people in the youngest group (*i.e.* 20-24 years old) have a very low risk of making the transition to parenthood. Thus, the analyses were replicated both on the subsample of individuals by different age ranges. Firstly, we consider a sample of people aged 25 years or more, secondly, we include individuals aged 35 and above (Appendix Table 2.14 and Table 2.15). In both the cases results did not change in relation to main tested hypotheses.

However, an interesting pattern emerges in relation to how changes in the partnership are associated with maintaining and realising the intentions to be childless or parent. The analyses conducted on the sample aged 35-45 show that having a new partner is not significantly associated with any change in intentions or realization of fertility for women. Differently, men who change partner between the two waves have the highest chances of maintaining over time the intentions to have children and achieve these intentions in the short run, even more than those with a stable partner. Future result might address this aspect more in depth and

clarify whether men give a stronger priority to children compared to women, and whether they are willing to change partner to achieve this goal.

Finally, a further limitation of our analytic strategy is that we pooled a quite heterogeneous group of countries. Despite the relatively large number of observations, the sample size was not sufficient to fit separately the regression models on each of the countries considered. However, we tried to partially address the issue of the heterogeneity of the countries considered by running the analyses on Western European countries only. The results of these latter analyses indicate that the signs of the associations reported above do not change when excluding Eastern European countries from the analyses (Appendix Table 2.12 and Table 2.13).[11]

## 6. Conclusions

After reaching its lowest level among cohorts of women born between 1935 and 1945, the childlessness rate in Europe has been on the increase among post-WWII birth cohorts, reaching levels around or higher than 30% in several countries. Only in recent years there have been the first signs of a trend reversal in some European societies. This trend has taken place within the more general framework of decreasing fertility rates.

Even if the quota of childless women among the 1970s birth cohorts is similar to that registered at the beginning of the 20th century, it has been argued that the paths to childlessness are markedly different from what they were in the past. In particular, scholars have suggested that there has been an increase in the number of women who are (involuntarily) childless due to the postponement of the decision to

[11] The results of sensitivity analysis are presented in the Appendix of Chapter 2, Tables from 2.9 to 2.12.

become a parent and, most importantly, the proportion of women who are voluntarily childless. Nonetheless, most of the previous literature on the topic has focused on the "accidental" or "involuntary" component of childlessness. The aim of this paper, instead, has been to shed light on the decision to be childless, and it has done so by focusing on the stability and realisation of intentions to be childless, adopting a short-term perspective.

The results of our analyses indicate that individuals who claim they want children in the short-term are more likely to keep their intentions unchanged after three years compare to people who say they don't want to have children. Notwithstanding childbearing intentions remain less realised in the case of parenthood than in the case of childlessness, what is worth noting here is that both intentions toward parenthood and childlessness change even in the short-run, and particularly during young adulthood. This finding highlights the need to adopt a dynamic (vs. a static) perspective when studying individuals' fertility intentions and their determinants.

Next, utilizing the approach of the Theory of Planned Behaviour we have shown that individuals' attitudes towards parenthood and perceived social pressure to become a parent – from parents and friends – are important correlates of the stability and realisation of childlessness intentions, whereas factors connected with individuals' perceived control seem to be weakly related with our dependent variables. Moreover, regarding individuals' socio-demographic characteristics our results suggest that one of the main factors driving the stability and realisation of fertility intentions is partnership status and its change. Individuals who, during the observation period, were in a stable partnership, or entered a new partnership, were less likely to maintain their intention not to have children and more likely to change their mind and have a child. Ending a partnership, on the other hand, seems only marginally to affect individuals' fertility intentions.

This study has a number of important limitations, especially in relation to the limited length of the observation period and the need to pool data from different countries because of small sample size. These choices, imposed by data limitations,

have also restricted the possibility to conduct more detailed analyses of variations in individuals' childlessness intentions, and thereby gain better understanding of how intentions change in relation to life course events and individuals' socio-economic conditions.

The results presented in this work suffer more than anything from the limitation given from the short time window available in the GGS data. This limitation prevented us from taking into account the changing nature of fertility decisions. More in detail, the analysis presented here does not enable to discriminate between effects that influence the choice of living a life without children tout court from postponing the arrival of a new-born. Partially, we tried to stem this problem by introducing sub-analyses on a subsample of the population with an age closer to the end of reproductive period, but shortcomings remain. By observing childbearing intentions over a relatively short time period there are interpretative limitation both regarding the validity of the measures of intentions toward parenthood and intentions toward childlessness, because – as the analysis shows – intentions are likely to vary over time in an individual's life course.

These shortcomings are likely to be overcome with longer panel data. Adopting a long-term perspective on voluntary childless plans remains an important challenge for future research. In contrast to motherhood, childlessness is a choice that remains reversible for a long time. Future studies should focus on the evolution of the life course of voluntary childless individuals, considering childlessness as both a preference and an outcome. At this point, however, we think that our results can improve understanding of the dynamics of the micro-level social processes governing childlessness intentions – and thus voluntary childlessness.

# CHAPTER III.

# WOMEN'S EDUCATION AND CHILDLESSNESS. STABILITY AND CHANGE IN THE EDUCATIONAL GRADIENT OF CHILDLESSNESS ACROSS EUROPEAN COUNTRIES.


**Brief Summary**

*There is much work documenting that women's educational attainment relates to their fertility timing and fertility outcome. Fertility levels in a population have been often related to changes in compositions of female education, particularly giving attention to the expansion of women with tertiary degrees. Research also shows that level of education influences being childless. The increased educational attainment of women over time might also offer an explanation for the rapid growth of childlessness that has been taking place over the past decades throughout European counties. Drawing upon the theory of the New Home Economics and of the Second Demographic Transition, this work addresses this issue by analysing the extent to which women's educational attainment relates to different probabilities of being childless over time. By making use of the data of the European Labour Force Survey this chapter documents increasing proportions of adult women living without children across nine European countries up to 2017 and considers how the association between education and lack of children changes over time. Results show that childlessness has generally risen among all educational groups, thus providing evidence in contrast with the assumption that the increase in women's educational attainment is related to increased childlessness. However, the educational gradient of childlessness does not appear to have narrowed over time, showing how better-educated women continue to be more likely to be childless compared to lower-educated counterparts. I discuss these findings in relation to the economic and value change perspectives.*

## 1. Introduction

Education has undergone significant changes over the last decades, especially among women. Nowadays, women are much more educated compared to previous generations and tend to outnumber men both in secondary and tertiary education (Schofer and Meyer, 2005; OECD, 2019a)[12]. This is true also in Southern and Eastern European countries, where the proportions of women with a tertiary or equivalent degree are the smallest in Europe. Although in presence of a a strong geopolitical variation, over the last two decades the proportion of women in the age group 35-39 that have completed tertiary education has been steadily growing, while the proportion of the less-educated women has generally decreased (Figure 3.1).

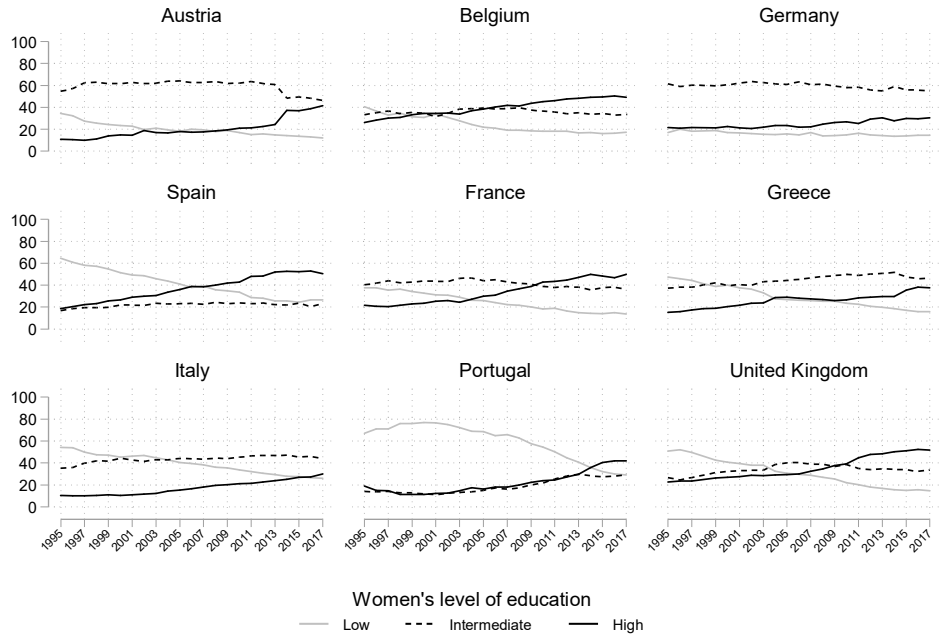
Increasing female participation in tertiary education has important documented consequences on the life course of women. Educational attainment is one of the most influential sources to activate women into employment (Cutuli and Scherer, 2014; Goldthorpe and Jackson, 2008; Thévenon, 2013) and the expansion of women in higher education has been accompanied by a simultaneous increase in women's participation in the labour market across most industrialised societies (OECD, 2019b). As a consequence, women's educational attainment is widely perceived as a powerful engine for socio-economic and demographic changes.

The period between the end of the 20th century and the first decades of the 21st century also saw a generalised fall in fertility levels across western European countries (Goldstein, Sobotka, and Jasilioniene, 2009; Kohler, Billari, and Ortega, 2002). At the same time fertility was falling until reaching previously unseen levels of *low* and *lowest-low fertility* across western European societies (Kohler, Billari

[12] If in 1985 only 20% of women had a secondary qualification, in 2010 this ratio was doubled, against an increase of only 15 percentage points among men. The same happened among tertiary degrees that especially increased among women, passing from 6% in the 1985 to 22% in the 2010, whereas for men from 8 to 16% (Ballarino and Scherer, 2013).

and Ortega, 2002), also the number of women without children saw an exceptional increase and the majority of advanced societies went through the highest ever levels of childlessness documented in contemporary society (Frejka, 2017; Rowland, 2007).

**Figure 3. 1** – Percentage distributions of women at age 35-39 by level of education over time in 8 European Countries.




Source: EU-LFS, author's elaboration

Stimulated by the coincidence of these trends, education has been extensively studied as an explanans to low fertility and a long tradition of research on the relationship between educational expansion and low fertility arisen (e.g., Axinn and Barber, 2001; Rindfuss *et al.*, 1980).

Along with this large literature focussing on the influence of education and both the *timing* and *quantum* of births, increasing childlessness has also stimulated

research interest on the link between women's education and the likelihood to be childless. As well as higher education is associated to having fewer children than intended (Testa, 2014; Iacovu and Tavares, 2011) and fewer children than less educated counterparts (Yang and Morgan, 2003; Bongaarts, 2001; Quesnel-Valléè and Morgan, 2003), extant research shows how childlessness is usually more common among highly educated women (Tanturri *et al.,* 2015).

The present study addresses the relationship between women's educational achievement and definitive childlessness over time, and does so by analysing how the highest level of educational attainment predicts differently the likelihood a woman has to live without children at 35-39 years old across different European countries and over different periods in time.

Investigating how the relationship between educational attainment and lack of children has changed over time is important for several reasons.

First, it could help to understand whether the increase in childlessness can be traced back to women's increasing investment in higher education.

Second, determining if the relationship between childlessness and education has remained stable or has changed over time – and, in case, in which direction – could also provide insights into the question of how costs-opportunity associated with motherhood evolve in societies. On the one hand, the educational gradient of childlessness might be decreased over time, that is, either the more educated women are less often childless or the less educated are more often childless. In the first case, it could mean that the costs associated with motherhood have decreased over time among the better-educated; in the second case, it could mean that childlessness is a new behaviour that spreads from higher toward lower educated. On the other hand, it could be that the educational gradient of childlessness persists, namely the most educated women are equally or increasingly more likely to not have children over time. This could mean that the costs of motherhood have not reduced over time. Considering the substantial investment of welfare regimes addressed to encouraging childbearing implicitly among college-graduated women by attempting to reduce the costs of motherhood and to reconcile a female career with

family, a closing educational gap might be an indicator of effective policies, whereas a stable or increasing gap might advise inefficiencies on the welfare states side.

The remainder of the chapter is structured as follows. The next section briefly sketches previous work and theories connected to the relationship between women's educational attainment and fertility behaviour, explicitly focusing on childlessness. Following the approaches of the *New Home Economics* and the *Second Demographic Transition*, I argue that a changing pattern of the educational gradient of childlessness over time should be expected and I draw the main hypothesis concerning the direction of this change. Section 3 provides information about the data I use and presents the method of the analysis. Section 4 firstly presents a description of the trends of childlessness across nine European countries over time and describes how they are related to educational attainment composition; then, it gives the result of the analysis. Finally, Section 5 offers the concluding remarks.

## 2. Previous work and theoretical background

Female education is widely acknowledged to affect family formation and fertility behaviour. Particularly, research shows how both vertical and horizontal dimensions of education are related to fertility, namely the duration of the enrolment in education and the level of educational attainment reached in the first case; the field of study in the second case (Lappegård and Rønsen, 2005: Van Bavel, 2010). This work considers the vertical dimension of education. Namely, the focus is on the relationship between female educational attainment and childlessness across countries over time.

### *2.1. The relationship between women's education and childlessness*

Greater cultural and economic capital is found to be associated with a delay in the transition to parenthood in industrialised societies (Begall and Mills, 2012; Bhrolcháin and Beaujouan, 2012; Gustafsson and Kalwij, 2006; Kneale and Joshi, 2008; Kravdal and Rindfuss, 2008, Lappegård and Rønsen 2005; Van Bavel, 2006; 2012), as well as with an overall small family size (Skirbbekk, 2008; Yang and Morgan, 2003).

Although scholars have been paying strong attention on the impact that education has on the *timing* and the *quantum* of births, research concerning the role of education on female childlessness is relatively young. In the last few years, however, a growing body of empirical research has focused on this relationship. Current evidence tends to show that childlessness in adulthood is usually more common among highly educated women than among lower educated women throughout Europe. Evidence from single countries indicates that the higher the level of the degree obtained, the higher the chance that a woman has not yet become a mother at a given age. For examples, the more educated women are documented to be more likely to be childless compared to lower educated women in Northern Europe (Kravdal and Rindfuss, 2008 for Norway, Hoem *et al.*, 2006 for Sweden), in Central and Western Europe (Berrington, 2017 in the UK; Kreyenfeld and Konietza 2017 about West and East Germany; Liefbroer and Corijn, 1999 about the Netherlands and Flanders; Neyer, Hoem and Andersson 2017 in Austria and Sweden), as well as in the southern European context (Bagavos, 2010 about Greece; Mencarini and Tanturri, 2006 about Italy). Even though empirical evidence is relatively less developed concerning the nexus between women's educational attainment and voluntary childlessness, research in this field tends to provide support to the evidence of a positive relationship as well. In many cases, more educated women are found to be more likely to develop intentions toward a childless life (Miettinen *et al.,* 2015 about Europe overall; Tanturri and Mencarini,

2008 about Italy), although they appear to maintain less often these intentions in the short run (Chapter 2).

In the large majority of previous studies, these findings have been interpreted in light of two very different approaches, namely the *New Home Economics* (NHE) and the *Second Demographic Transition* thesis (SDT), which explain a lower disposition to motherhood in terms of higher costs or new individuals' values toward children and parenting roles.

According to the NHE, the fact that highly educated women have fewer children or greater likelihood of being childless compared to their less well-educated counterpart are interpreted as being the result of the investment women do in their education and their careers (Blossfeld and Huinink, 1991). To the extent that children may provide to parents personal or subjective benefits, as well as non-material rewards and satisfaction throughout their life, and parents may invest on them according to different preferences, the NHE interprets children as durable and desired goods (Becker, 1960). Since to have them parents needs to carry out some expenditure, childbearing decision-making follows then the same principles behind the decision toward any durable and costly goods. Accordingly, economics theories argue that to decide their number of children parents make reasoned actions, which are contingent on costs and benefits of the children (Becker, 1981; Cigno, 1991). Following this paradigm, the positive association between women's educational attainment and childlessness is due to the rising cost-opportunity of children in relation to the increase in the human capital investment by women. Educational investment is widely acknowledged to be one of the most important means to increase the individual level of human capital, which, in turn, is vastly documented to pave the road to better working positions, which are usually related to better earnings and better earnings profile over the life cycle (Becker, 1962; Becker, Murphy and Tamura, 1990). Therefore, the higher is the level of education achieved by women – being this also an indicator of better job prospects and potential earning – the higher will be the propensity of women to be childless, because the relative loss in terms of career prospects in case of non-market activities such as pregnancy

or childrearing of the child would be higher than the loss incurred by a women with a lower level of education (Cigno and Ermisch, 1989; Happel *et al.,* 1984; Walker, 1995). This interpretation is complemented by numerous studies which highlight how motherhood is associated with a decrease in women's earnings and earning potentials (Avellar and Smock, 2003; Gangl and Ziefle, 2009; Hanson, 1983) and with a size of motherhood penalty higher for higher skilled women (England and Buding, 2016; Wilde, 2010), , despite the sharp increase in women's educational attainment and career aspirations (DiPrete and Buchmann, 2006).

On the side of the SDT, childlessness among women is interpreted as a result of the changes in norms and values (van de Kaa, 2002), according to which a positive association between education and childlessness is to be expected as well. The theory describes the changes in value orientation that occurred during the 1960s, and relates such changes to the demographic transformations associated with living arrangements and family formations that came into being during the same period: cohabitation started to replacing marriage, followed by an increase of extramarital childbirths and divorces, motherhood started to be postponed already in the late 1960s, and low- and lowest-low fertility rates were reached during the 1990s (Billari and Liefbroer, 2004; Surkin and Lesthaeghe, 2004). Especially, at the roots of the new family forms, there was a shift toward the so-called *post-materialist* attitudes and norms. That is, people became more autonomous in the ethical, moral and political sphere, they started to reject forms of institutional controls and authority, and higher-order needs of self-actualisation became rival priorities over doing family (Surkin and Lesthaeghe, 2004; van de Kaa, 2001; Zaidi and Morgan, 2017). This change of values contingent upon the transformations described by the SDT, has been generally embraced by the more educated social groups, which are often described as the "forerunners" of demographic changes (Aassve, Sironi and Bassi, 2011; De Fejter, 1991; Lesthaeghe and Neels, 2002; Lestaheghe and Suryn, 2008; Tanturri and Mencarini, 2008; Thornton, Axinn and Xie, 2008). Hence, to the extent that more educated women are more likely to have

values detached from family life, more educated women might also be more likely to be childless compared to women with lower levels of education.

However, given the increased women's educational attainment and labour force participation in European countries, an additional issue to be considered is the extent to which the education-childlessness link may be changed over time. The directions that this association may have taken are discussed in the next section.

### *2.2. The trend of women's educational attainment and the increasing prevalence of childlessness.*

Given that the highly-educated women tend more to be childless compared to less well-educated counterparts, and given that there are more and more better educated women and less low educated women, the expansion of women in tertiary or equivalent levels of education could be interpreted as a road toward rising childlessness. Contrary to that, literature on NHE and SDT suggests that the educational gradient of childlessness has lessened over time, which should make the rising of childlessness unrelated to the expansion of women in higher educational levels.

As outlined above, the literature on household economics suggests that highly educated women are more likely to be childless because they are faced with higher costs for having children. Nonetheless, the stratification of the costs for children may vary not only among social groups, but also over time in relation to the changed costs associated with motherhood. The cost of children in the labour market is higher for women (Budig and England, 2001) and penalties to having children are notably higher among the women in better positions (Budig *et al.*, 2016). However, the costs for motherhood are associated to social and institutional changes (Barbieri *et al.*, 2014; 2015; Barbieri and Bozzon, 2016; Blossfeld, 1995). Therefore, the stratification of childlessness by women's educational level may change also in

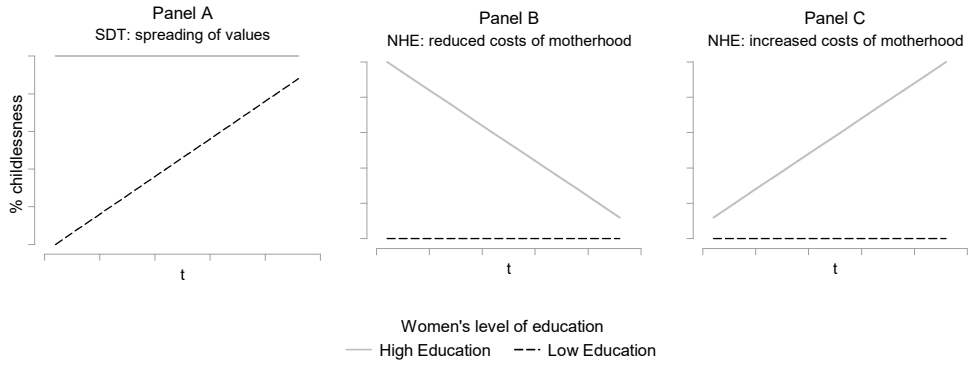
response to the kind of family policies targeted at tackling motherhood costs and penalties in the labour market.

On the one hand, policies might reduce the trade-off between work and family by providing maternity and parental leave that reduces career interruption for women, by favouring the continuity with the same employer, and subsiding or providing childcare arrangements that free mothers from their caregiver roles (Gangl and Ziefle, 2009). Thus, family policies may mitigate the penalties associated with motherhood. Accordingly, it should be expected a lessening association between educational attainment and childlessness over time. Namely, this reduction in the educational gap of childlessness should be related to a diminished likelihood to be childless among the women with higher degrees (Figure 3.2, panel B), as a result of the advancements and growing investments states made with the introduction and instruments addressed at making parenthood more compatible with female work and career (Esping-Andersen, 1999; 2009; Kalwij, 2010). In line with this are the works that document the loss of the traditional division of work within the family and the increased participation of men in care work (Poortman and Van Lippe, 2009), as well as the erosion of the male breadwinner model (Crompton, 1999) in favour of the diffusion of breadwinning women (Drago, Black and Wooden, 2005; Vitali and Arpino, 2016).

On the other hand, policies might keep women at work, yet without reducing the costs associated with motherhood. For example, if policies are designed in such a way that mothers return to work after long career interruptions, changing employers, perhaps landing in an underpaid part-time, costs associated with motherhood might be high, especially for better-skilled women. Under these circumstances, it might be hypothesised that the effect of education on the propensity to be childless has not changed over time, or that it has changed eventually exacerbating the educational gap in childlessness between highly- and low-educated women (Figure 3.2, panel C). Empirical analyses that show how the penalty associated with motherhood has not diminished over time underpin this option (Avellar and Smock, 2003).

The SDT thesis supports alternatively the idea that the rising of childlessness is related to the diffusion of new values. According to the theory, the better-educated groups of individuals are those who develop new values. In this sense, they also represent the "forerunners" of new behaviours, that is they have new ideas which spreads toward lower educated groups of individuals through a process of diffusion, eventually triggering the social changes (Lesthaeghe and Neels, 2002; Lesthaeghe and Surkyn, 2008; Lesthaeghe, 2010). In line with this argument, the association between higher education and greater childlessness may lessen over time as female education increases, due to the aforementioned diffusions mechanism. If better educated women embody the precursors of new rules of behaviours as much for childlessness as for other family behaviours (Ní Bhrolcháin and Beaujouan; Vitali *et al.*, 2015), this is meant to happen because the more educated women broadcast their new values to the less well-educated counterparts, who, in turn, start to behave like them. The result will be an increase of childless also among the lower educated women, and a reduction in the educational gradient of childlessness (Figure 3.2, panel A).

**Figure 3. 2** – Expected dynamic of association between women's level of education and childlessness according to the SDT and NHE perspectives.




Source: author's elaboration

Whereas a growing number of works have been focusing on analysing the extent to which women's tendency to increasingly invest in education, and to do more so compared to men, has modified their reproductive behaviour (Blossfeld and Huinink, 1991; Kravdal and Rindfuss, 2008), relatively less work has been done concerning the changing relationships between education and childlessness among women over time. The body of extant empirical evidence concerning the effects of female educational attainment on childlessness reports generally signs of a changed association, but in many cases, research is based on one single country (Berrington, Stone and Beaujouan, 2015 for Britain; Jalovaara *et al.,* 2018; Neyer *et al.*, 2017; Persson, 2010 for Nordic Countries). Although the emergence of demographic changes might be similar across countries, the ability of states to answer to new risks related with family and childrearing intimately depends according to their very different national welfare system and macro-level settings. States ability to overcome new individual risks and needs largely depends on their economies, structures of the labor market, family responsibility and gender contract (Barbieri and Bozzon, 2016; Barbieri, Cutuli and Tosi, 2012; Esping-Andersen 1990; 2009; Philipov, Liefbroer and Klobas, 2015). Accordingly, macro-level conditions might also mediate the extent to which women can translate their human capital investment into advantageous positions and the size of the costs they face with the (potential) arrival of a child over time, and previous research has seldom accounted for this role. Available evidence on childlessness and parity progression by women level of education shows significant between-country variation in the association between education and fertility, and comparative perspective is of crucial relevance also when analysing the dynamics between childlessness and women's level of education over time.

To the best of my knowledge, there are two studies that examine the time-varying association between education and childlessness across European countries explicitly. Wood and colleagues (2014) analyse educational gradients in the progression to first births focussing on differences across countries and cohorts of women born between 1940 and 1961. They find that highly educated women are

overall less likely to enter motherhood compared to lower educated women, but a limited variation across cohorts within most countries is present. Similarly, Beaujuouan and colleagues (2016) examine the association between trends in childlessness and patterns in education by focussing on birth cohorts corresponding to the period between 1940s and 2000s. They also find that childlessness is limitedly linked to growing educational attainment. Both the studies, however, cover the birth cohorts corresponding to the period between the 1940 and early 2000s, which may be a too limited or too early period to assess a potential effect of female educational expansion on the increasing prevalence of childlessness.

The present work contributes to this debate by assessing to which extent the role of female educational attainment in affecting childlessness has changed over time, by using an alternative dataset that covers a more recent period, viz. 1995-2017. As such, it allows understanding the extent to which the increase of childlessness might be related to massive female educational expansion.

Consequently, the following empirical hypotheses are tested throughout the analysis:

Hypothesis 1: There is a positive relationship between education and childlessness, that is, the more educated women are more likely to be childless.

Hypothesis 2: The relationship between education and childlessness has changed in the period between 1995 and 2017.

Hypothesis 3: The positive relationship between education and childlessness lessened over time; that is, the propensity to be childless is overall less stratified by women's level of education.

## 3. Data and methods

### *3.1. Data*

Analyses are based on the micro-data of the European Union Labor Force Survey (EU LFS), a large household sample survey developed for analysing labor force participation of people aged 15 and over.

Although it is an unusual choice when studying childbearing behaviour, this dataset contains information on all people who co-reside with the respondent and report the relationship these people have with the reference person in the household. In other words, the dataset allows to know which are the persons that in certain age groups do not have coresident children, and to make some assumption to the use of this measure as an indicator of childlessness.

Furthermore, EU-LFS contains information on the highest level of education achieved by respondents at the time of the interview. It is thus a valuable dataset that allows to reconstruct the proportion of women without children living in the same household across European countries, and to relate this trend to the expansion in higher education of women since it also provides comparable information on the educational attainment over time across countries.

### *3.2. Variables and methods*

The EU LFS contains no variable indicating how many children each person in the sample ever had. Nevertheless, a *proxy* measurement for childlessness can be considered. As already said, the dataset includes information about the number of co-resident family members and the relationship the head of the family has with them. This specific design allows linking children to their mother living in the same household. If we assume that observing that people do not have children in their

family unit in specific stages of life is informative is informative of their actual status of childlessness, and that that these people are unlikely to have ever had children or to have children in the future, we can proceed to create a measurement for childlessness by considering women who do not have co-resident biological children[13]. The EU LFS provides the age of individuals grouped into classes of five. Since the implicit risk of this procedure is that it may drive to consider as childless those women whose children already left the household on the one side, as well as to consider as childless women whose children still have to born, I decided to take into account a relatively young range of age, *i.e.* 35-39. In the end, childlessness is measured on women aged 35-39 who do not live in same-sex unions, and it takes value of 1 when a woman is 35-39 and does not have co-resident children in her household, whereas it has value of 0 when a woman in the same age group has co-resident children. This age selection reduces from the risk of considering childless someone with a child who left the household already, although it does not protect form considering as definitive childless people who postponed childbirth till very late ages[14].

Benefits of using the EU LFS outweigh limitations: the dataset provides a big sample – which is important when analysing childlessness – and it covers a good number of European countries and years. As such, it offers a reliable instrument for comparing trends of childlessness across countries and to relate the lack of children in the household to female's education over time in several European countries.

Educational attainment is measured as the highest level of education women had completed at the time of the interview. A drawback of analysing different numbers of countries is that of comparing educational attainment across very

[13] This proxy has also been used in previous studies analysing childlessness (Caltabiano, Comolli and Rosina, 2017).

[14] Albeit slight, transition to first births after 35 years is not null (Appendix Figure 3.8 and 3.9). In 2017, Around 3% of births of first children in the EU were to women aged 40 and above, with the highest proportions registered in Southern European countries (Eurostat, 2017). For this reason, in the appendix I provide a comparison between the proxy of childlessness adopted in this analysis and the levels of childlessness retrievable from previous studies (Table 3.3 and 3.4). The results show that considering 35-39 aged women who are without children in their household leads the risk of overestimating the true levels of childlessness by about 4%.

different educational systems. To minimize problem of comparisons, our measure of education is built by following the 1997 UNESCO International Standard Classification of Education (ISCED) and groups together broad educational levels. In all countries, respondents with lower than secondary education are included in the "low" category (ISCED 0 – ISCED 2), respondents with upper secondary education in the "middle" category (ISCED 3 – 4), and those with tertiary education in the "high" category (ISCED 5 – ISCED 6).

Because information on the type of relationship with the reference person of the survey is available only starting from more recent years and because valid codes for education are unavailable for some countries before the 1995, the analysis is restricted to a smaller sample of countries and time. Namely, countries included are Austria, Belgium, Germany, Spain, France, Greece, Italy, Portugal and United Kingdom and the analysis cover the period from 1995 to 2017.

### *3.3. Analytic strategy*

The first part of the analysis provides the background of this study and it reconstructs the trends of female childlessness across nine European countries throughout the period 1995-2017 (Figure 3.3). The second part of the analysis focuses specifically on the relationship between education and childlessness over time. A descriptive trend of childlessness broken down by educational level over time is firstly presented for women aged 35-39 from 1995 onwards (Figure 3.4). Then, binary logistic regressions are applied to test for the changing association of women's education and the risk to be without children at 35-39 years old over time, by including an interaction term between education and period. Specifically, I investigate the education-childlessness link over time by means of three logistic regressions (Appendix Table 3.3 and 3.4). In a first model the likelihood of being childless when a woman is 35-39 is conditioned only upon time. With this specification I aim at explaining the variance of childlessness in terms of changes over time. Then I specify a second model, in which a variable indicating the level

of education of women is included, so as to measure the average direct role that education plays on childlessness. Third, an interaction term between women's education and time is specified. Such an interaction term is aimed at testing whether the direct effect of education varies over years.

In light of previous works documenting that women's labour force participation is related to augmented costs of children (Budig and England, 2001), that might in turn suggest an increased propensity to be childless, as well as of studies showing how having a stable partner is still a prerequisite toward parenthood (Chapter 2), a final model that includes controls for women's working position and their marital status at the time of the interview is specified, so as to grasp how much of the total effect of education on childlessness is a direct effect of education, and how it has modified over time (Appendix Table 3.3 and 3.4, M3). Thus, we control whether a woman was *a)* previously married, if she declared to be divorced, legally separated or widowed; *b)* not in a union; or *c)* married. To account for the economic activity the data allow to distinguish between women who are *a)* Inactive, *b)* Unemployed, or *c)* Employed at the time of the interview. Within this latter group I further discriminate allocating respondent to their class according to their current occupation based on the International Standard Classification of Occupation (ISCO-88 1 digit). Women were grouped into five classes, distinguishing by *i)* Higher-grade service class (ISCO 1 and 2); *ii)* Lower-grade service class (ISCO 3); *iii)* Skilled worker (ISCO 4 to 7) and *iv)* Unskilled workers (ISCO 8 and 9). People belonging to armed forces were eliminated from the sample (Oesch, 2006). Unfortunately, EU-LFS does not provide a satisfactory measurement of previous female working careers, and the role of occupation on childlessness should be considered with cautions. Women who are childless might be more likely to work compared to mothers on the one hand, as well as women who are not working or have lower-skilled positions more likely to make the transition to children on the other. For the reason that women's allocation of working time at the time of the interview could be endogenous with respect to childlessness I also considered both a model specification with the inclusion of female occupation, as well as a model without it.

Finally, since I expect mechanisms being different across contexts, country separate models are estimated.

## 4. Results

### *4.1. Country differences in the trend of childlessness across Europe*

To deepen the understanding of the variability of the phenomenon of childlessness I reconstructed the evolution of the proportion of women without co-habiting children in the age class 35-39 starting from the1995 across nine European regions (Figure 3.3).

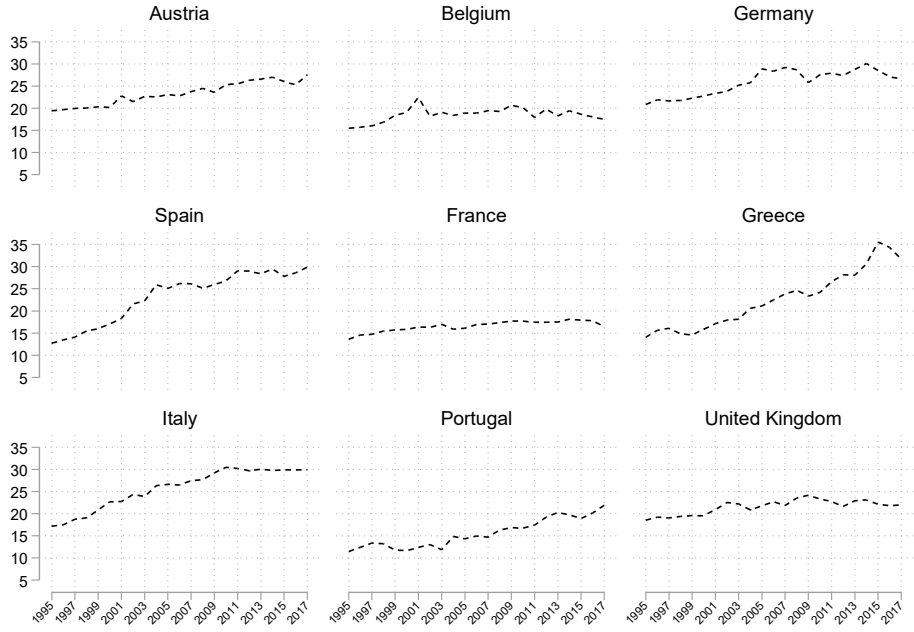
Data are not available early in the time series for all the considered countries, but previous research on childlessness indicates that there was a considerable homogeneity in the proportions of childless women across Europe until the 1990s (Beaujouan *et al.*, 2016; Rowland, 2007). The presented results show instead how the share of women without children started to increase throughout entire Europe, and to vary considerably across countries both in the levels and in the speed of growth.

The highest rates of increase of women aged 35-39 without children occurred in Greece (where the rate rose from 14% in 1995 to 31% in 2017), Italy (from 17% to 30%) and Spain (from 13 % to 30%). Within the Mediterranean context, only Portugal differs as the country that has shown a smaller increase compared to other countries, since it shows a rate of women without children increased by only 8 percentage points.

To accompany the countries of southern Europe in their primacy of high levels and high growth of childlessness, there are also two western European countries, namely Germany and Austria. In these countries the proportion of childless women

have increased in the last twenty years, going from levels close to 20% in 1995 to levels of around 30% in 2017. The trend, however, confirms previous studies showing that in Germany a stalemate in the growth of childless women has occurred in recent years (Destatis, 2017). In this context of generalized growth, only the countries of central Europe, such as Belgium, France and the United Kingdom, report a less market growth. In particular, France is confirmed as the country of Western Europe with the lowest increase in childlessness: if in 1995 the share of women aged 35-39 without children was 14%, in 2017 this had increased by only few percentage points (16.4%).

**Figure 3. 3** – The proportion of women who live childless at 35-39 has generally increased in Europe.

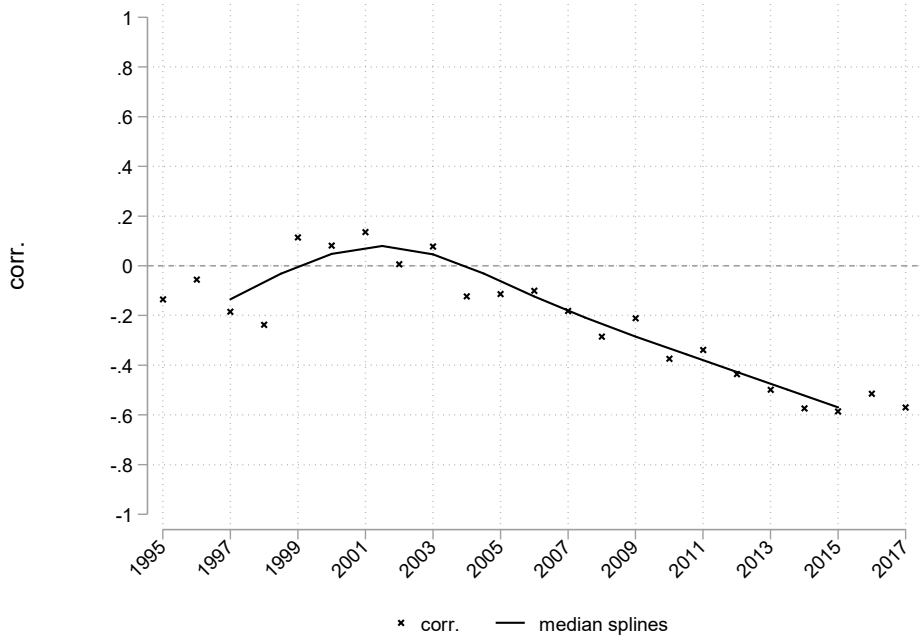



*Source*: EU LFS, author's elaboration. *Note*: Childlessness proportions are computed on women in the age group 35-39 who have no biological children in their household.

*4.2. Educational differences in the trend of childlessness across Europe*

To test the general hypothesis of changed educational gradient of childlessness across European countries over the last two decades, I first present how the correlation between childlessness and education changed over time at an aggregate level.

**Figure 3. 4** – Cross-country correlation over time between levels of childlessness and share of women with tertiary educational attainment, age group 35-39.




*Source*: EU LFS, author's elaboration. *Note*: Childlessness proportions are computed on women in the age group 35-39 who have no biological children in their household.

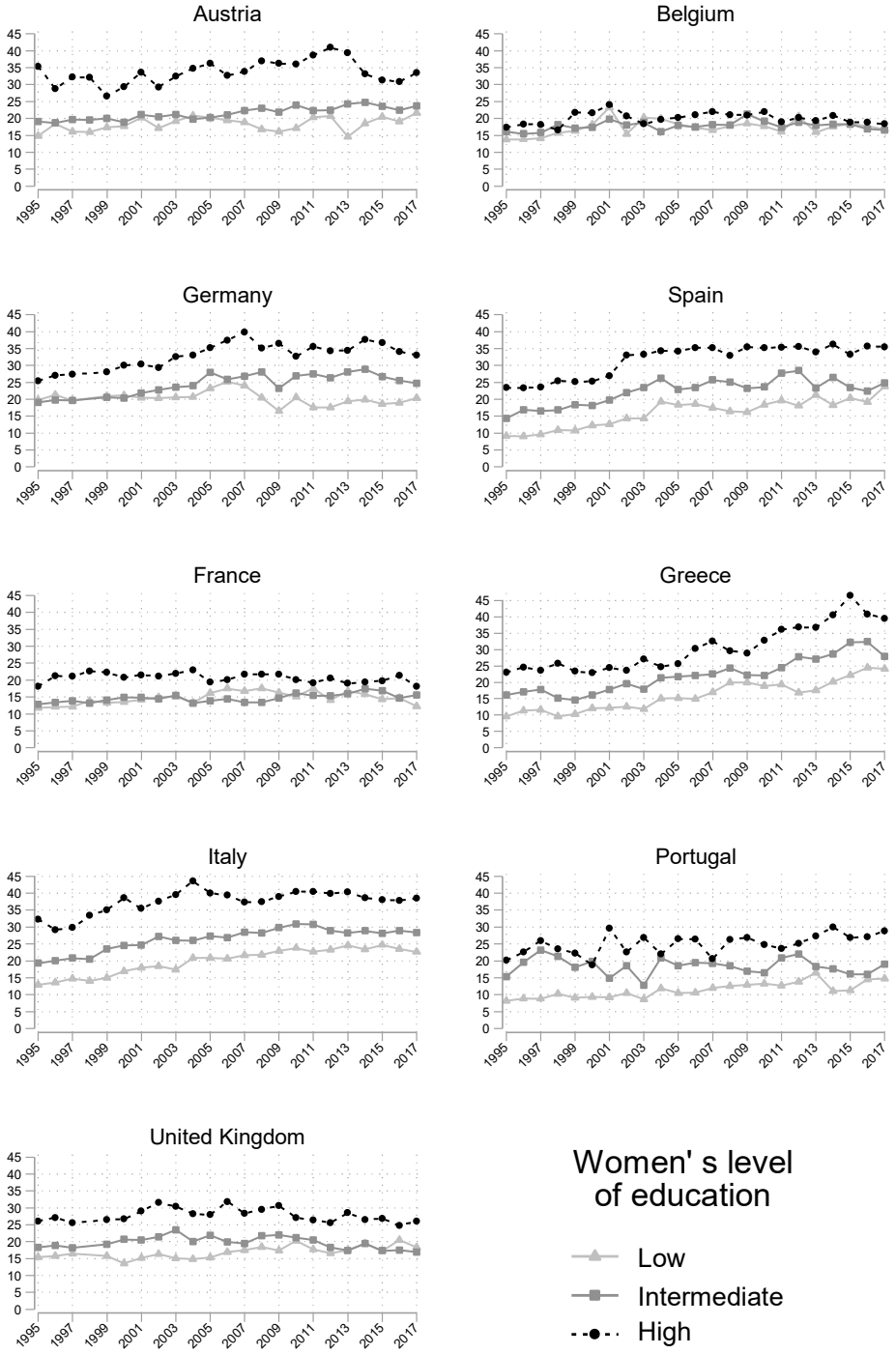
Figure 3.4 reports the correlation coefficients between the share of childless women at 35-39 years old and the proportion of women in the same age with tertiary or equivalent education in the period between 1995-2017. A look at the trend makes

it possible to note how the association between female education and being childless at 35-39 changes over time. The correlation between the share of tertiary educated women and childlessness across European countries is negative until the end of the '90s, then it becomes positive, but starts to decrease significantly till becoming negative around 2005. From this graph it appears therefore that the stratification of childlessness has changed over time. Particularly, it emerges how not only the nexus between education and childlessness has changed over the period between 1995-2017, but also how it has negatively strengthened. This evidence might suggest that the gap between higher and lower education in the propensity to be childless has diminished over time, that is higher childlessness is less common in period when tertiary education is more widespread.

To shine better light into this link, we can look at how the trend of childlessness within education levels changed over time. Thus, I reconstruct the proportion of childlessness at 35-39 by level of education of women over time and across countries, distinguishing proportions of childlessness between low, intermediate and highly educated women. Results presented in Figure 3.5 allow to do some observations.

First, despite the heterogeneity in levels, in almost all the countries considered, there is a positive relationship between education and childlessness that is persistent over time. In line with this, the smallest proportions of childlessness are generally detected among women with low levels of educations, although the differences between low and middle educated groups are generally smaller than the differences between middle and highly educated ones.

**Figure 3. 5** – Proportion of childless women by level of education over time in 9 European countries.




*Source*: EU-LFS, author's elaboration. *Note*: Childlessness proportions are computed on women in the age group 35-39 who have no biological children in their household.

This result highlights how the pattern of association between education and childlessness is not homogeneous across countries on the one side, and emphasises the importance of considering institutional differences on the other, so as to recognise that the role of education may be more important in certain societies than in others.

Third, we can look at how the probability of being childless at 35-39 evolved within educational levels. In a descriptive setting, results show how it is difficult to assess among which level of education the most significant increase in childlessness took place. In some countries indeed (*i.e.* Germany) the childless rate among women with tertiary degrees in 2017 is much higher than the rate registered among women with the same characteristics during the 90s. In other countries instead, the differences in the levels of education remained more stable over time – *i.e.* there was a homogenous increase of childlessness among levels of educations (*i.e.*, Greece, Italy) – or remained very subtle (*i.e.* Belgium, France).

Overall, the increase of childlessness in certain countries appears to be generalised among all levels of education. However, a descriptive setting does not allow understanding the extent to which to the increase of childlessness is related to the increase of women in educational attainment, because the increase of women in higher education is not accounted for. To the extent that better-educated women report overall higher shares of childlessness, and considered that tertiary education has increased over the last decades, it is interesting to investigate whether the increase of female educational attainment is related to a changed likelihood to ben childless among levels of women's education.

### *4.3. To what extent is childlessness related to the increase in educational attainment of women?*

We are interested in analysing whether, year by year, the importance of education in predicting childlessness decreases or increases, that is whether the

educational gap remained stable or changed over time, net of the transformed composition of educational levels. To do this, I investigate the relationship between childlessness and female education through logistic regression and evaluate the extent to which the changed composition of the population in terms of education might have played a role on the time-varying relationship between women's education and childlessness and test the condition of a convergence or divergence across educational lines.

Figure 3.6 shows the results from logistic regression models analysing the association between women's education and the probability of living without children at 35-39. Since in a logistic regression setting the comparison of logit coefficients between different groups is not feasible (Allison 1999, Mood, 2010), Average Marginal Effects (AMEs) and Average Partial Effects (APEs) which allow comparability across groups and have a straightforward interpretation are reported. Hence, AMEs and APEs can be interpreted as differences in the probability of being childless between categories of education, quantified in percentage points. Each graph reports the period of observation on the *x*-axis and the average partial effects of education on the *y*-axis. 95% confidence intervals around the estimates are presented so as to give a sense of the sampling uncertainty. In each model, the reference category is represented by women with a low level of education, which is compared with categories of women with a middle or high level of education.

These outcomes are complemented with results reported in Figure 3.7. In this figure I plotted predicted probabilities of being childless by women's level of education over time, in order to understand whether the expansion or contraction of differences between educational levels is due to an increased or decreased propensity to be childless among specific educational groups.

In most of the countries taken into consideration, except for Belgium, there remains a strong educational gradient over the years, such that the most educated 35- to 39-year-old women were more likely to live without children in 1995 and still are in 2017. On the contrary, women with lower levels of education were more likely to be mothers in 1995 and still are in 2017. Belgium stands out as the only

country in which the level of education reached by women at 35-39 years does not stratify the propensity of the latter to be a mother or to be childless, both in 2017 and in 1995. The hypothesis 1, that is, that there is a positive relationship between education and childlessness such that, as the level of education increases, the propensity to be childless seems, therefore, corroborated.

However, there have been over time some changes in the way in which the level of education achieved by women stratifies the propensity to be childless in the other eight countries included in the analysis. Notably, it can be observed that in Austria, Spain and Portugal, the educational gradient of childlessness has tended to remain stable over the years. In Germany and Greece, on the contrary, the educational gradient has intensified over time, whereas in France, Italy and the United Kingdom it has weakened (Figure 3.5).

In the first group of countries it is possible to note how, despite a stable educational gradient over time, the composition of women without children has changed. In all three countries the most educated women are the most likely to have a childless family unit when they are 35-39 years old (Figure 3.5). However, the likelihood to be childless in Austria has increased especially among women with intermediate qualifications, whereas in Spain and Portugal, it has increased especially among women with higher and lower levels of education, while less sustained growth has been recorded among women with intermediate education levels.

In the second group of countries, namely Germany and Greece, the educational gradient of childlessness has instead become tighter over time. Here, the level of women's education has become over time increasingly strong in the stratifying childlessness. In both countries, indeed, the gap between those with high education and those with low levels of education has increased over time. The reasons for this changed gap, however, are different. On the one hand, in Germany this occurred due to an increased probability of being childless at 35-39 years among women with high and intermediate levels of education, whereas the propensity to be childless has remained stable over time among women with a low level of education. On the

other hand, the likelihood of being childless in Greece has increased among women with all levels of education but has increased especially among women with higher educational qualifications than women with lower education (Figure 3.6).

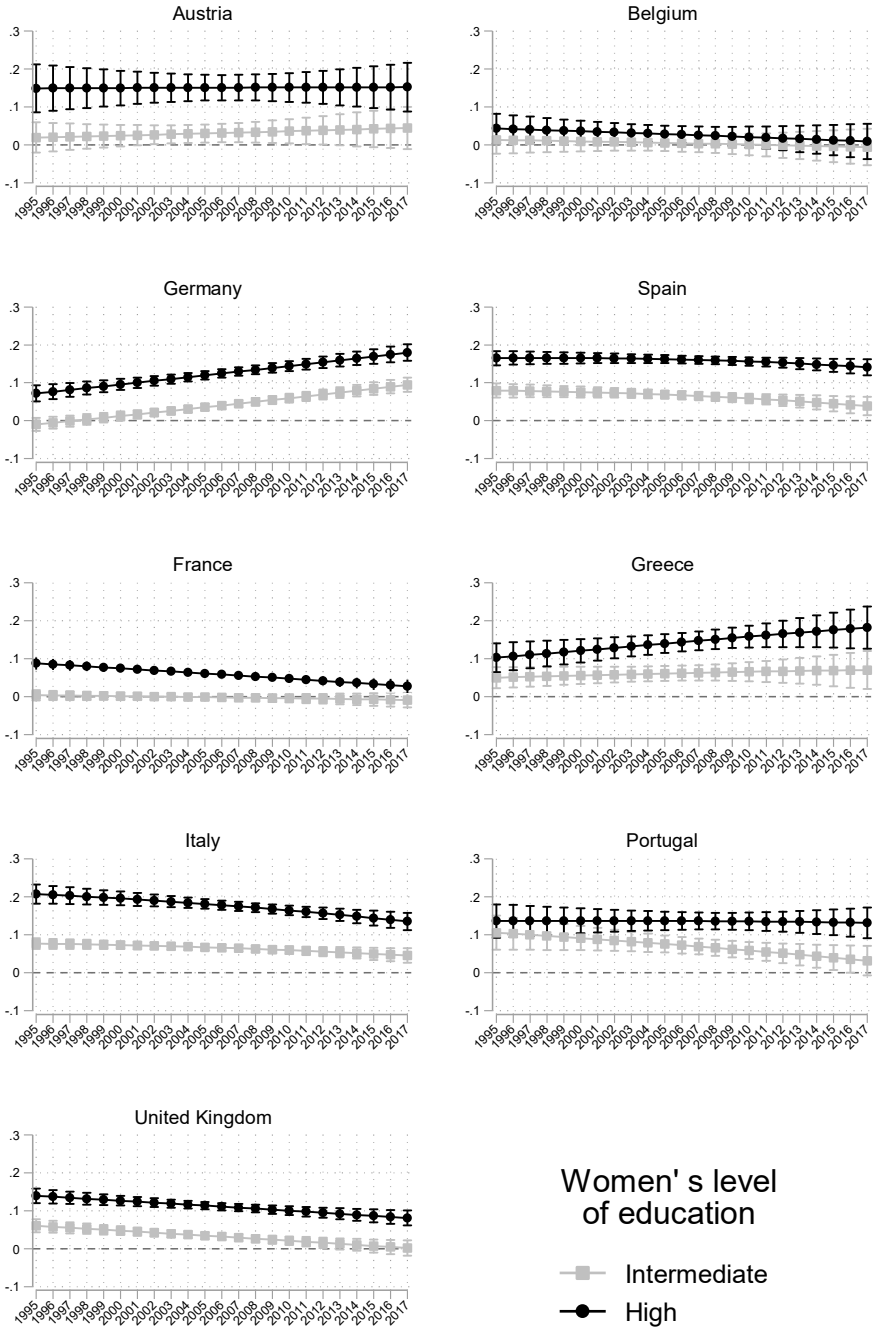
Finally, in Italy, UK and France, the educational gradient has decreased over the last two decades (Figure 3.5).

Looking at Italy it is possible to notice how women with tertiary level of study have remained the most prone to be childless over time, followed by women with intermediate and low level of study respectively. However, although the proportion of those 35-39 years old without children in the family unit has increased within all levels of education, this has been particularly sustained among women with intermediate and low educational qualifications, while the increase it was less sustained among women with tertiary degrees (Figure 3.6).

In the UK and France, instead, the decrease in the educational gradient of childlessness appears to have been due to a lessening in the probability of being childless especially among women with higher levels of education. In the UK women with tertiary level remain the more likely to be childless over time than women with lower educational levels. However, the proportion of childlessness increases only among lower-educated women, while it remains stable among women with intermediate qualifications and it decreases among women with tertiary education (Figure 3.6). In France the gap decreases for a similar pattern: the propensity to be childless diminishes over time among women with tertiary education on the one hand, and the probability of being childless increases especially among women with lower educational qualifications, both primary and secondary, on the other.

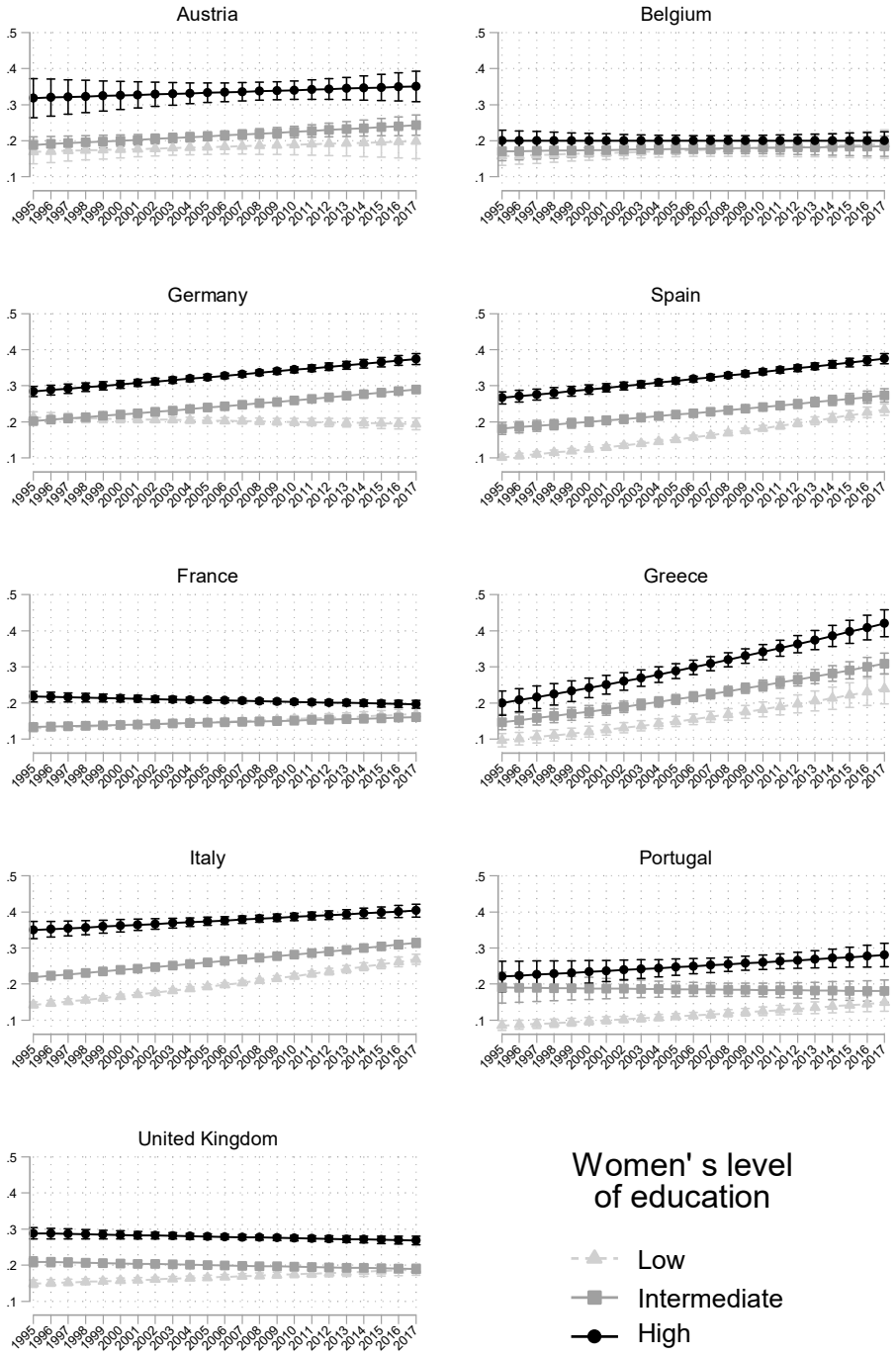
Differences between the more-educated and the less-educated women are partly explained by women's working status and position in the labour market, as well as by their marital status. Yet, the highly educated appear overall more likely to be childless compared to the less-educated women (Appendix Table 3.3, Model 3).

**Figure 3. 6** – Average Partial Effects (in percentage points) and 95% confidence intervals from binomial logistic regression models predicting childlessness according to women's education over time.




*Source*: EU LFS, author's calculation. *Note*: APEs computed on Model 3 of Appendix Table 3.3. Tabular results in Appendix Table 3.4. Childlessness proportions are computed on women in the age group 35-39 who have no biological children in their household.

**Figure 3. 7** – Predicted probabilities of being childless according to women's level of education, across European countries and over time.




Source: EU-LFS, author's elaboration. *Note*: Predicted probabilities computed on Model 3 of Appendix Table 3.3. Tabular results in Appendix Table 3.4. Childlessness proportions are computed on women in the age group 35-39 who have no biological children in their household.

## 5. Conclusions

With the present work, I was interested in analysing in which way the increased proportion of childless women occurred over the last decades is linked to the increase in the proportion of women in tertiary levels of education. To answer this question, I investigated how the levels of female education are associated, year-by-year, to the different likelihood of being childless across European countries and examined. In so doing, the analysis provides a deepen description of the presence of women who live without children at 35-39 years old between groups of women with different educational endowments.

Although minimal changes in some countries, results show that the educational gradient of childlessness is persisting over time, Namely, the educational gap has decreased in France, in the UK and in Italy, whereas among all the other European countries included in the present analysis the educational gap between higher and lower educated women in childlessness remained the same as it was twenty years ago (Austria, Spain, and Portugal) or it has further increased (Germany and Greece).

Following the theory of New Home Economics and the thesis of the Second Demographic Transition, I was expecting a change in the educational gradient over time, although motivated by different mechanisms.

On the one side, according to the NHE, I was expecting a change in the education gradient over time motivated by the different cost of children in the labour market over time. To the extent that some countries have begun to develop family policies and set conditions targeted at integrating working mothers into the labour market, costs associated with children and motherhood might have changed and reduced through the years. Based on this, I tested the hypothesis of a reduction in the educational gap of childlessness due to diminished costs of children among the better-educated women in contexts that support work-family reconciliation, firstly. Likewise, I also tested the hypothesis of an increase in the educational gap of childlessness due to augmented costs for children in countries where the

conciliation between work and family is scarce, secondly. The case of Germany, France, Greece and the UK seems to be fully compatible with the notion of the NHE. On the one side, the better-educated women are increasingly likely to be childless over time compared to their lower educated women in countries that do not support maternal employment (i.e. Germany and Greece). On the other side, a narrowing educational gap is registered in relation to a lessening of the likelihood to be childless among the higher educated in countries that have been providing wealthy family policies, which sustain broad participation of women in the labour market, as well as higher fertility (i.e. UK and France) (Pailhé, Solaz and Tanturri, 2018).

In the other side, following the perspective of the SDT, the analysis was also addressed at testing the hypothesis of a lessening of the educational gap. In particular, insofar as more educated women are the forerunners of social changes portrayed by the SDT in connection with new individual values, I was expecting the difference between education levels to have reduced over time, because of women with low levels of education imitating women with higher level of education, and therefore low-educated women being increasingly more exposed to the propensity to be childless over time in front of higher educated women exposed to unchanged probabilities. Overall, results that directly fit this prediction are not found.

However, the changes in the educational gaps found in Austria, Spain, Italy and Portugal seem to be composed of traits identifiable both in the prediction of economic theory and in that of changing values. Here, there has been a progressive increase in childlessness among less educated women, which could bring the path of these countries into line with the predictions of value theory. However, Spain, Italy and Portugal also show an increased risk of being childless among highly educated women. Considering that Austria, Spain and Italy stand out in Europe as a gender conservative country, results appear more likely to underly the economic dimension behind educational disparities in childlessness In Austria, the welfare state tends to support the absence of mothers from the labour market, rather than

their integration, and is not particularly committed to the redistribution of inequalities (Hoem, Prskawetz, and Neyer, 2001). Similarly, Italy and Spain are characterized by unfavourable policies and low public spending on family (Esping-Andersen 1990, 2002), which might suggest increased costs of children not only among the better-educated women but also among women with lower levels of education.

To wrap-up, the positive association between education and childlessness has remained over a period of twenty years in the majority of European countries and eventuated changes toward a reduction in the educational gaps of childlessness are rather minimal. All in all, the increase of childlessness shows to be poorly related to the expansion of women in higher education and mechanisms predicted by the NHE appear to predicts the European patterns better than STD does.

However, significant differences in the final probability of being childless by educational levels exist across countries, thus suggesting that the process leading a woman to not to have children might depend on conditions traceable both at the micro- and at the macro-level. This is going to be the focus of the analysis in the following Chapter.

There are key weaknesses of the present study that should however be addressed.

First, given the scarce availability of comparative data on childlessness, this study uses a proxy to measure childlessness among women. Although this is an application already employed in previous studies (Caltabiano, Comolli and Rosina, 2017), measuring childlessness as the absence children living in the household when their (potential) mothers is 35-39 can raise relevant issues connected with measurement errors over time, across countries, and in relation to the characteristics of individuals. This type of selection could lead to the risk of considering childless women who are not: firstly, for considering childless mothers whose children already left the family; secondly, for considering childless women who postponed motherhood at older ages. An implication of this is that part of the relationship between education and childlessness discussed in the paper is attributable to a

phenomenon of postponement of the first birth at later ages, which furthermore is closely related with women's level of education. However, although the transition to the first child after the age of 40 is not null, the proportion of women who become mothers after 40 is limited (*i.e.* in 2017, about 3% of first births occurred among women over 40 years old) (Eurostat, 2017). To better understand the degree of uncertainty of the presented results, I tried to validate the consistency of childlessness proxied as not having copresident children at 35-39, by comparing this measurement with estimates reported in previous works (Sobotka, 2009; Rowland 2007). The comparison highlights that considering 35-39 aged women who are without children in their household leads the risk of overestimating the "real" levels of childlessness of about 4% (Appendix of Chapter 3, Table 3.1 and Table 3.2). Because the transition to first child occurs at very diversified ages in Europe and because this transition is not independent of women's level of education, future studies on the relationship between female education and childlessness should try to address the question by making use of better measurement of childlessness.

A further limitation regards the impossibility of considering males into the analysis. Since EULFS data of this measure is that it allows considering only women, thus excluding men from the analyses, because the effect of age on fertility is much lower in men than in women.

Notwithstanding these limitations, the work helps to highlight the important differences that characterised childlessness according to women's level of education, across European countries and over time.

This is an important issue, because the distribution of childlessness across groups of education affects the distribution of newborns and children's statuses as well. One direction for future research regard the possible consequences of the persisting educational gradient in childlessness and eventuated instruments that states could offer to offset these persisting risks. Giving that childlessness is much more related with lower level of education over time, future research should also paid attention at the emergence of the social risks among the weakest social groups.

# CHAPTER IV.

# CHILDLESSNESS AND LOW FERTILITY IN CONTEXT. EVIDENCE FROM A MULTILEVEL ANALYSIS ON 20 EUROPEAN COUNTRIES.[15]


## Brief summary

*The rapid and progressive fertility decline that occurred in most Western European countries since the mid-seventies constitutes a core element of debate in research, together with the growing scientific interest upon the determinants of smaller families. Increasing research is focussing on factors affecting childlessness and interprets its determinants mainly as endogenous to low-fertility. The present article discusses this assumption and presents a comparison between the determinants of low-fertility and the determinants of childlessness. The idea behind is that although the two phenomena are largely interpreted as being driven by the same determinants, childlessness might be qualitatively different from the condition of having fewer children. By making use of micro level data from the European Labor Force Survey (2005-2010) and external data sources, I approach the debate behind micro- and macro-determinants of fertility and childlessness by analysing women who live with their children when they are 35-39 years old. Through a series of multilevel models, I discuss the moderating role of institutional and normative context in the link between individual characteristics and childlessness and analyse the extent to which micro- and macro-level determinants of childlessness differ from factors driving lower-parities. Linking childlessness with fertility determinants, differentials in the likelihood of being childless across European societies over time are investigated and accounted for. Results partially confirm the necessity to explore childlessness as a phenomenon on its own, distinguishing its determinants from determinants of (low) fertility.*


[15] A slightly different version of this chapter is currently submitted at an international peer-reviewed journal.

## 1. Introduction

Over the 20th century, families in Europe moved toward a new fertility model where the majority of women bear less than two children and childlessness is more common compared to previous cohorts of women (Esping-Andersen, 2007; Rindfuss, Choe and Brauner-Otto, 2016). Notwithstanding the increase of childlessness has been generalised throughout Europe, there is significant cross-country variation in the reached levels of childlessness. Despite that, the analysis focussing on cross-country variation of childlessness is not commensurate with the number of studies analysing fertility, and research made lass progress in relation to the identification of the explanatory factors of childlessness compared to the identification of the factors of fertility (and low fertility especially).

Two principal reasons can be identified to explain why research did not progress any further on the explanations of childlessness.

First, the lack of children has long been considered as an intimate choice (Tanturri and Mencarini, 2008) and, as such, sociologically uninteresting. Rather than analysing its determinants, scholars have more debated about the social acceptance of a life-choice without children (see: Eicher *et al.*, 2015; Merz and Liefbroer, 2012; Noordhuizen, de Graaf, and Sieben, 2010; Sobotka and Testa, 2008), or about the consequences of a childless life (see: Albertini and Mencarini, 2012; Allen and Wiles, 2013; Gillespie, 2001; Keizer, Dykstra and Poortman, 2010).

Second, because an inverse correlation between the trend of childlessness and total fertility persisted for years, processes behind childlessness have long been perceived equivalent to those that lead women to have fewer children (Kohler, Billari, and Ortega, 2002; Poston and Trent, 1982; Rowland, 2007). Hence, the mechanisms behind zero-parity have been often interpreted as equivalent to that of lower-parity, thus making childlessness endogenous to low fertility.

Under these circumstances, childlessness as a phenomenon on its own remained an overlooked and unexplained reality, and, although research on childlessness is increasing, there are still some essential issues to be taken into consideration.

On the one hand, there is a decreasing correlation over time between childless and total fertility rates across European countries (Chapter 1: 29). This evidence suggests that childlessness is qualitatively different from low fertility and that it may arise through channels that are distinct from that leading to lower parity.

On the second hand, research that to date addresses factors related to childlessness frames the analyses within two of the main theoretical perspectives that propose to explain (low) fertility: the Second Demographic Transition thesis (henceforth: SDT; van de Kaa, 2002; Lesthaeghe, 2010) and Becker's New Home Economics approach (henceforth: NHE; Becker, 1960; 1981)[16]. Beyond identifying the individual actors as the starting point for explaining phenomena at the societal level, such approaches recognise also the relevance of the macro-level context within which individuals and families live for the understanding of their behaviour. In contrast to that, extant analysis concerning childlessness mostly looks at how people without children differ from parents in terms of socio-economic characteristic only relying at the micro-level. In so doing, research carried out to date yielded to a sort of "unspoken agreement" according to which childlessness is neither structured nor influenced by the institutional and normative setting in which individuals are embedded, and reproduced the view according to which that non-childbearing choices in Europe constitute manly a private matter[17] (Miettinen, Rotkirch, Szalma, Donno, and Tanturri, 2015). This, however, is in contrast with research on fertility, which shows, conversely, that childbearing choices and preferences must be considered in relation to macro-level conditions, because they

[16] For a discussion of such theories see Esping-Andersen and Billari (2015); Lesthaeghe (2010).

[17] An exception is the work of Hakim (2005). She highlights how active policies for families have a negligible influence on fertility decisions, with a very limited impact, if any at all, on childlessness.

are intensely institutionally stratified (Ahn and Mira 2002; Barbieri *et al.*, 2015; Billari, Liefbroer, and Philipov 2006; Billingsley and Ferrarini 2014; Liefbroer *et al.*, 2015). If the reasons why people are childless are the same reasons behind of opting for fewer children, and if contextual aspects are vastly mentioned as crucial in the literature about family formation and fertility decline, why do studies about determinants of childlessness rely only on individual level determinants? This paradox constitutes the central tangles this work aims to disentangle.

The analytic strategy to address this issue is to test whether the theoretical explanations offered for fertility decision-making process also hold in the case of childlessness. In so doing the chapter offers an exploration of different forms of stratification of the phenomenon of childlessness. Especially, it focuses on the role of individuals' characteristics on the one hand, and the influence of the institutional and normative context in which people perform their childbearing decisions on the other. Especially, the work relates childlessness to the dimensions of gender equality and gender equity that have been lately suggested to increasingly contribute to changes in family and fertility behaviour (Brinton and Lee, 2016; Mason, 1995; McDonald, 2000b; Neyer, 2006).

In so doing, the work adds contribution to the literature on childlessness by providing an analysis of micro-level determinants of childlessness in comparative perspective integrated with an analysis of macro-level determinants associated with childlessness on the one hand, and by discussing how micro and macro level institutional factors that are assumed to influence low fertility might also be related to childlessness on the other.

## 2. Theoretical background

According to the classic microeconomic approach, the choice of having children is a rational choice that is subjectively maximized based on costs and

benefits children bring into individual life. Therefore, any factor decreasing the cost of children should be considered as a potential factor enhancing fertility (Becker, 1981; Cigno, 1991). Under this logic, the growth in women's economic independence and the following conflict between family and work, represent two of the the key factors contributing to the demographical changes associated with low-fertility in Europe at a socio-economic level.

During the "first phase" of the gender revolution (Goldscheider, Bernhardt, and Lappegård, 2015) the increase in female labour market participation echoed in a delayed family formation: working women started to married less and later (Espanshade, 1985), to have children at greatest ages (), and to have overall fewer children than non-working women (Bernhardt, 1933). Furthermore, better educated women resulted as the group facing the wort effects of job insecurity, often postponing motherhood (Kreyenfeld, 2005), and suffering the greatest working career losses associated with motherhood (Baizan, 2005, Barbieri and Scherer, 2008). With the process of gender revolution going on, the relationship between available resources to women and fertility started to decrease. One the one hand, women started to receive a greater involvement from the partner in the care activities (Aassve, Fuochi and Mencarini, 2014), on the other, states changed their attitudes in relation to interventions toward families and women's economic autonomy.

The cost-opportunity women experience with the arrival of a child are therefore different, not only because different are the groups of women who experience these costs, but also because countries and welfare regimes differ in the degree to which they are able to ease the work-family frictions (McDonald, 2000). As such, the opportunity costs of children are not independent of the changes introduced in the labor market and of the structure of gender relations that exists at the societal level (Ahn and Mira, 2002, Gauthier, 2007, Esping 2009). Policies targeted at families with children, as well as policies and institutional settings without a specific demographic target, have recently been listed among the causes of low and lowest-low fertility (Ermisch, 1986; Rindfuss and Brauner-Otto, 2008; Scherer and Steiber

2007). Following the aforementioned literature, the same mechanisms by which policies and institutional settings may favour higher fertility might also contribute to understand why some persons remain without children and why more people today are exposed to such a risk than in was the past.

### *2.1. Public policies targeted at reducing the cost-opportunity 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 the de-familization of care, thus helping in reconciling female careers with maternity. The capacity of policies addressed at families with children to affect fertility intentions and behaviour has been much discussed in the literature because evidence about their efficacy in fragmented and very dependent upon the policy package considered and the length of considered effect (see Gauthier 2007, Mills *et al.*, 2011 for a review). Policies might be targeted at subsidising the family income on the one side (*i.e.*, through direct or indirect money transfers or tax reductions); or at reconciling work and family life on the other (*i.e.*, parental leaves, childcare).

Generally speaking, there are only few works documenting that child income support can favour the transition to parenthood (Laroque and Salanie, 2004) or higher parity births (Milligan, 2005), whereas the vast majority of studies agrees upon showing how policies aimed at increasing individual or family wealth have a minimum impact on fertility (Gauthier and Hatzius, 1997; Georgellis and Wall, 1992 for the USA), if not null (Zhang, Quan, and Van Meerbergen, 1994 for Canada). To the opposite, policies aimed at reducing the costs associated with parenthood, have been shown to be a valuable factor in supporting birth rates (Björklund, 2006; Blanchet and Ekert-Jaffé, 1994; Castles, 2003; Del Boca, 2002; Del Boca and Repetto-Alaia, 2003; DiPrete *et al.*, 2002; Ekert-Jaffé, 1986; Hoem, 1993; Lalive and Zweimüller, 2005; Oláh, 2003; Walker, 1995), although the effect has sometimes been found to be related only to second or higher parity births (Ekert-Jaffé *et al.*, 2002), or to be limited in time (Buttner and Lutz, 1990). Under the

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

### *2.2. Inadvertent policies*

In addition to policies directly targeted at families, there are also structural and institutional arrangements that can potentially affect childbearing behaviour (Ermisch, 1986; Rindfuss and Brauner-Otto, 2008). By working on dimensions related to the labour market, governments can encourage – intendedly or unintendedly – a more equal distribution of paid and unpaid work within couples. One the one side, governments can encourage men to uptake family obligations, consequently relieving work-oriented women from family tasks and supporting their fertility (Esping Andersen, 2009, Andersen 2009; Keck and Saraceno, 2013). On the other side, governments can regulate the incompatibilities between fertility and female employment by offering labour market measures that enable women to better organise their family time (Del Boca *et al.*, 2009).

The organisation of working time in different European countries by means of national labour contracts constitutes an example of how the institutional conditions may promote gender relation supportive for fertility. A lower amount of time spent by men on the main job (*i.e.* with lower average working hours) can allow men to uptake 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 better reconcile family and work (Baizan, Arpino, and Delclòs, 2016; Keck and Saraceno, 2013; Saraceno and Keck, 2011; Anxo, Fagan, Cebrian, and Moreno, 2006; Barbieri *et al.*, 2019).

Based on these premises, it can be expected that those countries in which institutions support more egalitarian gender relations 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 lower in contexts that support reconciliation of work and family (Hypothesis 2).

### *2.3. Gender norms*

Besides a greater equal division of roles within the couple, even the perception of fairness is at least as important. There are indeed two different dimensions of gender egalitarianism. The first is related to the gender equity, that refers to the equality between genders in various institutional domains (e.g. gender quality in education or participation in the labour market), the second refers to the gender equality, that indicates how the distribution of certain resource (e.g. access to education, chances to employment) is perceived as fair by men and women, in a situation in which men and women could potentially have equal access to (but not necessarily equal levels of) that resource (McDonald 2000a, 2000b, 2013). Remarkably, McDonald argues that what matters most for fertility outcomes is not the equality in results (gender equality), but the perceived equality in the access (gender equity) is at least as important. Put differently: the involvement in care work might be unequal in practice, but as long as it is perceived to be fair, it should have no negative effect on fertility.

Low fertility, therefore, may be interpreted as the result of frictions between the institutional and the normative context, in the sense that, where a normative perception of gender egalitarianism does not support gender equality in institutions, low fertility can be the result. Empirical research seems to corroborate this idea: in those societies where people express more egalitarian attitudes toward the division of gender roles and where there is a more fair division of household work and childcare time, fertility rates, as well as fertility intentions, are generally higher (Arpino, Esping-Andersen, and Pessin, 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 (Esping-Andersen, 2009), lower fertility rates are found (Esping-Andersen and Billari, 2015).

Referring to evidence on the trend of childlessness reported in Chapter 2, it is possible to observe how some countries with higher childlessness rates also report lower scores in the gender equality indices (*i.e.*, Italy and Germany). Yet, counterevidence also exists. Low levels of childlessness occur both in countries with a relatively high (*i.e.*, Belgium, Ireland, Luxembourg) and low gender equality (*i.e.*, Portugal). Lastly, considering that institutions are interrelated with a broader normative context that includes different attitudes, norms and values (Boeckmann, Misra, and Budig, 2015), it is possible to expect that the cultural background interacts with the structural conditions in shaping the intentions to be childless and childlessness as an outcome. As in the case of fertility, in particular, it is possible to expect that childlessness depend on a gender imbalance that persists despite the revolution in women's role (Esping-Andersen and Billari, 2015; McDonald, 2000a, 2006). I will, therefore, test the working hypothesis that the effect of gender egalitarian conditions in buffering the risk of being childless is stronger the more gender-equal society is (Hypothesis 3).

Furthermore, the generalised increase in female labour market participation suggests that women across all the socio-economic groups have become more strongly affected in their fertility decisions by labour market equilibriums. Nevertheless, to the extent that employment chances, wealth and return on educations decline with the birth of a child, empirical research have been showing how women who invested more in their education are also more likely to invest more in their career before having children (Barbieri and Scherer, 2008). Accordingly, research also shows that not all women benefit the same from conditions that aim to reduce the constraints of fertility (Bratti and Tatsiramos, 2012). The potential effect of policies largely depends on the opportunities and costs associated with motherhood, as well as on individual preferences. In societies that support less gender egalitarianism and that entails a strong choice between family and career, the decision is harder for women who invested more in their career and job. Considering how these socio-economic groups perceive higher costs associated with maternity and have often lower access for reconciling work and

family life, childlessness may be contained by policies. We will, therefore, assess the extent to which the effect of gender equality policies in affecting childlessness differs between social groups of women. Notably, we will investigate the extent to which the effect of conditions and policies that favour equal gender relations differs according to the opportunity cost of children and test the working hypothesis that the protective role of gender egalitarian policies on childlessness will be more significant among highly educated women as well as among women employed in better working positions (Hypothesis 4).

Overall, if we consider the mechanisms behind childlessness being the same as those underlying low fertility, previous theoretical arguments support the hypothesis of an effect of the institutional and cultural context in cushioning childlessness. Contrarily, if mechanisms behind childlessness are different from those of low fertility, we should expect distinctive mechanisms or no effect at all. We thus test the additional hypothesis that macro-level institutional factors influencing childlessness rates are different from those affecting fertility (Hypothesis 5).

## 3. Data and Method

Analyses are based on the micro-data of the European Union Labor Force Survey (EU-LFS), which is complemented with macro-level indicators retrieved from the Multilinks Database on Intergenerational Policy Indicators, the European Value Survey (EVS), and the OECD database.

The EU-LFS represents a large household sample survey developed for analysing labour force participation of people aged 15 and over. Although it is an unusual choice when analysing childbearing behaviour, the dataset represents a valuable source, because it collects information about all the members living in a private family roaster. This specific design allows therefore to reconstruct the

proportion of women living with or without children at specific ages. Furthermore, the data provides ample sample and harmonised information at the European level. The surveys are indeed conducted by the national statistical institutes, but centrally processed by Eurostat.

The Multilinks Database on Intergenerational Policy Indicators collects empirical information about social policies and the legal framework of European countries for the years 2004 and 2009. Notably, it addresses explicitly how the state, through public policies and legal norms, defines and regulates intergenerational obligations within the family.

Due to the availability of macro information, the analyses cover the time span between 2005 and 2010 and 20 countries are considered, namely: Austria, Belgium, Bulgaria, Czech Republic, Germany, Estonia, Spain, France, Greece, Hungary, Ireland, Italy, Lithuania, Luxembourg, Latvia, the Netherlands, Poland, Portugal, Slovakia, United Kingdom.

### *3.1. Dependent variables*

Two dependent variables measure whether a woman is childless in her household or whether she is a mother, distinguishing in this latter case how many cohabiting children she has. The EU-LFS does not provide direct information about the actual number of children women have over their lifetime, but it contains information on the number of co-resident family members and family relationship with them. It is therefore possible to consider the number of children who reside in their mother's household at specific ages of the mother. Accordingly, the first dependent variable measures whether a woman has or not cohabiting children when she is 35-39, whereas a second dependent variable measures how many children live in the household when the mother is the same years old. I assess the validity of these measures by comparing obtained country-year estimations with available

macro information on childlessness and adjusted total fertility rates.[18] Overall, there is a high correlation between childlessness and total fertility proxied as the absence of cohabiting children when women are 35-39 years old and the number of children live together with this group of mothers. It is therefore possible to conclude that the measurement is representative of the actual condition also at the micro level. This kind of operativization has the cost of excluding men from the analyses, since the effect of age on fertility is much lower in men than in women, which is the motivation why I could not include men on the analysis.

### *3.2. Independent variables*

Country-level variables collect information about institutional and normative conditions and are retrieved from the Multilinks Database and the EVS dataset. To test the influence of family policies and institutional settings, three indicators were considered (Table 4.1).

To test whether policies targeted at families might mitigate childlessness, I considered a measure of the generosity of leaves regulations. Precisely, paid and unpaid parental leaves are considered as an indicator of policies designed at recognising the care work for children and for dependent family members. This information is retrieved from the Multilinks Database on Intergenerational Policies 2011 (version 2.0)[19] 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 being an indicator of both the duration and the quality of parental leaves. In the considered period, parental leaves are particularly stable and effective among the former Communist bloc. Countries like the Czech Republic, Hungary and Lithuania, report the highest level of leaves,

[18] Please refer to the Appendix of Chapter 4 for detail con comparison.
[19] Available at the website: https://multilinks-database.wzb.eu/

whereas very low levels are registered in the UK, Spain and Ireland. The indicator is available for 2004 and for 2009, therefore the observations that go from 2005 to 2008 match the first value, while the observations collected in the period 2009 and 2010 are merged with the second one.

To the extent that inadvertent policies can also influence an equal share of family responsibility between partners and can support in this way a more or less gender equal setting, two indicators of countries' institutional settings are furthermore considered.

First, the share of women working part-time is included as an indicator of institutional setting that allows women to be both commodified and defamilialised. Specifically, this measure indicates the incidence of female part-time employment in the age group 25-54, based on the conventional threshold of 30 working hours in the main job. The Netherlands in the years that goes from 2005 to 2008 is the country with the highest share of female part-time, whereas Bulgaria is the country with the lowest levels, as it remains below the 1% along all the five years considered. There has not been enormous change over years, but some increases are observable in the Mediterranean countries such as in Spain, Greece and Italy together with Austria and Germany. Still, in these countries, the final levels are very dissimilar.

Second, the number of hours worked by men on the primary job is included as an indicator of labour market conditions that encourage men to take an equal share of family responsibilities. Being men who work longer hours on the labor market less likely to engage in care and household activities, this indicator shall 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 is 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.

**Table 4. 1** – Country level policies and Gender Egalitarian Norms index

| Country | Share of women working part-time(a) | | | | | | Parental leave (months) (c) | | Average usual weekly hours worked on the main job by men (a) | | | | | | Gender Egalitarian Norms (b) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year of use | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2005/ 2008 | 2009/ 2010 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2005/ 2008 | 2009/ 2010 |
| Survey year | 2000/ 2004 | 2001/ 2005 | 2002/ 2006 | 2003/ 2007 | 2004/ 2008 | 2005/ 2009 | 2004 | 2009 | 2000/ 2004 | 2001/ 2005 | 2002/ 2006 | 2003/ 2007 | 2004/ 2008 | 2005/ 2009 | 1999 | 2008 |
| Austria | 28.3 | 29.3 | 30.4 | 31.1 | 31.7 | 32.1 | 10.9 | 9.8 | 42.0 | 42.6 | 43.2 | 43.8 | 44.4 | 44.2 | 52.9 | 67.0 |
| Belgium | 34.2 | 33.5 | 33.4 | 33.0 | 32.6 | 31.9 | 4.7 | 4.6 | 41.1 | 41.1 | 41.0 | 41.0 | 40.9 | 40.8 | 70.1 | 78.8 |
| Bulgaria | 2.3 | 2.3 | 2.0 | 1.8 | 1.6 | 1.5 | 17.6 | 16.8 | 41.6 | 41.7 | 41.7 | 41.8 | 42.0 | 42.0 | 47.5 | 58.4 |
| Chez Rep. | 3.9 | 3.9 | 4.0 | 4.1 | 4.2 | 4.2 | 25.2 | 17.9 | 44.4 | 44.2 | 44.2 | 44.1 | 44.0 | 43.9 | 65.3 | 59.4 |
| Germany | 36.8 | 37.8 | 38.5 | 39.2 | 39.5 | 39.7 | 6.8 | 12.6 | 41.2 | 41.0 | 40.9 | 40.8 | 40.9 | 40.9 | 55.9 | 65.1 |
| Estonia | 6.8 | 6.8 | 6.5 | 6.7 | 6.7 | 7.2 | 15.3 | 17.6 | 42.0 | 41.8 | 41.7 | 41.6 | 41.5 | 41.2 | 75.5 | 73.1 |
| Spain | 15.4 | 16.3 | 17.0 | 17.8 | 18.5 | 19.1 | 3.7 | 3.7 | 42.1 | 42.1 | 42.1 | 42.2 | 42.2 | 42.2 | 62.5 | 70.9 |
| France | 22.4 | 22.1 | 21.8 | 21.6 | 21.4 | 21.3 | 13.3 | 13.0 | 40.5 | 40.7 | 41.1 | 41.5 | 41.6 | 41.6 | 68.3 | 84.5 |
| Greece | 9.6 | 9.9 | 10.7 | 11.4 | 11.9 | 12.6 | 3.5 | 4.1 | 45.0 | 45.0 | 45.0 | 44.9 | 44.8 | 44.7 | 72.6 | 59.6 |
| Hungary | 3.8 | 3.9 | 4.0 | 4.0 | 3.8 | 3.8 | 20.2 | 20.5 | 42.1 | 41.9 | 41.7 | 41.6 | 41.4 | 41.2 | 67.9 | 84.1 |
| Ireland | 32.6 | 32.9 | 33.0 | 33.2 | 33.6 | 33.9 | 2.1 | 2.7 | 42.7 | 42.4 | 42.1 | 41.9 | 41.6 | 41.2 | 75.6 | 71.1 |
| Italy | 24.4 | 25.5 | 26.7 | 27.9 | 29.3 | 29.6 | 5.5 | 5.5 | 41.6 | 41.7 | 41.8 | 41.8 | 41.9 | 41.7 | 56.8 | 67.6 |
| Lithuania | 13.7 | 13.5 | 12.4 | 11.3 | 9.8 | 8.7 | 16.7 | 24.3 | 39.3 | 39.4 | 39.4 | 39.6 | 39.8 | 39.8 | 65.1 | 62.9 |
| Luxemburg | 30.8 | 31.3 | 30.4 | 30.0 | 29.6 | 29.6 | 11.7 | 10.6 | 41.2 | 41.0 | 40.8 | 40.5 | 40.2 | 40.3 | 66.0 | 76.9 |
| Latvia | 9.2 | 8.8 | 8.0 | 7.1 | 6.6 | 6.3 | 12.9 | 12.1 | 44.1 | 44.0 | 43.8 | 43.4 | 42.9 | 42.3 | 69.5 | 70.9 |
| Netherlands | 57.1 | 57.4 | 57.5 | 57.2 | 56.8 | 56.3 | 3.7 | 7.0 | 39.3 | 39.2 | 39.1 | 39.1 | 39.2 | 39.2 | 83.4 | 85.3 |
| Poland | 14.4 | 14.3 | 14.4 | 14.1 | 13.7 | 13.0 | 3.2 | 4.1 | 44.3 | 44.4 | 44.4 | 44.3 | 44.2 | 44.0 | 45.1 | 65.2 |
| Portugal | 10.3 | 10.0 | 9.6 | 9.4 | 9.2 | 9.0 | 3.9 | 5.2 | 42.1 | 42.0 | 41.9 | 41.8 | 41.8 | 41.7 | 61.4 | 63.6 |
| Slovakia | 2.6 | 2.6 | 2.7 | 3.0 | 3.1 | 3.1 | 8.8 | 11.9 | 42.5 | 42.2 | 42.0 | 42.0 | 42.2 | 42.2 | 54.2 | 54.0 |
| UK | 37.3 | 36.7 | 36.2 | 35.8 | 35.3 | 35.0 | 2.5 | 3.7 | 45.0 | 44.7 | 44.4 | 44.2 | 44.0 | 43.7 | 66.9 | 79.1 |

Source: Own elaboration from (a) OECD.Stat (http://stats.oecd.org/Index.aspx?DataSetCode=FTPTC_I), (b) EVS 1999-2008 (http://zacat.gesis.org/webview), (c) Multilinks Database on Intergenerational Policies 2011 (version 2.0) (https://multilinks-database.wzb.eu/session/new)

Both these indicators are 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 five years preceding the time of observation. To give an example, the part-time indicator for women who are 35-39 years old in 2010 reflects the situation when these women were 30-35 years old.

Finally, a proxy of social beliefs about gender equity norms is considered to investigate the extent to which the relationship between childlessness and structural conditions depends on the stage of gender equity reached within one country. To do so the rate of respondents who said to disagree with the statement *"When jobs are scarce, men should have more right to a job than women"* is retrieved from the third and the fourth waves of the EVS.

As before, 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 is the country in which not only policies are most developed, but also gender-egalitarian attitudes are more diffused. Italy, Spain, Portugal and Poland have egalitarian norms below the average in the first period, but a general improvement can be noticed for almost all the countries considered as time goes by.

Models also include a series of individual controls. To establish the extent to which the structural and normative determinants are equally distributed in the population, an interaction effect with women's education and working position is tested. In order to reduce the cross-country complexity in the different levels of education and allow for a comparison, the educational attainment is measured with three dummy variables based on the 1997 UNESCO International Standard Classification of Education (ISCED). The analyses distinguish between low educated (ISCED 1 – ISCED 2), middle educated (ISCED 3 – ISCED 4) and high educated (ISCED 5 – ISCED 6) women. Similarly, the information about the female working position contains evidence both about the labour status and the labour position, distinguishing between Inactive, Unemployed and Employed women.

Within this latter group, I further discriminate depending on being low-skilled blue-collar, high-skilled blue-collar, low-skilled white collar and high-skilled white-collar worker, according to the information provided by the ISCO-88 classification at one-digit level.

Given the importance of partnership in the pathway toward childlessness (Keizer, Dykstra, and Jansen, 2008) models furthermore controls for relationship status. Hence, women are grouped in a) previously married, if they declared to be divorced, legally separated or widowed; b) women who are not in a union; and c) married women.

By excluding non-native women and considering missing information on the level of education, working position or marital status, the final sample includes almost 720 thousand childless women and 630 thousand mothers, aged between 35-39 years.

### *3.3. Analytical strategy*

In order to examine the association between institutional, normative and socio-demographic factors with both childlessness and total fertility, analyses applying a multilevel technique were conducted. Specifically, linear probability multilevel regression models in the case of childlessness and linear multilevel regressions model in the case of the number of children were performed with women (level 1) nested in a combination of country-year observations (level 2). In order to evaluate how the relationship between macro-level factors and childlessness differ by individual characteristics, I test whether institutional factors and societal norms are moderated by the level of education and working position of women by introducing a cross-level interactions effects.

This method has two decisive advantages: on the one side, analysing childlessness and fertility jointly – *i.e.* using the same data, techniques, and predictors – allows for a comparison of the mechanisms behind the two phenomena and to estimate if macro-level institutional factors influencing childlessness are

different from those affecting fertility. On the other side, the multilevel technique allows to take the nested structure of the data into account and to estimate the proportion of the total variance that is attributable to the individual and the contextual level.

Five multilevel models' specifications are considered. After presenting a null model (Table 4.2) – multilevel analyses in which childlessness and parity are separately regressed without the inclusion of any predictors – I look at how individual determinants influence both childlessness and low fertility (Table 4.3). This second step helps in identifying 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 considered countries. Several regressions are estimated to assess the relationship between the individual current level of education, working status and position, and partnership status with both fertility and childlessness.

Being interested in observing whether the effect of the predictors of fertility differs from that of childlessness, their impact is estimated through a series of nested models (Columns 1a-1d), so as to account for potential different direct effect if each of the predictors. Accordingly, the impact of macro-indicators on fertility and childlessness is included in the third step of the analysis, by investigating it one at a time and jointly (Table 4.4). Fourth, an interaction model between macro and micro determinants is applied (Figures 4.1-2-3).

This cross-level interaction seeks at revealing whether the impact of macro-characteristics of childlessness differs significantly according to the opportunity cost associated with children.

In the final step, an interaction model of the macro relationship between policies and institutional assets together with the level of gender equality is investigated (Figure 4.4).

## 4. Results

The variance decomposition of the null model (Table 4.2) confirms that fertility decisions are mainly an individual level phenomenon. Still, a part of contextual variation not only related to fertility, but also regarding childlessness, remains unexplained at the micro-level. The *Intra Class Correlation – i.e.* the proportion of the total variation at the country-year level – shows that the 3% of the variance in fertility is over country-years, and the remaining 97% at an individual level, whereas the 2% of the variance in childlessness can be attributed to differences between country-years.

**Table 4. 2** – Estimates of two separate two-level multilevel models for permanent childlessness and number of children (Beta coefficient – Standard errors in parentheses).

| Variable | Number of children | Childlessness |
|---|---|---|
| Constant | 1.947*** | 0.172*** |
| | (0.014) | (0.005) |
| var(cy) | 0.024*** | 0.003*** |
| | (0.002) | (0.000) |
| var(Residual) | 0.725*** | 0.148*** |
| | (0.001) | (0.000) |
| N | 626,477 | 719,832 |
| ICC | 0.0325 | 0.0204 |

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

### *4.1. The role of individual characteristics on fertility and childlessness*

Models in Table 4.3 present results of individual characteristics associated with fertility and with childlessness among women aged 35-39. The model makes it possible to observe the extent to which the level of education, employment status

and position, and partnership history are associated with both parity (N1a-N1d) and childlessness (C1a-C1d). Several considerations can be made.

First, the model illustrates that there is a significant within country-year variation both in fertility and in childlessness, which is in line with the increasing trend of childlessness and decreasing trend of fertility largely documented by the extant research and depicted in Chapter 3. Being the within country-year variation significantly different from zero in all the specifications, the models also allow to consider that individual determinants of fertility and childlessness significantly differ across countries, which further stresses the importance of consider characteristics of both fertility and childlessness situated in specific contexts.

Second, the model makes it possible to observe the relationship between fertility and female socio-economic characteristics, as well as between childlessness and socio-economic characteristics, net of the heterogeneous features that arrive from institutional and normative context. When predicting the number of children, models show a consistent relationship between the level of education and parity: the lowest fertility appears to be present among the most educated women. Contrary to that, the more a woman is educated, the more she is likely to remain childless, as analyses suggests by showing how low educated women have overall a lower propensity to remain childless compared to middle and highly educated women, who, in turn, report the highest likelihood toward childlessness. Hence, education has a direct and significant negative effect on fertility, whereas it positively affects the likelihood to be a childless woman (models N1a and C1a).

Also, the working status and position of women affects both their family size and likelihood to be childless at 35-39. Being inactive in the labour market is associated with a higher propensity of women to have many children, whereas women who participate in the labour market – weather employed or unemployed – have overall less chance to have large families. Especially, women employed in white-collar jobs have significantly higher propensity to have fewer children compared to 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 childlessness is higher within those women in the labour force than among inactive women, and it also prevails for female workers in white-collar jobs than in lower-skilled once (model C1b).

**Table 4. 3** – Individual level predictors. Multilevel model for Number of Children and Childlessness. Beta coefficient (Standard errors in parentheses).

| Variable | Childlessness | | | | Number of children | | | |
|---|---|---|---|---|---|---|---|---|
| | C1a | C1b | C1c | C1d | N1a | N1b | N1c | N1d |
| Low Edu. | -0.024*** | | | -0.014*** | 0.234*** | | | 0.165*** |
| | (0.001) | | | (0.001) | (0.003) | | | (0.003) |
| High Edu. | 0.078*** | | | 0.039*** | -0.082*** | | | -0.040*** |
| | (0.001) | | | (0.001) | (0.003) | | | (0.003) |
| Unemployed | | 0.094*** | | 0.041*** | | -0.258*** | | -0.207*** |
| | | (0.002) | | (0.002) | | (0.005) | | (0.005) |
| LS blue collar | | 0.061*** | | 0.040*** | | -0.274*** | | -0.264*** |
| | | (0.002) | | (0.001) | | (0.004) | | (0.004) |
| HS blue collar | | 0.057*** | | 0.046*** | | -0.180*** | | -0.178*** |
| | | (0.002) | | (0.002) | | (0.005) | | (0.005) |
| LS white collar | | 0.090*** | | 0.056*** | | -0.407*** | | -0.355*** |
| | | (0.001) | | (0.001) | | (0.003) | | (0.003) |
| HS white collar | | 0.132*** | | 0.069*** | | -0.422*** | | -0.337*** |
| | | (0.001) | | (0.001) | | (0.003) | | (0.003) |
| Prev. married | | | 0.090*** | 0.091*** | | | -0.237*** | -0.227*** |
| | | | (0.001) | (0.001) | | | (0.004) | (0.004) |
| Single | | | 0.540*** | 0.533*** | | | -0.425*** | -0.421*** |
| | | | (0.001) | (0.001) | | | (0.003) | (0.003) |
| Constant | 0.155*** | 0.090*** | 0.060*** | 0.007 | 1.919*** | 2.237*** | 2.035*** | 2.254*** |
| | (0.005) | (0.005) | (0.005) | (0.005) | (0.016) | (0.015) | (0.015) | (0.017) |
| Var. cy level | 0.003*** | 0.003*** | 0.003*** | 0.003*** | 0.030*** | 0.027*** | 0.028*** | 0.034*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.002) | (0.002) | (0.002) | (0.002) |
| Var. explained | 0 | 0 | 0 | 0 | -25 | -13 | -17 | -42 |
| Var. Ind. level | 0.146*** | 0.145*** | 0.105*** | 0.104*** | 0.712*** | 0.696*** | 0.701*** | 0.669*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.001) | (0.001) | (0.001) | (0.001) |
| Var. explained | 1 | 2 | 29 | 30 | 2 | 4 | 3 | 8 |
| ICC | 0.021 | 0.022 | 0.027 | 0.031 | 0.040 | 0.037 | 0.038 | 0.048 |
| N | 719,832 | | | | 626,477 | | | |

*Source*: EU-LFS 2005-2010, author's elaboration. *Sing. Levels*: * p < .05, ** p<.01, *** p<.001. *Note*: N country-year: 120. ICC is the intra Class Correlation. *Baseline categories*: Middle educated, inactive, married women.

Additionally, the analysis provides evidence about how large part of the variability in fertility and childlessness especially is directly accounted by the

marital status of women, to the extent that there is a strong association between marital status and both fertility and childlessness. Mothers tend to be married, whereas childless women tend to be not. Likewise, women who are divorced, legally separated or widowed, as well as women who are not in a union, tend to have smaller families and higher childless propensity compared to women who are married at the time of the interview (models N1c and C1c).

Third, if we compare the present findings with the results for the null model (Table 4.2), the inclusion of individual-level characteristics reduces the amount of unexplained variance that is associated with the overall error term concerning fertility and childlessness. Furthermore, the proportion of variance explained at the individual level shows that the added individual predictors account for the 30% of variance in childlessness (C1d), whereas they only account for the 8% of the variance in fertility (N1d). Of course, since we are dealing with individual-level predictors, this represents an expected reduction and that individual characteristics account for some of the total variability both for fertility and for childlessness.

A less expected result is that, when the model with individual predictors is compared with the unadjusted model, the unexplained variance of fertility at the country-year level increases, whereas it remains stable for childlessness. That is to say that, once the variability in the two phenomena is accounted for by means of individual characteristics, there is an increase in the level-2 residual variance in the case of fertility, whereas the proportion of level-2 residual variance for childlessness remains stable. This is confirmed also when we consider an index of the proportion reduction of the variance at level-2 and obtain negative values for fertility. That is to say that before controlling for individual characteristics the levels of fertility were much similar across country-years, whereas after having added individual characteristics there is 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 greater influence of individual characteristic on fertility than contextual features. The ICC showing variation from the adjusted in

respect to the null model shall also support this possible interpretation. In fact, once individual predictors are included, only a small proportion of the variance of fertility and childlessness appears to be explained by characteristics associated with the country-year level – *i.e.* 5% in the case of fertility – 3% in the case of childlessness.

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

Country-level predictors are now included in the analysis, seeking to investigate how characteristics of macro-level conditions are associated with fertility and childlessness. In particular, we observe how policies – explicitly or inexplicitly targeted at families – and gender norms influence mothers to have more or fewer children and argue how institutional conditions might also play a role in affecting the possibility to be childless. In line with the aforesaid literature, we expect that if the mechanisms behind childlessness are the same than 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 share of family responsibility. Consistent with this expectation, Table 4 displays the unconditioned effects of policies and norms on individual fertility and childlessness, net of individual characteristics (complete outcome is available in Appendix Table 8 and 9).

Longer and better leaves are significantly associated with both fewer children and a lower propensity to be a childless woman. Where and when the opportunity to uptake a parental leave for mothers and fathers is higher, and leaves are longer and of better quality, women tend to have a lower propensity to increase their family size (N2a). However, they tend less often to be childless (C2a). This finding seems to support the hypothesis that where family policies better support childcare there is a lower propensity to be childless. In the presence of more generous leaves, women tend to be mothers more often. However, their families are smaller, and it

appears that leaves do not have a significant role in raising fertility through mother's higher order births.

**Table 4. 4** – Unconditioned effects of policies and norms on the likelihood of being childless and on the number of children. Results of separate multilevel models (Beta coefficient. Standard errors in parentheses).

| Variables | Childlessness | | | | |
|---|---|---|---|---|---|
| | C2a | C2b | C2c | C2d | CM3 |
| Parental leaves | -0.004*** | | | | -0.004*** |
| | (0.001) | | | | (0.001) |
| Female part-time | | 0.001* | | | 0.001 |
| | | (0.000) | | | (0.000) |
| Men worked hours | | | 0.004 | | 0.001 |
| | | | (0.003) | | (0.003) |
| Gender equity | | | | -0.002** | -0.002*** |
| | | | | (0.001) | (0.001) |
| Constant | 0.048*** | -0.012 | -0.176 | 0.122*** | 0.152 |
| | (0.009) | (0.009) | (0.143) | (0.036) | (0.152) |
| Var. cy level | 0.003*** | 0.003*** | 0.003*** | 0.003*** | 0.002*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Var. ind. level | 0.104*** | 0.104*** | 0.104*** | 0.104*** | 0.104*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| N | | | 719,832 | | |
| ICC | 0.0244 | 0.0296 | 0.0307 | 0.0286 | 0.0208 |

| Variables | Number of Children | | | | |
|---|---|---|---|---|---|
| | N2a | N2b | N2c | N2d | NM3 |
| Parental leaves | -0.0002*** | | | | 0.005 |
| | (0.003) | | | | (0.003) |
| Female part-time | | 0.004*** | | | 0.0036* |
| | | (0.001) | | | (0.001) |
| Men worked hours | | | -0.012 | | 0.018 |
| | | | (0.01) | | (0.012) |
| Gender equity | | | | 0.0094*** | 0.008*** |
| | | | | (0.002) | (0.002) |
| Constant | 2.255*** | 2.178*** | 2.76*** | 1.623*** | 0.816 |
| | (0.031) | (0.027) | (0.456) | (0.103) | (0.502) |
| Var. cy level | 0.034*** | 0.031*** | 0.034*** | 0.026*** | 0.024*** |
| | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) |
| Var. ind. level | 0.669*** | 0.669*** | 0.669*** | 0.669*** | 0.669*** |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| N | | | 626,477 | | |
| ICC | 0.0483 | 0.0439 | 0.0478 | 0.0368 | 0.0348 |

Source: EU-LFS 2005-2010, author's elaboration. Sing. Levels: * p < .05, ** p<.01, *** p<.001.
Note: N country-year: 120. ICC is the Intra Class Correlation. Models are net of level of education, working status and position, marital status (Complete model available in Appendix Table 8 and 9)

I also looked at how fertility and childlessness relate to female part-time and average men working hours, so as to test the hypothesis that fertility is higher and childlessness is lower in contexts that reduce the cost of a child by favour gender egalitarian relations through institutional settings that support gender equality. Results show a positive and significant association between female part-time and both parity and childlessness, so that the higher the share of women working part-time, the higher is both fertility and childlessness (N2b and C2b).

Accordingly, women who live in a context where men spend longer time on the primary job appear to have a lower probability of having larger families (N2c), and a higher likelihood to be childless (C2c). Although in line with the expectations, the effect is not statistically significant. Therefore, only from the link between part-time and fertility or childlessness we can get some conclusion about the hypothesis of a positive effect of institutional conditions supporting egalitarian relation not only for fertility but also for childlessness. We were expecting to find that the higher the female part-time, the greater the family size, and therefore the lower is childless. Results, on the contrary, show that part-time does associate with higher fertility, but also with a greater likelihood to be childless. Although these findings appear counter-intuitive according to theoretical forecasts outlined above, it should be considered that the use of female part-time varies extensively among the countries examined, not only in its level but also in its quality (Del Boca, 2009). Thus, the structure of the labour market and the level of social protection that is attached to part-time very much varies across countries, and it defines the role that the part-time work might have in affecting the costs women attach to motherhood. For example, in Southern European countries part-time work is scarce and often associated with precarious conditions. In these contexts, part-time job is also negatively perceived, to the extent that it is frequently related to precarious labour market conditions and it imposes higher career costs for women with children, who are therefore more often forced to working full-time or not working (Barbieri *et al.*, 2019). In other countries instead, like in the Nordic ones, part-time is generally a well-perceived condition, as well as more appreciated as an option to combine work

and family also among highly educated women. Therefore, to the extent that not in all contexts the part-time job has the power to level off the costs associated with motherhood, which could result in observing that where female part-time is more diffused, the propensity to be childless is higher.

Lastly, in line with several recent theories in demography which have been suggesting that gender equality and fertility have a u-shaped relationship, I tested whether between gender equality and childlessness a relationship also exists. Overall, it is possible to see that in societies where more people 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 to be childless to a greater extent (C2d). This indicator about attitudes toward female employment can be considered an indicator of gender equality at the societal level, which leads to conclude 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 entire picture, it appears that childlessness as well as fertility is associated with family-friendly institutions and the level of gender equality reached in societies, therefore highlighting the potential effects that institutional and normative context might have on childlessness too. However, the effect of policies, institutional settings, and normative conditions on childlessness does not always display the same gradient than on fertility. This evidence is consistent with the hypothesis that mechanisms leading to childlessness do not necessarily reflect those affecting fertility.

Lastly, in line with several recent theories in demography that have been suggested that gender equality and fertility have a u-shaped relationship, we test whether between gender equality and childlessness a relationship also exists. Overall, we found that in societies where more people 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 to be childless to a greater extent (C2d). We interpret this indicator about attitudes toward female employment as an indicator of gender equality at the societal level and conclude 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 entire picture, it appears that childlessness as well as fertility is associated with family-friendly institutions and the level of gender equality reached in societies, therefore highlighting the potential effects that institutional and normative context might have on childlessness too. However, the effect of policies, institutional settings, and normative conditions on childlessness does not always display the same gradient than on fertility. This evidence is consistent with the hypothesis that mechanisms leading to childlessness do not necessarily reflect those affecting fertility.

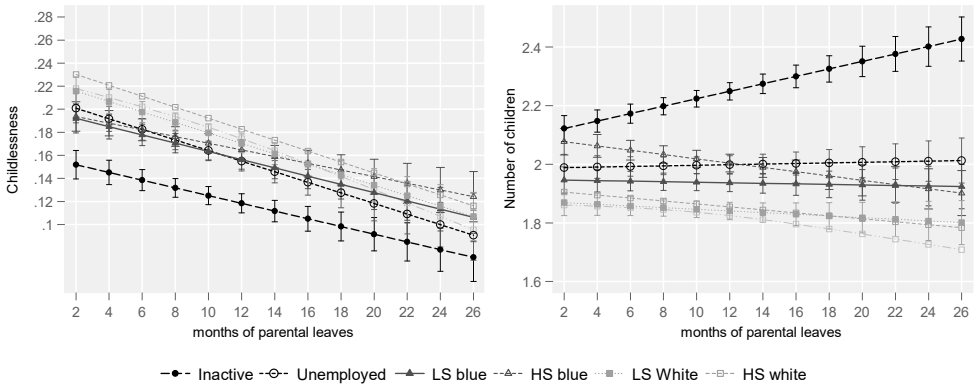
### *4.3. Which women benefit most?*

Policies supporting gender relations might 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 of evidence resulting from previous models showing that most of the variability in childlessness appears to be related to individual-level characteristics. Following this, the analysis looks at whether the relationship between gender equalising conditions and fertility, on the one side, and gender equalising conditions and childlessness, on the other, changes across groups of women who perceive different motherhood-related costs. The expectation is that the effect of policies and labour market conditions in reducing childlessness is stronger among women who perceive higher costs associated with the birth of a child – *i.e.*, women better educated and in better working positions. To test this hypothesis a cross-level interaction between women's socio-demographic and family policies and institutional arrangements is specified in the model, so as to evaluate whether the effect of gender-equalising conditions is different according to a different distribution of the costs associated with children in the female population. The series of multilevel modelling holding this specification is fully

reported in Appendix Table 8 and Table 9. The graphs plotted in Figure 1 shows the strength to which female socio-economic status on childlessness (left panel) and fertility (right panel) differs across different levels of macro-level conditions. Given that the parental leaves are recognised as a tool to bring mothers back into the labour market following childbirth and thought as an instrument for job continuity with the collateral effect of boosting fertility, an interaction with woman's working condition is introduced. The other macro-level characteristics interact with the female's education, which is better suited to capturing the perceived cost associated with having a child. To ease the substantive interpretation of results, predicted probabilities are reported.

The relationship between parental leaves and fertility varies according to the working position of women, whereas the inverse relationship between more effective leaves and childlessness remains stable across all the groups of female workers (Figure 1).

**Figure 4. 1** – Predicted probability of being without children (left) and predicted number of children (right) by length of parental weeks available and female level of education (90% Conf. Int. displayed).

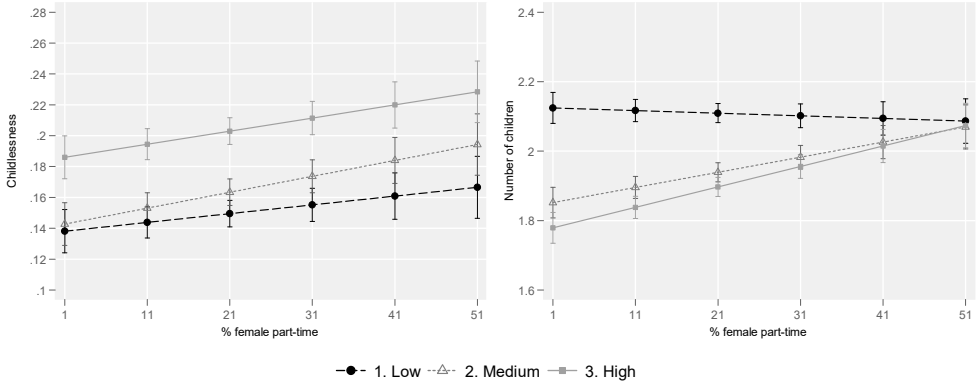



*Source*: EU-LFS 2005-2010, author's elaboration. Predictions refer to Table 8 and Table 9, model C3.

Once the heterogeneity of female working position is considered, more effective parental leaves seems to play a significant and substantive role only among the inactive group of women, whereas the relationship disappears among the active group of women. To the opposite, in contexts that provide few weeks of parental leaves, childlessness is higher irrespective of a woman's occupation, being lower among the inactive women and higher among women occupied in high skilled white-collar jobs. Therefore, leaves appear as instruments related with higher fertility only among inactive women but appear also to be related to a higher propensity to be mothers across all the social groups, being associated with a lower likelihood of living in an empty nest.

Considering the share of women working part-time as measures of institutional assets that allow women to be both commodified and defamilialised, it can be similarly commented that in countries where a lower proportion of women works part-time there is a robust educational gradient in fertility (Figure 2).

**Figure 4. 2** – Predicted probability of being without children (left) and predicted number of children (right) by share of female part-time and female level of education (90% Conf. Int. displayed).




*Source*: EU-LFS 2005-2010, author's elaboration. Predictions refer to Table 8 and Table 9, model C1.

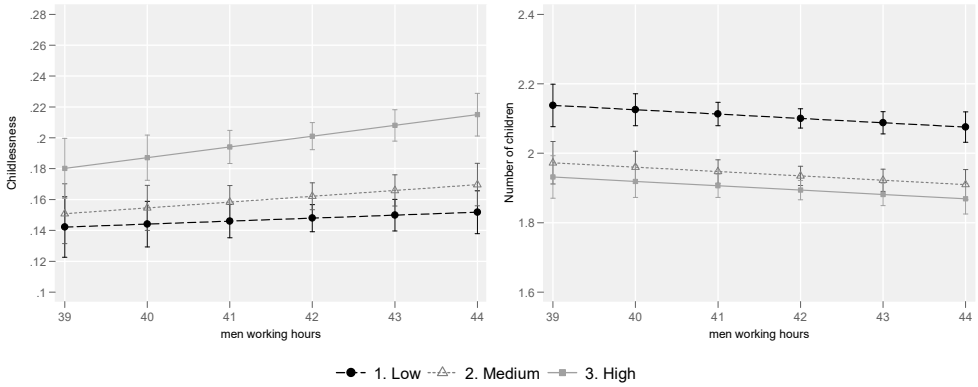
In these contexts, women with an intermediate or higher level of education are those who have fewer children, whereas lower educated women have overall larger families. This differential persists in contexts where female part-time work is more common but diminishes till becoming not significant where most women share part-time work. The effect of part-time in boosting fertility is, therefore, particularly notable among middle and high-educated women, who turns out to be the groups of women who profit most from its diffusion.

To the contrary, the effect of part-time does not vary greatly among women's level of education, and a significant and positive effect exists at all education levels. However, where the level of female part-time is remarkably low, women with the highest level of education are the most penalised group, showing a higher share of childlessness than the lower educated counterpart. Instead, where the level of part-time is more diffused, childlessness does not decrease, but the gap between educational level becomes weaker and not significant anymore. In sum, the share of female part-time does not seem to significantly affect childlessness, while it positively associated with higher fertility among women with secondary or tertiary degrees. It seems therefore that institutional assets that allow defamilialization and commodification through female part-time work reduce educational inequalities in fertility but are unrelated to childlessness.

Furthermore, the analysis considers the interplay between women's characteristics and the average number of hours that men spend on their main job, which is considered to be an institutional condition that might support men to take up caring responsibilities (Figure 3). Results reveal that where men work longer hours there is a strong educational gradient in fertility, with middle and higher educated women having fewer children than their lower educated counterpart. Instead, where men work less, the effect of education on fertility weakens and becomes only visible between the lowest and the highest educated, who shows the highest and the lowest fertility levels respectively. To the contrary, the amount of time men spend on the main job is unrelated to fertility for low educated women. Similarly, lower hours that men spend in the job market help to reduce a woman's

propensity to be childless among all the educational levels, although the effect is particularly strong among the highest educated. Therefore, it seems that a reduction of hours spent by men on the main job might help women who face higher opportunity costs to increase their fertility and to reduce their propensity to be childless.

**Figure 4. 3** – Predicted probability of being without children (left) and predicted number of children (right) by average hours worked by men on the main job and female level of education (90% Conf. Int. displayed).




*Source*: EU-LFS 2005-2010, author's elaboration. Predictions refer to Table 8 and Table 9, model C2.

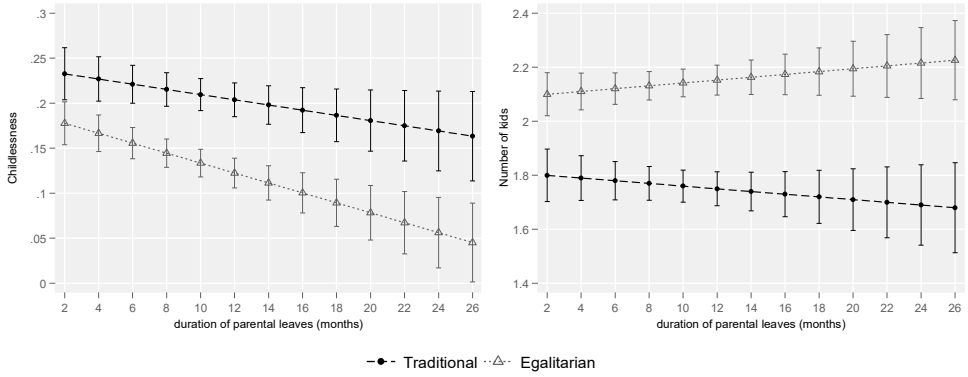
All in all, results confirm the hypothesis that family policies supporting childcare and a stability of mothers' employment, through conditions that help women to better combine work and family, are associated with a lower propensity to remain childless, and that childlessness is lower in the context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

*4.4. Does the effect of policies and institutional arrangements depend on the broader normative context?*

In line with the literature on low fertility, it is also relevant 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 do so, I investigate whether the positive association between gender egalitarian conditions and lower childlessness is stronger the more gender equal society is. This hypothesis is 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. The full outcome resulting from different models' specifications is available in Appendix Table 8 and Table 9. In the following text, the predictive margins with 90% of confidence intervals that show the predicted probability of having a childless household and the predicted numbers of children at different levels of gender egalitarianism are given. Separated figures indicate the moderating role of gender equity in the case of effective parental leaves (Figure 4.4), female part-time (Figure 5); and average male working hours (Figure 4.6).

The level of generosity in parental leaves does not appear to affect women's fertility neither in traditional nor in gender equal countries, as it is shown by the predicted number of children to not being affected by the duration of parental leaves (Figure 4.4). If we look at childlessness instead, the 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

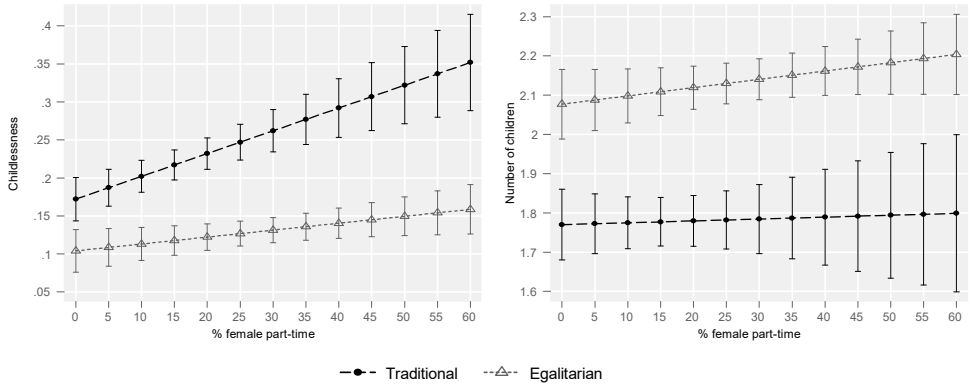
**Figure 4. 4** – Predicted probabilities of being childless (left panel) and predicted number of children (right panel) by parental leaves duration and different levels of gender egalitarianism.




Source: EU-LFS 2005-2010, author's elaboration. Complete outcome in Appendix Tables 8 and 9, Model D3.

Also, the role that the diffusion of female-part time has on fertility does not appear to be linked to the normative contexts concerning gender equity (Figure 5). To the contrary, the level of gender egalitarianism interacts with the level of female part-time available in a country in shaping the likelihood of women to be childless. As observed, female part-time is associated with a stronger propensity to have a childless household where a lower level of gender egalitarianism in diffused. Conversely, where women are perceived as having the same right to work as men in presence of scarce job – that we interpreted as women living in egalitarian societies – the level of part-time does not seem to be related to a different propensity to be childless.

**Figure 4. 5** – Predicted probabilities of being childless (left panel) and predicted number of children (right panel) by the share of female part-time and different levels of gender egalitarianism.

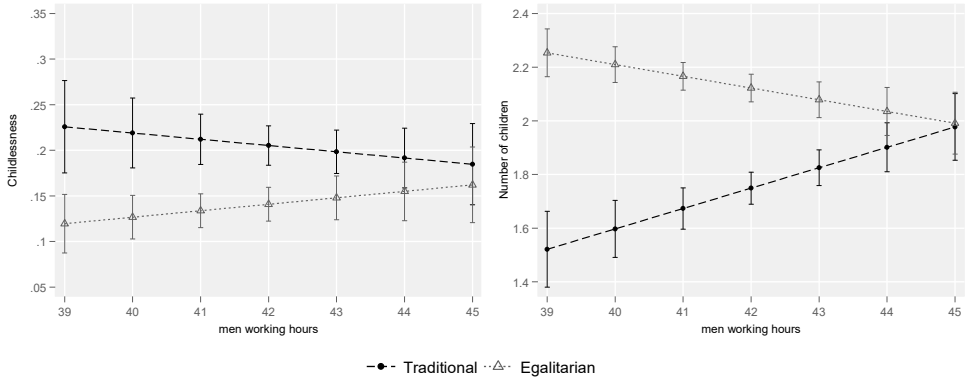



Source: Own elaboration on EU-LFS 2005-2010. Complete outcome in Appendix Tables 8 and 9, Model D1.

Lastly, the normative climate about gender egalitarianism modifies the relationship between men working hours and childbearing behaviour only when looking at fertility, whereas nothing changes int the case of childlessness (Figure 4.6). In the first case, the amount of time that 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 higher the average of working hours the smaller the family.

Differently for childlessness, the relationship probability of not having children at 35-39 years old for women is not significantly related to the amount of time men spend on their main job, neither in gender equal nor in traditional countries.

**Figure 4. 6** – Predicted probabilities of being childless and predicted number of children according the number of hours worked in the main job by man and the level of gender equality within country.




Source: EU LFS 2005-2010, author's elaboration. Complete outcome in Appendix Tables 8 and 9, model D2.

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.

## 5. Conclusions

Although there has been increasing interest among social scientists, childlessness is under-theorised and both specific explanations and theoretical arguments for the phenomenon have received little attention when compared to the determinants of fertility. This is especially true regarding macro-level mechanisms potentially affecting childlessness. To date, vast body of theoretical and empirical literature discusses the effects of family-friendly policies on fertility (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.

Throughout the last decades, increasing research has shown how fertility decisions largely are influenced by national contexts in which women make their preferences concerning families and by institutional and normative structures that affect their opportunity costs. Policies, characteristics of the labour market, as well as social norms directed at integrating women into the labour market – which I referred at to "gender equalising policies" throughout the text – have been argued to be at the root of the below replacement fertility levels and widely examined in several contexts.

The present work studied the role of macro-level factors also for childlessness and analysed whether the likelihood of being childless is linked to gender equalising policies, in the idea that the macro context modifies the role of socio-economic characteristics usually found to shape the likelihood of being childless. This general expectation was on the one side trained on by the theoretical postulates of low-fertility research. According to this perspective, the context indirectly works on the balance of work and family life, through different mechanisms that rely on economic or cultural circumstances. On the other side, this assumption has been somehow neglected in the research on childlessness, which has mainly focused on the individual characteristics associated with childlessness without these latter being affected by the different institutional and normative contexts. I investigated this relative unexplored aspect of childlessness, by considering not only several policies and institutional features that are usually considered to be "gender-equalising", but also the level of gender norms in the society. The tested association is that, by alleviating the higher family cost for the more educated and more career-oriented women, policies favouring equality within the household and the perception of equality might be a buffer to being childless.

The analysis shows that generous family-friendly policies are generally associated with both lower childlessness and a higher number of children. More extended leaves, longer hours spent by men in the labour market, and a greater

egalitarianism are overall associated with a lower probability for a woman to be childless, corroborating the initial hypothesis about the role of policies and institutional conditions supporting egalitarian gender relations in lowering childlessness.

However, results show that larger female part-time work is related to a greater probability of being a childless woman across all educational levels, which does not support the hypothesis that part-time availability reduces childlessness as an instrument that offers reconciliation to women who need care facilities at home. Some plausible explanation for this result can be given ex-post. Firstly, the use of part-time varies considerably across the countries included in the analysis. In some contexts – *i.e.* the Netherlands and Germany – female part-time tends to be more appreciated as an option to combine work and family (Booth and van Ours, 2013), whereas in other countries – *i.e.* the Mediterranean ones – part-time is often associated with precarious working conditions. In this latter group of countries, female part-time work is one of the few available instruments for women to be included into the labour force (OECD, 2013; Thevenon, 2013; Barbieri *et al.*, 2019). Accordingly, the availability of part-time work might be irrelevant as a strategy of reconciliation between family and work, and the availability of female part-time might play no role in affecting the likelihood to be a mother or having larger families. Furthermore, not always part-time work leads to a flattening of gender differences in private and public spheres. On the contrary, it often reproduces a specialisation via traditional gender roles, with women being secondary earners and primary caregivers. Consequently, part-time work might be less attractive for the more educated and more work-oriented women who, if forced to work part-time because of unavailability of better jobs, might delay having children till better working-position. All in all, the observed positive association between the share of female part-time in a country and being childless is difficult to causally interpret in this work and interesting to be assessed in future research. Such association may be due to both a large share of female part-time causing women to be more childless on the one hand, as well as to unobserved

characteristics driving jointly the propensity to not having children and women's allocation of working time on the other, so that the two seems associated, but in facto are not causally so.

Aside from the role of part-time, the analyses find that the effect of gender-equalising policies, on both childlessness and fertility, depends on the level of education and earning potentials of women. Results corroborate the second hypothesis that labour market and family-friendly policies may have a stronger effect on childlessness when women invest more in their education or career. Family policies, therefore, might help in raising below replacement level of fertility, not only by boosting higher-parity births, but also by reducing the number of women who are childless.

Furthermore, this result depends on the degree of gender egalitarianism reached within countries. The analysis shows that the effect of the considered policies importantly varies according to the degree of gender egalitarianism reached in the considered countries. Even though with some specificities, the effect of policies in reducing childlessness is stronger in gender egalitarian context, whereas is minimum in more traditional societies.

Overall, the analysis contributes to the literature on childlessness by showing macro-factors are important when analysis childlessness and showing that childlessness is only partially explainable by the same determinants of low fertility. Therefore, childlessness and low-fertility are two distinct phenomena and further research is needed in order to disentangling the underlying explanations for childlessness, both empirically and theoretically.

To the extent that childlessness is strongly related with postponing parenthood at later ages, until children is sometimes too late, future research should also assess the role of policies aimed at enabling parenthood at earlier ages. In this regard, there is resent research that has starting to put in relation childlessness and housing policies and that shows how there is a positive relationship between the sense of security provided by having a home and fertility (Vignoli, Rinesi and Mussino, 2012).

# CHAPTER V.

# IS CHILDLESSNESS A RISK FACTOR FOR SOCIAL AND EMOTIONAL ISOLATION IN MID- AND ELDERLY-LIFE?


**Brief summary**

*The relationship between family configuration and wellbeing has gained increasing attention in the field of ageing and there is growing research that examines how having children impacts on individuals' life. This article addresses the issue of the consequences of childlessness in terms of loneliness. Data from the GGS are used to analyse late-life social and emotional loneliness in Germany, France and Bulgaria, among people who are put on a continuum between those who never had children and parents who are in contact with children to different extents. Random effect linear regressions are applied. Results, based on men and women aged + 45, shows the following: 1) Never having had children is associated with higher levels of emotional and social loneliness. 2) After taking the heterogeneity of parenthood into account, the association between childlessness and both emotional and social loneliness decreases. 3) Individual characteristics do not fully account for the loneliness differentials of parenthood. Overall, result show that ties with children, more than their presence, is a factor that affects the experience of loneliness in mid- and later life.*

# 1. Introduction

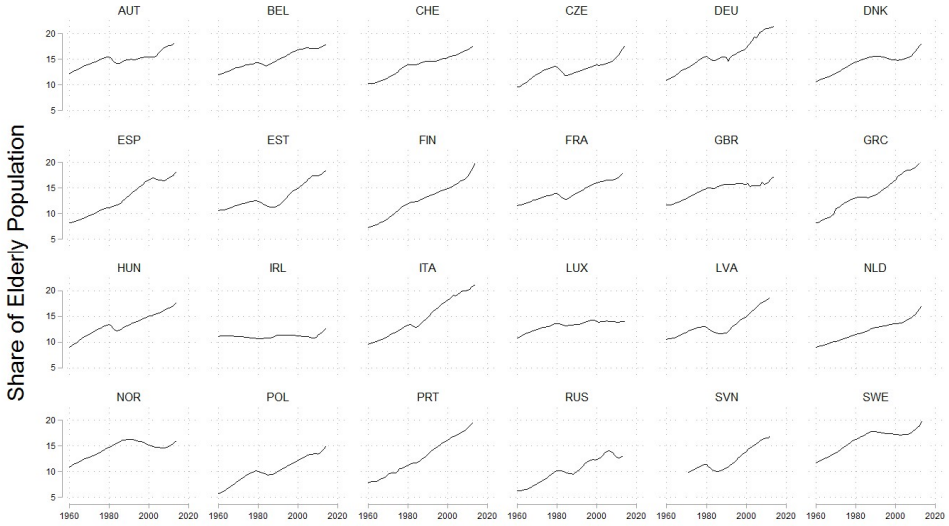
There have been many studies in the area of consequences of family events, which describes family formation as a biographical break in the life cycles of individuals. The experience of parenthood affects the life of people and has documented implications on both subjective and objective realms of individual life. One the one side, the birth of a child increases the perceived wellbeing of parents (Myrskylä and Margolis, 2014; Kohler, 2005), who show higher levels of happiness than non-parents (Aassve, Goisis and Sironi, 2011; Kohler and Mencarini, 2016). On the other side, having children also implies changes concerning parents' economic wellbeing. Family transitions are associated with higher poverty risks for households (Barbieri, Cutuli and Tosi, 2012), and motherhood especially relates to a lower accumulation of personal wealth and wages (Lersch, Jacob and Hank, 2017; Oesch, 2019).

Much of this literature documents the consequences of family transition on individuals' lives closely after the birth of a child. However, the potential implications of parenthood may carry on into later life as well. Particularly, the results of the lack of a child might be even more visible in the long-term, when the period spent without having children is longer.

The study of children as a source of social and instrumental support is especially relevant in light of the increasingly changing composition of the elderly population. Life expectancy continues to rise in European countries, which have experienced a marked increase in the share of older individuals (Figure 5.1). Together with this increase, the number of people experiencing childlessness has also increased (Chapter 3), either by choice or as a result of postponement or infertility. The result of this demographic shift coupled with a changed fertility-related behaviour is not only that the elderly population without children today is

higher than it was in the past, but also that there will be unprecedented numbers of people without children reaching oldest old age over the future years.

**Figure 5. 1** – Increasing share of elderly population across European countries since 1960.




*Source*: OECD (2019c). Author's elaboration on elderly population indicator. *Note*: The share of elderly population is defined as the ratio of people aged 65 and over on the total population.

Although traditionally the elderly population without children has received little attention in research (Dykstra and Hagestad, 2007), much has changed since Rubinstein stated in 1987 that "Almost nothing is concretely known about childless elderly in cross-cultural perspective" (Rubinstein, 1987: 1). Indeed, the combination of increasing childlessness and ageing spurred research interested in the wellbeing of the elderly population without children. Especially, research focussing on the unequal distribution of wellbeing between elderly people with and without children has taken into consideration various expressions of wellbeing, such as mental health (Buber and Engelhardt, 2008; Gibney *et al.*, 2017), satisfaction of life and happiness (Dykstra and Wagner, 2007), as well as healthy behaviours (Kendig *et al.,* 2007). There is however little conclusive evidence on

the influence of children on the quality of life of older adults. On the one side, the literature suggests a positive relationship between children and parental wellbeing. For example, Dykstra and Wagner (2007) find an association between parenthood and life satisfaction in late-life, both in Germany and in the Netherlands. Similarly, Buber and Engelhardt (2008) use SHARE data at the European level to show that childless people over the age of 65 are in general mentally worse-off than their parents' counterparts. On the other side, some research highlights that children do not play a significant role in the wellbeing of their parents. An example of this is the work of Hansel and colleagues (2009), who find that parental status does not influence individual wellbeing in terms of depression and loneliness in Norway. Also, Gibney and colleagues (2017) disconfirm the aforementioned European pattern, and show an increase in depressive symptoms among childless people, but only in Nordic countries.

In short, empirical research on the link between parenthood and condition of older adults has not conclusively ruled out the possibility that childless people are worse-off in later life compared to parents. The lack of consistent evidence regarding the role of children might suggest that more than parenthood itself, other individual characteristics could be relevant predictors of quality of life in mid- and late-life. Some research has illustrated this point, by showing how the role that children might play on old life depends on the socio-economic status of their parents. After having accounted for socioeconomic status, Gibeny (2012) finds no causal effect of childlessness on depressive symptoms for women who are 55-75 years old.

Similarly, research on the relationship between family status and well-being in later life has generally overlooked the importance of the societal context, partly because of limited data available in-depth comparative analyses (Hank and Wagner, 2013)

The present research feeds into this particular debate and sheds light on the relationship between childlessness and mid- and late-life outcome in two European

countries, using loneliness as a wellbeing measure. Two are the main contributions this work adds to extant research.

First, the vast majority of the studies on the consequences of childlessness confronts people with children with people without children. As recently pointed out (Albertini and Kohli, 2017; Albertini and Arpino, 2018), this dichotomy is possibly a stretch of reality because the condition of ageing without children can originate from numerous trajectories of life. Accordingly, in this chapter I consider parents as being a more heterogeneous group than what has previously been done. The analysis is then implemented by acknowledging that parenthood is not dichotomous to being childless, and considering the number of meetings with children as a possible source of heterogeneity within the group of the parents. The primary interest is to understand whether being childless, or being a parent with a different extent of contact with one's children affect subjective wellbeing in terms of loneliness.

Second, I investigate the bi-dimensional nature of loneliness, *i.e.* whether the condition of childlessness relates differently with perceived emotional isolation and with social isolation. In following this approach, the analysis offers a descriptive account of the prevalence of social and emotional isolation among people who are put on a continuum between those who never had children and parents who are in contact with children to different extents.

In this sense, the analysis bridges the interest of sociology of health – interested in identifying predictors of diseases and mortality (Burton-Jeangros *et al.*, 2015) – as well as of sociology of the family – by focussing on the family as an essential determinant of quality of late life (Glenn and Weaver, 1979). Since adult children usually care for their elderly parents, the growing proportion of the childless population is worrisome in term of potential care gaps old people without children might encounter and makes worth investigating the potential vulnerabilities of elderly people without children.

## 2. Theoretical Background

### *2.1. The experience of loneliness and childlessness in mid- and elderly-life*

The experience of loneliness is defined as a subjective and negative experience that occurs when people evaluate their overall social network and level of social interaction as defective (de Jong-Gierveld, van Tilburg, and Dykstra 2006; de Jong-Gierveld, 1987; Peplau and Perlman, 1982). Central to the concept is not only the discrepancy between the quality and quantity of existing relationships and the relationship standards of individuals, but also that loneliness is the result of lack of social contacts (Perlman and Peplau, 1981; de Jong-Gierlveld, Van Tilburg and Dykstra, 2006).

It is widely recognised in literature that social relations and social support are important instruments for enhancing people's wellbeing (Chappell and Badger, 1989). Children are overall referred to as one of the principal sources of social integration (Durkheim, 1896). Parenthood is commonly described in the literature as an experience that triggers social interaction and prevents isolation (Dykstra, 2006; Furstenberg, 2005). Becoming a parent is a moment in life that introduces new experiences: not only does it lead to greater responsibilities towards others, but also to greater involvement in social activities and social relations (Wenger *et al.*, 2007; Umberson, 1987; Umberson and Gove, 1989). Research illustrating this integrative role of children shows how offspring brings parents to have higher participation in the "outside world", for instance fostering connections with schools, organisations and overall community-life (Furstenberg, 2005). The potential source of social integration stimulated by children has also been extended in the gerontological literature that depicts children as a source of social support in later life as well (Albertini and Kohli, 2017; Bachrach, 1980; Eggebeen and Uhlenberg, 1985; Koropeckyj-Cox, 1998; Mahne and Huxhold 2014; van Gaalen

and Dykstra 2006; Zoutewelle-Terovan and Liefbroer, 2017). In this sense, elderly parents are reported to profit directly from a series of benefits concerning instrumental, emotional and informational support that children might provide, as well as from indirect benefits connected with the social support network and social integration that the parental experience might have activated. Overall, insofar as children are one of the principal forms of direct and indirect social embeddedness in later life (Choi, 1994; Mahne and Huxhold, 2014), and that social integration is linked with higher physical and psychological well-being (Mette, 2005), people ageing without children are expected to be at a higher risk of experiencing loneliness compared to parents.

In contrary to this assumption, the empirical evidence depicts a different scenario concerning the social integrative role of children. For example, childless individuals are found to compensate for the lack of a family network by adopting a series of strategies to cope with social isolation (Wenger, 2009). Furthermore, they are found to participate in charitable and voluntary work as much as parents do, and to have an overall extended network of friends and kin that they consider as potential supporters (Albertini and Kohli, 2009; Schnettler and Wöhler, 2016). To the extent that childless persons are reported to offset the integrating social function of children through broader social networks, childlessness might make people less isolated than expected and loneliness may be experienced in a similar way between parents and childless people. In line with this, there is research documenting how childless elderly people do not receive any less support than parents (Albertini and Mencarini, 2014).

However, evidence that childless people are integrated into the community to the same extent as parents does not provide information on the degree of their emotional isolation. As suggested by Weiss (1973), in the debate about loneliness it has become central to make a distinction between the loneliness that arises from social isolation and loneliness that stems from emotional isolation (e.g., Di Tommaso and Spinner, 1996; Drennan *et al.*, 2008; Dykstra and Fokkema, 2007; Perlman, 2004; Pinquart and Sörensen, 2001; Van Baarsen *et al.*, 2001). More in

detail, social loneliness refers to the experience of lacking a wider circle of friends and acquaintances, whereas emotional loneliness describes a condition of missing intimate attachment. Although elderly without children are reported overall to have broad groups of contacts, (Schnettler and Wöhler, 2016) this does not necessarily compensate for the lack of a figure of close emotional attachment such as that of a child. Therefore, it is relevant to examine differences in social and emotional loneliness between parents and childless people.

### *2.2. Childless, parents, and what lies in between*

Recent research points out that the mere dichotomisation of the population in childless and parents makes little sense, and that considering parenthood and childlessness as a duality can be misleading (Albertini and Arpino, 2018; Raab and Struffolino, 2019). The status of childlessness at the end of reproductive life includes a broad set of conditions that go beyond never having any children during one's lifetime. The experience of parenthood is likely to change over the life course: children grow up and may leave the parental home, some parents divorce and may see their children less often, children may move elsewhere for studying or because of a job, others may die living their parents alone. These few examples illustrate how childlessness in later life is a condition that encompasses a wide range of possible scenarios where individuals who did have children in their life lost contact with them over the years. In line with the emerging literature, this work considers that "how someone ends up with no children may be more important than not having a child per se" (Albertini and Kohli, 2017) and that the heterogeneous pathways that bring people to the condition of childlessness may also be relevant when considering the potential consequences that childlessness has on the experience of loneliness. Accordingly, it is assumed that the role that the absence of children plays on people's experience of loneliness depends on how people ended up without children. So, a more nuanced analysis of the dichotomy of parents versus childless is presented, considering that being childless in mid and late life

could be the result of different life paths. This chapter, therefore, is addressed at analysing if people without children and people who lost contact with them suffer differently from different types of loneliness.

If differences in the level of perceived isolation between parents and childless are observed, the question that arises is how to interpret and explain these differences. The distinction within the group of the parents, between those who have frequent contacts with their children, and those who lost contact with them, could help to understand if the differences between childless and parents are due to the lack of the transition to parenthood or to the lack of the social experiences activated by parenthood. In the first case, I expect to find differences between those who are parents and those who never had children. In the second case, I expect to find differences between parents who lost contact with their children and people who never had children in their life. Following this idea, this work suggests that different pathways to childlessness could lead to various emotional and social consequences, and it explores whether people who lost contact with their children suffer more from emotional isolation than childless people, and less from social isolation.

### *2.3. Loneliness across social groups and across countries*

The literature suggests how the levels of perceived loneliness might vary also in relation to other individual characteristics and experiences. In particular, the presence of a partner and having experienced significant life and labour market events are documented to affect individual subjective wellbeing (Kohler, Behrman and Skytthe, 2005). Although it is often described how people return to baseline levels after a certain period, marriage and unemployment are shown to be important determinants of life satisfaction also in the long run (Clark *et al.*, 2008). As such, I am interested in analysing the relationship between the lack of children and experience of loneliness in later life, net of the presence of partner and labour market activation.

Besides, the levels of subjective wellbeing vary significantly not only across groups of people, but they are also heterogeneously experienced across different social contexts. There is research illustrating this point, that shows how individual characteristics are shown to not fully mediate the country-variance in perceived isolation (de Jong-Gierveld and Van Tilburg, 2010; Hansen and Slagsvold, 2015). Thus, the role of family ties on elderly wellbeing might be different in relation to the generalised support opinion, cultural norms, and demographic profile of each country (Albertini and Mencarini, 2014).

Ageing parents have some degree of expectation about the extent to which their adult children should be responsible for their care (Silverstein and Giarrusso, 2010; Gans and Silverstein, 2006). These expectations, in turn, are described to strongly differ across countries according to the generalised norms of filial responsibility. For example, research highlights the European East-West divide in the support for filial norms and shows how filial obligations are stronger in Eastern Europe compared to Western Europe (de Jong-Gierveld and Tesch-Römer, 2012).

In line with this, the analysis is also aimed at considering whether family ties relate differently with loneliness among mid and elderly adults living in countries characterised with different degrees of filial obligations and different levels of familialisation of elderly-care. To tackle this issue, the work takes a comparative perspective across three European countries characterised by different degrees of loneliness in adult and elderly population, and by different levels of normative and institutionalised family support to elderly people. Namely, I focus on France as a country providing *defamilialisation of care*, and on Bulgaria as a country characterised by *familisms by default* (Saraceno and Keck, 2011).

The literature illustrates how higher or lower degrees of supported services in long-term care are likely to decommodify and defamilialise care work. France can be considered as a defamilialisation country. Here, cash provisions are directed to families and must be used to pay care workers under a formal contract, thus outsourcing elderly care. Finally, Bulgaria is one of the European countries with the lowest coverage through care services for frail elderly people, a situation which

mostly reinforces familisms by default (ibidem). Bulgaria, therefore, can be studied as a country in which well-being in elderly life is more dependent on having close children compared to France. Accordingly, I expect that experiencing childlessness in Bulgaria is more detrimental in terms of subjective isolation compared to France.

## 3. Data and method

### *3.1. Data*

The current study is based on data from the first and second waves of the Generations and Gender Survey (GGS), that collects through national surveys on random populations aged 18-79 demographic and social behaviour connected with social development on several European and non-European countries. Data were collected between 2004 and 2008, using face-to-face interviews. Data provide information on the parenting histories of respondents, as well as on the number of contacts parents have with their children and a measurement for loneliness was implemented in the national questionnaire.

In line with the comparative aim outlined above, I use data from France and Bulgaria[20] and select adults at the end of their reproductive period (+45) from the panel component of the random sample, *i.e.* 2195 women and 1735 men who took part both in the first and second wave of the GGS.

### *3.2. Variables*

[20] Moreover, France is one among the only possible Western European countries available in the panel component of the GGS, whereas many Eastern countries remains. Of these, I have chosen Bulgaria because a previous analysis shows that the two-dimensional measurement of loneliness is more sharply distinguished here (De Jon Gierveld, and Van Tilburg, 2010).

Loneliness is the dependent variable and it is measured following the short version of the de Jong-Giereveld Loneliness Scale (de Jong-Gierveld and Van Tilburg, 2006). The scale has been proven cross-national equivalence, thus allowing for intercultural comparison (de Jong-Gierveld and Van Tilburg, 2010). Namely, the scale includes six-items addressed at gathering information about the individual feelings of both social and emotional abandonments. More specifically, people are asked to answer "*no*" "*more or less*" or "*yes*" on a set of six items, as it is shown in Table 5.1. The scale allows to distinguish between the loneliness that emerges when someone is missing a wider social network and the loneliness that emerges when someone misses an intimate relationship. When processing the scale, I computed two measurements of loneliness, one of which pertains to the dimension of social loneliness (items *i-iii*), and one to the dimension of emotional loneliness (items *iv-vi*). After reversing the scale for positive items, I summarised the scores of each respondent, so as to obtain two measurements of "*social loneliness*" and "*emotional loneliness*" both ranging from 0 to 6, where 6 indicates the highest level of loneliness.

**Table 5. 1** – Record of items to measure Social and Emotional Loneliness

| **Social Loneliness** | No | More or less | Yes |
|---|---|---|---|
| *i. There are plenty of people I can rely on when I have problems;* | 0 | 1 | 2 |
| *ii. There are many people I can trust completely;* | 0 | 1 | 2 |
| *iii. There are enough people I feel close to;* | 0 | 1 | 2 |
| **Emotional Loneliness** | No | More or less | Yes |
| *iv. I experience a general sense of emptiness* | 0 | 1 | 2 |
| *v. I miss having people around me* | 0 | 1 | 2 |
| *vi. I often feel rejected* | 0 | 1 | 2 |

Since I am interested in the consequences of loneliness due to childlessness, the independent variable collects information about the presence of children in the life of individuals. Having outlined above that childlessness should no more be

considered as the opposite of parenthood, I constructed a categorical measurement for childless-parents, that distinguishes within the group of the parents according to the frequency of contacts with their non-resident children. Therefore, I summarize information up to the fourth child about the highest number of face-to-face meetings that the respondent had throughout a year with their child. I was forced to adapt the categories of France and Bulgaria to that of Germany, where the variable provides the lowest level of specificity. Considering that weekly meetings have been used in the literature as a cut-off point (e.g. Grundy and Read, 2012; Tosi and Grundy, 2018), I distinguish between the following groups of people:

i. *Childless:* people reporting that they never adopted or had a natural child;
ii. *Parents who lost contact:* parents who never meet their child(ren) or do so at best on a yearly basis;
iii. *Parents with monthly contacts:* parents meeting their child(ren) monthly;
iv. *Parents with weekly contact:* parents meeting at least weekly at least one of their children.

### *3.3. Method*

The data makes it possible to have repeated observations for individuals in two points in time. Accordingly, to estimate the role of childlessness and contact frequency with children in the experience of loneliness, random effects linear regression models are estimated. Random effects modelling allows to maximise the available information in terms of sample size, and to gain insight both into the variance between groups of parents and childless people, as well as about the variation within groups[21].

[21] Because transition for childlessness to parents after 45 is very little (i.e. on average 9.6% of people transit from being childless to being parent over the two points in time) as well as changes in parents-children contacts (i.e. on average more than 70% of contacts remains as they are) I choose random effects instead of fixed effects.

An interaction term is included between parental status and gender, because of conspicuous existing empirical evidence about gender differences in health consequences related to family ties (e.g. de Jong-Gierveld, van Tilburg, and Dykstra, 2006; Pinquart and Sörensen, 2001). To account for possible confounders, indicators of partnership status (partnered *vs* alone) and general health (bad *vs* good) are included. Also, given that literature has reported how higher educational attainment is both related to higher integration and better health all over Europe (Mackenback *et al.*, 1997), analyses control for the level of education of respondents and distinguish between respondents having a low, intermediate, or higher level of education. Since loneliness is strongly related with the ageing process (Pinquart and Sörensen, 2001) I add a control for being in mid- or old-age. Thus, I differentiate people according to being part of the baby-boomers generation (45-59 in the sample), or the silent generation (over 60 in the sample). Models are estimated for each country separately, thereby accounting for a contextual impact of childlessness on the loneliness scores.

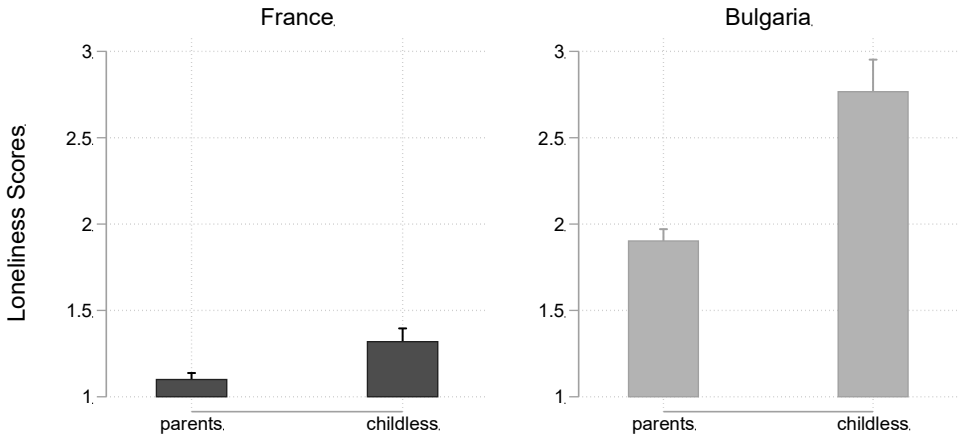
Results are presented firstly by considering the dichotomy between childless versus parents, and then by discriminating different degrees of parenthood. The Appendix provides the complete tables.

## 4. Results

Figure 5.2 shows the average number of loneliness-related symptoms experienced by people with children and people without children in France and Bulgaria. In line with what has been identified on the theoretical level, it is possible to note that France generally shows lower levels of loneliness compared to those experienced by people living in Bulgaria, where the levels almost double those observable in France. Furthermore, it is evident that on a descriptive level a

significant divergence emerges between people with children and people without children in the level of experienced loneliness. In particular, people with children appear to experience lower levels of loneliness than parents in France (1.1 vs 1.3). However, it is especially in Bulgaria that strong differences between those who have children and those who never had children in the perception of loneliness among mid- and old-aged people emerge (1.9 vs 2.8).

**Figure 5. 2** – Childless people in France and Bulgaria report higher prevalence of loneliness than parents on averages.




Source: GGS Wave 1 and Wave 2, author's elaboration.

Following the theoretical lines outlined above, I am interested in understanding if the experience of solitude varies not only with the absence of children, but also concerning different forms of loneliness. In particular, it is relevant to considerate whether people who have not had children are more likely to experience emotional loneliness, which occurs when there is a lack of an intimate attachment, or a social loneliness, which occurs when a person is not connected with the community. If the social integration function of children is verified, social loneliness should be higher among those without children than among those who parent. Similarly, as the children may represent a form of intimate resource for parents, it can be expected

that people without children suffer more from an emotional deficiency compared to parents. The results shown in Table 5.2 and Table 5.3 support the hypothesis of a double dimension of loneliness and illustrate how people without children suffer from higher loneliness than parents.

**Table 5. 2** – Results of a series of random effects linear regression predicting different scores of **Emotional loneliness**

| | France | | | Bulgaria | | |
|---|---|---|---|---|---|---|
| VARIABLES | M1 | M2 | M3 | M1 | M2 | M3 |
| *Parental Status* | | | | | | |
| Childless | 0.161** | 0.093 | 0.047 | 0.913*** | 0.612*** | 0.453** |
| *Sex of respondent (ref. Female)* | | | | | | |
| Male | | -0.443*** | -0.302*** | | -0.337*** | -0.054 |
| Male × Childless | | 0.173+ | 0.054 | | 0.608* | 0.201 |
| Constant | 0.936*** | 1.125*** | 2.261*** | 1.187*** | 1.338*** | 3.003*** |
| Observations | 5,820 | 5,820 | 5,820 | 2,030 | 2,030 | 2,030 |
| n | 2,910 | 2,910 | 2,910 | 1,015 | 1,015 | 1,015 |

*Sign. Levels*: *** p < .001, ** p < .01, * p < .05, + p <.1
*Source*: GGS Wave 1 and Wave 2, author's elaboration. *Note*: M3 includes controls for partnership status, generation, educational attainment and health. Full model available in the Appendix of Chapter 5, Table 5.6 and Table 5.7

**Table 5. 3** – Results of a series of random effects linear regression predicting different scores of **Social loneliness**

| | France | | | Bulgaria | | |
|---|---|---|---|---|---|---|
| Variables | M1 | M2 | M3 | M1 | M2 | M3 |
| Parental Status | | | | | | |
| Childless | 0.246*** | 0.172* | 0.151* | 0.757*** | 0.438* | 0.491* |
| *Sex of respondent (ref. Female)* | | | | | | |
| Male | | -0.006 | 0.033 | | -0.027 | 0.107 |
| Male × Childless | | 0.159 | 0.120 | | 0.581* | 0.332 |
| Constant | 1.271*** | 1.274*** | 1.773*** | 2.625*** | 2.637*** | 3.574*** |
| Observations | 5,820 | 5,820 | 5,820 | 2,030 | 2,030 | 2,030 |
| n | 2,910 | 2,910 | 2,910 | 1,015 | 1,015 | 1,015 |

*Sign. Levels*: *** p < .001, ** p < .01, * p < .05, + p <.1
*Source*: GGS Wave 1 and Wave 2, author's elaboration. *Note*: M3 includes controls for partnership status, generation level, educational attainment and health. Full model available in the Appendix of Chapter 5, Table 5.6 and Table 5.7.

Specifically, in France people without children suffer more from social isolation than from emotional isolation. Therefore, part of the relationship between

childlessness and loneliness is explained by higher degrees of social loneliness rather than emotional loneliness experienced by childless people. Bulgaria presents a different result, where much of the effect of childlessness on loneliness appears to be driven by emotional isolation rather than social isolation (M1, Table 5.3 and Table 5.2).

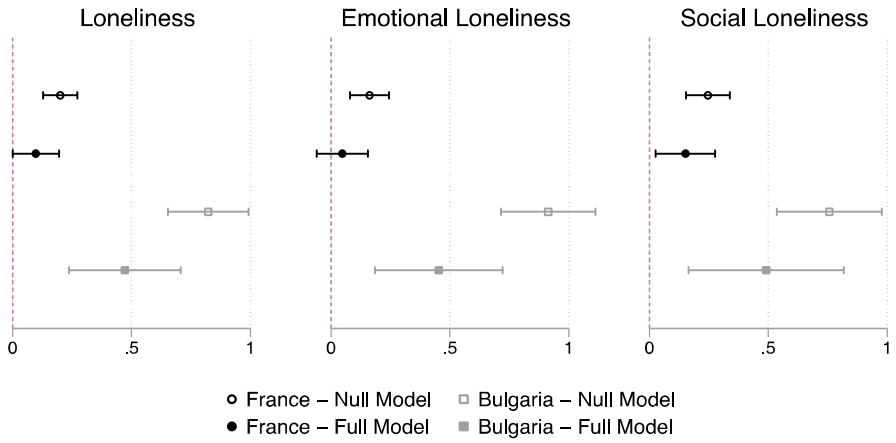
The specification of the model further allows to notice how there is an interaction effect between gender and childless status in affecting the experience of loneliness (M2). Being a man in France is overall associated with experiencing lower levels of emotional isolation, whereas no gender differences are found to be significant concerning social isolation. Further, the degree to which childlessness appears to be associated with higher emotional and social loneliness results to be higher among men than among women. Notwithstanding men suffer overall from lower emotional loneliness than women, among men being childless is associated with higher scores of emotional loneliness compared to fathers, whereas among women, mothers do no sees to worse off compared to childless women in terms of emotional isolation.

Bulgaria presents a similar scenario. Like in France, being a father in Bulgaria is associated with experiencing lower scores of emotional loneliness. Differences in terms of social loneliness are instead relevant only among men, with childless men suffering more from social isolation than fathers, whereas no significant differences are found between mothers and childless women. Furthermore, lifetime childlessness also relates to higher scores of social loneliness both among men and among women, however men mid- and old-ages appear to suffer the lack of a child more than women do.

Before introducing the discussion about how the heterogeneity of parenthood might matter to differently distribute risks of experiencing loneliness in mid- and elderly-ages, I am interested also in whether the direct role of childlessness in affecting different types of loneliness remains once controlled for possible confounders. Figure 5.3 complements graphically the results and charts the directs effects of childlessness on loneliness, social loneliness and emotional loneliness

estimated in the null (M1) and in the full model (M3). The full model includes controls related to sex and age of the respondent, their partnership status, their level of education and general health.

**Figure 5. 3** – The direct effect of childlessness on experiencing loneliness in mid- and later-life persists once controls are included

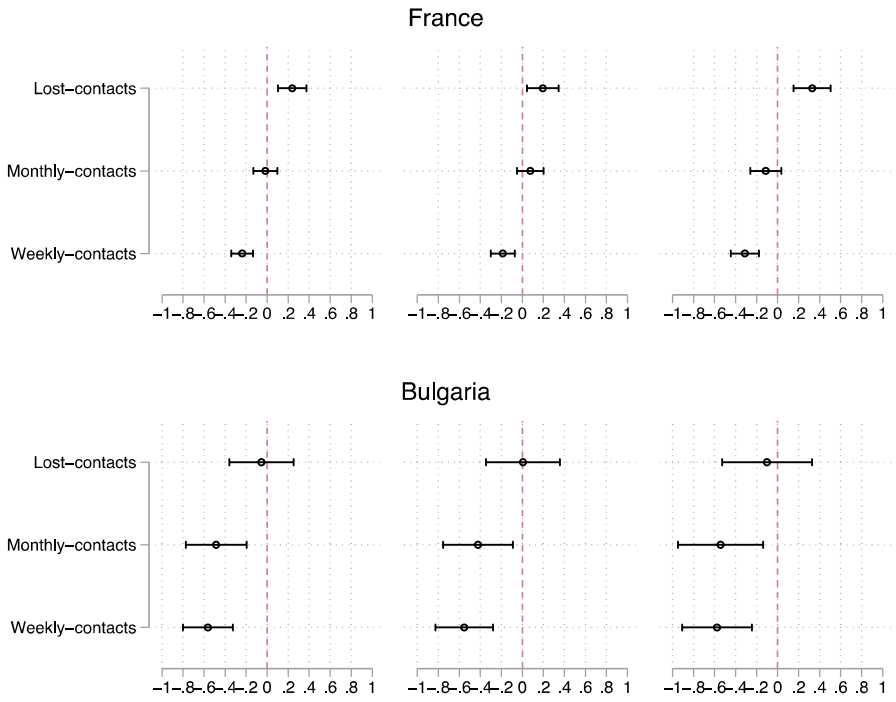



*Source*: GGS Wave 1 and Wave 2, author's elaboration. *Note*: Beta coefficients and 95 per cent confidence intervals. Parents are the baseline. Full model includes controls concerning sex, an interaction between sex and childlessness, generation, partnership status, level of education and general health. Complete model is available in the Appendix of Chapter 5, Table 5.4, Table 5.5 and Table 5.6, Model 3.

Characteristics of individuals influence loneliness outcomes in later life. Particularly, the effect size of childlessness is reduced in both the countries, but remains unexplained in some cases. Individual characteristics are found to fully account for the differences between childless and parents in terms of emotional loneliness in France countries, whereas they only marginally explain the effect in terms of emotional isolation. In Bulgaria, to the contrary, individual characteristics account for more of the childless divide in emotional isolation than of that in social loneliness.

In sum, people without children in France are more likely to suffer significantly from loneliness arising from the lack of a broad social network. In France, childless people are more likely to suffer from loneliness arising from the lack of intimate persons.

**Figure 5. 4** – The role of different degrees of parenthood on experiencing loneliness in mid- and later-life.




*Source*: GGS Wave 1 and Wave 2, author's elaboration. *Note*: Beta coefficients and 95 per cent confidence intervals. Childless are the baseline. Full model includes controls concerning sex, an interaction between sex and parental status, generation, partnership status, level of education and general health. Complete model is available in the Appendix of Chapter 5. Table 5.2, Table 5.3 and Table 5.4, M4.

It appears therefore that lifetime childlessness is associated with higher scores in loneliness compared to being a parent. However, I have theoretically discussed how people can experience different degrees of parenting. Accordingly, I am

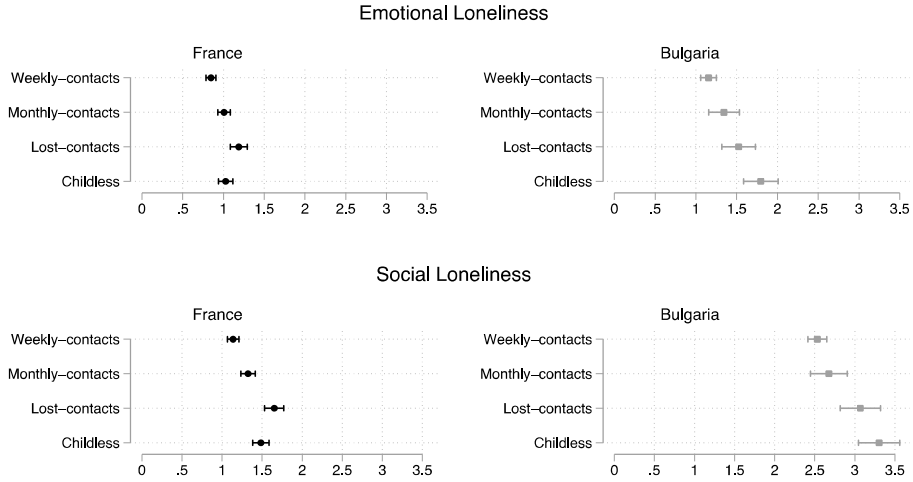
interested in analysing if people without children, and parents who have different contacts with their children, suffer differently from isolation in mid- and later-life. Results are displayed in Figure 5.4, which reports the coefficients of the loneliness score for different degrees of parents compared to lifetime childless people.

Having weekly meetings with children seem to preserve from the risk of feeling both emotional and social isolation in France as well as in Bulgaria.

People who meet their children at least once a week are found to be less likely to experience both emotional social isolation than childless people. Instead, being a parent with less frequent contacts does not seem to automatically protect from the experience of isolation. To the contrary, people who lost contacts with their children seem to be more predisposed to the experience of loneliness compared to people who never had children, at least in France.

To grasp information about the substantial role of childlessness and parenthood on loneliness, I computed the predicted scores of loneliness by parental status according to the full estimated model (Figure 5.5).

**Figure 5. 5** – Predicted scores of loneliness in mid and later-life by degrees of parenthood.




*Source*: GGS Wave 1 and Wave 2, author's elaboration. *Note*: Predicted scores and 95 per cent confidence intervals. Full model includes controls concerning sex, an interaction between sex and parental status, generation, partnership status, level of education and general health. Based on the complete model available in the Appendix of Chapter 5. Table 5.24, Table 5.4 and Table 5.4, M4.

Results show that being childless is overall significantly associated with higher scores of social loneliness both in France and in Bulgaria, whereas it only relates with higher relevant scores of emotional loneliness, in Bulgaria. In France, people are predicted to suffer more from both emotional and social isolation when they are childless rather than parents with frequent connections with children, but those who lost contact are the worst-off both. In Bulgaria lifetime childless people score higher than those who lost contacts with their children in emotional loneliness and show higher predicted scores of social loneliness than people who have weekly contacts with their children.

Overall, having weekly contacts with children seems to protect from the risk of experiencing both social and emotional isolation.

## 5. Conclusions and discussion

People in elderly life are commonly described in the literature as frail and more likely to experience phenomena of isolation (Hansen and Slagsvold, 2015). In a moment in which the Western society is confronted with rapid population ageing, in combination with an increase in the population without children, the issue of loneliness in later life is of crucial relevance. Indeed, over the coming years, there will be a higher share of population ageing without children.

Loneliness has a central significance for the wellbeing and health of mid- and older-age adults. For example, the experience of isolation has been shown to be detrimental on health, and to be related with more frequent hospitalisation (Courtin and Knapp, 2015; Hawkley and Cacippo, 2010; Shankar *et al.*, 2017; Tilvis *et al.*, 2011). Thus, experiencing loneliness represents an element of mediation in the causal chain that leads to examining the consequences of childlessness. It also

highlights the need for a better understanding of what instruments there may be for reducing loneliness, and for understanding who the people more at risk of experiencing feelings of loneliness are.

The family is overall described in the literature as a potential source of social integration and instrumental support in middle and elderly life (Silverstein and Giarrusso, 2010; Tomassini *et al.*, 2004). Accordingly, children may alleviate perceptions of social isolation because of their social integrating function, and also reduce feelings of emotional loneliness as a source of intimate support.

With this work, I was interested in exploring the extent to which not having experienced parenthood (*i.e.* being childless) or having experienced it to different degrees (*i.e.* being parents with different levels of contact with their children) might relate to different feelings of social and emotional isolation in two different countries characterised by different norms concerning filial responsibility, *i.e.* France and Bulgaria.

Results, net of other individual characteristics, show that having frequent contact with children is associated with lower scores of loneliness in both the countries, and that middle- and old-aged people who have at least weekly contacts with their children are overall less subjected to feelings of isolation. More frequent contacts with children are associated with lower perceptions of both social and emotional isolation.

The theoretical predictions based on considerations related to familial obligations and institutionalised elderly-care suggested that mid- and older-age people could be more dependent on having children in Bulgaria rather than in France. Following this argument, I was expecting to find having never had children to be associated with higher scores of loneliness in Bulgaria, because this country tends to support familialisation of care. On the contrary, in the case of France, I was expecting to find never having had children to be less associated with loneliness in adult and old life because households are invited to outsource care for elderly members through forms of public benefit. In line with this, the results confirm that in Bulgaria childless people are worse-off compared to parents in terms of both

emotional and social loneliness. In France, to the opposite, childless people are not always the worst-off, and it appears that the experience of loneliness is more attached to having lost contact with children rather than being lifetime childless.

Before concluding, there are some shortcomings of the present research that should be considered for future research.

First, the study lacks an objective dimension of isolation, which might provide more nuanced evidence regarding the degree to which people who never had children and parents to a different extent lack forms of embeddedness in their mid- and later-life. However, in the way that the dimension of social loneliness is operationalized, it could be considered a better indicator of wellbeing compared to more vague concepts like happiness. Indeed, it allows for disentangling both an objective aspect of wellbeing – *i.e.* people suffering from the absence of a broader social network – and the subjective aspects of wellbeing - *i.e.* people suffering from lack of an intimate figure.

Second, and more importantly, the analyses do not rule out problems related to selection into parenthood. There is literature suggesting that an association between childlessness and low wellbeing exists not because of children having any (causal) positive effects on their parents' wellbeing, but because people who live better are more likely to enter parenthood. Accordingly, people who are less isolated and less lonely are more likely to become parents in their life. This selection effect, for example, has been suggested in relation to health selection into parenthood (Buber and Engelhardt, 2008). Therefore, whether the prevalence of emotional loneliness among elderly people is to be causally linked to the lack of children or to their antecedent state remains an open question. Datasets collecting retrospective histories or, even better, panel datasets with longer design might be of help in future research to understand the causal link between childlessness and loneliness by identifying features of early life that affect late-life statuses.

Third, intergenerational family bonds are likely to take place in a greater number of ways: not only through face to face meetings, but also through other types of interactions (Silverstein and Bengston, 1997). The present analysis limits

its focus on face to face meeting between children and parents, and runs the risk of considering parents who have new forms of contacts with their children as parents who lost contacts with them. The changes that have been taking place over the last years in relation to structural solidarity, which refers to factors that enhance or reduce the opportunity of interaction between generations (*i.e.* geographical distance), highlights the importance of considering multiple dimensions behind intergenerational bonds rather than just face-to-face meeting. Future empirical investigation therefore should also pay attention in analysing different forms through which associational solidarity takes place, *i.e.* phone calls, skype meetings.

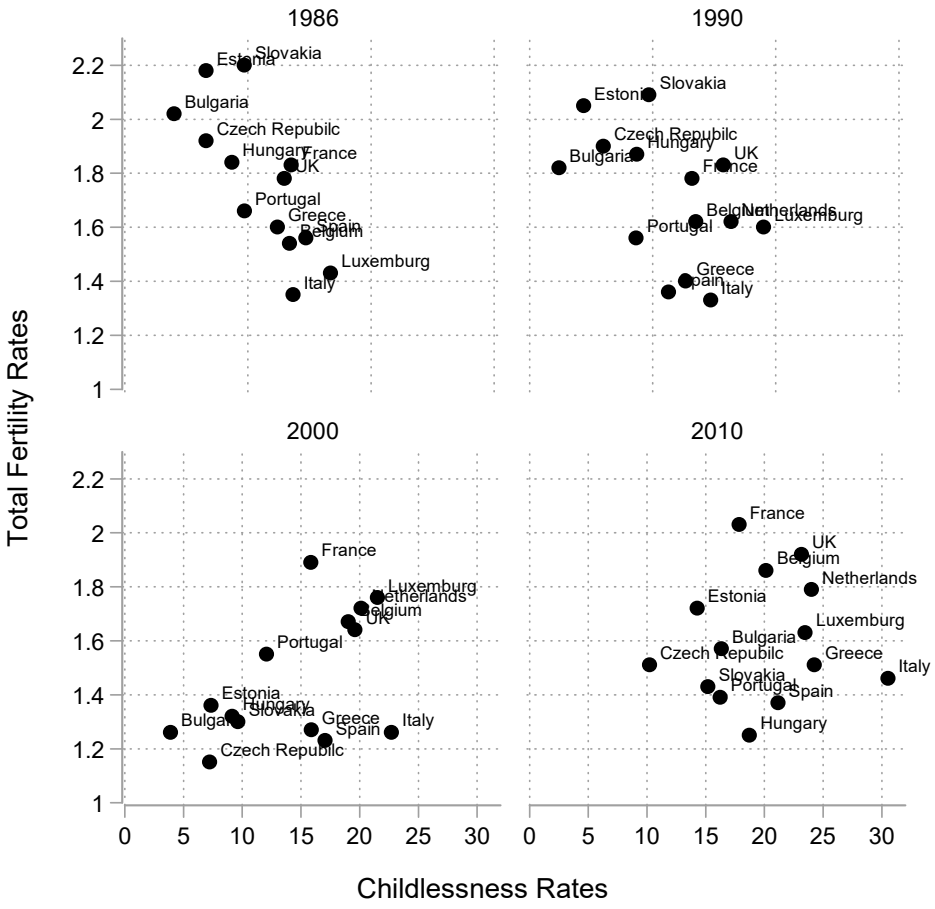
Notwithstanding these limitations, the study contributes to our knowledge about the possible consequences of childlessness in the long-term. Notably, it shows how generally people who never experienced parenthood and those who have lost contacts with their children are more likely to experience emotional and social loneliness in later life compared to people who have frequent contacts with their offspring. Especially, results highlight how more than parenthood itself, what matters most for making feeling older adults less lonely is having frequent contacts with their children.

Loneliness constitutes both a social issue and a policy issue and presented results could be helpful for policy makers by highlight that not only lifetime childless people are at risk of feeling lonely in later life, but also people who lost contacts with children are. Especially, in those countries in which care of elderly people is strongly familialised, people who live without children are more likely to feel worst in later life in terms of loneliness, whereas in countries that tend to outsource the care of elderly people both childlessness and not having contacts with children relates to worse feeling of loneliness. All in all, frequent social contacts with children appear as an essential instrument to contribute to healthy ageing.

# APPENDIX

## Appendix Chapter 1

**Figure 1. 2 – Childlessness and Total Fertility Rate for women across European countries over different point in times.**




*Sources*: EU-LFS, Eurostat, OECD, Human Fertility Database, author's elaboration. *Notes:* Childlessness rates are computed as the proportion of women 35-39 living without children and by using the European Labour Force Survey. Total fertility rate proportions refer to Eurostat for all countries (http://goo.gl/j7gz5j), except for OECD data retrieved for France 1982-1997 (https://data.oecd.org/chart/4Buv). For Croatia (1983-1996), Slovakia (1983-1999), Hungary (1993-1999), Bulgaria (1983-2000), Germany (1983-1986, only East) and Lithuania (1995-2001) data refer to the Human Fertility Database (http://www.humanfertility.org).

# Appendix Chapter 2

Table 2. 7 – Factors associated with the intention to be childless. Logistic Regression (Wave I)

| | Men | | Women | |
|---|---|---|---|---|
| Variables | AMEs | Std. Err. | AMEs | Std. Err. |
| *Age (ref. 20-24)* | | | | |
| 25-29 | -0.14*** | 0.02 | -0.13*** | 0.03 |
| 30-34 | -0.19*** | 0.03 | -0.10*** | 0.03 |
| 35-39 | -0.15*** | 0.03 | -0.02 | 0.04 |
| 40-45 | -0.07* | 0.04 | 0.18*** | 0.03 |
| Level of education (ref. Middle) | | | | |
| Low Educated | -0.04 | 0.03 | 0.08* | 0.04 |
| High Educated | -0.05*** | 0.02 | -0.03 | 0.02 |
| *Partnered (ref. Not partnered)* | | | | |
| Partnered | -0.15*** | 0.02 | -0.15*** | 0.02 |
| *Employment status (ref. Not employed)* | | | | |
| Employed | -0.02 | 0.03 | 0.04 | 0.03 |
| *Factors of the TPB* | | | | |
| Negative Attitude | 0.21*** | 0.01 | 0.17*** | 0.01 |
| Positive Attitude | -0.18*** | 0.01 | -0.18*** | 0.02 |
| Subjective Norms | -0.16*** | 0.01 | -0.16*** | 0.01 |
| Perceived control | 0.03*** | 0.01 | 0.03*** | 0.01 |
| *Countries* | | | | |
| Austria | 0.02 | 0.06 | 0.01 | 0.05 |
| France | -0.01 | 0.07 | -0.04 | 0.05 |
| Germany | 0.02 | 0.08 | 0.03 | 0.08 |
| Eastern Countries | -0.03 | 0.06 | -0.06 | 0.05 |
| N. of cases | 2,198 | | 1,782 | |

*Source*: GGS Wave 1 and Wave 2, authors' calculation. *Sign. Levels:* * p < .10, ** p < .05, *** p < .01

Table 2. 8 – – Results of a multinomial logistic regression predicting the stability of intentions to be parents and to be childless (Average Marginal Effects).

| | Men | | | | | | Women | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Prospective Fathers | | Wavers | | Prospective Childless | | Prospective Mothers | | Wavers | | Prospective Childless | |
| Variables | AMEs | Std. Err. | AMEs | Std. Err. | AMEs | Std. Err. | AMEs | Std. Err. | AMEs | Std. Err. | AMEs | Std. Err. |
| *Age (ref. 20-24)* | | | | | | | | | | | | |
| 25-29 | 0.12*** | 0.02 | 0.02 | 0.03 | -0.13*** | 0.02 | 0.11*** | 0.03 | -0.02 | 0.03 | -0.09*** | 0.02 |
| 30-34 | 0.15*** | 0.03 | -0.04 | 0.03 | -0.11*** | 0.03 | 0.00 | 0.03 | -0.02 | 0.04 | 0.01 | 0.03 |
| 35-39 | 0.08** | 0.03 | -0.00 | 0.04 | -0.07** | 0.03 | -0.06 | 0.04 | -0.05 | 0.04 | 0.10*** | 0.04 |
| 40-45 | -0.01 | 0.04 | -0.08* | 0.04 | 0.09** | 0.04 | -0.25*** | 0.03 | -0.12*** | 0.04 | 0.37*** | 0.04 |
| *Level of Education (ref. Intermediate)* | | | | | | | | | | | | |
| Low Education | 0.02 | 0.03 | 0.05 | 0.04 | -0.07** | 0.03 | -0.03 | 0.04 | -0.06 | 0.05 | 0.09** | 0.04 |
| High Education | 0.07*** | 0.02 | -0.02 | 0.02 | -0.05*** | 0.02 | 0.05** | 0.02 | 0.01 | 0.03 | -0.06*** | 0.02 |
| *Partnered (ref. Unpartnered)* | | | | | | | | | | | | |
| New partnership | 0.10*** | 0.03 | 0.02 | 0.03 | -0.11*** | 0.03 | 0.09*** | 0.03 | 0.07* | 0.04 | -0.16*** | 0.03 |
| Ended partnership | 0.04 | 0.04 | -0.03 | 0.04 | -0.01 | 0.03 | 0.10** | 0.04 | -0.11** | 0.05 | 0.01 | 0.04 |
| Stable partnership | 0.18*** | 0.03 | -0.02 | 0.03 | -0.16*** | 0.02 | 0.17*** | 0.03 | -0.02 | 0.03 | -0.15*** | 0.03 |
| *Employment status (ref. Unstable, unemployed, inactive)* | | | | | | | | | | | | |
| Stable employed | -0.01 | 0.02 | 0.03 | 0.02 | -0.02 | 0.02 | -0.02 | 0.03 | 0.04 | 0.03 | -0.02 | 0.03 |
| *Factors of the TPB* | | | | | | | | | | | | |
| Negative Attitude | -0.16*** | 0.02 | 0.00 | 0.02 | 0.15*** | 0.01 | -0.12*** | 0.01 | 0.01 | 0.02 | 0.11*** | 0.01 |
| Positive Attitude | 0.15*** | 0.02 | -0.03 | 0.02 | -0.12*** | 0.01 | 0.16*** | 0.02 | -0.05*** | 0.02 | -0.11*** | 0.01 |
| Subjective Norms | 0.11*** | 0.02 | 0.00 | 0.01 | -0.11*** | 0.01 | 0.12*** | 0.01 | -0.01 | 0.01 | -0.11*** | 0.01 |
| Perceived Control | -0.03*** | 0.01 | 0.01* | 0.01 | 0.02** | 0.01 | -0.03*** | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| *Home owner* | -0.01 | 0.02 | 0.00 | 0.02 | 0.00 | 0.02 | 0.00 | 0.02 | -0.01 | 0.03 | 0.00 | 0.02 |
| *Childless* | 0.01 | 0.02 | -0.07** | 0.03 | 0.07** | 0.03 | 0.03 | 0.03 | -0.09*** | 0.03 | 0.07** | 0.03 |
| *Country (ref. Italy)* | | | | | | | | | | | | |
| Austria | -0.02 | 0.05 | 0.07 | 0.06 | -0.05 | 0.07 | 0.02 | 0.04 | -0.01 | 0.06 | -0.01 | 0.05 |
| France | 0.02 | 0.06 | 0.06 | 0.07 | -0.08 | 0.08 | 0.08 | 0.05 | 0.01 | 0.06 | -0.09 | 0.06 |
| Germany | -0.08 | 0.05 | 0.07 | 0.09 | 0.01 | 0.09 | 0.04 | 0.08 | -0.04 | 0.09 | -0.01 | 0.08 |
| Eastern Countries | 0.05 | 0.05 | 0.12* | 0.06 | -0.18** | 0.07 | 0.05 | 0.04 | 0.08 | 0.06 | -0.12** | 0.05 |
| N. of cases | 2,198 | | | | | | 1,782 | | | | | |

*Source*: GGS Wave 1 and Wave 2, authors' calculation. *Sign. Levels:* * p < .10, ** p < .05, *** p < .01

Table 2. 9 – – Results of a multinomial logistic regression predicting the realisation of intentions to be parents and to be childless. (Average Marginal Effects)

| | Men | | | | | | Women | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Voluntary Fathers | | Wavers | | Voluntary Childless | | Voluntary Mothers | | Wavers | | Voluntary Childless | |
| Variables | AMEs | Std. | AMEs | Std. | AMEs | Std. | AMEs | Std. | AMEs | Std. | AMEs | Std. |
| *Age (ref. 20-24)* | | | | | | | | | | | | |
| 25-29 | 0.02 | 0.02 | 0.11*** | 0.03 | -0.13*** | 0.02 | 0.04* | 0.02 | 0.10*** | 0.03 | -0.14*** | 0.03 |
| 30-34 | 0.05** | 0.02 | 0.13*** | 0.03 | -0.18*** | 0.03 | 0.03 | 0.03 | 0.08** | 0.04 | -0.11*** | 0.03 |
| 35-39 | -0.00 | 0.02 | 0.18*** | 0.04 | -0.18*** | 0.03 | -0.07*** | 0.02 | 0.10** | 0.04 | -0.03 | 0.04 |
| 40-45 | -0.02 | 0.03 | 0.12*** | 0.04 | -0.10*** | 0.04 | -0.13*** | 0.02 | -0.06* | 0.03 | 0.19*** | 0.03 |
| *Level of Education (ref. Middle)* | | | | | | | | | | | | |
| Low Educated | 0.02 | 0.02 | 0.04 | 0.03 | -0.06** | 0.03 | 0.02 | 0.03 | -0.05 | 0.05 | 0.03 | 0.04 |
| High Educated | 0.01 | 0.01 | 0.05** | 0.02 | -0.06*** | 0.02 | -0.01 | 0.02 | 0.03 | 0.02 | -0.01 | 0.02 |
| *Partnership status (ref. No Partner)* | | | | | | | | | | | | |
| New partnership | 0.19*** | 0.02 | -0.02 | 0.03 | -0.17*** | 0.03 | 0.15*** | 0.02 | -0.02 | 0.03 | -0.13*** | 0.03 |
| Ended partnership | 0.02* | 0.01 | 0.07** | 0.04 | -0.10*** | 0.04 | 0.02 | 0.02 | 0.10** | 0.04 | -0.12*** | 0.04 |
| Stable partnership | 0.23*** | 0.02 | 0.03 | 0.03 | -0.26*** | 0.02 | 0.19*** | 0.02 | 0.03 | 0.03 | -0.21*** | 0.03 |
| *Employment status (ref. Unstable, Unemployed or Inactive)* | | | | | | | | | | | | |
| Stable employed | -0.02 | 0.02 | 0.03 | 0.02 | -0.00 | 0.02 | -0.01 | 0.02 | -0.01 | 0.03 | 0.02 | 0.03 |
| *Factors of the TPB* | | | | | | | | | | | | |
| Negative Attitude | -0.05*** | 0.01 | -0.14*** | 0.02 | 0.19*** | 0.02 | -0.04*** | 0.01 | -0.12*** | 0.02 | 0.16*** | 0.01 |
| Positive Attitude | 0.04*** | 0.01 | 0.12*** | 0.02 | -0.16*** | 0.01 | 0.00 | 0.01 | 0.15*** | 0.02 | -0.16*** | 0.02 |
| Subjective Norms | 0.06*** | 0.01 | 0.09*** | 0.01 | -0.15*** | 0.01 | 0.05*** | 0.01 | 0.10*** | 0.01 | -0.15*** | 0.01 |
| Perceived Control | -0.01** | 0.01 | -0.01 | 0.01 | 0.03*** | 0.01 | -0.03*** | 0.01 | -0.01 | 0.01 | 0.05*** | 0.01 |
| *Home Owner* | 0.01 | 0.01 | -0.04* | 0.02 | 0.03 | 0.02 | 0.02 | 0.02 | -0.04 | 0.02 | 0.02 | 0.02 |
| *Country (ref. Italy)* | | | | | | | | | | | | |
| Austria | -0.04 | 0.03 | 0.00 | 0.07 | 0.04 | 0.07 | -0.12*** | 0.03 | 0.11** | 0.05 | 0.01 | 0.05 |
| France | 0.04 | 0.04 | -0.06 | 0.08 | 0.02 | 0.08 | -0.01 | 0.04 | 0.06 | 0.05 | -0.04 | 0.06 |
| Germany | -0.03 | 0.04 | -0.04 | 0.09 | 0.07 | 0.09 | -0.08* | 0.05 | 0.08 | 0.08 | 0.01 | 0.08 |
| Eastern Countries | 0.00 | 0.03 | 0.07 | 0.07 | -0.07 | 0.07 | -0.06** | 0.03 | 0.17*** | 0.05 | -0.10** | 0.05 |
| N. of cases | 2275 | | | | | | 1782 | | | | | |

*Source*: GGS Wave 1 and Wave 2, authors' calculation. *Sign. Levels:* * p < .10, ** p < .05, *** p < .01

Table 2. 10 – Results of a multinomial logistic regression predicting the stability of intentions to be parents and to be childless only among people in union at Wave 1 (Average Marginal Effects)

| | Men | | | | | | Women | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Prospective Fathers | | Wavers | | Prospective Childless | | Prospective Mothers | | Wavers | | Prospective Childless | |
| Variables | AMEs | Std. | AMEs | Std. | AMEs | Std. | AMEs | Std. | AMEs | Std. | AMEs | Std. |
| *Age (ref. 20-24)* | | | | | | | | | | | | |
| 25-29 | 0.14*** | 0.04 | -0.02 | 0.04 | -0.12*** | 0.03 | 0.11*** | 0.04 | -0.03 | 0.04 | -0.07** | 0.03 |
| 30-34 | 0.17*** | 0.05 | -0.10** | 0.05 | -0.07 | 0.04 | -0.00 | 0.05 | -0.05 | 0.05 | 0.05 | 0.04 |
| 35-39 | -0.04 | 0.05 | 0.03 | 0.06 | 0.02 | 0.05 | -0.13** | 0.05 | -0.06 | 0.06 | 0.19*** | 0.05 |
| 40-45 | -0.02 | 0.06 | -0.10* | 0.06 | 0.12** | 0.05 | -0.35*** | 0.04 | -0.09 | 0.05 | 0.44*** | 0.05 |
| men > 46 | -0.31*** | 0.05 | -0.13 | 0.09 | 0.44*** | 0.09 | | | | | | |
| *Level of Education (ref. Middle)* | | | | | | | | | | | | |
| Low Educated | 0.11** | 0.05 | -0.01 | 0.05 | -0.09** | 0.04 | 0.02 | 0.06 | -0.07 | 0.06 | 0.05 | 0.05 |
| High Educated | 0.07** | 0.03 | -0.02 | 0.03 | -0.05** | 0.03 | 0.06* | 0.03 | 0.01 | 0.03 | -0.07*** | 0.03 |
| *Partnership (ref. Stable partner)* | | | | | | | | | | | | |
| Ended partnership | -0.12*** | 0.04 | 0.00 | 0.04 | 0.12*** | 0.03 | -0.08* | 0.04 | -0.07 | 0.04 | 0.15*** | 0.04 |
| *Employment status (ref. Unstable, unemployed, inactive)* | | | | | | | | | | | | |
| Stable employed | 0.02 | 0.04 | -0.01 | 0.04 | -0.01 | 0.03 | 0.00 | 0.04 | 0.02 | 0.04 | -0.03 | 0.03 |
| *Factors of the TPB* | | | | | | | | | | | | |
| Negative Attitude | -0.14*** | 0.03 | -0.02 | 0.03 | 0.16*** | 0.02 | -0.16*** | 0.02 | 0.03 | 0.02 | 0.13*** | 0.02 |
| Positive Attitude | 0.15*** | 0.02 | -0.02 | 0.03 | -0.13*** | 0.02 | 0.20*** | 0.02 | -0.04* | 0.03 | -0.16*** | 0.02 |
| Subjective Norms | 0.09*** | 0.01 | 0.01 | 0.01 | -0.10*** | 0.01 | 0.09*** | 0.01 | -0.00 | 0.02 | -0.09*** | 0.01 |
| Perceived control | -0.07*** | 0.01 | 0.06*** | 0.01 | 0.01 | 0.01 | -0.05*** | 0.01 | 0.03** | 0.01 | 0.02 | 0.01 |
| *Home Owner* | -0.02 | 0.03 | -0.01 | 0.03 | 0.03 | 0.02 | 0.01 | 0.03 | 0.00 | 0.03 | -0.02 | 0.02 |
| *Childless* | 0.01 | 0.03 | -0.11*** | 0.04 | 0.10*** | 0.03 | 0.03 | 0.03 | -0.11*** | 0.04 | 0.08** | 0.03 |
| *Country (ref. Italy)* | | | | | | | | | | | | |
| Austria | -0.03 | 0.07 | 0.06 | 0.07 | -0.03 | 0.07 | 0.00 | 0.05 | 0.02 | 0.06 | -0.02 | 0.05 |
| France | -0.01 | 0.07 | 0.04 | 0.08 | -0.03 | 0.07 | 0.02 | 0.06 | 0.02 | 0.06 | -0.04 | 0.06 |
| Germany | -0.07 | 0.09 | 0.12 | 0.10 | -0.05 | 0.08 | 0.04 | 0.09 | -0.04 | 0.09 | -0.00 | 0.07 |
| Eastern Countries | 0.03 | 0.06 | 0.05 | 0.07 | -0.08 | 0.07 | -0.01 | 0.05 | 0.05 | 0.06 | -0.05 | 0.05 |
| N. of cases | 1021 | | | | | | 962 | | | | | |

*Source*: GGS Wave 1 and Wave 2, authors' calculation. *Sign. Levels:* * p < .10, ** p < .05, *** p < .01

Table 2. 11 – Results of a multinomial logistic regression predicting the realisation of intentions to be parents and to be childless only among people in union at Wave 1 (Average Marginal Effects)

| | Men | | | | | | Women | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Voluntary Fathers | | Wavers | | Voluntary Childless | | Voluntary Mothers | | Wavers | | Voluntary Childless | |
| Variables | AMEs | Std. | AMEs | Std. | AMEs | Std. | AMEs | Std. | AMEs | Std. | AMEs | Std. |
| *Age (ref. 20-24)* | | | | | | | | | | | | |
| 25-29 | 0.03 | 0.03 | 0.13*** | 0.04 | -0.16*** | 0.04 | 0.07** | 0.04 | 0.05 | 0.04 | -0.12*** | 0.03 |
| 30-34 | 0.08* | 0.04 | 0.09* | 0.05 | -0.16*** | 0.04 | 0.05 | 0.04 | 0.08 | 0.05 | -0.13*** | 0.05 |
| 35-39 | -0.02 | 0.04 | 0.16*** | 0.05 | -0.14*** | 0.05 | -0.11*** | 0.04 | 0.10* | 0.06 | 0.01 | 0.05 |
| 40-45 | -0.04 | 0.05 | 0.13** | 0.06 | -0.08 | 0.06 | -0.20*** | 0.03 | -0.07 | 0.05 | 0.26*** | 0.05 |
| men > 46 | -0.11* | 0.06 | -0.12 | 0.09 | 0.23*** | 0.09 | | | | | | |
| *Level of Education (ref. Middle)* | | | | | | | | | | | | |
| Low Educated | 0.00 | 0.04 | 0.10* | 0.06 | -0.11** | 0.05 | 0.03 | 0.05 | -0.04 | 0.06 | 0.01 | 0.05 |
| High Educated | 0.00 | 0.03 | 0.05 | 0.03 | -0.05* | 0.03 | -0.02 | 0.03 | 0.04 | 0.03 | -0.02 | 0.03 |
| *Partnership (ref. Stable partner)* | | | | | | | | | | | | |
| Ended partnership | -0.21*** | 0.02 | 0.05 | 0.04 | 0.16*** | 0.04 | -0.18*** | 0.02 | 0.08* | 0.04 | 0.10** | 0.04 |
| *Employment status (ref. Unstable, unemployed, inactive)* | | | | | | | | | | | | |
| Stable employed | 0.01 | 0.03 | 0.09** | 0.04 | -0.09*** | 0.04 | 0.02 | 0.03 | -0.01 | 0.04 | -0.01 | 0.04 |
| *Factors of the TPB* | | | | | | | | | | | | |
| Negative Attitude | -0.05** | 0.02 | -0.13*** | 0.03 | 0.18*** | 0.03 | -0.07*** | 0.02 | -0.11*** | 0.02 | 0.18*** | 0.02 |
| Positive Attitude | 0.07*** | 0.02 | 0.07*** | 0.03 | -0.14*** | 0.02 | -0.01 | 0.02 | 0.20*** | 0.02 | -0.19*** | 0.02 |
| Subjective Norms | 0.09*** | 0.01 | 0.04*** | 0.02 | -0.13*** | 0.01 | 0.07*** | 0.01 | 0.06*** | 0.01 | -0.13*** | 0.01 |
| Perceived control | -0.03*** | 0.01 | -0.00 | 0.01 | 0.03*** | 0.01 | -0.05*** | 0.01 | -0.00 | 0.01 | 0.05*** | 0.01 |
| *Home Owner* | 0.02 | 0.02 | -0.06* | 0.03 | 0.04 | 0.03 | -0.01 | 0.02 | -0.01 | 0.03 | 0.02 | 0.03 |
| *Country (Ref. Italy)* | | | | | | | | | | | | |
| Austria | -0.05 | 0.05 | -0.00 | 0.08 | 0.05 | 0.07 | -0.18*** | 0.05 | 0.13*** | 0.05 | 0.04 | 0.05 |
| France | 0.07 | 0.06 | -0.11 | 0.08 | 0.03 | 0.08 | -0.05 | 0.05 | 0.03 | 0.06 | 0.02 | 0.06 |
| Germany | -0.01 | 0.07 | -0.06 | 0.10 | 0.07 | 0.10 | -0.13* | 0.07 | 0.10 | 0.09 | 0.03 | 0.08 |
| Eastern Countries | -0.01 | 0.05 | 0.07 | 0.07 | -0.06 | 0.07 | -0.11** | 0.05 | 0.17*** | 0.05 | -0.06 | 0.05 |
| N. of cases | 1021 | | | | | | 962 | | | | | |

*Source*: GGS Wave 1 and Wave 2, authors' calculation. *Sign. Levels:* * p < .10, ** p < .05, *** p < .01

Table 2. 12 – Results of a multinomial logistic regression predicting the stability of intentions to be parents and to be childless without considering Eastern European countries (Average Marginal Effects)

| | Men | | | | | | Women | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Prospective Fathers | | Wavers | | Prospective Childless | | Prospective Mothers | | Wavers | | Prospective Childless | |
| Variables | AMEs | Std. | AMEs | Std. | AMEs | Std. | AMEs | Std. | AME | Std. | AMEs | Std. |
| *Age (ref. 20-24)* | | | | | | | | | | | | |
| 25-29 | 0.11** | 0.04 | -0.01 | 0.05 | -0.10** | 0.04 | 0.12*** | 0.04 | -0.05 | 0.04 | -0.07** | 0.03 |
| 30-34 | 0.11** | 0.05 | -0.01 | 0.06 | -0.11** | 0.05 | 0.07 | 0.05 | -0.06 | 0.05 | -0.01 | 0.05 |
| 35-39 | 0.04 | 0.05 | -0.01 | 0.06 | -0.03 | 0.06 | -0.02 | 0.05 | -0.05 | 0.06 | 0.07 | 0.05 |
| 40-45 | -0.01 | 0.05 | -0.08 | 0.06 | 0.09* | 0.05 | -0.21*** | 0.04 | -0.19*** | 0.05 | 0.40*** | 0.05 |
| men > 46 | -0.25*** | 0.04 | -0.07 | 0.11 | 0.31*** | 0.11 | | | | | | |
| *Level of educaiton (ref. Middle)* | | | | | | | | | | | | |
| Low Educated | 0.03 | 0.05 | -0.01 | 0.06 | -0.02 | 0.05 | 0.00 | 0.05 | -0.09* | 0.06 | 0.09* | 0.05 |
| High Educated | 0.05 | 0.04 | -0.01 | 0.04 | -0.04 | 0.04 | -0.00 | 0.03 | 0.06* | 0.04 | -0.06** | 0.03 |
| *Partnered (ref. Not partnered)* | | | | | | | | | | | | |
| New partnership | 0.09* | 0.05 | 0.07 | 0.06 | -0.16*** | 0.05 | 0.05 | 0.06 | 0.15** | 0.07 | -0.20*** | 0.05 |
| Ended partnership | 0.15** | 0.06 | -0.07 | 0.07 | -0.08 | 0.07 | 0.03 | 0.07 | -0.01 | 0.08 | -0.02 | 0.07 |
| Stable partnership | 0.22*** | 0.04 | 0.05 | 0.05 | -0.26*** | 0.05 | 0.18*** | 0.05 | 0.05 | 0.05 | -0.22*** | 0.05 |
| *Employment status (ref. Unstable, unemployed, inactive)* | | | | | | | | | | | | |
| Stable employed | 0.05 | 0.04 | 0.00 | 0.05 | -0.05 | 0.04 | -0.02 | 0.04 | 0.04 | 0.05 | -0.02 | 0.04 |
| *Factors of the TPB* | | | | | | | | | | | | |
| Negative Attitude | -0.18*** | 0.03 | -0.06* | 0.03 | 0.24*** | 0.03 | -0.16*** | 0.02 | 0.03 | 0.03 | 0.13*** | 0.02 |
| Positive Attitude | 0.14*** | 0.03 | 0.02 | 0.03 | -0.16*** | 0.03 | 0.18*** | 0.02 | 0.00 | 0.03 | -0.18*** | 0.02 |
| Subjective Norms | 0.07*** | 0.01 | 0.04*** | 0.02 | -0.12*** | 0.01 | 0.11*** | 0.01 | -0.01 | 0.02 | -0.10*** | 0.01 |
| Perceived control | -0.07*** | 0.02 | 0.05*** | 0.02 | 0.01 | 0.02 | -0.03** | 0.01 | 0.01 | 0.02 | 0.02 | 0.01 |
| *Home owner* | -0.04 | 0.03 | -0.02 | 0.03 | 0.06* | 0.03 | -0.01 | 0.03 | 0.03 | 0.03 | -0.02 | 0.03 |
| *Childless* | -0.01 | 0.04 | -0.13*** | 0.05 | 0.14*** | 0.05 | -0.02 | 0.03 | -0.12** | 0.05 | 0.14*** | 0.04 |
| *Country (ref. Italy)* | | | | | | | | | | | | |
| Austria | -0.05 | 0.06 | 0.09 | 0.06 | -0.04 | 0.08 | 0.07 | 0.04 | -0.03 | 0.06 | -0.04 | 0.06 |
| France | -0.04 | 0.07 | 0.08 | 0.07 | -0.03 | 0.08 | 0.11** | 0.05 | -0.03 | 0.07 | -0.07 | 0.07 |
| Germany | -0.10 | 0.08 | 0.07 | 0.08 | 0.03 | 0.09 | 0.07 | 0.07 | -0.05 | 0.09 | -0.02 | 0.08 |
| N. of cases | 806 | | | | | | 905 | | | | | |

*Source*: GGS Wave 1 and Wave 2, authors' calculation. *Sign. Levels:* * p < .10, ** p < .05, *** p < .01

**Table 2. 13** – Results of a multinomial logistic regression predicting the realisation of intentions to be parents and to be childless without considering Eastern European countries (Average Marginal Effects)

| | Men | | | | | | Women | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Voluntary Fathers | | Wavers | | Voluntary Childless | | Voluntary Mothers | | Wavers | | Voluntary Childless | |
| Variables | AMEs | Std. Err | AMEs | Std. Err | AMEs | Std. Err | AMEs | Std. Err | AMEs | Std. Err | AMEs | Std. Err |
| *Age (ref. 20-24)* | | | | | | | | | | | | |
| 25-29 | 0.04 | 0.04 | 0.11** | 0.05 | -0.15*** | 0.04 | 0.08** | 0.03 | 0.06* | 0.04 | -0.14*** | 0.04 |
| 30-34 | 0.12*** | 0.04 | 0.04 | 0.06 | -0.15*** | 0.06 | 0.07* | 0.04 | 0.11** | 0.05 | -0.18*** | 0.05 |
| 35-39 | 0.03 | 0.04 | 0.16*** | 0.06 | -0.18*** | 0.06 | -0.08** | 0.04 | 0.20*** | 0.06 | -0.12** | 0.05 |
| 40-45 | 0.01 | 0.04 | 0.10 | 0.06 | -0.11* | 0.06 | -0.16*** | 0.03 | -0.01 | 0.05 | 0.17*** | 0.04 |
| men > 46 | -0.02 | 0.05 | -0.23*** | 0.06 | 0.25*** | 0.07 | | | | | | |
| *Level of educaiton (ref. Middle)* | | | | | | | | | | | | |
| Low Educated | -0.02 | 0.03 | 0.11* | 0.06 | -0.09* | 0.06 | 0.00 | 0.04 | -0.03 | 0.06 | 0.03 | 0.05 |
| High Educated | 0.01 | 0.03 | 0.03 | 0.04 | -0.04 | 0.04 | -0.00 | 0.02 | -0.02 | 0.03 | 0.02 | 0.03 |
| *Partnered (ref. Not partnered)* | | | | | | | | | | | | |
| New partnership | 0.08** | 0.04 | 0.01 | 0.06 | -0.09* | 0.05 | 0.06 | 0.03 | 0.06 | 0.06 | -0.12** | 0.05 |
| Ended partnership | 0.02 | 0.02 | 0.11 | 0.07 | -0.13* | 0.07 | 0.06* | 0.03 | 0.06 | 0.07 | -0.12* | 0.07 |
| Stable partnership | 0.16*** | 0.02 | 0.08 | 0.05 | -0.24*** | 0.05 | 0.19*** | 0.01 | 0.02 | 0.05 | -0.21*** | 0.05 |
| *Employment status (ref. Unstable, unemployed, inactive)* | | | | | | | | | | | | |
| Stable employed | -0.04 | 0.03 | 0.08* | 0.04 | -0.04 | 0.04 | 0.04 | 0.03 | -0.02 | 0.04 | -0.02 | 0.04 |
| *Factors of the TPB* | | | | | | | | | | | | |
| Negative Attitude | -0.07*** | 0.02 | -0.18*** | 0.03 | 0.26*** | 0.03 | -0.06*** | 0.02 | -0.12*** | 0.02 | 0.17*** | 0.02 |
| Positive Attitude | 0.07*** | 0.02 | 0.10*** | 0.03 | -0.16*** | 0.03 | 0.01 | 0.02 | 0.21*** | 0.03 | -0.22*** | 0.02 |
| Subjective Norms | 0.08*** | 0.01 | 0.04** | 0.02 | -0.12*** | 0.01 | 0.05*** | 0.01 | 0.09*** | 0.01 | -0.14*** | 0.01 |
| Perceived control | -0.05*** | 0.01 | -0.00 | 0.02 | 0.05*** | 0.02 | -0.04*** | 0.01 | -0.01 | 0.01 | 0.04*** | 0.01 |
| *Home owner* | 0.01 | 0.02 | -0.08*** | 0.03 | 0.08** | 0.03 | 0.02 | 0.02 | -0.03 | 0.03 | 0.00 | 0.03 |
| *Country (ref. Italy)* | | | | | | | | | | | | |
| Austria | -0.02 | 0.04 | -0.08 | 0.08 | 0.10 | 0.08 | -0.14*** | 0.04 | 0.15*** | 0.04 | -0.00 | 0.05 |
| France | 0.06 | 0.04 | -0.15* | 0.09 | 0.09 | 0.09 | -0.04 | 0.05 | 0.10* | 0.05 | -0.05 | 0.06 |
| Germany | -0.02 | 0.05 | -0.09 | 0.10 | 0.11 | 0.09 | -0.11* | 0.06 | 0.13* | 0.08 | -0.02 | 0.07 |
| N. of cases | 806 | | | | | | 905 | | | | | |

*Source*: GGS Wave 1 and Wave 2, authors' calculation. *Sign. Levels:* * p < .10, ** p < .05, *** p < .01

**Table 2. 14** – Results of a multinomial logistic regression predicting the stability of intentions to be parents and to be childless on people in the age group 35-45 (Average Marginal Effects)

| | Men | | | | | | Women | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Prospective Fathers | | Wavers | | Prospective Childless | | Prospective Mothers | | Wavers | | Prospective Childless | |
| | AMEs | Std. Err. | AMEs | Std. Err. | AMEs | Std. Err. | Women | Std. Err. | AMEs | Std. Err. | AMEs | Std. Err. |
| Age ref. (35-40) | | | | | | | | | | | | |
| 40-45 | -0.11** | 0.05 | -0.06 | 0.05 | 0.16*** | 0.04 | -0.22*** | 0.04 | -0.01 | 0.04 | 0.24*** | 0.04 |
| Educational Level (ref. Intermediate) | | | | | | | | | | | | |
| Low Educated | 0.02 | 0.07 | 0.03 | 0.08 | -0.04 | 0.06 | 0.10 | 0.09 | -0.21*** | 0.07 | 0.12 | 0.09 |
| High Educated | 0.10* | 0.05 | -0.05 | 0.05 | -0.05 | 0.05 | 0.12*** | 0.04 | -0.07 | 0.05 | -0.05 | 0.04 |
| Partnership (ref. Stable partner) | | | | | | | | | | | | |
| New Partnership | 0.20** | 0.08 | -0.09 | 0.08 | -0.11 | 0.07 | 0.07 | 0.08 | 0.08 | 0.09 | -0.15* | 0.08 |
| Ended partnership | -0.01 | 0.09 | 0.05 | 0.10 | -0.04 | 0.08 | -0.03 | 0.07 | -0.16** | 0.07 | 0.20** | 0.08 |
| Stable partnership | 0.10* | 0.06 | 0.00 | 0.06 | -0.11* | 0.06 | 0.06 | 0.05 | 0.02 | 0.06 | -0.07 | 0.05 |
| Employment status (ref. Unstable, not working) | | | | | | | | | | | | |
| Stable employed | -0.06 | 0.06 | -0.01 | 0.06 | 0.07 | 0.05 | 0.05 | 0.05 | -0.05 | 0.06 | -0.01 | 0.06 |
| Factors of the TPB | | | | | | | | | | | | |
| Negative Attitude | -0.21*** | 0.04 | -0.01 | 0.04 | 0.22*** | 0.04 | -0.07** | 0.03 | -0.09*** | 0.03 | 0.16*** | 0.03 |
| Positive Attitude | 0.15*** | 0.04 | 0.02 | 0.04 | -0.17*** | 0.04 | 0.09*** | 0.03 | 0.08** | 0.03 | -0.17*** | 0.03 |
| Subjective Norms | 0.09*** | 0.02 | 0.04* | 0.02 | -0.13*** | 0.02 | 0.09*** | 0.02 | 0.06*** | 0.02 | -0.15*** | 0.02 |
| Perceived Control | -0.04* | 0.02 | 0.06*** | 0.02 | -0.02 | 0.02 | -0.02 | 0.02 | 0.02 | 0.02 | 0.00 | 0.02 |
| Home Owner | 0.01 | 0.05 | -0.07 | 0.06 | 0.06 | 0.04 | 0.05 | 0.04 | -0.09* | 0.05 | 0.04 | 0.05 |
| Childless | 0.11* | 0.05 | -0.12* | 0.06 | 0.02 | 0.06 | 0.12** | 0.05 | -0.28*** | 0.08 | 0.16** | 0.08 |
| Country (ref. Italy) | | | | | | | | | | | | |
| Austria | 0.01 | 0.10 | 0.06 | 0.09 | -0.07 | 0.09 | 0.05 | 0.07 | 0.12* | 0.07 | -0.17** | 0.07 |
| France | -0.21* | 0.11 | 0.14 | 0.12 | 0.06 | 0.12 | -0.01 | 0.08 | 0.13 | 0.10 | -0.12 | 0.10 |
| Germany | -0.11 | 0.12 | 0.20 | 0.13 | -0.09 | 0.12 | 0.08 | 0.17 | -0.00 | 0.14 | -0.08 | 0.14 |
| Est | 0.01 | 0.10 | 0.12 | 0.09 | -0.12 | 0.10 | 0.03 | 0.07 | 0.17** | 0.07 | -0.19** | 0.08 |
| N. of cases | 403 | | | | | | 395 | | | | | |

*Source*: GGS Wave 1 and Wave 2, authors' calculation. *Sign. Levels:* * p < .10, ** p < .05, *** p < .01

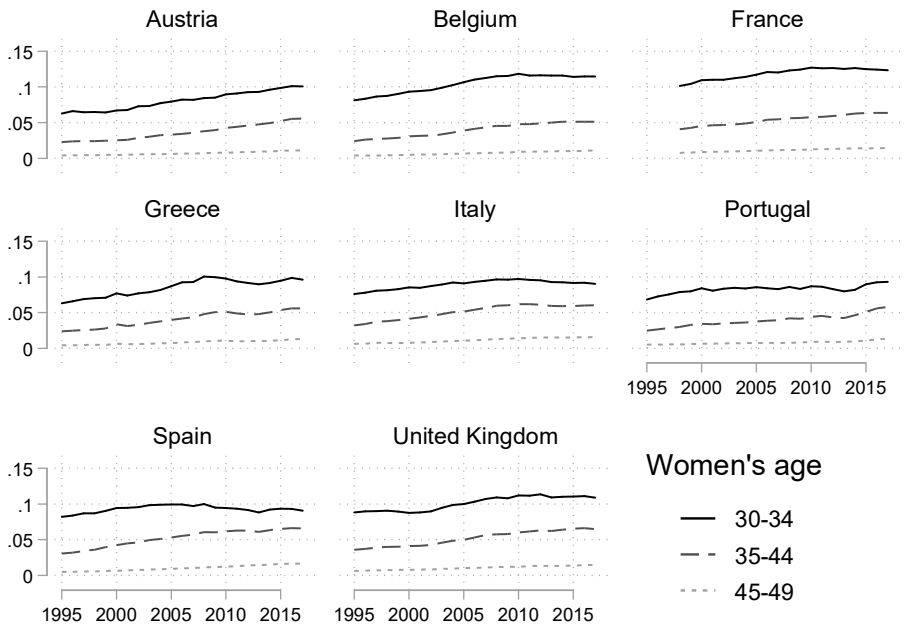
**Table 2. 15** – Results of a multinomial logistic regression predicting the realisation of intentions to be parents and to be childless on people in the age group 35-45 (Average Marginal Effects)

| | Men | | | | | | Women | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Voluntary Fathers | | Inconsistent | | Voluntary Childless | | Voluntary Mothers | | Inconsistent | | Voluntary Childless | |
| | AMEs | Std. Err. | AMEs | Std. Err. | AMEs | Std. Err. | Women | Std. Err. | AMEs | Std. Err. | AMEs | Std. Err. |
| Age (ref. 35-39) | | | | | | | | | | | | |
| 40-45 | -0.02 | 0.03 | -0.06 | 0.05 | 0.08* | 0.04 | -0.08*** | 0.02 | -0.13*** | 0.05 | 0.21*** | 0.05 |
| Level of Eduation (ref. Intermediate) | | | | | | | | | | | | |
| Low Education | -0.07** | 0.04 | 0.09 | 0.08 | -0.01 | 0.07 | 0.02 | 0.05 | 0.02 | 0.09 | -0.04 | 0.09 |
| Higher Education | 0.02 | 0.04 | 0.08 | 0.05 | -0.10** | 0.05 | 0.03 | 0.02 | 0.04 | 0.05 | -0.07 | 0.05 |
| Partnership (ref. Unpartnered) | | | | | | | | | | | | |
| New Partnership | 0.23*** | 0.07 | -0.05 | 0.09 | -0.18** | 0.08 | 0.02 | 0.03 | 0.09 | 0.09 | -0.11 | 0.08 |
| Ended partnership | -0.01 | 0.01 | 0.12 | 0.09 | -0.12 | 0.09 | 0.02 | 0.03 | -0.03 | 0.09 | 0.01 | 0.09 |
| Stable partnership | 0.20*** | 0.03 | 0.02 | 0.06 | -0.22*** | 0.05 | 0.08*** | 0.03 | 0.06 | 0.06 | -0.15*** | 0.06 |
| Employment status (ref. Unstable, Not working) | | | | | | | | | | | | |
| Stable employed | -0.04 | 0.04 | 0.05 | 0.06 | -0.02 | 0.05 | 0.04* | 0.02 | 0.02 | 0.06 | -0.06 | 0.06 |
| Factors of the TPB | | | | | | | | | | | | |
| Negative Attitude | -0.04 | 0.03 | -0.22*** | 0.04 | 0.26*** | 0.04 | -0.00 | 0.02 | -0.13*** | 0.03 | 0.13*** | 0.03 |
| Positive Attitude | 0.01 | 0.03 | 0.18*** | 0.04 | -0.19*** | 0.04 | 0.01 | 0.02 | 0.13*** | 0.04 | -0.14*** | 0.04 |
| Subjective Norms | 0.07*** | 0.02 | 0.06*** | 0.02 | -0.13*** | 0.02 | 0.02 | 0.01 | 0.13*** | 0.02 | -0.15*** | 0.02 |
| Perceived Control | -0.00 | 0.02 | 0.00 | 0.02 | -0.00 | 0.02 | -0.03** | 0.01 | 0.02 | 0.02 | 0.00 | 0.02 |
| Home Owner | -0.04 | 0.04 | 0.02 | 0.06 | 0.02 | 0.05 | 0.01 | 0.02 | -0.05 | 0.05 | 0.04 | 0.05 |
| Country (ref. Italy) | | | | | | | | | | | | |
| Austria | -0.06 | 0.06 | 0.11 | 0.11 | -0.05 | 0.10 | -0.05 | 0.04 | 0.20*** | 0.08 | -0.15* | 0.08 |
| France | 0.01 | 0.07 | -0.17 | 0.12 | 0.16 | 0.12 | -0.08** | 0.04 | 0.14 | 0.10 | -0.06 | 0.11 |
| Germany | -0.01 | 0.08 | -0.03 | 0.14 | 0.04 | 0.13 | -0.09*** | 0.03 | -0.05 | 0.15 | 0.14 | 0.15 |
| Est | -0.02 | 0.06 | 0.10 | 0.11 | -0.08 | 0.10 | -0.03 | 0.05 | 0.18** | 0.08 | -0.15* | 0.08 |
| N. of cases | 403.00 | | | | | | 395.00 | | | | | |

*Source*: GGS Wave 1 and Wave 2, authors' calculation. *Sign. Levels:* * p < .10, ** p < .05, *** p < .01

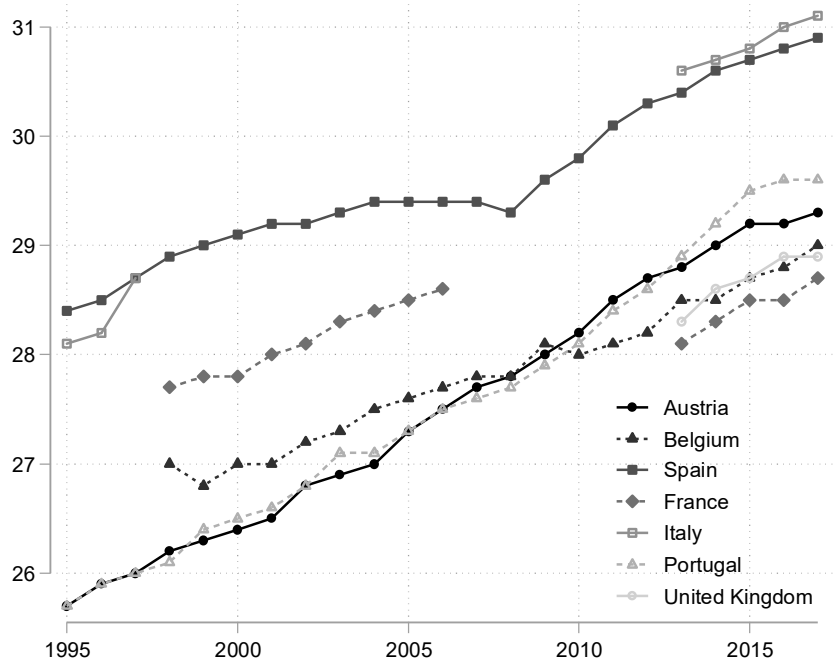
# Appendix Chapter 3

**Figure 3. 8** – Total Fertility Rates by women's age across European countries, over time.




Source: Eurostat, fertility rates by age (indicator demo_frate)

**Figure 3. 9** – Mean age of women at first childbirth across European countries, over time.




Source: Eurostat, fertility rates by age (indicator demo_frate)

**Table 3. 1**– Childlessness among women, selected cohorts (1900–1972), by country and region

| *Cohort* | *1960* | *1965* | *1968* | *1970* | *1972* |
|---|---|---|---|---|---|
| Austria | 16 | 17 | 18 | 19 | 19 |
| Belgium | 16 | 16 | 16 | - | - |
| Germany | 18 | 22 | 23 | - | - |
| Spain | 12 | 15 | 17 | 19 | 21 |
| France | 13 | - | 14 | - | - |
| Greece | 11 | 16 | - | - | - |
| Italy | 14 | 18 | 20 | 21 | 21 |
| Portugal | 11 | 13 | 12 | - | - |
| England and Wales | 19 | 20 | 18 | 18 | - |

Source: Sobotka, T. (2017).

**Table 3. 2**– Proportion of women who live without children at 35-39 years old, by country and period

| *Cohort* | *1995* | *2002* | *2005* | *2007* | *2009* |
|---|---|---|---|---|---|
| Austria | 20 | 21 | 23 | 24 | 24 |
| Belgium | 15 | 18 | 19 | 19 | 21 |
| Germany | 21 | 24 | 29 | 29 | 26 |
| Spain | 13 | 22 | 25 | 26 | 26 |
| France | 14 | 16 | 16 | 17 | 18 |
| Greece | 14 | 18 | 21 | 24 | 23 |
| Italy | 17 | 24 | 27 | 27 | 29 |
| Portugal | 11 | 13 | 14 | 15 | 17 |
| UK | 19 | 23 | 22 | 22 | 24 |

Source: EU-LFS, author's elaboration

**Table 3. 3**– Results a series of logistic regressions predicting the likelihood of being childless (1) rather than mothers (0) in several European countries (Logit coefficients – Standard Errors in parenthesis)

| | Austria | | | | Belgium | | | | Germany | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VARIABLES | M0 | M1 | M2 | M3 | M0 | M1 | M2 | M3 | M0 | M1 | M2 | M3 |
| Year | 0.021*** | 0.012* | 0.009 | -0.009 | 0.006 | 0.004 | 0.011 | -0.028** | 0.019*** | 0.017*** | -0.005 | -0.018*** |
| | (0.004) | (0.004) | (0.011) | (0.012) | (0.004) | (0.004) | (0.009) | (0.010) | (0.001) | (0.001) | (0.004) | (0.004) |
| Level of education (ref. Low) | | | | | | | | | | | | |
| Intermediate | | 0.189* | -11.528 | 13.463 | | 0.041 | 12.274 | 31.610 | | 0.218*** | -52.769*** | -20.792* |
| | | (0.079) | (24.674) | (27.611) | | (0.077) | (23.191) | (25.453) | | (0.028) | (8.729) | (9.944) |
| High | | 0.787*** | 5.313 | 13.857 | | 0.184* | 21.725 | 32.572 | | 0.636*** | -46.633*** | -39.412*** |
| | | (0.091) | (27.660) | (31.453) | | (0.075) | (22.330) | (24.687) | | (0.031) | (9.502) | (10.974) |
| Level of education × Year | | | | | | | | | | | | |
| Intermediate × Year | | | 0.006 | -0.007 | | | -0.006 | -0.016 | | | 0.026*** | 0.010* |
| | | | (0.012) | (0.014) | | | (0.012) | (0.013) | | | (0.004) | (0.005) |
| High × Year | | | -0.002 | -0.007 | | | -0.011 | -0.016 | | | 0.024*** | 0.020*** |
| | | | (0.014) | (0.016) | | | (0.011) | (0.012) | | | (0.005) | (0.005) |
| Working status and class (ref. Inactive) | | | | | | | | | | | | |
| Unemployed | | | | 0.625*** | | | | -0.048 | | | | 0.672*** |
| | | | | (0.183) | | | | (0.146) | | | | (0.054) |
| Higher-grade service class | | | | 0.835*** | | | | -0.009 | | | | 1.381*** |
| | | | | (0.132) | | | | (0.113) | | | | (0.045) |
| Lower-grade service class | | | | 0.752*** | | | | 0.087 | | | | 1.114*** |
| | | | | (0.124) | | | | (0.138) | | | | (0.040) |
| Skilled workers | | | | 0.578*** | | | | 0.137 | | | | 1.045*** |
| | | | | (0.109) | | | | (0.098) | | | | (0.037) |
| Unskilled workers | | | | 0.430** | | | | 0.235+ | | | | 0.658*** |
| | | | | (0.137) | | | | (0.123) | | | | (0.050) |
| Marital Status (ref. Previously married) | | | | | | | | | | | | |
| Single | | | | 1.483*** | | | | 1.377*** | | | | 1.748*** |
| | | | | (0.103) | | | | (0.102) | | | | (0.036) |
| Married | | | | -0.896*** | | | | -1.089*** | | | | -0.752*** |
| | | | | (0.100) | | | | (0.101) | | | | (0.034) |
| Constant | -42.795*** | -24.558** | -19.252 | 17.088 | -13.300 | -9.357 | -22.637 | 55.062** | -39.729*** | -35.356*** | 8.585 | 35.173*** |
| | (8.759) | (9.001) | (21.518) | (24.069) | (8.533) | (8.681) | (17.877) | (20.021) | (2.893) | (2.910) | (7.827) | (8.892) |
| Observations | 108,472 | 108,472 | 108,472 | 108,472 | 60,019 | 60,019 | 60,019 | 60,019 | 220,696 | 220,696 | 220,696 | 220,696 |
| AIC | 7627 | 7536 | 7539 | 6172 | 7853 | 7849 | 7852 | 6537 | 69898 | 69352 | 69318 | 54741 |
| BIC | 7647 | 7575 | 7597 | 6297 | 7871 | 7885 | 7906 | 6654 | 69919 | 69393 | 69380 | 54875 |
| Pseudo R-squared | 0.00296 | 0.0154 | 0.0155 | 0.196 | 0.000244 | 0.00122 | 0.00134 | 0.171 | 0.00256 | 0.0104 | 0.0109 | 0.219 |

Standard errors in parentheses Note: *** p<0.001, ** p<0.01, * p<0.05, + p<0.10

| | Spain | | | | France | | | | Greece | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VARIABLES | M0 | M1 | M2 | M3 | M0 | M1 | M2 | M3 | M0 | M1 | M2 | M3 |
| Year | 0.045*** | 0.030*** | 0.045*** | -0.005 | 0.011*** | 0.004* | 0.014*** | -0.021*** | 0.055*** | 0.046*** | 0.049*** | 0.029* |
| | (0.002) | (0.002) | (0.003) | (0.004) | (0.002) | (0.002) | (0.004) | (0.004) | (0.004) | (0.004) | (0.009) | (0.011) |
| Level of education (ref. Low) | | | | | | | | | | | | |
| Intermediate | | 0.435*** | 42.942*** | 35.624** | | 0.004 | 8.641 | 14.340 | | 0.413*** | 11.536 | -2.203 |
| | | (0.035) | (10.863) | (12.744) | | (0.033) | (10.241) | (11.148) | | (0.068) | (21.208) | (28.333) |
| High | | 0.905*** | 45.784*** | 8.047 | | 0.405*** | 40.342*** | 24.411* | | 0.850*** | 1.713 | -9.538 |
| | | (0.029) | (9.128) | (10.808) | | (0.033) | (10.158) | (11.173) | | (0.073) | (22.708) | (30.937) |
| Level of education × Year | | | 0.000 | 0.000 | | | 0.000 | 0.000 | | | 0.000 | 0.000 |
| | | | (0.000) | (0.000) | | | (0.000) | (0.000) | | | (0.000) | (0.000) |
| Intermediate × Year | | | -0.021*** | -0.018** | | | -0.004 | -0.007 | | | -0.006 | 0.001 |
| | | | (0.005) | (0.006) | | | (0.005) | (0.006) | | | (0.011) | (0.014) |
| High × Year | | | -0.022*** | -0.004 | | | -0.020*** | -0.012* | | | -0.000 | 0.005 |
| | | | (0.005) | (0.005) | | | (0.005) | (0.006) | | | (0.011) | (0.015) |
| Working status and condition (ref. Inactive) | | | | | | | | | | | | |
| Unemployed | | | | 0.380*** | | | | 0.446*** | | | | 0.282* |
| | | | | (0.054) | | | | (0.058) | | | | (0.126) |
| Higher-grade service class | | | | 0.567*** | | | | 0.557*** | | | | 0.276* |
| | | | | (0.055) | | | | (0.054) | | | | (0.131) |
| Lower-grade service class | | | | 0.667*** | | | | 0.383*** | | | | 0.277+ |
| | | | | (0.063) | | | | (0.053) | | | | (0.158) |
| Skilled workers | | | | 0.616*** | | | | 0.362*** | | | | 0.252* |
| | | | | (0.047) | | | | (0.045) | | | | (0.100) |
| Unskilled workers | | | | 0.319*** | | | | 0.378*** | | | | 0.213 |
| | | | | (0.058) | | | | (0.055) | | | | (0.162) |
| Single | | | | 2.044*** | | | | 1.406*** | | | | 4.438*** |
| | | | | (0.055) | | | | (0.050) | | | | (0.181) |
| Married | | | | -0.904*** | | | | -0.902*** | | | | -0.753*** |
| | | | | (0.053) | | | | (0.053) | | | | (0.116) |
| Constant | -91.28*** | -62.43*** | -92.22*** | 7.504 | -23.62*** | -10.78** | -29.99*** | 39.11*** | -111.38*** | -94.53*** | -99.86*** | -60.96** |
| | (3.812) | (3.968) | (6.975) | (8.161) | (3.720) | (3.838) | (8.156) | (8.993) | (8.064) | (8.260) | (17.319) | (22.940) |
| Observations | 132,875 | 132,875 | 132,875 | 132,875 | 116,640 | 116,640 | 116,640 | 116,640 | 155,650 | 155,650 | 155,650 | 155,650 |
| AIC | 41431 | 40439 | 40416 | 30079 | 43414 | 43177 | 43161 | 36079 | 9300 | 9161 | 9165 | 5640 |
| BIC | 41451 | 40478 | 40475 | 30207 | 43434 | 43216 | 43219 | 36204 | 9320 | 9201 | 9224 | 5770 |
| Pseudo R-squared | 0.0137 | 0.0374 | 0.0380 | 0.284 | 0.000806 | 0.00635 | 0.00682 | 0.170 | 0.0203 | 0.0354 | 0.0354 | 0.408 |

Standard errors in parentheses Note: *** p<0.001, ** p<0.01, * p<0.05, + p<0.10

| | Italy | | | | Portugal | | | | United Kingdom | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VARIABLES | M0 | M1 | M2 | M3 | M0 | M1 | M2 | M3 | M0 | M1 | M2 | M3 |
| Year | 0.034*** | 0.024*** | 0.036*** | 0.004 | 0.035*** | 0.016*** | 0.029*** | -0.018* | 0.010*** | -0.001 | 0.013*** | -0.014*** |
| | (0.002) | (0.002) | (0.003) | (0.003) | (0.005) | (0.005) | (0.007) | (0.008) | (0.002) | (0.002) | (0.004) | (0.004) |
| Level of education (ref. Low) | | | | | | | | | | | | |
| Intermediate | | 0.378*** | 28.259*** | 28.896** | | 0.543*** | 64.175** | 76.754** | | 0.239*** | 36.821*** | 39.198*** |
| | | (0.024) | (7.541) | (9.088) | | (0.079) | (24.297) | (27.704) | | (0.031) | (9.871) | (10.666) |
| High | | 0.866*** | 52.285*** | 37.159*** | | 0.963*** | 29.897 | 29.789 | | 0.673*** | 34.941*** | -7.648 |
| | | (0.029) | (9.190) | (11.256) | | (0.071) | (21.751) | (25.565) | | (0.030) | (9.231) | (10.098) |
| Level of education × Year | | | | | | | | | | | | |
| Intermediate × Year | | | -0.014*** | -0.014** | | | -0.032** | -0.038** | | | -0.018*** | -0.019*** |
| | | | (0.004) | (0.005) | | | (0.012) | (0.014) | | | (0.005) | (0.005) |
| High × Year | | | -0.026*** | -0.018** | | | -0.014 | -0.014 | | | -0.017*** | 0.004 |
| | | | (0.005) | (0.006) | | | (0.011) | (0.013) | | | (0.005) | (0.005) |
| Working status and class (ref. Inactive) | | | | | | | | | | | | |
| Unemployed | | | | 0.527*** | | | | -0.103 | | | | 0.537*** |
| | | | | (0.053) | | | | (0.163) | | | | (0.073) |
| Higher-grade service class | | | | 0.632*** | | | | -0.243 | | | | 1.390*** |
| | | | | (0.049) | | | | (0.153) | | | | (0.043) |
| Lower-grade service class | | | | 0.638*** | | | | -0.072 | | | | 1.284*** |
| | | | | (0.045) | | | | (0.160) | | | | (0.049) |
| Skilled workers | | | | 0.642*** | | | | -0.125 | | | | 0.825*** |
| | | | | (0.035) | | | | (0.116) | | | | (0.040) |
| Unskilled workers | | | | 0.589*** | | | | -0.148 | | | | 0.637*** |
| | | | | (0.049) | | | | (0.137) | | | | (0.059) |
| Marital Status (ref. Previously married) | | | | | | | | | | | | |
| Single | | | | 1.965*** | | | | 2.251*** | | | | 1.237*** |
| | | | | (0.047) | | | | (0.123) | | | | (0.037) |
| Married | | | | -1.094*** | | | | -1.007*** | | | | -0.760*** |
| | | | | (0.043) | | | | (0.119) | | | | (0.036) |
| Constant | -68.703*** | -50.244*** | -73.823*** | -8.628 | -71.929*** | -35.099*** | -59.755*** | 34.802* | -21.393*** | -0.180 | -26.870*** | 26.148** |
| | (3.226) | (3.308) | (5.744) | (6.910) | (9.141) | (9.509) | (14.518) | (16.613) | (3.527) | (3.666) | (7.407) | (8.078) |
| Observations | 349,971 | 349,971 | 349,971 | 349,971 | 86,225 | 86,225 | 86,225 | 86,225 | 90,208 | 90,208 | 90,208 | 90,208 |
| AIC | 56589 | 55710 | 55681 | 41096 | 7603 | 7423 | 7420 | 5485 | 48197 | 47629 | 47616 | 41081 |
| BIC | 56611 | 55753 | 55745 | 41236 | 7621 | 7460 | 7476 | 5607 | 48216 | 47667 | 47673 | 41203 |
| Pseudo R-squared | 0.00781 | 0.0233 | 0.0239 | 0.280 | 0.00784 | 0.0319 | 0.0328 | 0.287 | 0.000674 | 0.0125 | 0.0129 | 0.149 |

Standard errors in parentheses Note: *** p<0.001, ** p<0.01, * p<0.05, + p<0.10

**Table 3. 4**– The Average Marginal Effects and Average Partial Effects from the logit analyses on being childless (1) rather than mothers (0) in several European countries (Standard Errors in parenthesis).

| | Austria | | | | Belgium | | | | Germany | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VARIABLES | M0 | M1 | M2 | M3 | M0 | M1 | M2 | M3 | M0 | M1 | M2 | M3 |
| Year | 0.004*** | 0.002* | 0.002** | -0.002** | 0.001 | 0.001 | 0.001 | -0.005*** | 0.004*** | 0.003*** | 0.003*** | -0.001*** |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.000) | (0.000) | (0.000) | (0.000) |
| Level of education (ref. Low) | | | | | | | | | | | | |
| Intermediate | | 0.030* | 0.031* | -0.011 | | 0.006 | 0.004 | 0.001 | | 0.038*** | 0.040*** | -0.024*** |
| | | (0.012) | (0.012) | (0.013) | | (0.011) | (0.011) | (0.011) | | (0.005) | (0.005) | (0.005) |
| High | | 0.147*** | 0.150*** | 0.041* | | 0.028* | 0.027* | 0.021+ | | 0.122*** | 0.124*** | -0.010+ |
| | | (0.017) | (0.017) | (0.018) | | (0.011) | (0.011) | (0.013) | | (0.006) | (0.006) | (0.006) |
| Working status (ref. Inactive) | | | | | | | | | | | | |
| Unemployed | | | | 0.080** | | | | -0.006 | | | | 0.080*** |
| | | | | (0.025) | | | | (0.017) | | | | (0.007) |
| Higher-grade service class | | | | 0.111*** | | | | -0.001 | | | | 0.189*** |
| | | | | (0.018) | | | | (0.013) | | | | (0.006) |
| Lower-grade service class | | | | 0.099*** | | | | 0.011 | | | | 0.145*** |
| | | | | (0.016) | | | | (0.017) | | | | (0.005) |
| Skilled workers | | | | 0.073*** | | | | 0.017 | | | | 0.134*** |
| | | | | (0.013) | | | | (0.012) | | | | (0.004) |
| Unskilled workers | | | | 0.053** | | | | 0.030+ | | | | 0.078*** |
| | | | | (0.017) | | | | (0.016) | | | | (0.006) |
| Marital status (ref. Previously married) | | | | | | | | | | | | |
| Single | | | | 0.331*** | | | | 0.298*** | | | | 0.388*** |
| | | | | (0.020) | | | | (0.019) | | | | (0.007) |
| Married | | | | -0.122*** | | | | -0.128*** | | | | -0.111*** |
| | | | | (0.016) | | | | (0.015) | | | | (0.006) |
| Observations | 108,472 | 108,472 | 108,472 | 108,472 | 60,019 | 60,019 | 60,019 | 60,019 | 220,696 | 220,696 | 220,696 | 220,696 |

*Source*: EU LFS, author's elaboration. *Sign. Levels*: *** p<.001, ** p<.01, * p<.05, + p<.10

| | Spain | | | | France | | | | Greece | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VARIABLES | M0 | M1 | M2 | M3 | M0 | M1 | M2 | M3 | M0 | M1 | M2 | M3 |
| year of survey | 0.008*** | 0.005*** | 0.005*** | -0.001*** | 0.002*** | 0.001* | 0.001* | -0.003*** | 0.009*** | 0.008*** | 0.008*** | 0.003*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.001) | (0.001) | (0.001) | (0.001) |
| Level of education (ref. Low) | | | | | | | | | | | | |
| Intermediate | | 0.067*** | 0.063*** | 0.031*** | | 0.001 | -0.002 | -0.006 | | 0.062*** | 0.062*** | 0.023** |
| | | (0.005) | (0.006) | (0.005) | | (0.004) | (0.004) | (0.004) | | (0.010) | (0.010) | (0.008) |
| High | | 0.159*** | 0.158*** | 0.086*** | | 0.058*** | 0.059*** | 0.035*** | | 0.145*** | 0.144*** | 0.048*** |
| | | (0.005) | (0.005) | (0.005) | | (0.005) | (0.005) | (0.005) | | (0.012) | (0.012) | (0.011) |
| Working status and class (ref. Inactive) | | | | | | | | | | | | |
| Unemployed | | | | 0.043*** | | | | 0.049*** | | | | 0.024* |
| | | | | (0.006) | | | | (0.007) | | | | (0.011) |
| Higher-grade service class | | | | 0.066*** | | | | 0.063*** | | | | 0.024* |
| | | | | (0.006) | | | | (0.006) | | | | (0.012) |
| Lower-grade service class | | | | 0.079*** | | | | 0.041*** | | | | 0.024+ |
| | | | | (0.008) | | | | (0.006) | | | | (0.014) |
| Skilled workers | | | | 0.072*** | | | | 0.039*** | | | | 0.021* |
| | | | | (0.005) | | | | (0.005) | | | | (0.008) |
| Unskilled workers | | | | 0.036*** | | | | 0.041*** | | | | 0.018 |
| | | | | (0.007) | | | | (0.006) | | | | (0.014) |
| Marital status (ref. Previously married) | | | | | | | | | | | | |
| Single | | | | 0.445*** | | | | 0.245*** | | | | 0.750*** |
| | | | | (0.010) | | | | (0.007) | | | | (0.018) |
| Married | | | | -0.117*** | | | | -0.073*** | | | | -0.094*** |
| | | | | (0.008) | | | | (0.005) | | | | (0.018) |
| Observations | 132,875 | 132,875 | 132,875 | 132,875 | 116,640 | 116,640 | 116,640 | 116,640 | 155,650 | 155,650 | 155,650 | 155,650 |

*Source*: EU LFS, author's elaboration. *Sign. Levels*: *** p<.001, ** p<.01, * p<.05, + p<.10 (Standard errors in parentheses)

| | Italy | | | | Portugal | | | | United Kingdom | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VARIABLES | M0 | M1 | M2 | M3 | M0 | M1 | M2 | M3 | M0 | M1 | M2 | M3 |
| Year | 0.006*** | 0.005*** | 0.004*** | -0.001*** | 0.005*** | 0.002*** | 0.002*** | -0.003*** | 0.002*** | -0.000 | -0.000 | -0.003*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.001) | (0.001) | (0.001) | (0.001) | (0.000) | (0.000) | (0.000) | (0.000) |
| Level of education (ref. Low) | | | | | | | | | | | | |
| Intermediate | | 0.067*** | 0.064*** | 0.018*** | | 0.067*** | 0.070*** | 0.045*** | | 0.035*** | 0.031*** | 0.020*** |
| | | (0.004) | (0.004) | (0.004) | | (0.010) | (0.011) | (0.010) | | (0.005) | (0.005) | (0.005) |
| High | | 0.171*** | 0.175*** | 0.070*** | | 0.137*** | 0.136*** | 0.088*** | | 0.113*** | 0.110*** | 0.052*** |
| | | (0.006) | (0.006) | (0.006) | | (0.011) | (0.011) | (0.013) | | (0.005) | (0.005) | (0.005) |
| Working status and class (ref. Inactive) | | | | | | | | | | | | |
| Unemployed | | | | 0.064*** | | | | -0.010 | | | | 0.058*** |
| | | | | (0.007) | | | | (0.015) | | | | (0.009) |
| Higher-grade service class | | | | 0.078*** | | | | -0.022 | | | | 0.188*** |
| | | | | (0.006) | | | | (0.014) | | | | (0.006) |
| Lower-grade service class | | | | 0.079*** | | | | -0.007 | | | | 0.170*** |
| | | | | (0.006) | | | | (0.015) | | | | (0.007) |
| Skilled workers | | | | 0.079*** | | | | -0.011 | | | | 0.097*** |
| | | | | (0.004) | | | | (0.011) | | | | (0.004) |
| Unskilled workers | | | | 0.072*** | | | | -0.014 | | | | 0.071*** |
| | | | | (0.006) | | | | (0.013) | | | | (0.007) |
| Marital Status (ref. Previously married) | | | | | | | | | | | | |
| Single | | | | 0.441*** | | | | 0.466*** | | | | 0.253*** |
| | | | | (0.009) | | | | (0.020) | | | | (0.007) |
| Married | | | | -0.169*** | | | | -0.092*** | | | | -0.101*** |
| | | | | (0.008) | | | | (0.014) | | | | (0.005) |
| Observations | 349,971 | 349,971 | 349,971 | 349,971 | 86,225 | 86,225 | 86,225 | 86,225 | 90,208 | 90,208 | 90,208 | 90,208 |

*Source*: EU LFS, author's elaboration. *Sign. Levels*: *** p<.001, ** p<.01, * p<.05, + p<.10 (Standard errors in parentheses)

**Table 3. 5**– Adjusted predictions of Childlessness and 95% confidence intervals for each predicted probability (Results based on the Model 3 of Appendix-Table 3.2)

**Austria**

| Level of Education | | Pr. Childless | Std. Err. | Conf. | Interval |
|---|---|---|---|---|---|
| Low | 1995 | 17% | 0.02 | 14% | 20% |
| | 2017 | 20% | 0.02 | 15% | 25% |
| Intermediate | 1995 | 19% | 0.01 | 17% | 21% |
| | 2017 | 24% | 0.01 | 22% | 27% |
| High | 1995 | 32% | 0.03 | 26% | 37% |
| | 2017 | 35% | 0.02 | 31% | 39% |

**Belgium**

| Level of Education | | Pr. Childless | Std. Err. | Conf. | Interval |
|---|---|---|---|---|---|
| Low | 1995 | 16% | 0.01 | 13% | 18% |
| | 2017 | 19% | 0.02 | 15% | 23% |
| Intermediate | 1995 | 17% | 0.01 | 14% | 20% |
| | 2017 | 18% | 0.01 | 16% | 21% |
| High | 1995 | 20% | 0.01 | 17% | 23% |
| | 2017 | 20% | 0.01 | 17% | 22% |

**Germany**

| Level of Education | | Pr. Childless | Std. Err. | Conf. | Interval |
|---|---|---|---|---|---|
| Low | 1995 | 21% | 0.01 | 20% | 23% |
| | 2017 | 19% | 0.01 | 18% | 21% |
| Intermediate | 1995 | 20% | 0 | 19% | 21% |
| | 2017 | 29% | 0.01 | 28% | 30% |
| High | 1995 | 28% | 0.01 | 27% | 30% |
| | 2017 | 37% | 0.01 | 36% | 39% |

**Spain**

| Level of Education | | Pr. Childless | Std. Err. | Conf. | Interval |
|---|---|---|---|---|---|
| Low | 1995 | 10% | 0 | 9% | 11% |
| | 2017 | 23% | 0.01 | 22% | 25% |
| Intermediate | 1995 | 18% | 0.01 | 16% | 20% |
| | 2017 | 27% | 0.01 | 25% | 29% |
| High | 1995 | 27% | 0.01 | 25% | 28% |
| | 2017 | 38% | 0.01 | 36% | 39% |

**France**

| Level of Education | | Pr. Childless | Std. Err. | Conf. | Interval |
|---|---|---|---|---|---|
| Low | 1995 | 13% | 0.01 | 12% | 14% |
| | 2017 | 17% | 0.01 | 15% | 18% |
| Intermediate | 1995 | 13% | 0 | 12% | 14% |
| | 2017 | 16% | 0.01 | 15% | 17% |
| High | 1995 | 22% | 0.01 | 20% | 23% |
| | 2017 | 20% | 0.01 | 19% | 21% |

**Greece**

| Level of Education | | Pr. Childless | Std. Err. | Conf. | Interval |
|---|---|---|---|---|---|
| Low | 1995 | 10% | 0.01 | 8% | 11% |
| | 2017 | 24% | 0.02 | 20% | 28% |
| Intermediate | 1995 | 15% | 0.01 | 13% | 17% |
| | 2017 | 31% | 0.01 | 28% | 34% |
| High | 1995 | 20% | 0.02 | 17% | 23% |
| | 2017 | 42% | 0.02 | 38% | 46% |

**Italy**

| Level of Education | | Pr. Childless | Std. Err. | Conf. | Interval |
|---|---|---|---|---|---|
| Low | 1995 | 14% | 0 | 13% | 15% |
| | 2017 | 27% | 0.01 | 25% | 28% |
| Intermediate | 1995 | 22% | 0.01 | 21% | 23% |
| | 2017 | 31% | 0.01 | 30% | 33% |
| High | 1995 | 35% | 0.01 | 33% | 37% |
| | 2017 | 40% | 0.01 | 39% | 42% |

**Portugal**

| Level of Education | | Pr. Childless | Std. Err. | Conf. | Interval |
|---|---|---|---|---|---|
| Low | 1995 | 8% | 0.01 | 7% | 10% |
| | 2017 | 15% | 0.01 | 13% | 17% |
| Intermediate | 1995 | 19% | 0.02 | 15% | 23% |
| | 2017 | 18% | 0.02 | 15% | 21% |
| High | 1995 | 22% | 0.02 | 18% | 26% |
| | 2017 | 28% | 0.02 | 25% | 31% |

**The UK**

| Level of Education | | Pr. Childless | Std. Err. | Conf. | Interval |
|---|---|---|---|---|---|
| Low | 1995 | 15% | 0.01 | 14% | 16% |
| | 2017 | 19% | 0.01 | 17% | 20% |
| Intermediate | 1995 | 21% | 0.01 | 20% | 22% |
| | 2017 | 19% | 0.01 | 18% | 20% |
| High | 1995 | 29% | 0.01 | 27% | 30% |
| | 2017 | 27% | 0.01 | 26% | 28% |

*Source*: EU LFS, author's elaboration.

## Appendix Chapter 4

**Table 1** – The proportion of women aged 35-39 without cohabiting children slightly overestimates the share of childlessness across country.

| | % women aged 35-39 without cohabiting children [a] | | | | | | % childless women [b] | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| *Survey Year* | *2005* | *2006* | *2007* | *2008* | *2009* | *2010* | | | | |
| *Birth cohort* | *1966-70* | *1967-1971* | *1967-72* | *1969-74* | *1970-74* | *1971-75* | *1965* | *1968* | *1970* | *1972* |
| Austria | 17.90 | 19.12 | 19.29 | 20.35 | 20.03 | 21.08 | 17.20 | 18.40 | 18.50 | 19.00 |
| Belgium | 18.30 | 18.03 | 19.21 | 19.02 | 19.54 | 19.03 | 16.00 | 16.10 | – | – |
| Bulgaria | 11.31 | 12.84 | 13.03 | 17.12 | 16.55 | 15.79 | 7.90 | 7.80 | 9.30 | 9.90 |
| Chez Rep. | 8.06 | 9.44 | 9.96 | 8.99 | 9.03 | 9.55 | 6.60 | 7.80 | 7.70 | 9.40 |
| Germany | 28.28 | 29.24 | 27.90 | 26.53 | 28.99 | - | 21.80 | 23.10 | – | – |
| Estonia | 7.95 | 10.84 | 9.40 | 9.12 | 9.30 | 9.06 | 10.60 | 11.10 | 11.50 | – |
| Spain | 20.48 | 20.92 | 22.72 | 21.34 | 23.19 | 25.34 | 14.50 | 16.50 | 18.60 | 20.70 |
| France | 15.33 | 16.21 | 17.16 | 17.29 | 17.73 | 16.89 | – | 14.30 | – | – |
| Greece | 20.70 | 21.08 | 22.38 | 23.19 | 22.20 | 23.36 | 16.40 | – | – | – |
| Hungary | 11.60 | 11.82 | 11.96 | 13.69 | 14.92 | 15.97 | 9.30 | 10.90 | – | – |
| Ireland | 18.92 | 19.86 | 18.69 | 20.11 | 19.58 | 0.00 | 18.00 | 18.80 | – | – |
| Italy | 23.72 | 24.55 | 25.40 | 25.86 | 27.89 | 28.92 | 18.40 | 19.80 | 20.60 | 20.90 |
| Lithuania | 8.67 | 8.15 | 9.55 | 9.57 | 10.72 | 11.78 | 8.90 | 9.30 | – | – |
| Netherlands | 17.06 | 18.10 | 18.22 | 19.43 | 17.60 | 18.02 | 18.10 | 17.70 | – | – |
| Poland | 9.09 | 8.46 | 9.94 | 10.75 | 10.40 | 11.92 | 8.00 | – | – | – |
| Portugal | 14.29 | 14.20 | 14.07 | 16.40 | 16.55 | 16.56 | 12.90 | 12.30 | | |
| Slovakia | 9.73 | 10.95 | 14.17 | 14.86 | 14.50 | 15.19 | 11.00 | 11.30 | 11.80 | 12.30 |
| UK | 21.10 | 22.20 | 20.89 | 22.82 | 23.26 | 22.19 | 20.00 | 18.00 | 18.00 | – |

Sources: (a) EU LFS, author's elaboration. (b) Sobotka, 2017.

**Table 2** – The number of cohabiting children in the household when women are 35-39 reflect women's total fertility rate.

| | Average number of cohabiting children when mother is 35-39 years old | | | Adjusted Total fertility rate | | |
|---|---|---|---|---|---|---|
| | 2006 | 2008 | 2010 | 2006 | 2008 | 2010 |
| Austria | 1.96 | 1.92 | 1.95 | 1.63 | 1.64 | 1.66 |
| Belgium | 2.13 | 2.08 | 2.05 | 1.77 | 1.86 | 1.85 |
| Bulgaria | 1.66 | 1.57 | 1.55 | 1.53 | 1.70 | 1.73 |
| Chez Rep. | 1.97 | 1.92 | 1.88 | 1.67 | 1.76 | 1.79 |
| Germany | 1.79 | 1.81 | 1.87 | 1.51 | 1.59 | 1.62 |
| Estonia | 2.12 | 2.05 | 2.10 | 1.95 | 1.85 | 1.90 |
| Spain | 1.75 | 1.77 | 1.70 | 1.33 | 1.39 | 1.40 |
| France | 2.08 | 2.08 | 2.09 | 2.02 | 2.07 | 2.13 |
| Greece | 1.93 | 1.87 | 1.86 | 1.49 | 1.52 | 1.52 |
| Hungary | 2.03 | 2.02 | 2.00 | 1.76 | 1.75 | 1.65 |
| Ireland | 2.35 | 2.24 | 2.26 | 2.22 | 2.17 | 2.08 |
| Italy | 1.78 | 1.77 | 1.74 | 1.41 | 1.48 | 1.47 |
| Lithuania | 1.97 | 1.90 | 1.85 | 1.66 | 1.68 | 1.75 |
| Luxemburg | 1.99 | 1.99 | 2.01 | 1.83 | 1.82 | 2.05 |
| Latvia | 1.87 | 1.84 | 1.82 | 1.56 | 1.59 | 1.61 |
| Netherlands | 2.09 | 2.08 | 2.10 | 1.82 | 1.82 | 1.79 |
| Poland | 2.12 | 2.02 | 1.97 | 1.64 | 1.58 | 1.50 |
| Portugal | 1.80 | 1.75 | 1.71 | 1.8 | 1.65 | 1.56 |
| Slovakia | 2.08 | 2.01 | 1.87 | 1.6 | 1.66 | 1.66 |
| UK | 2.06 | 2.06 | 2.05 | 1.85 | 1.98 | 2.07 |

Sources: (a) EU LFS 2005-2010, (b) EUROSTAT, (c) European Demographic Data Sheet 2006, 2008, 2010

**Table 3 – Comparison of a single-level model with a multilevel model**

| | Childlessness | | Number of children | |
|---|---|---|---|---|
| Log Likelihood 2 level model | -333,556.88 | | -788,466.19 | |
| Log Likelihood 1 level model | -341,259.56 | | -797,401.67 | |
| Likelihood ratio test statistic (LR) | -15,405.36 | (1df) | 17,870.96 | (1df) |

To verify whether a multilevel model with two levels is better than a simple model, I compared the specified model with the equivalent single-level model. Bearing in mind that the 5% point of a chi-squared distribution on 1 degrees of freedom is 3.84, Table 2 reports an overwhelming evidence of country-year effects on childlessness. It is possible therefore revert to the multilevel model with country-year effects for both childlessness and total fertility rate and begin the analyses.

**Table 4** – 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.

| | A | B1 | B2 | B3 | B4 | B5 | C1 | C2 | C3 | C4 | D1 | D2 | D3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Education* | | | | | | | | | | | | | |
| Low | -0.014*** | -0.014*** | -0.014*** | -0.014*** | -0.014*** | -0.014*** | -0.004* | 0.063* | -0.014*** | 0.003 | -0.014*** | -0.014*** | -0.014*** |
| High | 0.039*** | 0.039*** | 0.039*** | 0.039*** | 0.039*** | 0.039*** | 0.043*** | -0.096*** | 0.039*** | 0.043*** | 0.039*** | 0.039*** | 0.039*** |
| *Working position* | | | | | | | | | | | | | |
| Unemployed | 0.041*** | 0.041*** | 0.041*** | 0.041*** | 0.041*** | 0.041*** | 0.041*** | 0.041*** | 0.052*** | 0.041*** | 0.041*** | 0.041*** | 0.041*** |
| LS blue-collar | 0.040*** | 0.040*** | 0.040*** | 0.040*** | 0.040*** | 0.040*** | 0.040*** | 0.040*** | 0.041*** | 0.040*** | 0.040*** | 0.040*** | 0.040*** |
| HS blue-collar | 0.046*** | 0.046*** | 0.046*** | 0.046*** | 0.046*** | 0.046*** | 0.046*** | 0.046*** | 0.041*** | 0.046*** | 0.046*** | 0.046*** | 0.046*** |
| LS white-collar | 0.056*** | 0.056*** | 0.056*** | 0.056*** | 0.056*** | 0.056*** | 0.056*** | 0.056*** | 0.066*** | 0.056*** | 0.056*** | 0.056*** | 0.056*** |
| HS white-collar | 0.069*** | 0.069*** | 0.069*** | 0.069*** | 0.069*** | 0.069*** | 0.069*** | 0.069*** | 0.081*** | 0.069*** | 0.069*** | 0.069*** | 0.069*** |
| *Marital status* | | | | | | | | | | | | | |
| Previously married | 0.091*** | 0.091*** | 0.091*** | 0.091*** | 0.091*** | 0.091*** | 0.091*** | 0.091*** | 0.091*** | 0.091*** | 0.091*** | 0.091*** | 0.091*** |
| Single | 0.533*** | 0.533*** | 0.533*** | 0.533*** | 0.533*** | 0.533*** | 0.533*** | 0.533*** | 0.533*** | 0.533*** | 0.533*** | 0.533*** | 0.533*** |
| *Part-time* | | 0.001* | | | | 0.001 | 0.001** | | | | 0.005** | | |
| X Low Education | | | | | | | -0.001*** | | | | | | |
| X High Education | | | | | | | -0.000** | | | | | | |
| *Men working hours* | | | 0.004 | | | 0.001 | | 0.004 | | | | -0.023 | |
| X Low Education | | | | | | | | -0.002** | | | | | |
| X High Education | | | | | | | | 0.003*** | | | | | |
| *Parental leaves* | | | | -0.004*** | | -0.004*** | | | -0.003*** | | | | 0.000 |
| X Unemployed | | | | | | | | | -0.001*** | | | | |
| X LS blue-collar | | | | | | | | | 0.000 | | | | |
| X HS blue-collar | | | | | | | | | 0.001 | | | | |
| X LS white-collar | | | | | | | | | -0.001*** | | | | |
| X HS white-collar | | | | | | | | | -0.001*** | | | | |
| *Gender Egalitarian Norms* | | | | | -0.002** | -0.002*** | | | | -0.002** | -0.002* | -0.016 | -0.001 |
| X Low Education | | | | | | | | | | -0.000** | | | |
| X High Education | | | | | | | | | | 0.000 | | | |
| *Macro-level interaction* | | | | | | | | | | | | | |
| PT × GE | | | | | | | | | | | 0.000 | | |
| MWH × GE | | | | | | | | | | | | 0.000 | |
| PL × GE | | | | | | | | | | | | | 0.000 |
| *Constant* | 0.007 | -0.01 | -0.176 | 0.048*** | 0.122*** | 0.152 | -0.014 | -0.151 | 0.041*** | 0.118*** | 0.087 | 1062 | 0.133* |
| *var(cy)* | 0.003*** | 0.003*** | 0.003*** | 0.003*** | 0.003*** | 0.002*** | 0.003*** | 0.003*** | 0.003*** | 0.003*** | 0.003*** | 0.003*** | 0.002*** |
| *var(Residual)* | 0.104*** | 0.104*** | 0.104*** | 0.104*** | 0.104*** | 0.104*** | 0.104*** | 0.104*** | 0.104*** | 0.104*** | 0.104*** | 0.104*** | 0.104*** |
| *ICC* | 0.031 | 0.03 | 0.031 | 0.024 | 0.029 | 0.021 | 0.03 | 0.031 | 0.024 | 0.029 | 0.024 | 0.028 | 0.021 |

N of women: 719832; 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). PT is Part time, GE is Gender egalitarianism within the country, MWH is the average men working hours, PL is the level of Parental Leaves ICC is the intra Class Correlation. Baseline categories: Middle education, inactive, married women. *Source*: own elaboration based on EU-LFS 2005-2010

**Table 5** – Estimations of a series of ordinary least square multilevel models regressing the number of children cohabiting with their 35-39 years old mother on individual and contextual characteristics.

| | A | B1 | B2 | B3 | B4 | B5 | C1 | C2 | C3 | C4 | D1 | D2 | D3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Education* | | | | | | | | | | | | | |
| Low | 0.165*** | 0.165*** | 0.165*** | 0.165*** | 0.165*** | 0.165*** | 0.278*** | -0.467*** | 0.167*** | 0.071*** | 0.165*** | 0.165*** | 0.165*** |
| High | -0.04*** | -0.04*** | -0.04*** | -0.040*** | -0.040*** | -0.040*** | -0.074*** | 0.812*** | -0.046*** | -0.161*** | -0.040*** | -0.04*** | -0.04*** |
| *Working position* | | | | | | | | | | | | | |
| Unemployed | -0.207*** | -0.207*** | -0.207*** | -0.207*** | -0.207*** | -0.207*** | -0.210*** | -0.208*** | -0.110*** | -0.208*** | -0.207*** | -0.207*** | -0.207*** |
| LS blue-collar | -0.264*** | -0.264*** | -0.264*** | -0.264*** | -0.264*** | -0.264*** | -0.265*** | -0.264*** | -0.149*** | -0.265*** | -0.264*** | -0.264*** | -0.264*** |
| HS blue-collar | -0.178*** | -0.178*** | -0.178*** | -0.178*** | -0.178*** | -0.177*** | -0.184*** | -0.182*** | -0.005 | -0.178*** | -0.178*** | -0.178*** | -0.178*** |
| LS white-collar | -0.355*** | -0.355*** | -0.355*** | -0.355*** | -0.355*** | -0.355*** | -0.352*** | -0.354*** | -0.222*** | -0.354*** | -0.355*** | -0.355*** | -0.355*** |
| HS white-collar | -0.337*** | -0.337*** | -0.337*** | -0.337*** | -0.337*** | -0.337*** | -0.335*** | -0.336*** | -0.181*** | -0.337*** | -0.337*** | -0.337*** | -0.337*** |
| *Marital status* | | | | | | | | | | | | | |
| Previously married | -0.227*** | -0.227*** | -0.227*** | -0.227*** | -0.227*** | -0.227*** | -0.225*** | -0.227*** | -0.227*** | -0.227*** | -0.227*** | -0.227*** | -0.227*** |
| Single | -0.421*** | -0.421*** | -0.421*** | -0.421*** | -0.421*** | -0.421*** | -0.421*** | -0.421*** | -0.424*** | -0.420*** | -0.421*** | -0.421*** | -0.421*** |
| *Part-time* | | 0.004*** | | | | 0.004* | 0.004*** | | | | -0.001 | | |
| X Low Education | | | | | | | -0.005*** | | | | | | |
| X High Education | | | | | | | 0.002*** | | | | | | |
| *Men working hours* | | | -0.012 | | | 0.018 | | -0.009 | | | | 0.211** | |
| X Low Education | | | | | | | | 0.015*** | | | | | |
| X High Education | | | | | | | | -0.020*** | | | | | |
| *Parental leaves* | | | | 0.000 | | 0.005 | | | 0.013*** | | | | -0.017 |
| X Unemployed | | | | | | | | | -0.012*** | | | | |
| X LS blue-collar | | | | | | | | | -0.014*** | | | | |
| X HS blue-collar | | | | | | | | | -0.020*** | | | | |
| X LS white-collar | | | | | | | | | -0.016*** | | | | |
| X HS white-collar | | | | | | | | | -0.017*** | | | | |
| *Gender Egalitarian Norms* | | | | | 0.009*** | 0.008*** | | | | 0.009*** | 0.008** | 0.135*** | 0.007* |
| X Low Education | | | | | | | | | | 0.001*** | | | |
| X High Education | | | | | | | | | | 0.002*** | | | |
| *Macro-level interaction* | | | | | | | | | | | | | |
| PT × GE | | | | | | | | | | | 0.000 | | |
| MWH × GE | | | | | | | | | | | | -0.003** | |
| PL × GE | | | | | | | | | | | | | 0.000 |
| *Constant* | 2.254*** | 2.178*** | 2.760*** | 2.255*** | 1.623*** | 0.816 | 2.166*** | 2.645*** | 2.149*** | 1.670*** | 1.711*** | -7.228** | 1.781*** |
| *var(cy)* | 0.034*** | 0.031*** | 0.034*** | 0.034*** | 0.026*** | 0.024*** | 0.032*** | 0.033*** | 0.034*** | 0.025*** | 0.025*** | 0.024*** | 0.025*** |
| *var(Residual)* | 0.669*** | 0.669*** | 0.669*** | 0.669*** | 0.669*** | 0.669*** | 0.668*** | 0.669*** | 0.667*** | 0.669*** | 0.669*** | 0.669*** | 0.669*** |
| *ICC* | 0.048 | 0.044 | 0.048 | 0.048 | 0.037 | 0.035 | 0.046 | 0.048 | 0.048 | 0.036 | 0.036 | 0.039 | 0.037 |

N of women: 719832; 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). PT is Part time, GE is Gender egalitarianism within the country, MWH is the average men working hours, PL is the level of Parental Leaves ICC is the intra Class Correlation. Baseline categories: Middle education, inactive, married women. *Source*: own elaboration based on EU-LFS 2005-2010

## Appendix Chapter 5

**Table 5. 4** – Results of a series of random effects linear regressions predicting different scores of loneliness in mid and later life in France and Bulgaria.

| | France | | | | Bulgaria | | | |
|---|---|---|---|---|---|---|---|---|
| VARIABLES | M0 | M1 | M2 | M3 | M0 | M1 | M2 | M3 |
| Parental Status | | | | | | | | |
| Childless | 0.200*** | 0.127* | 0.097+ | | 0.823*** | 0.523*** | 0.472*** | |
| Lost-contacts | | | | 0.238** | | | | -0.054 |
| Monthly-contacts | | | | -0.018 | | | | -0.485** |
| Weekly-contacts | | | | -0.237*** | | | | -0.563*** |
| Sex of respondent (ref. Female) | | | | | | | | |
| Male | | -0.226*** | -0.139** | -0.037 | | -0.179* | 0.027 | 0.288+ |
| Male × childless | | 0.170+ | 0.101 | | | 0.575** | 0.262 | |
| Male × Lost-contacts | | | | -0.224+ | | | | -0.430+ |
| Male × Monthly-contacts | | | | -0.170 | | | | -0.121 |
| Male × Weekly-contacts | | | | -0.053 | | | | -0.298 |
| Partnership status (ref. Alone) | | | | | | | | |
| Partnered | | | -0.330*** | -0.311*** | | | -0.752*** | -0.724*** |
| Generation (ref. Silent) | | | | | | | | |
| Baby boomers | | | 0.081+ | 0.098* | | | -0.267*** | -0.281*** |
| Level of eucaiton (ref. Low) | | | | | | | | |
| Intermediate | | | -0.087+ | -0.093+ | | | 0.018 | 0.008 |
| High | | | -0.238*** | -0.259*** | | | -0.334*** | -0.359*** |
| Health (ref. Bad) | | | | | | | | |
| Good | | | -0.592*** | -0.590*** | | | -0.821*** | -0.812*** |
| Constant | 1.104*** | 1.201*** | 1.960*** | 2.043*** | 1.908*** | 1.988*** | 3.282*** | 3.760*** |
| Observations | 5820 | 5820 | 5820 | 5820 | 2030 | 2030 | 2030 | 2030 |
| n | 2910 | 2910 | 2910 | 2910 | 1015 | 1015 | 1015 | 1015 |

*Source*: GGS Wave 1 and Wave 2, author's elaboration. *Sign. Levels:* *** p < .001, ** p < .01, * p < .05, + p <.1

**Table 5. 5** – Results of a series of random effects linear regressions predicting different scores of Emotional loneliness in mid and later life in France and Bulgaria.

| Emotional loneliness | France | | | | Bulgaria | | | |
|---|---|---|---|---|---|---|---|---|
| | M1 | M2 | M3 | M4 | M1 | M2 | M3 | M4 |
| Parental Stats | | | | | | | | |
| Childless | 0.161** | 0.093 | 0.047 | | 0.913*** | 0.612*** | 0.453** | |
| Lost-contacts | | | | 0.194* | | | | 0.005 |
| Monthly-contacts | | | | 0.075 | | | | -0.422* |
| Weekly-contacts | | | | -0.187** | | | | -0.553*** |
| Sex of respondent (ref. Female) | | | | | | | | |
| Male | | -0.443*** | -0.302*** | -0.248** | | -0.337*** | -0.054 | 0.147 |
| Male × Childless | | 0.173+ | 0.054 | | | 0.608* | 0.201 | |
| Male × Lost-contacts | | | | -0.074 | | | | -0.595* |
| Male × Monthly-contacts | | | | -0.216+ | | | | -0.061 |
| Male × Weekly-contacts | | | | 0.018 | | | | -0.185 |
| Partnership status (ref. Alone) | | | | | | | | |
| Partnered | | | -0.507*** | -0.488*** | | | -1.051*** | -1.027*** |
| Generation (ref. Silent) | | | | | | | | |
| Baby boomers | | | 0.028 | 0.044 | | | -0.252** | -0.262*** |
| Level of eucaiton (ref. Low) | | | | | | | | |
| Intermediate | | | -0.209*** | -0.212*** | | | -0.028 | -0.034 |
| High | | | -0.401*** | -0.417*** | | | -0.272** | -0.286** |
| Health (ref. Bad) | | | | | | | | |
| Good | | | -0.789*** | -0.782*** | | | -1.054*** | -1.042*** |
| Constant | 0.936*** | 1.125*** | 2.261*** | 2.288*** | 1.187*** | 1.338*** | 3.003*** | 3.452*** |
| Observations | 5820 | 5820 | 5820 | 5820 | 2030 | 2030 | 2030 | 2030 |
| n | 2910 | 2910 | 2910 | 2910 | 1015 | 1015 | 1015 | 1015 |

*Source*: GGS Wave 1 and Wave 2, author's elaboration. *Sign. Levels:* *** p < .001, ** p < .01, * p < .05, + p <.1

**Table 5. 6** – Results of a series of random effects linear regressions predicting different scores of Social loneliness in mid and later life in Germany, France and Bulgaria.

| Social Loneliness | France | | | | Bulgaria | | | |
|---|---|---|---|---|---|---|---|---|
| | M1 | M2 | M3 | M4 | M1 | M2 | M3 | M4 |
| Parental Status | | | | | | | | |
| Childless | 0.246*** | 0.172* | 0.151* | | 0.757*** | 0.438* | 0.491* | |
| Lost-contacts | | | | 0.328** | | | | -0.101 |
| Monthly-contacts | | | | -0.113 | | | | -0.543* |
| Weekly-contacts | | | | -0.311*** | | | | -0.576** |
| Sex of respondent (ref. Female) | | | | | | | | |
| Male | | -0.006 | 0.033 | 0.154 | | -0.027 | 0.107 | 0.437+ |
| Male × childless | | 0.159 | 0.120 | | | 0.581* | 0.332 | |
| Male × Lost-contacts | | | | -0.373* | | | | -0.285 |
| Male × Monthly-contacts | | | | -0.108 | | | | -0.180 |
| Male × Weekly-contacts | | | | -0.082 | | | | -0.417 |
| Partnership status (ref. Alone) | | | | | | | | |
| Partnered | | | -0.163** | -0.143** | | | -0.455*** | -0.421*** |
| Generation (ref. Silent) | | | | | | | | |
| Baby boomers | | | 0.138* | 0.157** | | | -0.278** | -0.298** |
| Level of eucaiton (ref. Low) | | | | | | | | |
| Intermediate | | | 0.036 | 0.026 | | | 0.049 | 0.038 |
| High | | | -0.074 | -0.103 | | | -0.401*** | -0.436*** |
| Health (ref. Bad) | | | | | | | | |
| Good | | | -0.516*** | -0.513*** | | | -0.599*** | -0.592*** |
| Constant | 1.271*** | 1.274*** | 1.773*** | 1.911*** | 2.625*** | 2.637*** | 3.574*** | 4.079*** |
| Observations | 5820 | 5820 | 5820 | 5820 | 2030 | 2030 | 2030 | 2030 |
| n | 2910 | 2910 | 2910 | 2910 | 1015 | 1015 | 1015 | 1015 |

*Source*: GGS Wave 1 and Wave 2, author's elaboration. *Sign. Levels:* *** p < .001, ** p < .01, * p < .05, + p <.1

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# REFERENCES


Aarssen, L. W., and Altman, S. T. (2006). Explaining below–replacement fertility and increasing childlessness in wealthy countries: Legacy drive and the "transmission competition" hypothesis. *Evolutionary Psychology, 4*(1): 290–302

Aassve, A., Goisis, A., and Sironi, M. (2012). Happiness and childbearing across Europe. *Social indicators research*, *108*(1): 65–86.

Aassve, A., Sironi, M., and Bassi, V. (2011). Explaining attitudes towards demographic behaviour. *European Sociological Review*, *29*(2): 316–333.

Adsera, A. (2004). Changing fertility rates in developed countries. The impact of labor market institutions. *Journal of Population Economics, 17*(1): 17–43.

Ahn, N., and Mira, P. (2002). A note on the changing relationship between fertility and female employment rates in developed countries. *Journal of Population Economics, 15*(4): 667–682.

Ajzen, I. (1985). From Intentions to Actions: A Theory of Planned Behavior. In: Kuhl J., Beckmann J. (Ed.) *Action Control. From Cognition to Behavior.* Springer Series in Social Psychology. Berlin, Heidelberg: Springer-Verlag: 11–39.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2): 179–211.

Ajzen, I. (2005). *Attitudes, personality, and behavior* (2nd ed.). Maidenhead, UK: Open University Press.

Ajzen, I., and Driver, B. L. (1992). Application of the theory of planned behavior to leisure choice. *Journal of Leisure Research, 24*(3): 207–224.

Ajzen, I., and Fishbein, M. (1973). Attitudinal and normative variables as predictors of specific behavior. *Journal of Personality and Social Psychology, 27*(1): 41.

Ajzen, I., and Klobas, J. (2013). Fertility intentions: An approach based on the theory of planned behavior. *Demographic Research, 29*(8): 203–232.

Albertini, M., and Arpino, B. (2018). Childlessness, parenthood and subjective wellbeing: The relevance of conceptualizing parenthood and childlessness as a continuum. Retrieved from: https://osf.io/preprints/socarxiv/xtfq6/

Albertini, M., and Kohli, M. (2009). What childless older people give: is the generational link broken?. *Ageing and Society, 29*(8): 1261–1274.

Albertini, M., and Kohli, M. (2017). Childlessness and intergenerational transfers in later life. In: Kreyenfeld, M., and Konietzka, D. (Ed.) *Childlessness in Europe: Contexts, Causes, and Consequences*. New York: Springer: 351–368.

Albertini, M., and Mencarini, L. (2014). Childlessness and Support Networks in Later Life: New Pressures on Familistic Welfare States?. *Journal of Family Issues, 35*(3): 331–357.

Albreht, T. (2009). Privatization processes in health care in Europe – a move in the right direction, a 'trendy'option, or a step back?. *The European Journal of Public Health, 19*(5): 448–450.

Allen, R. E. S., and Wiles, J. L. (2013). How Older People Position Their Late–Life Childlessness: A Qualitative Study. *Journal of Marriage and Family, 75*(1): 206–220.

Anderson, T. M., and Kohler, H. P. (2015b). Low fertility, socioeconomic development, and gender equity. *Population and Development Review, 41*(3): 381–407.

Anderson, T. M., and Kohler, HP. (2015a). Demographic Transition Revisited: Low Fertility, Socioeconomic Development, and Gender Equity.

Andersson, G. (2000). The impact of labour–force participation on childbearing behaviour: Pro–cyclical fertility in Sweden during the 1980s and the 1990s. *European Journal of Population*, *16*(4): 293–333.

Anxo, D., Fagan, C., Cebrian, I., and Moreno, G. (2006). Patterns of labour market integration in Europe–a life course perspective on time policies. *Socio–Economic Review, 5*(2): 233–260.

Ariès, P. (1980). Two successive motivations for the declining birth rate in the West. *Population and Development Review*: 645–650.

Arpino, B., Esping–Andersen, G., and Pessin, L. (2015). How do changes in gender role attitudes towards female employment influence fertility? A macro–level analysis. *European Sociological Review, 31*(3): 370–382.

Ashburn–Nardo, L. (2017). Parenthood as a moral imperative? Moral outrage and the stigmatization of voluntarily childfree women and men. *Sex Roles, 76*(5–6): 393–401.

Avellar, S., and Smock, P. J. (2003). Has the price of motherhood declined over time? A cross–cohort comparison of the motherhood wage penalty. *Journal of marriage and family*, *65*(3): 597–607.

Axinn, W. G., and Barber, J. S. (2001). Mass education and fertility transition. *American Sociological Review*, *66*(4): 481–505.

Bachrach, C. A. (1980). Childlessness and social isolation among the elderly. *Journal of Marriage and the Family*: 627–637.

Bagavos, C. (2010). Education and childlessness: the relationship between educational field, educational level, employment and childlessness among Greek women born in 1955–1959. *Vienna Yearbook of Population Research*: 51–75.

Baizan, P., Arpino, B., and Delclòs, C. E. (2016). The Effect of Gender Policies on Fertility: The Moderating Role of Education and Normative Context. *European Journal of Population*, *32*(1): 1–30.

Balbo, N., and Mills, M. (2011). The effects of social capital and social pressure on the intention to have a second or third child in France, Germany, and Bulgaria, 2004–05. *Population Studies 65*(3): 335–351.

Balbo, N., Billari, F. C., and Mills, M. (2013). Fertility in advanced societies: A review of research. *European Journal of Population, 29*(1): 1–38.

Ballarino, G., and Scherer, S. (2013). More investment, less returns? Changing returns to education in Italy across three decades. *Stato e Mercato, 33*(3): 359–388.

Bandura, A. (1977). Self–efficacy: toward a unifying theory of behavioral change. *Psychological Review, 84*(2): 191–215.

Barbieri, P., and Bozzon, R. (2016). Welfare, labour market deregulation and households' poverty risks: An analysis of the risk of entering poverty at childbirth in different European welfare clusters. *Journal of European Social Policy, 26*(2): 99–123.

Barbieri, P., and Scherer, S. (2008). Flexibilizing the Italian labour market. Unanticipated consequences of partial and targeted labour market deregulation. In: Blossfeld, H.P.,

Buchholz, S. Bukodi, E. and Kurz, K. (2008) *Young Workers, Globalisation and the Labour Market: Comparing Early Working Life in Eleven Countries*. Cheltenham: Edward Elgar Publishing Limited: 155–180.

Barbieri, P., Bozzon, R., Scherer, S., Grotti, R., and Lugo, M. (2015). The Rise of a Latin Model? Family and fertility consequences of employment instability in Italy and Spain. *European Societies, 17*(4): 423–446.

Barbieri, P., Cutuli, G., and Scherer, S. (2018). In–work poverty in un mercato del lavoro duale: individualizzazione riflessiva dei rischi sociali o stratificazione della diseguaglianza sociale?. *Stato e mercato*, *38*(3): 419–460.

Barbieri, P., Cutuli, G., and Tosi, M. (2012). Families, labour market and social risks. Childbirth and the risk of poverty among Italian households. *Stato e mercato*, *32*(3): 391–428.

Barieri, P. Cutuli, G., Scherer, S. and Guetto, R. (2019) Part–time work and female labor market participation in Europe. A revival of the employment–equality trade–off? LIW Working Paper Series N2. Retrievable at: https://bit.ly/2HW4rKF

Barthold, J. A., Myrskylä, M., and Jones, O. R. (2012). Childlessness drives the sex difference in the association between income and reproductive success of modern Europeans. *Evolution and Human Behavior, 33*(6): 628–638.

Baudin T., De La Croix D., and Gobbi P., (2018), Endogenous Childlessness and Stages of Development, *Journal of the European Economic Association,* jvy042

Baudin, T., De La Croix, D., and Gobbi, P. (2012). DINKs, DEWKs and Co. Marriage, Fertility and Childlessness in the United States.

Baudin, T., De La Croix, D., and Gobbi, P. E. (2015). Fertility and childlessness in the United States. The American Economic Review, 105(6): 1852–1882.

Beaujouan, É., Brzozowska, Z., and Zeman, K. (2016). The limited effect of increasing educational attainment on childlessness trends in twentieth–century Europe, women born 1916–65. *Population Studies, 70*(3): 275–291.

Beaujouan, É., Sobotka, T., Brzozowska, Z., and Zeman, K. (2017). Has childlessness peaked in Europe? *Population and Societes*, 540.

Becker, G. S. (1960). An economic analysis of fertility. In: Chairman, R. G.B., Universities–National Bureau Committee for Economic Research (Ed.) *Demographic and Economic Change in Developed Countries*. Columbia University Press: 209–240

Becker, G. S. (1962). Investment in human capital: A theoretical analysis. *Journal of political economy*, *70*(5, Part 2): 9–49.

Becker, G. S. (1981a). *A Treatise on the Family*. Cambridge, MA, Harvard UniversityPress.

Becker, G. S. (1981b). Altruism in the Family and Selfishness in the Market Place. *Economica*, 48(189): 1–15.

Becker, G. S. (1994). Human capital revisited. In: Becker, G.S (Ed.) Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education. The university of Chicago press: 15–28.

Becker, G. S., Murphy, K. M., and Tamura, R. (1990). Human capital, fertility, and economic growth. *Journal of Political Economy, 98*(5, Part 2): S12–S37.

Beckman, L. J., and Houser, B. B. (1982). The consequences of childlessness on the social–psychological well–being of older women. *Journal of Gerontology, 37*(2): 243–250.

Begall, K., and Mills, M. (2012). The influence of educational field, occupation, and occupational sex segregation on fertility in the Netherlands. *European Sociological Review, 29*(4): 720–742.

Bernardi, L., and Klärner, A. (2014). Social networks and fertility. *Demographic Research, 30*(22): 641–670.

Bernardi, L., Mynarska, M., and Rossier, C. (2015). Uncertain, changing and situated fertility intentions. In: Philipov, D., Liefbroer, A. C., and Klobas, J. E. (Ed.), *Reproductive decision–making in a macro–micro perspective.* Dordrecht: Springer Netherlands: 113–139.

Bernhardt, E., and Goldscheider, F. (2006). Gender equality, parenthood attitudes, and first births in Sweden. *Vienna Yearbook of Population Research*: 19–39.

Berninger, I., Weiß, B., and Wagner, M. (2011). On the links between employment, partnership quality, and the intention to have a first child: The case of West Germany. *Demographic Research, 24*(24): 579–610.

Berrington, A. (2017). Childlessness in the UK. In: Kreyenfeld, M., and Konietzka, D. (Ed.) *Childlessness in Europe: Contexts, Causes, and Consequences*. New York: Springer: 57–76

Berrington, A., and Pattaro, S. (2014). Educational differences in fertility desires, intentions and behaviour: A life course perspective. *Advances in Life Course Research, 21*:10–27.

Berrington, A., Stone, J., and Beaujouan, E. (2015). Educational differences in timing and quantum of childbearing in Britain: A study of cohorts born 1940–1969. *Demographic Research*, *33*(26): 733–764.

Bianchi, S. M. (2000). Maternal employment and time with children: Dramatic change or surprising continuity? *Demography, 37*(4): 401–414.

Billari, F. C., and Kohler, H. P. (2004). Patterns of Low and Lowest–low Fertility in Europe. *Population Studies, 58*(2): 161–176.

Billari, F. C., and Liefbroer, A. C. (2004). Is the Second Demographic Transition a useful concept for demography? Introduction to a debate. *Vienna Yearbook of Population Research, 2*: 1–3

Billari, F. C., Liefbroer, A. C., and Philipov, D. (2006). The postponement of childbearing in Europe: Driving forces and implications. *Vienna Yearbook of Population Research, 4*: 1–17.

Billari, F. C., Liefbroer, A. C., Bernhardt, E., Billari, F. C., and Liefbroer, A. C. (2004). Is the Second Demographic Transition a useful concept for demography? *Vienna Yearbook of Population Research*, 2: 1–3.

Billari, F. C., Philipov, D., and Testa, M. R. (2009). Attitudes, norms and perceived behavioural control: Explaining fertility intentions in Bulgaria. *European Journal of Population, 25(*4): 439–465.

Billingsley, S. (2010). The post–communist fertility puzzle. *Population Research and Policy Review, 29*(2): 193–231.

Billingsley, S., and Ferrarini, T. (2014). Family policy and fertility intentions in 21 European countries. *Journal of Marriage and Family, 76*(2): 428–445.

Björklund, A. (2006). Does family policy affect fertility?: Lessons from Sweden. *Journal of Population Economics, 19*(1): 3–24.

Blackstone, A., and Stewart, M. D. (2012). Choosing to be childfree: Research on the decision not to parent. *Sociology Compass, 6*(9): 718–727.

Blanchet, D., and Ekert–Jaffé, O. (1994). The demographic impact of family benefits: evidence from a micro–model and from macro–data.

Bloom, D. E., and Freeman, R. B. (1986). *Population growth, labor supply, and employment in developing countries.* National Bureau of Economic Research Cambridge, Mass., USA.

Bloom, D. E., and Pebley, A. R. (1982). Voluntary childless: A review of the evidence and implications. *Population Research and Policy Review, 1*: 203–224.

Bloom, D. E., Canning, D., Fink, G., and Finlay, J. E. (2010). The Cost of Low Fertility in Europe. *European Journal of Population, 26*(2): 141–158.

Blossfeld, H. P. (1995). *The new role of women: Family formation in modern societies.* Boulder, Westview Press

Blossfeld, H. P., and De Rose, A. (1992). Educational expansion and changes in entry into marriage and motherhood. The experience of Italian women. *Genus*: 73–91.

Blossfeld, H. P., and Drobnic, S. (2001). Careers of couples in contemporary society: From male breadwinner to dual–earner families: From male breadwinner to dual–earner families. OUP Oxford.

Blossfeld, H.P., and Huinink, J. (1991). Human capital investments or norms of role transition? How women's schooling and career affect the process of family formation. *American Journal of Sociology, 97(*1): 143–168.

Boeckmann, I., Misra, J., and Budig, M. J. (2015). Cultural and Institutional Factors Shaping Mothers' Employment and Working Hours in Postindustrial Countries. *Social Forces, 93*(4): 1301–1333.

Bongaarts, J. (2001). Fertility and reproductive preferences in post–transitional societies. *Population and Development Review, 27*: 260–281.

Bongaarts, J., and Feeney, G. (1998). On the quantum and tempo of fertility. *Population and Development Review, 24*(2): 271–291.

Bongaarts, J., and Feeney, G. (2000). On the quantum and tempo of fertility: Reply. *Population and Development Review, 26*(3): 560–564.

Bozzon, R., and Guetto, R. (2012). Fertility and work–family reconciliation in Italy, (July).

Bram, S. (1978). Through the looking glass: Voluntary childlessness as a mirror for contemporary changes in the meaning of parenthood. The First Child and Family Formation: 368–391.

Bratti, M., and Tatsiramos, K. (2012). The effect of delaying motherhood on the second childbirth in Europe. *Journal of Population Economics, 25*(1): 291–321.

Breen, R. and Luijkx, R. (2004) Social Mobility in Europe between 1970 and 2000. In: Breen, R. (Ed.) *Social Mobility in Europe*, Oxford University Press: 37–77.

Brinton, M. C., and Lee, D. (2016). Gender-Role Ideology, Labor Market Institutions, and Post–industrial Fertility. Population and Development Review, 42(3): 405–433.

Brody, E. M. (1985). Parent care as a normative family stress. The Gerontologist, 25(1): 19–29.

Brouillette, L., Felteau, C., and Lefebvre, P. (1993). Les effets de la fiscalité sur les comportements de fécondité au Québec. Canadian Public Policy: 260–278.

Buber, I., and Engelhardt, H. (2008). Children's impact on the mental health of their older mothers and fathers: findings from the Survey of Health, Ageing and Retirement in Europe. *European Journal of Ageing, 5*(1): 31–45.

Budig, M. J., and England, P. (2001). The wage penalty for motherhood. *American sociological review*, *66*(2): 204–225.

Bühler, C. (2008). On the structural value of children and its implication on intended fertility in Bulgaria. *Demographic Research, 18*(20): 569–610.

Buhr, P., and Huinink, J. (2017). Why childless men and women give up on having children. *European Journal of Population, 33*(4): 585–606.

Bukodi, E., and Goldthorpe, J. H. (2011). Class Origins, Education and Occupational Attainment in Britain: Secular Trends or Cohort–Specific Effects?. *European Societies*, 13(3): 347–375.

Bulatao, R. A., Lee, R. D., Hollerbach, P. E., and Bongaarts, J. (1983). *Determinants of fertility in developing countries.* New York: Academic Press.

Burkimsher, M., and Zeman, K. (2017). Childlessness in Switzerland and Austria. In: Kreyenfeld, M., and Konietzka, D. (Ed.) *Childlessness in Europe: Contexts, Causes, and Consequences*. New York: Springer: 115–137

Burton–Jeangros, C., Cullati, S., Sacker, A., and Blane, D. (Ed.), (2015). A life course perspective on health trajectories and transitions (Vol. 4). Springer.

Buttner, T., and Lutz, W. (1990). Estimating fertility responses to policy measures in the German Democratic Republic. Population and Development Review: 539–555.

Bystrov, E. (2014). Testing the second demographic transition theory with seemingly unrelated regression: marital postponement and human empowerment. *European Sociological Review*, *30*(4): 483–499.

Callan, V. J. (1984). Voluntary childlessness: early articulator and postponing couples. *Journal of Biosocial Science, 16*(4): 501–509.

Caltabiano, M., Castiglioni, M., and Rosina, A. (2009). Lowest–low fertility: Signs of a recovery in Italy? *Demographic Research, 21*: 681–718.

Caltabiano, M., Comolli, C. L., and Rosina, A. (2017). The effect of the Great Recession on permanent childlessness in Italy. *Demographic Research, 37:* 635–668.

Castles, F. G. (2003). The world turned upside down: below replacement fertility, changing preferences and family–friendly public policy in 21 OECD countries. *Journal of European Social Policy, 13*(3), 209–227.

Chancey, L., and Dumais, S. A. (2009). Voluntary childlessness in marriage and family textbooks, 1950–2000. *Journal of Family History, 34*(2): 206–223.

Chappell, N. L., and Badger, M. (1989). Social isolation and well–being. Journal of Gerontology, 44(5): S169–S176.

Chesnais, J.–C. (1996). Fertility, Family, and Social Policy in Contemporary Western Europe. Population and Development Review, 22(4): 729–739.

Chesnais, J.–C. (1998). Below–replacement fertility in the European Union (EU–15): Facts and policies, 1960–1997. *Review of Population and Social Policy, 7*(101): 83–101.

Choi, N. G. (1994). Patterns and determinants of social service utilization: Comparison of the childless elderly and elderly parents living with or apart from their children. *The Gerontologist*, 34(3): 353–362.

Chrastil, R. (2017). *Childlessness in Northwestern Europe: A Brief History.* Paper presented at the 17th Berkshire Conference on the History of Women, Genders and Sexualities, Hofstra University, June 1–4.

Cigno, A. (1991). Economics of the family. Oxford, Oxford University Press

Cigno, A., and Ermisch, J. (1989). A microeconomic analysis of the timing of births. *European Economic Review*, 33(4): 737–760.

Clark, A.E., Diener, E., Georgellis, Y., and Lucas, R.E. (2008). Lags and leads in life satisfaction: A test of the baseline hypothesis. *The Economic Journal, 118*(529): 222–243.

Coale, A. J. (1986). Demographic Effects of Below–Replacement Fertility and Their Social Implications. *Population and Development Review, 12*: 203–216.

Combet, B., and Oesch, D. (2019). The Gender Wage Gap Opens Long before Motherhood. Panel Evidence on Early Careers in Switzerland. *European Sociological Review*.

Comolli, C. L. (2017). The fertility response to the Great Recession in Europe and the United States: Structural economic conditions and perceived economic uncertainty. *Demographic Research, 36*: 1549–1600.

Comolli, C. L., and Bernardi, F. (2015). The causal effect of the great recession on childlessness of white American women. *IZA Journal of Labor Economics, 4*(1): 21.

Cooke, T. J. (2008). Gender role beliefs and family migration. *Population, Space and Place, 14*(3): 163–175.

Coontz, S. (2004). Historical Perspectives on Family Studies. *Journal of Marriage and Family, 62*(2): 283–297.

Courtin, E., and Knapp, M. (2015). Health and wellbeing consequences of social isolation and loneliness in old age. *NIHR School for Social Care Research, London*.

Crompton, R. (Ed.), (1999). *Restructuring gender relations and employment: The decline of the male breadwinner*. Oxford University Press.

Cutuli, G., and Scherer, S. (2014). La (non) partecipazione femminile al mercato del lavoro. In: Barbieri, P., Fullin, G. (Ed.), *Lavoro, Istituzioni, Diseguaglianze. Sociologia Comparata Del Mercato Del Lavoro*. Bologna: Il Mulino: 145–164.

Dalla Zuanna, G. (2001). The banquet of Aeolus: A familistic interpretation of Italy's lowest low fertility. *Demographic Research, 4*(5), 133–162.

Daum, M. (2014). *Shallow and Self–absorbed: Sixteen Writers on the Decision Not to Have Kids.* Picador.

Davis–Kean, P. E. (2005). The influence of parent education and family income on child achievement: the indirect role of parental expectations and the home environment. *Journal of family psychology*, *19*(2): 294.

De Feijter, H. 1991. Voorlopers *bij Demografische Veranderingen (Forerunners in demographic changes).* The Hague: Netherlands Interdisciplinary Demographic Institute.

de Jong–Gierveld, J. (1987). Developing and testing a model of loneliness. *Journal of personality and social psychology, 53*(1): 119

de Jong–Gierveld, J. and Tesch–Römer, C. (2012). Loneliness in old age in Eastern and Western European societies: Theoretical perspectives. *European Journal of Ageing*, *9*(4): 285–295.

de Jong–Gierveld, J. and Van Tilburg, T. (2006). A 6–item scale for overall, emotional, and social loneliness: Confirmatory tests on survey data. *Research on aging, 28*(5): 582–598.

de Jong–Gierveld, J. and Van Tilburg, T. (2010). The De Jong Gierveld short scales for emotional and social loneliness: tested on data from 7 countries in the UN generations and gender surveys. *European journal of ageing, 7*(2): 121–130.

de Jong-Gierveld, J., van Tilburg, T. G., and Dykstra, P. A. (2006). Loneliness and social isolation. In D. Perlman, and A. Vangelisti (Eds.), *The Cambridge handbook of personal relationships.* Cambridge: Cambridge University Press: 485-500.

De Sandre, P., Ongaro, F., Rettaroli, R., and Salvini, S. (1997). *Matrimonio e figli: tra rinvio e rinuncia*. il Mulino.

Del Boca, D. (2002). The effect of child care and part time opportunities on participation and fertility decisions in Italy. *Journal of Population Economics*, 15(3): 549–573.

Del Boca, D., and Repetto–Alaia, M. (2003). *Women's Work, the Family, and Social Policy: Focus on Italy in a European Perspective (Vol. 2).* Peter Lang Pub Incorporated.

Destatis. (2017). Childlessness in Germany has not increased further. Press release 254. https://www.destatis.de/EN/PressServices/Press/pr/2017/07/PE17_254_122.html.

Di Prete, T., Engelhardt, H., Morgan, P., and Pacalova, H. (2002). Do cross–national differences in the costs of children influence fertility behavior? *Population Research and Policy Review*, 22(5-6): 439–477

DiTommaso, E., Brannen–McNulty, C., Ross, L., and Burgess, M. (2003). Attachment styles, social skills and loneliness in young adults. *Personality and individual differences*, 35(2): 303–312.

Dommermuth, L., Klobas, J., and Lappegård, T. (2011). Now or later? The Theory of Planned Behavior and timing of fertility intentions. *Advances in Life Course Research, 16*(1): 42–53.

Dommermuth, L., Klobas, J., and Lappegård, T. (2015). Realization of fertility intentions by different time frames. *Advances in Life Course Research, 24*: 34–46.

Drago, R., Black, D., and Wooden, M. (2005). Female breadwinner families: Their existence, persistence and sources. *Journal of Sociology, 41*(4): 343–362.

Drennan, J., Treacy, M., Butler, M., Byrne, A., Fealy, G., Frazer, K., and Irving, K. (2008). The experience of social and emotional loneliness among older people in Ireland. *Ageing and Society*, *28*(8), 1113–1132.

Duvall, E. (1962). *Family Development.* Philadephia: JB Lippincott.

Dykstra, P. A. (2009). Older adult loneliness: myths and realities. *European Journal of Ageing*, *6*(2): 91.

Dykstra, P. A., and Fokkema, T. (2007). Social and emotional loneliness among divorced and married men and women: Comparing the deficit and cognitive perspectives. *Basic and applied social psychology*, *29*(1), 1–12.

Dykstra, P. A., and Hagestad, G. O. (2007). Roads less taken: Developing a nuanced view of older adults without children. *Journal of family issues*, *28*(10): 1275–1310.

Dykstra, P. A., and Wagner, M. (2007). Pathways to childlessness and late–life outcomes. *Journal of Family Issues, 28*(11): 1487–1517.

Easterlin, R. A. (1976). The conflict between aspirations and resources. *Population and Development Review*: 417–425.

Eggebeen, D. J., and Knoester, C. (2001). Does fatherhood matter for men? *Journal of Marriage and Family, 63*(2): 381–393.

Eggebeen, D., and Uhlenberg, P. (1985). Changes in the organization of men's lives: 1960–1980. *Family Relations*: 251–257.

Eicher, V., Settersten, R. A., Penic, S., Glaeser, S., Martenot, A., and Spini, D. (2015). Normative Climates of Parenthood across Europe: Judging Voluntary Childlessness and Working Parents. *European Sociological Review, 31*(1): 1–15

Ekert–Jaffé, O. (1986). Effets et limites des aides financières aux familles: une expérience et un modèle. *Population* (French Edition): 327–348.

Ekert–Jaffé, O., Joshi, H., Lynch, K., Mougin, R., and Rendall, M. (2002). Fécondité, calendrier des naissances et milieu social en France et en Grande–Bretagne. *Population, 57*(3): 485–518.

Engelhardt, H., and Prskawetz, A. (2002). On the Changing Correlation Between Fertility and Female Employment over Space and Time. *MPIDR Working Paper* (Vol. WP 2002–05). Springer.

Engelhardt, H., Kögel, T., and Prskawetz, A. (2004). Fertility and women's employment reconsidered: A macro–level time–series analysis for developed countries, 1960–2000. *Population Studies, 58*(1): 109–120.

England, P., Bearak, J., Budig, M. J., and Hodges, M. J. (2016). Do highly paid, highly skilled women experience the largest motherhood penalty?. *American Sociological Review*, *81*(6): 1161–1189.

Ermisch, J. (1986). Impacts of policy actions on the family and household. *Journal of Public Policy*, *6*(3): 297–318.

Ermisch, J., and Francesconi, M. (2001). Family matters: Impacts of family background on educational attainments. *Economica*, *68*(270): 137–156.

ESHRE Capri Workshop Group. (2001). Social determinants of human reproduction. *Human Reproduction, 16*(7): 1518–1526.

Esping-Andersen, G. (1990). *The Three Worlds of Welfare Capitalism*. Princeton: Princeton Univ Press

Esping-Andersen, G. (1999). *Social foundations of postindustrial economies*. OUP Oxford.

Esping-Andersen, G. (2009). *The incomplete revolution: Adapting to women's new roles*. Cambridge: Polity Press

Esping–Andersen, G. (Ed.), (2007). Family Formation and Family Dilemmas in Contemporary Europe. Bilbao: Fundaciòn BBVA.

Esping-Andersen, G., and Billari, F. C. (2015). Re–theorizing family demographics. *Population and Development Review, 41*(1): 1–31.

Ferrera, M. (1996). The 'Southern model' of welfare in social Europe. *Journal of European Social Policy, 6*(1): 17–37.

Folbre, N. (1983). Of patriarchy born: The political economy of fertility decisions. *Feminist Studies, 9*(2): 261–284.

Frejka, T. (2017). Childlessness in the United States. In: Kreyenfeld, M., and Konietzka, D. (Ed.) *Childlessness in Europe: Contexts, Causes, and Consequences*. New York: Springer: 159–179

Furstenberg, F. F. (2005). Banking on families: How families generate and distribute social capital. *Journal of Marriage and Family*, *67*(4): 809–821.

Gangl, M., and Ziefle, A. (2009). Motherhood, labor force behavior, and women's careers: An empirical assessment of the wage penalty for motherhood in Britain, Germany, and the United States. *Demography*, *46*(2): 341–369.

Gans, D., and Silverstein, M. (2006). Norms of filial responsibility for aging parents across time and generations. *Journal of Marriage and Family*, *68*(4): 961–976.

Gauthier, A. H. (2007). The impact of family policies on fertility in industrialized countries: a review of the literature. *Population Research and Policy Review, 26*(3): 323–346.

Gauthier, A. H., and Hatzius, J. (1997). Family benefits and fertility: An econometric analysis. *Population Studies, 51*(3): 295–306.

Gee, E., and Gutman, G. (Ed.), (2000). *The Overselling of Population Ageing: Apocalyptic Demography, Intergenerational Challenges, and Social Policy.* Oxford University Press.

Georgellis, Y., and Wall, H. J. (1992). The fertility effect of dependent tax exemptions: Estimates for the United States. *Applied Economics, 24*(10): 1139–1145.

Gibney, S., Delaney, L., Codd, M., and Fahey, T. (2015). Lifetime Childlessness, Depressive Mood and Quality of Life Among Older Europeans. *Social Indicators Research, 130*(1): 305–323.

Gillespie, R. (2001). Contextualizing voluntary childlessness within a postmodern model of reproduction: implications for health and social needs. *Critical Social Policy, 21*(2): 139–159.

Glenn, N. D., and Weaver, C. N. (1979). A note on family situation and global happiness. *Social Forces*: 960–967.

Goldscheider, F., Bernhardt, E., and Lappegård, T. (2015). The gender revolution: A framework for understanding changing family and demographic behavior. *Population and Development Review, 41*(2): 207–239.

Goldstein, J. R., Lutz, W., and Testa, M. R. (2003). The emergence of sub–replacement family size idealsin Europe. *Population Research and Policy Review, 22*(2001): 479–496.

Goldstein, J. R., Sobotka, T., and Jasilioniene, A. (2009). The End of "Lowest–Low" Fertility ? *Population and Development Review, 35*(December): 663–699.

Goldthorpe, J., and Jackson, M. (2008). Education-based meritocracy: The barriers to its realization. In: Lareau, A. and Conley, D. (Eds.) *Social Class: How Does It Work,* Russel Sage Foundation: 93–117.

Gonzalez, M. J., and Jurado-Guerrero, T. (2006). Remaining childless in affluent economies: a comparison of France, West Germany, Italy and Spain, 1994–2001. *European Journal of Population*, *22*(4): 317–352.

Gonzalez, M. J., and Jurado-Guerrero, T. (2007). Is There a Minimum Set of Conditions for Having a Baby? The Experience of the 1955–1982 Female Cohort in West Germany, France, Italy and Spain. In: Esping-Andersen, G. (Ed.), *Family Formation and Family Dilemmas in Contemporay Europe*. Barcelona: Fùndaciòn BBVA: 33–93.

Greil, A. L. (1997). Infertility and psychological distress: a critical review of the literature. *Social Science and Medicine, 45(*11): 1679–1704.

Grundy, E., and Read, S. (2012). Social contacts and receipt of help among older people in England: are there benefits of having more children?. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 67(*6), 742–754.

Gustafsson, S. (2001). Optimal age at motherhood. Theoretical and empirical considerations on postponement of maternity in Europe. *Journal of Population Economics: 14*(2), 225–247.

Gustafsson, S. (2005). Having kids later. Economic analyses for industrialized countries. *Review of Economics of the Household, 3*(1): 5–16.

Gustafsson, S., and Kalwij, A. (Ed.), (2006). *Education and postponement of maternity: Economic analyses for industrialized countries* (Vol. 15). Springer Science and Business Media.

Gutmann, D. (1975). Parenthood: A key to the comparative study of the life cycle. In: Datan, N. and Ginsburg, L. H. (Ed.), *Life–span developmental psychology: Normative life crises*. New York: Academic Press: 167–184.

Hagestad, G. O., and Call, V. R. A. (2007). Pathways to childlessness: A life course perspective. *Journal of Family Issues, 28*(10): 1338–1361.

Hank, K., and Wagner, M. (2013). Parenthood, marital status, and well–being in later life: Evidence from SHARE. *Social Indicators Research, 114*(2): 639–653.

Hansen, T., and Slagsvold, B. (2016). Late–life loneliness in 11 European countries: Results from the generations and gender survey. *Social Indicators Research*, *129*(1): 445–464.

Hansen, T., Slagsvold, B., and Moum, T. (2009). Childlessness and psychological well–being in midlife and old age: An examination of parental status effects across a range of outcomes. *Social Indicators Research, 94*(2): 343–362.

Hanson, S. (1983). A family life–cycle approach to the socioeconomic attainment of working women. *Journal of Marriage and the Family, 45*: 323–338.

Happel, S. K., Hill, J. K., and Low, S. A. (1984). An economic analysis of the timing of childbirth. *Population studies*, *38*(2): 299–311.

Harknett, K., and Hartnett, C. S. (2014). The gap between births intended and births achieved in 22 European countries, 2004–07. *Population Studies, 68*(3): 265–282.

Hawkley, L. C., and Cacioppo, J. T. (2010). Loneliness matters: a theoretical and empirical review of consequences and mechanisms. *Annals of behavioral medicine*, *40*(2): 218–227.

Hoem, J. M. (1993). Public Policy as the Fuel of Fertility: Effects of a Policy Reform on the Pace of Childbearing in Sweden in the 1980s. *Acta Sociologica, 36*(1): 19–31.

Hoem, J. M., Neyer, G., and Andersson, G. (2006). Education and childlessness. The relationship between educational field, educational level, and childlessness among Swedish women born in 1955–59. *Demographic Research, 14:* 331–380.

Hook, J. L. (2006). Care in context: Men's unpaid work in 20 countries, 1965–2003. *American Sociological Review,* 71(4): 639–660.

Hook, J. L. (2015). Incorporating "class" into work–family arrangements: Insights from and for Three Worlds. *Journal of European Social Policy, 25*(1): 14–31.

Houseknecht S. K. (1987) Voluntary Childlessness. In: Sussman M.B., Steinmetz S.K. (ed.) *Handbook of Marriage and the Family*. Springer, Boston, MA: 369–395.

Houseknecht, S. K. (1979). Timing of the decision to remain voluntarily childless: Evidence for continuous socialization. *Psychology of Women Quarterly, 4*(1): 81–96.

Hudde, A. (2018). Societal Agreement on Gender Role Attitudes and Childlessness in 38 Countries. *European Journal of Population, 34* (5): 745–767.

Iacovou, M., and Tavares, L. P. (2011). Yearning, learning, and conceding: Reasons men and women change their childbearing intentions. *Population and development review*, *37*(1): 89–123.

Impicciatore, R., and Dalla Zuanna, G. (2017). The impact of education on fertility in Italy. Changes across cohorts and south–north differences. *Quality and Quantity, 51*(5): 2293–2317.

Jacobson, C. K., and Heaton, T. B. (1991). Voluntary childlessness among American men and women in the late 1980's. *Social Biology, 38*(1–2): 79–93.

Jaffe, A. J. (1942). Urbanization and Fertility. *American Journal of Sociology, 48*(1), 48–60.

Jalovaara, M., and Fasang, A. E. (2017). From never partnered to serial cohabitors: Union trajectories to childlessness. *Demographic Research, 36*(55): 1703–1720.

Jalovaara, M., Neyer, G., Andersson, G., Dahlberg, J., Dommermuth, L., Fallesen, P., and Lappegård, T. (2018). Education, Gender, and Cohort Fertility in the Nordic Countries. *European Journal of Population:*1–24.

Jenkins, S. P., and Siedler, T. (2007). The intergenerational transmission of poverty in industrialized countries. Colchester: Institute for Social and Economic Research (Chronic Poverty Research Centre Working Paper 75).

Joshi, H. (1990). The cash opportunity costs of childbearing: an approach to estimation using British data. *Population Series, 44*(1), 41–60.

Kaufman, G. (2000). Do gender role attitudes matter? Family formation and dissolution among traditional and egalitarian men and women. *Journal of Family Issues, 21*(1): 128–144.

Keck, W., and Saraceno, C. (2013). The impact of Different Social–Policy Frameworks on Social Inequalities among Women in Europe. *The Labour–Market Participation of Mothers, 20*(3): 1–39.

Keizer, R., and Ivanova, K. (2017). What's a (Childless) Man Without a Woman? The Differential Importance of Couple Dynamics for the Wellbeing of Childless Men and Women in the Netherlands. In: Kreyenfeld, M., and Konietzka, D. (Ed.) *Childlessness in Europe: Contexts, Causes, and Consequences*. New York: Springer: 313–330.

Keizer, R., Dykstra, P. A., and Jansen, M. D. (2008). Pathways into childlessness: evidence of gendered life course dynamics. *Journal of Biosocial Science, 40*(6): 863–878.

Keizer, R., Dykstra, P. a., and Poortman, A. R. (2010). Life outcomes of childless men and fathers. *European Sociological Review, 26(*1): 1–15.

Kendig, H., Dykstra, P. A., van Gaalen, R. I., and Melkas, T. (2007). Health of aging parents and childless individuals. *Journal of Family Issues 28*(11): 1457–1486.

Kiernan, K. (2001). The rise of cohabitation and childbearing outside marriage in Western Europe. *International Journal of Law, Policy and the Family, 15*(1): 1–21.

Klobas, J. E., and Ajzen, I. (2015). Making the decision to have a child. In: Philipov, D., Liefbroer, A. C., and Klobas, J. E. (Ed.), (2015). *Reproductive decision-making in a macro–micro perspective.* Dordrecht: Springer Netherlands: 41–78.

Kneale, D., and Joshi, H. (2008). Postponement and childlessness: Evidence from two British cohorts. *Demographic Research, 19*(58): 1935–1968.

Kohler, H. P., and Mencarini, L. (2016). The parenthood happiness puzzle: an introduction to special issue. *European Journal of Population*, *32*(3): 327–338.

Kohler, H. P., Behrman, J. R., and Skytthe, A. (2005). Partner + children= happiness? The effects of partnerships and fertility on well–being. *Population and development review*, *31*(3): 407–445.

Kohler, H. P., Behrman, J. R., and Watkins, S. C. (2001). The density of social networks and fertility decisions: Evidence from South Nyanza District, Kenya. *Demography, 38*(1): 43–58.

Kohler, H. P., Billari, F. C., and Ortega, J. A. (2002). The emergence of lowest–low fertility in Europe during the 1990s. *Population and Development Review*, *28*(4): 641–680.

Kohler, H. P., Billari, F. C., and Ortega, J. A. (2002). The Emergence of Lowest–Low Fertility in Europe During the 1990s. *Population and Development Review, 28*(4): 641–680.

Kohli, M., and Albertini, M. (2009). Childlessness and intergenerational transfers: what is at stake? *Ageing and Society*, *29*(08): 1171–1183

Köppen, K., Mazuy, M., and Toulemon, L. (2017). Childlessness in France. In: Kreyenfeld, M., and Konietzka, D. (Ed.) *Childlessness in Europe: Contexts, Causes, and Consequences*. New York: Springer: 77–95

Koropeckyj–Cox, T. (1998). Loneliness and depression in middle and old age: Are the childless more vulnerable?. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 53*(6), S303–S312.

Koropeckyj–Cox, T., Romano, V., and Moras, A. (2007). Through the lenses of gender, race, and class: Students' perceptions of childless/childfree individuals and couples. *Sex Roles, 56*(7–8): 415–428.

Korpi, W., Ferrarini, T., and Englund, S. (2013). Women's opportunities under different family policy constellations: Gender, class, and inequality tradeoffs in western countries re–examined. *Social Politics, 20*(1): 1–40.

Kravdal, Ø. (1992). The emergence of a positive relation between education and third birth rates in Norway with supportive evidence from the United States. *Population Studies*, 46(3): 459–475.

Kravdal, Ø., and Rindfuss, R. R. (2008). Changing relationships between education and fertility: A study of women and men born 1940 to 1964. *American Sociological Review, 73*(5): 854–873.

Kreyenfeld, M., and Konietzka, D. (2017). Analyzing childlessness. In: Kreyenfeld, M., and Konietzka, D. (Ed.) *Childlessness in Europe: Contexts, Causes, and Consequences*. New York: Springer: 3–15

Kreyenfeld, M., and Konietzka, D. (2017). Childlessness in East and West Germany: Long–Term Trends and Social Disparities. In: Kreyenfeld, M., and Konietzka, D. (Ed.) *Childlessness in Europe: Contexts, Causes, and Consequences*. New York: Springer: 91–114

Kreyenfeld, M., Hornung, A., Kubisch, K., and Jaschinski, I. (2010). Fertility and union histories from German GGS data: Some critical reflections. Rostock: Max Planck Institute for Demographic Research (MPIDR Working Paper 23)

Kulu, H., and Vikat, A. (2007). Fertility differences by housing type: The effect of housing conditions or of selective moves? *Demographic Research, 17*(26): 775–802.

Lalive, R., and Zweimüller, J. (2005). Does parental leave affect fertility and return–to–work? Evidence from a true natural experiment. IZA Discussion Paper No. 1613

Lappegård, T., and Rønsen, M. (2005). The multifaceted impact of education on entry into motherhood. *European Journal of Population*, *21*(1): 31–49.

Lechner, L., Bolman, C., and Van Dalen, A. (2006). Definite involuntary childlessness: associations between coping, social support and psychological distress. *Human Reproduction, 22*(1): 288–294.

Lee, R., and Mason, A. (2014). Is low fertility really a problem? Population aging, dependency, and consumption. *Science, 346*(6206): 229–234.

Leridon, H. (2008). A new estimate of permanent sterility by age: sterility defined as the inability to conceive. *Population studies*, *62*(1): 15–24.

Lersch, P. M., Jacob, M., and Hank, K. (2017). Parenthood, gender, and personal wealth. *European Sociological Review*, *33*(3): 410–422.

Lesthaeghe, R. J. (1983). A century of demographic and cultural change in Western Europe: An exploration of underlying dimensions. *Population and Development Review*: 411–435.

Lesthaeghe, R. J. (1995). The Second Demographic Transition: Theory and Evidence. In: Mason, K. and Jensen, A. (Ed.) *Gender and Family Change in Industrialized Countries.* Oxford: Claredon Press: 17–62.

Lesthaeghe, R. J. (2010). The unfolding story of the second demographic transition. *Population and Development Review, 36*(2): 211–251.

Lesthaeghe, R. J. (2014). The second demographic transition: A concise overview of its development. *Proceedings of the National Academy of Sciences, 111*(51): 18112–18115.

Lesthaeghe, R. J., and Neels, K. (2002). From the first to the second demographic transition: an interpretation of the spatial continuity of demographic innovation in France, Belgium and Switzerland. *European Journal of Population*, *18*(4): 325–360.

Lesthaeghe, R. J., and Surkyn, J. (2008). When history moves on: The foundations and diffusion of a second demographic transition. In: Jayakody, R., Axinn, W. G., and Thornton, A. (Ed.), *International family change: Ideational perspectives*. Mahwah, NJ: Lawrence Erlbaum Association: 81–118

Lesthaeghe, R. J., and Van de Kaa, D. J. (1986). Twee demografische transities. Bevolking:

Groei En Krimp: 9–24.

Letherby, G. (1999). Other than mother and mothers as others: The experience of motherhood and non–motherhood in relation to 'infertility' and 'involuntary childlessness.' *Women's Studies International Forum, 22*(3): 359–372.

Letherby, G. (2002). Childless and bereft?: Stereotypes and realities in relation to 'voluntary' and 'involuntary' childlessness and womanhood. *Sociological Inquiry, 72*(1): 7–20.

Lewis, J. (2006). Employment and care: The policy problem, gender equality and the issue of choice. *Journal of Comparative Policy Analysis: Research and Practice, 8*(2): 103–114.

Liefbroer, A. C. (2005). The impact of perceived costs and rewards of childbearing on entry into parenthood: Evidence from a panel study. *European Journal of Population, 21*(4): 367–391.

Liefbroer, A. C., and Corijn, M. (1999). Who, what, where, and when? Specifying the impact of educational attainment and labour force participation on family formation. *European Journal of Population*, *15*(1): 45–75

Liefbroer, A. C., Klobas, J. E., Philipov, D., and Ajzen, I. (2015). Reproductive decision–making in a macro–micro perspective: A conceptual framework. In: Philipov, D., Liefbroer, A. C., and Klobas, J. E. (Ed.), (2015). *Reproductive decision–making in a macro–micro perspective.* Dordrecht: Springer Netherlands: 1–15

Livi Bacci, M. (2015). *A history of Italian fertility during the last two centuries*. Princeton University Press.

Lois, D., and Becker, O. A. (2014). Is fertility contagious? Using panel data to disentangle mechanisms of social network influences on fertility decisions. *Advances in Life Course Research, 21*: 123–134.

Mackenbach, J. P., Kunst, A. E., Cavelaars, A. E., Groenhof, F., Geurts, J. J., and EU Working Group on Socioeconomic Inequalities in Health. (1997). Socioeconomic inequalities in morbidity and mortality in western Europe. *The Lancet, 349*(9066): 1655–1659.

Mahne, K., and Huxhold, O. (2014). Grandparenthood and subjective well–being: Moderating effects of educational level. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *70*(5): 782–792.

March, K., and Miall, C. (2000). Adoption as a family form. *Family Relations, 49*(4): 359–362.

Martin, E. A. (2015). *Concise medical dictionary.* Oxford University Press, USA.

Mason, K. O. (1995). Gender and demographic change: What do we know? IUSSP Paper.

Mason, K. O. (2001). Gender and Family Systems in the Fertility Transition. *Population and Development Review, 27*:160–176.

Matysiak, A., and Vignoli, D. (2013). Diverse effects of women's employment on fertility: Insights from Italy and Poland. *European Journal of Population*, 29(3): 273–302.

McAllister, F., and Clarke, L. (1998). *Choosing childlessness*. Family Policy Studies Centre London.

McDonald, P. (2000a). Gender equity, social institutions and the future of fertility. *Journal of the Australian Population Association, 17*(1): 1–16.

McDonald, P. (2000b). Gender equity in theories of fertility transition. *Population and Development Review, 26*(3): 427–439.

McDonald, P. (2006). Low fertility and the state: The efficacy of policy. *Population and Development Review, 32*(3): 485–510.

McDonald, P. (2013). Societal foundations for explaining low fertility: Gender equity. *Demographic Research, 28*: 981–994.

McLanahan, S. (2004). Diverging destinies: How children are faring under the second demographic transition. *Demography, 41*(4): 607–627.

Mencarini, L., and Tanturri, M. L. (2006). High fertility or childlessness: Micro–level determinants of reproductive behaviour in Italy. *Population*, *61*(4), 389–415.

Mencarini, L., Vignoli, D., and Gottard, A. (2015). Fertility intentions and outcomes: Implementing the theory of planned behavior with graphical models. *Advances in Life Course Research, 23*: 14–28.

Merz, E. M., and Liefbroer, A. C. (2012). The Attitude Toward Voluntary Childlessness in Europe: Cultural and Institutional Explanations. *Journal of Marriage and Family, 74*(3), 587–600.

Mette, C. (2005). Wellbeing and dependency among the European elderly: The role of social integration. ENEPRI Research Reports, (12).

Miettinen, A., Rotkirch, A., Szalma, I., Donno, A., and Tanturri, M. L. (2015). Increasing childlessness in Europe: Time trends and country differences. Stockholm: Stockholm University (FamiliesAndSocieties Working Paper 33).

Miller, W. B. (2011). Differences between fertility desires and intentions: implications for theory, research and policy. *Vienna Yearbook of Population Research* 9: 75–98.

Mills, M. (2010). Gender roles, gender (in) equality and fertility: An empirical test of five gender equity indices. *Canadian Studies in Population, 37*(3–4): 445–474.

Mills, M., and Blossfeld, H. P. (2001). Globalization and changes in the early life course. The Losers in a Globalizing World: Becoming an Adult in Uncertain Times.

Mills, M., and Blossfeld, H. P. (2003). Globalization, uncertainty and changes in early life courses. *Zeitschrift Für Erziehungswissenschaft, 6*(2): 188–218.

Mills, M., Blossfeld, H. P., and Klijzing, E. (2005). Becoming an adult in uncertain times: a 14-country comparison of the losers of globalization. In: Blossfeld, H. P., Klijzing, E., Mills, M. and Kurz, K. Kurz (Eds.). *Globalization, uncertainty and youth in society*. London, New York: Routledge: pp. 393–411

Mills, M., Mencarini, L., Tanturri, M. L., and Begall, K. (2008). Gender equity and fertility intentions in Italy and the Netherlands. *Demographic Research, 18*: 1–26.

Mills, M., Rindfuss, R. R., McDonald, P., and Te Velde, E. R. (2011). Why do people postpone parenthood? Reasons and social policy incentives. *Human Reproduction Update, 17*(6): 848–860.

Mirowsky, J., and Ross, C. E. (2003). Education, social status, and health. Series Title: Social institutions and social change. Hawthorne, NY: Aldine de Gruyter.

Morgan, S. P. (2003). Is low fertility a twenty–first–century demographic crisis? *Demography, 40*(4): 589–603.

Morgan, S. P., and Taylor, M. G. (2006). Low fertility at the turn of the twenty–first century. *Annual Review of Sociology, 32*, 375–399

Mueller, K. A., and Yoder, J. D. (1999). Stigmatization of non–normative family size status. *Sex Roles, 41*(11–12): 901–919.

Myrskylä, M., and Margolis, R. (2014). Happiness: Before and after the kids. *Demography*, *51*(5): 1843–1866.

Myrskylä, M., Kohler, H. P., and Billari, F. C. (2009). Advances in development reverse fertility declines. *Nature*, 460: 741–743.

Neyer, G. (2006). Family policies and fertility in Europe: Fertility policies at the intersection of gender policies, employment policies and care policies. Rostock: Max Planck Institute for Demographic Research (MPIDR Working Paper 49)

Neyer, G., Hoem, J. M., and Andersson, G. (2017). Education and childlessness: The influence of educational field and educational level on childlessness among Swedish and Austrian women. In: Kreyenfeld, M., and Konietzka, D. (Ed.) *Childlessness in Europe: Contexts, Causes, and Consequences*. New York: Springer:183–207

Neyer, G., Lappegård, T., and Vignoli, D. (2013). Gender equality and fertility: Which equality matters?. *European Journal of Population, 29*(3): 245–272.

Ní Bhrolcháin, M., and Beaujouan, É. (2012). Fertility postponement is largely due to rising educational enrolment. *Population studies*, *66*(3): 311–327.

Nitsche, N., Matysiak, A., Van Bavel, J., and Vignoli, D. (2018). Partners' educational pairings and fertility across Europe. *Demography*, 1–38.

Noordhuizen, S., de Graaf, P., and Sieben, I. (2010). The Public Acceptance of Voluntary Childlessness in the Netherlands: from 20 to 90 per cent in 30 years. *Social Indicators Research, 99*(1): 163–181.

Norman, P., Conner, M., and Bell, R. (1999). The theory of planned behavior and smoking cessation. *Health Psychology, 18*(1): 89–94.

OECD (2015). SF2.5 Childlessness. OECD Family Database.

OECD (2016). SF2.2 Ideal and actual number of children. OECD Family Database.

OECD (2019a). Trends Shaping Education 2019, OECD Publishing, Paris.

OECD (2019b). Employment rate (indicator).

OECD (2019c). Elderly population (indicator).

Oesch, D. (2006). Coming to grips with a changing class structure: An analysis of employment stratification in Britain, Germany, Sweden and Switzerland. *International Sociology*, *21*(2): 263–288.

Oláh, L. S. (2003). Gendering fertility: Second births in Sweden and Hungary. *Population Research and Policy Review, 22*(2): 171–200.

Oláh, L. S., and Fratczak, E. (2003). Gendering family formation. First marriage and first birth in Hungary and Poland. Population of Central and Eastern Europe. Challenges and Opportunities. Warsaw: Statistical Publishing Establishment, 219–250.

Oppenheimer, V. K. (1982). Work and the family. Academic Press.

Oppenheimer, V. K. (1988). A theory of marriage timing. *American Journal of Sociology, 94*(3): 563–591.

Oppenheimer, V. K. (2003). Cohabiting and marriage during young men's career–development process. *Demography, 40*(1): 127–149.

Pailhé, A., Solaz, A. and Tanturri, M.L. (2018) The Time Cost of Raising Children in Different Fertility Contexts: Evidence from France and Italy. *European Journal of Population*: 1–19

Park, K. (2002). Stigma Management Among the Voluntarily Childless. *Sociological Perspectives, 45*(1): 21–45.

Passaretta, G., Barbieri, P., Wolbers, M. H., and Visser, M. (2018). The direct effect of social origin on men's occupational attainment over the early life course: An Italian–Dutch comparison. *Research in Social Stratification and Mobility*, *56*: 1–11.

Pavlou, P. A., and Fygenson, M. (2006). Understanding and predicting electronic commerce adoption: An extension of the theory of planned behavior. *MIS Quarterly*, 30(1): 115–143.

Perlman, D. (2004). European and Canadian studies of loneliness among seniors. *Canadian Journal on Aging*, *23*(2): 181–188.

Perlman, D., and Peplau, L. A. (1981). Toward a social psychology of loneliness. *Personal relationships*, *3*: 31–56.

Perlman, D., and Peplau, L. A. (1982). Theoretical approaches to loneliness. *Loneliness: A sourcebook of current theory, research and therapy*: 123–134.

Persson, L. (2010). Trend reversal in childlessness in Sweden. Eurostat (Working Papers 11)

Petersen, T., Penner, A. M., and Høgsnes, G. (2014). From motherhood penalties to husband premia: The new challenge for gender equality and family policy, lessons from Norway. *American Journal of Sociology*, *119*(5): 1434–1472.

Philipov, D. (2009). Fertility intentions and outcomes: the role of policies to close the gap. European Journal of Population/Revue Européenne de Démographie 25(4): 355.

Philipov, D., Liefbroer, A. C., and Klobas, J. E. (Ed.), (2015). *Reproductive decision–making in a macro–micro perspective.* Dordrecht: Springer Netherlands.

Pinnelli, A., Hoffmann–Nowotny, H. J., and Fux, B. (2001). Fertility and new types of households and family formation in Europe (Vol. 35). Council of Europe Strasbourg.

Pinquart, M., and Sorensen, S. (2001). Influences on loneliness in older adults: A meta–analysis. Basic and applied social psychology, 23(4): 245–266.

Plotnick, R. D. (2009). Childlessness and the Economic Well–being of Older Americans. The Journals of Gerontology Series B, Psychological Sciences and Social Sciences, 64B(6): 767–776.

Poortman, A. R., and Van Der Lippe, T. (2009). Attitudes toward housework and child care and the gendered division of labor. *Journal of Marriage and Family*, *71*(3): 526–541.

Poston, D. L., and Trent, K. (1982). International variability in childlessness: A descriptive and analytical study. Journal of Family Issues, 3(4): 473–491.

Präg, P., and Mills, M. (2017). Assisted reproductive technology in Europe: usage and regulation in the context of cross–border reproductive care. In: Kreyenfeld, M., and Konietzka, D. (Ed.) *Childlessness in Europe: Contexts, Causes, and Consequences*. New York: Springer: 289–309

Puur, A., Oláh, L. S., Tazi–Preve, M. I., and Dorbritz, J. (2008). Men's childbearing desires and views of the male role in Europe at the dawn of the 21st century. *Demographic Research, 19*:1883–1912.

Qin, P., Agerbo, E., Westergård-Nielsen, N., Eriksson, T., and Mortensen, P. B. (2000). Gender differences in risk factors for suicide in Denmark. *The British Journal of Psychiatry, 177*(6): 546–550.

Quesnel-Vallée, A., and Morgan, S. P. (2003). Missing the target? Correspondence of fertility intentions and behavior in the US. *Population research and policy review*, *22*(5–6): 497–525.

Raab, M., and Struffolino, E. (2019). The Heterogeneity of Partnership Trajectories to Childlessness in Germany. *European Journal of Population*: 1–18.

Rainwater, L. (1965). *Family design: Marital sexuality, family size, and family planning*. Aldine, Chicago.

Régnier–Loilier, A. and Vignoli, D. (2011). Intentions de fécondité et obstacles à leur réalisation en France et en Italie. *Population, 66*(2): 361–389.

Reibling, N., and Möhring, K. (2018). Parenthood and Later Life Health: An International Life Course Analysis of Parents and Childless Adults Aged 50 and Older. *Swiss Journal of Sociology, 44*(2): 327–356.

Rhum, C.J. (2004). Parental employment and child cognitive development, *Journal of Human Resources, 39*: 155–192

Rindfuss, R. R., and Brauner-Otto, S. R. (2008). Institutions and the transition to adulthood: Implications for fertility tempo in low–fertility settings. *Vienna Yearbook of Population Research/Vienna Institute of Demography*, Austrian Academy of Sciences, 2008, 57.

Rindfuss, R. R., Bumpass, L., and St. John, C. (1980). Education and fertility: Implications for the roles women occupy. *American sociological review*: 431–447.

Rindfuss, R. R., Choe, M. K., and Brauner–Otto, S. R. (2016). The Emergence of Two Distinct Fertility Regimes in Economically Advanced Countries. *Population Research and Policy Review, 35*(3): 1–18.

Rondinelli, C., Aassve, A., and Billari, F. C. (2010). Women's wages and childbearing decisions: Evidence from Italy. *Demographic Research, 22*: 549–578.

Rotkirch, A., and Miettinen, A. (2017). Childlessness in Finland. In: Kreyenfeld, M., and Konietzka, D. (Ed.) *Childlessness in Europe: Contexts, Causes, and Consequences*. New York: Springer: 139–158

Rowland, D. T. (2007). Historical Trends in Childlessness. *Journal of Family Issues, 28*(10): 1311–1337.

Rubery, J., Smith, M., and Fagan, C. (1998). National working–time regimes and equal opportunities. *Feminist Economics, 4*(1): 71–101.

Rubinstein, R. L. (1987). Childless elderly: Theoretical perspectives and practical concerns. *Journal of Cross-Cultural Gerontology, 2*(1): 1–14.

Rutigliano, R., and Esping-Andersen, G. (2018). Partnership Choice and Childbearing in Norway and Spain. *European Journal of Population, 34*(3): 1–20.

Salib, E., El–Nimr, G., Habeeb, B., and Theophanous, M. (2004). Childlessness in Elderly Suicide: An analysis of coroner's inquests of 200 cases of elderly suicide in Cheshire 1989–2001. *Medicine, Science and the Law*, 44(3): 207–212.

Saraceno, C., and Keck, W. (2011). Towards an integrated approach for the analysis of gender equity in policies supporting paid work and care responsibilities. *Demographic research*, *25*: 371–406.

Scherer, S., and Steiber, N. (2007). Work and family in conflict? The impact of work demands on family life. *Employment Regimes and the Quality of Work,* 137–178.

Schnettler, S., and Wöhler, T. (2016). No children in later life, but more and better friends? Substitution mechanisms in the personal and support networks of parents and the childless in Germany. *Ageing and Society, 36*(7): 1–25.

Schofer, E., and Meyer, J. W. (2005). The worldwide expansion of higher education in the twentieth century. *American Sociological Review, 70*(6): 898–920.

Schröder–Butterfill, E., and Marianti, R. (2006). A framework for understanding old–age vulnerabilities. *Ageing and Society, 26*(1): 9–35.

Shanas, E. (1971). Measuring the home health needs of the aged in five countries. *Journal of Gerontology, 26*(1): 37–40.

Shani, C., Yelena, S., Reut, B. K., Adrian, S., and Sami, H. (2016). Suicidal risk among infertile women undergoing in–vitro fertilization: Incidence and risk factors. *Psychiatry Research, 240*: 53–59.

Shankar, A., McMunn, A., Demakakos, P., Hamer, M., and Steptoe, A. (2017). Social isolation and loneliness: Prospective associations with functional status in older adults. *Health psychology, 36*(2): 179

Silverstein, M., and Giarrusso, R. (2010). Aging and family life: A decade review. *Journal of marriage and family*, *72*(5): 1039–1058.

Skirbekk, V. (2008). Fertility trends by social status. *Demographic research*, *18*(5): 145–180.

Sobotka T., Testa M.R. (2008). Attitudes and Intentions Toward Childlessness in Europe. In: Höhn, C., Avramov, D., and Kotowska, *I.E.* (Eds.) *People, Population Change and Policies. European Studies of Population*, vol 16/1. Springer: Dordrecht: 177–211.

Sobotka, T. (2004). *Postponement of childbearing and low fertility in Europe.* Amsterdam: Dutch University Press.

Sobotka, T. (2004a). Is lowest–low fertility in Europe explained by the postponement of childbearing*? Population and Development Review, 30*(2), 195–220.

Sobotka, T. (2004b). Postponement of Childbearing and Low Fertility in Europe. Dutch University Press Amsterdam.

Sobotka, T. (2010). Shifting parenthood to advanced reproductive ages: Trends, causes and consequences. In: Tremmel, J. C. (Ed.) *A young generation under pressure?* Berlin, Heidelberg: Springer-Verlag: 129–154

Sobotka, T. (2017). Childlessness in Europe: Reconstructing Long–Term Trends Among Women Born in 1900–1972. In: Kreyenfeld, M., and Konietzka, D. (Ed.) *Childlessness in Europe: Contexts, Causes, and Consequences*. New York: Springer: 17–53.

Sobotka, T., and Testa, M. R. (2008). Attitudes and intentions toward childlessness in Europe. In: Sobotka, T., Testa, M. R., Höhn, C., Avramov, D., and Kotowska, I. E. (2008*). People, population change and policies*. Springer: 177–211.

Sobotka, T., Skirbekk, V., and Philipov, D. (2011). Economic recession and fertility in the developed world. *Population and Development Review, 37*(2), 267–306.

Spéder, Z., and Kapitány, B. (2015). Influences on the link between fertility intentions and behavioural outcomes. In: Philipov, D., Liefbroer, A. C., and Klobas, J. E. (Ed.), (2015). *Reproductive decision–making in a macro–micro perspective.* Dordrecht: Springer Netherlands: 79–112

Surkyn, J., and Lesthaeghe, R. J. (2004). Value orientations and the second demographic transition (SDT) in Northern, Western and Southern Europe: An update. *Demographic Research, 3*, 45–86.

Tanturri, M. L., and Mencarini, L. (2008). Childless or childfree? Paths to voluntary childlessness in Italy. *Population and Development Review, 34*(1): 51–77.

Tanturri, M. L., Mills, M., Rotkirch, A., Sobotka, T., Takács, J., Miettinen, A., Faludi, C., Kantsa, V. and Nasiri, D. (2015). State–Of–The–Art Report: Childlessness in Europe. FamiliesAndSocieties (FamiliesAndSocieties Working Paper 32).

Te Velde, E. R., and Pearson, P. L. (2002). The variability of female reproductive ageing. *Human Reproduction Update, 8*(2): 141–154.

Testa, M. R. (2014). On the positive correlation between education and fertility intentions in Europe: Individual–and country–level evidence. *Advances in life course research*, *21*: 28–42.

Testa, M. R., and Basten, S. (2014). Certainty of meeting fertility intentions declines in Europe during the 'Great Recession.' *Demographic Research, 31*(23): 687–734.

Testa, M. R., and Stephany, F. (2017). The educational gradient of fertility intentions: a meta–analysis of European studies. *Vienna Yearbook of Population Research, 15*: 293–330.

Testa, M.R. and Bolano D. (2018). From intentions to birth: Gendered paths of realization in a multi–dimensional life course perspective. In: Kapella, O., Schneider, N., and Rost, H. (ed.) Familie–Bildung–Migration: Familienforschung Im Spannungsfeld Zwischen Wissenschaft, Politik Und Praxis. Tagungsband Zum 5. Europäischen Fachkongress Familienforschung. Opladen, Berlin and Toronto:Verlag Barbara Budrich: 105–127.

The European IVF–Monitoring Consortium (EIM), for the European Society of Human Reproduction and Embryology (ESHRE), M.S. Kupka, T. D'Hooghe, A.P. Ferraretti, J. de Mouzon, K. Erb, J.A. Castilla, C. Calhaz–Jorge, Ch. De Geyter, V. Goossens, Assisted reproductive technology in Europe, 2011: results generated from European registers by ESHRE, Human Reproduction, 31(2): 233–248.

Thévenon, O. (2013)*, Drivers of Female Labour Force Participation in the OECD*, OECD Social, Employment and Migration Working Papers, No. 145, OECD Publishing, Paris.

Thomson, E. (1997). Couple childbearing desires, intentions, and births. *Demography, 34*(3): 343–354.

Thornton, A., Axinn, W. G., and Xie, Y. (2008). *Marriage and cohabitation*. University of Chicago Press.

Tilvis, R. S., Laitala, V., Routasalo, P. E., and Pitkälä, K. H. (2011). Suffering from loneliness indicates significant mortality risk of older people. *Journal of aging research*.

Tocchioni, V. (2018). Exploring the childless universe: Profiles of women and men without children in Italy. *Demographic Research, 38*(19): 451–470.

Tomassini, C., Kalogirou, S., Grundy, E., Fokkema, T., Martikainen, P., Van Groenou, M. B., and Karisto, A. (2004). Contacts between elderly parents and their children in four

European countries: current patterns and future prospects. *European Journal of Ageing*, *1*(1): 54–63.

Torr, B. M., and Short, S. E. (2004). Second births and the second shift: A research note on gender equity and fertility. *Population and Development Review, 30*(1): 109–130.

Tosi, M., and Grundy, E. (2018). Intergenerational contacts and depressive symptoms among older parents in Eastern Europe. *Aging and mental health*, 1–7.

Toulemon, L., and Testa, M. R. (2005). Fertility intentions and actual fertility: A complex relationship. *Population and Societies 415*(4): 1–4.

Trappe, H., and Kuhnt, A.–K. (2016). Channels of social influence on the realization of short–term fertility intentions in Germany. *Advances in Life Course Research, 27*: 16–29.

Umberson, D. (1987). Family status and health behaviors: Social control as a dimension of social integration. *Journal of health and social behaviour*: 306–319.

Umberson, D., and Gove, W. R. (1989). Parenthood and psychological well–being: Theory, measurement, and stage in the family life course. *Journal of family issues*, *10*(4): 440–462.

Umberson, D., and Karas Montez, J. (2010). Social relationships and health: A flashpoint for health policy. *Journal of health and social behavior*, 51(1_suppl), S54–S66.

Van Baarsen, B., Snijders, T. A., Smit, J. H., and Van Duijn, M. A. (2001). Lonely but not alone: Emotional isolation and social isolation as two distinct dimensions of loneliness in older people. *Educational and Psychological Measurement*, *61*(1): 119–135.

Van Bavel, J. (2006). The effect of fertility limitation on intergenerational social mobility: the quality–quantity trade–off during the demographic transition. *Journal of Biosocial Science*, *38*(4): 553–569.

Van Bavel, J. (2010). Choice of study discipline and the postponement of motherhood in Europe: The impact of expected earnings, gender composition, and family attitudes. *Demography, 47*(2): 439–458.

Van Bavel, J. (2012). The reversal of gender inequality in education, union formation and fertility in Europe. *Vienna Yearbook of Population Research*, *10*(1): 127–154.

Van de Kaa, D. J. (1987). Europe's second demographic transition. *Population Bulletin, 42*(1): 1–59.

Van de Kaa, D. J. (2001). Postmodern fertility preferences: from changing value orientation to new behavior. *Population and Development Review, 27*: 290–331.

Van de Kaa, D. J. (2002). The idea of a second demographic transition in industrialized countries. *Birth*: 35–45.

Van Gaalen, R. I., and Dykstra, P. A. (2006). Solidarity and conflict between adult children and parents: A latent class analysis. *Journal of Marriage and Family, 68*(4): 947–960.

Veevers, J. (1973). Voluntary Childlessness: A Neglected Area of Family Study. *The Family Coordinator, 22*(2): 199–205.

Veevers, J. E. (1972). The violation of fertility mores: voluntary childlessness as deviant behaviour. In: Boydell, C. L., Grindstaff, C. F. and Whitehead, P. C. (Ed.), *Deviant behaviour and societal reaction.* Toronto: Holt, Rinehart and Winston of Canada: 571–592.

Veevers, J. E. (1975). The moral careers of voluntarily childless wives: Notes on the defense of a variant world view. *Family Coordinator*, 473–487.

Veevers, J. E. (1980). *Childless by choice*. Toronto: Butterworths.

Vignoli, D., Drefahl, S., and De Santis, G. (2012). Whose job instability affects the likelihood of becoming a parent in Italy? A tale of two partners. *Demographic Research, 26*(2): 41–62.

Vikat, A., Spéder, Z., Beets, G., Billari, F. C., Bühler, C., Désesquelles, A., Tineke Fokkema, T., Hoem, J.M., MacFonald, A., Neyer, G., Pailhé, A., Pinnelli, A., and Solaz, A. (2007). Generations and gender survey: Concept and design. In: UNECE (Ed.): *Generations and Gender Programme. Concepts and Guidelines.* New York, Geneva: United Nations: 1–32.

Vitali, A., and Arpino, B. (2016). Who brings home the bacon? The influence of context on partners' contributions to the household income. *Demographic Research, 35*: 1213–1244.

Vitali, A., Billari, F. C., Prskawetz, A., and Testa, M. R. (2009). Preference Theory and Low Fertility: A Comparative Perspective. *European Journal of Population, 25*(4): 413–438.

Walker, J. R. (1995). The effect of public policies on recent Swedish fertility behavior. *Journal of Population Economics, 8*(3): 223–251.

Weiss, R. S. (1973). *Loneliness: The experience of emotional and social isolation*. Cambridge, MA, US: The MIT Press.

Wenger, G. C. (2009). Childlessness at the end of life: evidence from rural Wales. *Ageing and Society*, *29*(8): 1243–1259.

Wenger, G. C., and Burholt, V. (2001). Differences over time in older people's relationships with children, grandchildren, nieces and nephews in rural North Wales. *Ageing and Society, 21*(5): 567–590.

Wenger, G. C., Dykstra, P. A., Melkas, T., and Knipscheer, K. C. (2007). Social embeddedness and late–life parenthood: Community activity, close ties, and support networks. *Journal of family issues*, *28*(11): 1419–1456.

Wenger, G. C., Scott, A., and Patterson, N. (2000). How important is parenthood? Childlessness and support in old age in England. *Ageing and Society, 20*(2): 161–182.

Westoff, C. F., and Ryder, N. B. (1977). The predictive validity of reproductive intentions. *Demography, 14*(4): 431–453.

Wood, J., Neels, K., and Kil, T. (2014). The educational gradient of childlessness and cohort parity progression in 14 low fertility countries. *Demographic Research, 31*: 1365–1416.

Wu, Z., and Hart, R. (2002). The mental health of the childless elderly. *Sociological Inquiry, 72*(1): 21–42.

Wu, Z., and Pollard, M. S. (1998). Social support among unmarried childless elderly persons. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 53*(6): S324–S335.

Yang, Y., and Morgan, S. P. (2003). How big are educational and racial fertility differentials in the US?. *Social biology, 50*(3–4): 167–187.

Zaidi, B., and Morgan, S. P. (2017). The Second Demographic Transition Theory: A Review and Appraisal. *Annual Review of Sociology, 43*: 473–492.

Zhang, J., Quan, J., and Van Meerbergen, P. (1994). The effect of tax–transfer policies on fertility in Canada, 1921–88. *Journal of Human Resources*: 181–201.

Zhang, Z., and Hayward, M. D. (2001). Childlessness and the Psychological Well–Being of Older Persons. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 56(5): S311–S320.

Zoutewelle–Terovan, M., and Liefbroer, A. C. (2017). Swimming against the stream: Non–normative family transitions and loneliness in later life across 12 nations. *The Gerontologist*, *58*(6): 1096–1108.